FINAL REPORT

Technical Guidelines for the Design and Operation of Wood Preservation Facilities, 2004

Technical Guidance Document

Prepared for
Environment Canada
TRD Assessment/Implementation Working Group
Manufacturers/Treaters Steering Committee
Wood Preservation Sector Strategic Options Process

Prepared by

D. E. Konasewich
G. E. Brudermann

INTRODUCTION

Environment Canada's publication entitled, "Recommendations for the Design and Operation of Wood Preservation Facilities, 2004: Technical Recommendations Document" (2004 TRD), identifies the design features and operating practices that the wood preservation sector must implement in order to control the release from their facilities of those substances that have been identified as toxic under the terms of the *Canadian Environmental Protection Act, 1999*. These substances are referred to as CEPA-toxic.

During the period April to October, 2000, the 66 wood preservation plants then operating in Canada were evaluated under Environment Canada's Assessment 2000 Program to determine the degree of compliance of each plant with the detailed requirements of the 1999 TRD[i]. This program, administered by the Canadian Institute of Treated Wood (CITW), involved detailed inspections of the plants in accordance with the "TRD Assessment Protocol," an unpublished Environment Canada document.

During the course of Assessment 2000 it was determined that plants would not be able to achieve a uniform level of compliance with the 1999 TRD, due to the fact that many items in the TRD assessment protocol are open to interpretation. Furthermore, the TRD itself does not contain sufficient information to allow the plants to prepare comprehensive implementation plans (IPs), which will ensure a consistent approach to the correction of deficiencies identified in the assessment process. This situation has created the need to provide Canadian wood preservation plants with further information, in the form of a Technical Guidance Document (TGD), so that they can develop implementation plans, which will ensure uniform compliance with the requirements of the current TRD. An unpublished version of the TGD was in use prior to the publication of this updated 2004 TGD on CD.

2.0 OBJECTIVE

The objective of this document is to provide Canadian wood preservation plants with the information they need to prepare IPs to consistent standards, based on best available technology.

Thus, the 2004 TRD and this document provide plants with the basic information they need to achieve uniform compliance with the TRD. As a result, plants will be able to manage the environmental and public health risks posed by the toxic chemicals they use, in accordance with the *Canadian Environmental Protection Act, 1999*.

3.0 TECHNICAL GUIDANCE DOCUMENT

The document comprises individual sets of guidelines for each of the eight types of facilities currently used by the industry, broken down by preservative and treatment:

- Alkaline copper quaternary (ACQ)
- Ammoniacal copper zinc arsenate (ACZA).
- Chromated copper arsenate (CCA).
- Copper azole (CA-B)
- Creosote and creosote/oil solutions (CREO).
- Inorganic boron (borate)
- Pentachlorophenol/oil solutions applied by pressure treatment (PCPP)
- Pentachlorophenol/oil solutions applied by thermal treatment. (PCPT)

The guidelines for each type of facility have been organized along the same lines as the "TRD Assessment Protocol*" w*orksheets, which formed the basis of the "TRD Assessment Report" that was provided to each plant as part of the Assessment 2000 Program. This guideline format has been designed to allow plants to interpret their TRD assessment results in a consistent manner. To facilitate the preparation of IPs, this document links each question in the assessment protocol with TRD references and articulates a specific guideline, which explains the requirements for TRD compliance.

The guidelines include numerous references to various codes and standards, such as those of the Canadian Standards Association (CSA), American Wood-Preservers Association (AWPA), American Petroleum Institute (API), Canadian Council of Ministers of the Environment (CCME), National Fire Code of Canada (NFCC), and so on. It is necessary for plants to obtain copies of the requisite documents to ensure that their IPs comply with the most up-to-date TRD.

The page references provided in the earlier version of this guideline have been deleted to facilitate this and future updates. Note that some table numbers have changed in the updated TRD.

This document has been prepared by the following alliance of consulting expertise:

- FRIDO Consulting, Halfmoon Bay, B.C.
  G. E. Brudermann, Principal.

- Hemmera Envirochem Inc., Vancouver, B.C.
  Dr. D. E. Konasewich P. Eng., Vice President.
  P. E. Lowery P. Eng., Environmental Engineer.

This *Technical Guidance Document* has been reviewed and approved by the TRD Assessment/Implementation Working Group, which includes chemical suppliers and treating industry representatives.

4.0 IMPLEMENTATION PLAN CONTENT

The TRD Assessment/Implementation Working Group has determined that individual IPs shall contain the following information:

- general information about the plant,
- a statement of senior level commitment,
- the overall goals and objectives of the plant with respect to achieving TRD compliance,
- a summary of the TRD assessment results, including the assessment contractor's recommendations,
- a list of the deficient items to be addressed, together with associated timelines,
- a list of the actions to be taken to address the deficiencies, including the rationale for choosing the specific actions, a discussion of alternatives that may have been considered and an explanation of how priorities were established and applied to determine the list of actions, and
- a list of the organizations and individuals with whom the plant had discussions regarding the content and preparation of the IP.

This *Technical Guidance Document* is complementary to the TRD and must be used in conjunction with the TRD to prepare an IP. Although these guidelines represent best available technology, it should be noted that alternative methodology may be proposed in an IP, provided that the alternative methodology clearly meets the objectives of the TRD.

Whenever a plant has to comply with a guideline that requires engineering assessment, evaluation, inspection, testing or any other type of work by a third party, the action identified in the IP must be supported by a proposal from the third party, which clearly defines the details and scope of the work to be undertaken. For example, the requirement for site monitoring and workplace monitoring plans, in section 11 of each set of guidelines, must be addressed by providing detailed proposals from the environmental consultant and the industrial hygienist selected by the plant. These proposals must clearly describe the methodology that will be used to develop and implement the plans.

It should be noted that compliance with the TRD requirement for secondary containment by the use of an impermeable coating will represent a challenge for many plants. The application of a coating to a contaminated concrete surface, to achieve impermeability, is a complex problem, which should not be underestimated. Therefore, it is strongly recommended that plants seek expert assistance from manufacturers, contractors and applicators, who are experienced in the area of industrial coatings for chemical plants, to ensure that they achieve compliance with the coating performance requirements specified in the guidelines. Plants that have to apply a coating to achieve secondary containment should insist on contracts and warranties with suppliers, contractors and applicators, that will adequately protect their interests. Plants must ensure that their IPs include a detailed proposal from a coatings manufacturer, contractor and/or applicator, which clearly describes the methodology that will be used to achieve TRD compliance.

Plants that already have coatings as secondary containment must have the coating evaluated by an accredited testing agency to determine whether it meets the hydraulic

conductivity or permeability rating specified in the guidelines. The results of this evaluation must be included in the IP.

All plants must include a commitment in their IP to inspect secondary containment coatings annually and carry out repairs when and where necessary.

Whenever the guidelines specify that paving or floors shall be impermeable, or impervious, the paving or floors must have a hydraulic conductivity, or permeability rating, of $1x10^{-7}$ cm/sec or less and be resistant to the chemicals in use at the plant. It should be noted that uncoated concrete that was not sealed at the time of construction will not meet this permeability rating. Therefore a suitable coating will be required to achieve an impermeable surface.

Plants must check the guideline provided for every item in the Technical Guidance Document, regardless of the score they received in their assessment report, to determine which items they need to address in their IP. The reasons for this are as follows:

- During Assessment 2000, some procedures and/or equipment could not be verified or inspected and information supplied by the plant was used to determine the scores for those items.
- The TRD Assessment/Implementation Working Group's detailed review of the earlier unpublished *Technical Guidance Document* has resulted in more specific requirements for some items and more general requirements for others.

Plants must not assume that they do not need to take action because their assessment report shows a "YES" score for a particular item. Plants must check each item in the "TRD Assessment Protocol" worksheets against the corresponding guideline to determine the specific action that must be included in their IP.

Following the submission, verification and approval of individual IPs, plants will initiate the work required to achieve TRD compliance. All plants will submit annual progress reports, and some will be inspected each year, to verify the details of the completed work. Plants will be required to complete the required work by 2005 and then undergo a final audit, which will examine each item in the 2004 assessment protocol. At that time all plants will be expected to have achieved compliance with the objectives of the TRD.

[i] Environment Canada. 1999. Recommendations for the Design and Operation of Wood Preservation Facilities. Prepared for the National Office of Pollution Prevention, Environment Canada, and the Canadian Institute of Treated Wood by G.E. Brudermann, Frido Consulting. Binder.

PENTACHLOROPHENOL PRESSURE (PCPP) FACILITY TECHNICAL GUIDELINES

2004

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.1 ACCESS/SECURITY**		
1. Is off-loading area located away from high yard traffic routes?	General Table 3 PCPP Table 8	• Ideally, off-loading area for oil and solid PCP should be located away from any traffic. If relocation is impractical, traffic must be controlled by DANGER signs, barriers and constant supervision during unloading operations.
2. Is vehicle access restricted during delivery?	General Table 3 PCPP Table 8	• All vehicles, including contractors' trucks and visitors' vehicles must be restricted from the off-loading area by DANGER signs, barriers and constant supervision during unloading operations.
3. Are there locking valves on liquid delivery lines?	General Table 3 PCPP Table 8	• Oil delivery lines must be securely locked when not in use.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT FOR OIL DELIVERY**		
4. Is an unloading pad and catchment sump used?	General Table 3 PCPP Table 8	• An impervious pad must be provided, large enough in area to hold the full length of the truck or tank car. • The pad must be constructed so that any spill will be diverted to a leak-proof sump and/or containment, large enough to handle the entire volume of oil contained in the truck or tank car.
5. Are impervious construction materials used?	General Table 3 PCPP Table 8	• Pad and sump surfaces must have a hydraulic conductivity or permeable rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3 m and must be resistant to oil. • Materials and specifications should be developed in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior relevant experience.
6. Are liquid-tight joints sealed with chemical resistant material?	General Table 3 PCPP Table 8	• All joints in the pad must be sealed with oil resistant caulking that complies with the requirements defined in Section 1.2.9. • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, all sump joints must be sealed with oil resistant caulking that complies with the requirements defined in Section 1.2.9.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT FOR OIL DELIVERY CONT'D**		
7. Are pads designed to contain large (tanker) spills or does diversion to contained area exist?	General Table 3 PCPP Table 8	• The unloading pad must be constructed so that it will allow containment of the entire volume of oil in the truck or tank car.
8. Are pads and sumps free of settling and cracks?	General Table 3	• Pads and sumps must be designed to prevent settling and/or cracking. • Any visibly open cracks must be repaired with oil resistant caulking, using procedures that will ensure a liquid-tight seal. Evident or suspected settling must be evaluated by a certified engineer to determine the structural integrity of the pad and/or sump.

SECTION/CRITERIA	TRD REF.	GUIDELINE
9. Are pads and sumps lined?	General Table 3	• Secondary containment for this area is good practice and is required by some Provinces. • Secondary containment may be achieved by installing a subsurface membrane liner or by applying an impervious coating to the pad and sump surfaces. • Surface sealers, surface coatings and joint and crack sealants must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m. In addition they must be resistant to the chemicals in use at the plant and must have the physical properties (compressive, tensile and flexural strength), the abrasion and wear resistance and lifetime requirements, suitable for the intended application. The performance requirements for sealers and coatings will vary in different areas of the plant. For example, the drip pad represents the most severe application, due to constant exposure to chemical solutions, vehicle traffic and cleaning processes, while cylinder and tank farm containment areas, with occasional chemical exposure and foot traffic, represent a less stringent application. Sealers, coatings and sealants and their application technology must be determined in consultation with a manufacturer with experience in the field. A list of experienced manufacturers of sealers, coatings and sealants may be obtained from the chemical supplier. • See Introduction for further information.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 CONTAINMENT FOR SOLID PCP DELIVERY**		
10. Is unloading pad paved and with curbs?	PCPP Table 8	• Unless PCP is delivered in lined, sealed, steel drums or double wrapped block packages (e.g., with a fabric outer wrapping that totally encloses the package), a paved, curbed and roofed pad must be provided.
11. Is the pad drained to a containment?	PCPP Table 8	• If a pad is required, it must be contained or drained to a containment.
12. Is the pad roofed?	PCPP Table 8	• See 1.3.10 above.
13. Is a vacuum cleaner available?	PCPP Table 8	• A vacuum cleaner with a filtered exhaust must be readily available for unloading, storage and mixing operations.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.4 DELIVERY/TRANSFER EQUIPMENT**		
14. Is all equipment/piping in accordance with NFCC?	PCPP Table 8	• Equipment and piping must be installed in accordance with the National Fire Code of Canada (NFCC) Section 4.4 and 4.6. • Facilities must be available to allow unloading procedures as per Section 4.11 of the NFCC
15. Is all transfer equipment in a contained area?	PCPP Table 8 General Table 3	• PCP block packages and steel drums containing PCP must be securely sealed during transport to the mixing operation. Bags and drums manufactured from easily damaged materials such as paper, plastic and cardboard must not be transported over unpaved ground, unless they are transported in a contained carrier. For oil transfer, the vehicle, piping, valves and transfer pumps must be contained.
16. Are pipes and valves clearly identified?	General Table 3	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves and caplocks must be clearly labeled. • Identification must be in accordance with NFCC Section 4.4.4.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.4 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
17. Are delivery lines rigid, accessible and visible?	General Table 3	• There must be easy access to allow inspection, leak detection and maintenance of delivery lines. • Flexible hoses connecting railcars and trucks to tank piping must be shielded. All other piping must be rigid, permanent and of the appropriate material and schedule and with the required compatibility. • New and replacement piping shall not be buried. • Any existing buried piping must have secondary containment with provision for leak detection designed by a qualified engineer.
18. Is piping protected from mechanical damage?	General Table 3	• All piping must be protected to prevent damage by any means, such as the oil delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
19. Are hose and pipe connections designed to be secure?	General Table 3	• All hose and pipe connections must be leak tight. • Connections shall be located and constructed as per NFCC 4.3.6.4.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.4 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
20. Are pipes connected for top delivery to tanks?	General Table 3	• Different approaches may be used, including bottom delivery, top delivery, or top delivery into a drop tube that extends to the bottom of the tank. Systems with bottom delivery must have a double system of back flow preventors, approved by a qualified engineer. • The piping at the connection point between the storage tank system and the delivery truck or rail car shall be configured to prevent spillage when lines are disconnected.
21. Are back-flow preventors installed on delivery lines?	General Table 3	• Ensure back-flow of oil cannot occur under any circumstances or install a reliable back-flow preventor. • NFCC 4.6.4.3 requires that systems through which tank cars or tank vehicles discharge into above ground storage tanks, by means of pumps, shall be provided with check valves at the appropriate location in the system.
22. Is the delivery system totally visible from the point of off-loading to tankage?	General Table3	• "Totally visible" means from the truck controls to the oil storage tank.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.4 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
23. If visibility is limited, are audible alarms installed on tanks to detect overflow?	General Table 3	• Alarms must be audible at the locations where personnel are constantly on duty during the transfer operation, and must promptly stop or divert the flow. (CCME-EPC-LST-71E) • Alarm function must be tested weekly and prior to delivery of oil. • Alarm tests must be recorded and kept on file.
24. Is spill response equipment, absorbents and personnel protection equipment available and readily accessible?	General Table 3 PCPP Table 7	• Personal protection equipment must comply with TRD Reference PCPP, Table 7. Spill response equipment must be site specific, and must be in accordance with the preservative supplier's recommendations. • Equipment inventory must be checked weekly and logged and must be complete at all times. Location of equipment storage must allow prompt response to emergency situations.
25. Is the off-loading area equipped with a phone or a manual alarm switch?	General Table 3	• There must be a manual alarm in the off-loading area that is audible throughout the plant. • The alarm function must be tested weekly and prior to the delivery of oil. Alarm tests must be recorded and kept on file. • A phone and/or 2-way radio is also required to arrange any assistance that may be required.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY**		
1. Is there 24-hour security?	General Table 4 PCPP Table 9	• Systems and procedures must be in place to prevent unauthorized access to the chemical storage area on a 24 hour basis. • Examples include a restricted area policy, locked buildings with security monitoring alarms, locked buildings with security patrols, fencing of the storage areas as per NFCC Section 3.3.2.6, or fencing of a larger area that includes the storage area.
2. Are tank drain valves locked?	General Table 4 PCPP Table 9	• Any valve that could cause the release of chemical, as a result of unauthorized use, must be locked. • Examples include, sampling valves, drain valves and unloading and loading line valves.
3. Are tanks protected from mechanical impact?	General Table 4 PCPP Table 9	• All tanks must be protected to prevent damage by any means, such as the oil or PCP delivery truck, plant mobile equipment, wood piles, stored equipment, etc. • Tanks installed close to external walls that could be breached by mobile equipment and/or truck accidents require special attention.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY CONT'D**		
4. Are PCP blocks/bags stored in a locked area?	PCPP Table 9	• PCP must be stored in sealed bags, drums or wrapped block packages inside a ventilated building which is locked at all times.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE**		
5. Are tanks in sound physical condition, with no rust or damage?	General Table 4 PCPP Table 9	• All tanks must comply with NFCC Section 4.3 and "Technical Guidelines for Above Ground Storage Tank Systems Containing Petroleum Products," Canada Gazette, Part 1, August 17, 1996. • CCME-EPC-LST-61E requires daily inspections plus a thorough annual inspection. API 653 requires ultrasonic thickness testing at 5 year intervals and internal inspections at intervals not exceeding 20 years. • Inspections and tests must be recorded and kept on file.
6. Are underground tanks leak tested at least annually?	General Table 4 General Table 11	• It should be noted that leak testing will not prevent chemical release as leaks of .0.5 gals/hour and less cannot be detected. • Underground tanks should be removed and replaced with above ground tanks and must not be used in new construction. • If removal and replacement is impractical for an existing tank, it must have a leak detection system designed by a certified engineer. • All underground tanks must be tested annually and certified as suitable for the intended use, by an accredited testing company or agency. Tanks must conform to CCME, EPC-LST-61E, March 1993. • Tests must be recorded and kept on file.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
7. Are aboveground tanks mounted on containment pad surfaces?	General Table 4	• Tanks should be installed as per Section 4.3 of the NFCC and Section 3.5 of CCME-EPC-LST-71E. Existing tanks should be arranged as per Section 4.3 of the NFCC and Part 4 of CCME-EPC-LST-71E. • Tank bases must not be embedded in, or be encased by concrete. • Preferably, vertical tanks should be mounted on raised supports on containment pad surfaces. • If tanks must be in contact with pad surfaces, a monthly assessment of external corrosion must be carried out with ultrasonic testing every 5 years. • The tank containment floor must be kept clean and dry, to allow immediate detection of leaks.
8. Are tanks mounted in stable positions and anchored securely?	General Table 4	• Tanks must be mounted in stable positions and must be anchored if flooding of the containment by storm water or a spill would exert uplift forces. (NFCC 4.3.3)

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
9. Are tanks located in dyked area?	General Table 4	• All chemical storage tanks must be installed in a dyked containment. • In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
10. Are all interior tanks vented outside (or into recovery system)?	PCPP Table 9 General Table 4	• Tanks must be provided with vent piping for vapour control, as per NFCC Section 4.3. • Interior tanks must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow.
11. Are all insulated tanks provided with inspection points?	General Table 4	• Preferably, tanks should be raised on supports to allow leaks to be readily detected. • Whether tanks are raised or not, the tank farm floor must be kept clean and dry to allow immediate leak detection. • The lower 6" of insulated tanks must not be insulated to allow leaks to be readily detected or tanks must be provided with inspection points.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
12. Are tank vents controlled?	PCPP Table 9 General Table 4	• Tanks must be provided with vent piping for vapour control, as per NFCC Section 4.3. • Vents must be protected against release of entrained liquids or overflow. • Tanks must not vent directly into the workplace.
13. Are tanks equipped with electric bonding?	PCPP Table 9	• Electric bonding/grounding must be provided on all tanks in accordance with NFCC, Sections 4.3.12.10, 4.6.4.5 and 4.11.3.2. • The bonding systems must be checked for electrical continuity on a monthly basis.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT**		
14. Is piping rigid and permanent throughout the operation?	General Table 4 PCPP Table 9	• With the exception of the connection between the delivery vehicle and the storage tank, all piping must be rigid, permanent, of the appropriate material and schedule and must conform to Section 4.4 of the NFCC.
15. Is piping visible and accessible with a simple layout?	General Table 4 PCPP Table 9	• Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
16. Is piping above ground?	General Table 4 PCPP Table 9	• In general, all piping must be visible and readily accessible for leak detection and maintenance. • Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or piping must be brought above ground. • Underground piping is not allowed in new construction. • If there is no alternative to underground piping in existing construction, it must be installed in appropriate containment with provision for leak detection, designed by a qualified engineer. • Sub-grade piping must meet the requirements in Section 3.9 of CCME-EPC-LST-71E.
17. Is containment provided for sub-grade piping?	General Table 4 PCPP Table 9	• Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or piping must be brought above ground. • Underground piping must be installed in appropriate containment with provision for leak detection as per Section 3.9 of CCME-EPC-LST-71R.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
18. Are piping and fixtures chemically compatible?	General Table 4 PCPP Table 9	• Piping and fixtures must be compatible with PCP/oil solutions. • Any questions and/or uncertainties must be resolved with the chemical supplier.
19. Are valves identified by labeling or colour-coding?	General Table 4	• Valves must be labeled or colour coded. • The label or colour code must identify the valve function in accordance with the piping schematic in 2.3.15. • Colour coding must meet the requirements of NFCC Section 4.4.2.
20. Are valves and pipes protected from impact?	General Table 4	• All valves and piping must be protected to prevent damage by any means, such as the oil or PCP delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
21. Are lines protected from freezing (where applicable)?	General Table 4	• Heating may be used to enhance the transfer of solutions, and if used, must be in accordance with Section 4.4.9 of the NFCC.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
22. Do valves have local drip/spill catch trays?	General Table 4	• Valves must be installed properly and maintained regularly to prevent leakage. • The tank farm floor must be kept clean and dry to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. • Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid must be cleaned out.
23. Do pumps have local drip/spill catch trays?	General Table 4	• All pumps handling oil or PCP/oil solutions must have self-contained spill trays large enough to prevent contamination of the containment area. • There must be no free oil or solution on the containment floor. • Spill trays must be inspected daily and any free liquid must be cleaned out.
24. Is piping system designed to protect against inadvertent transfers?	General Table 4	• Pipes and valves must be clearly identified and operating instructions explicitly defined. • Manual systems must not be operated by untrained personnel. • Where there is common piping in multi-preservative plants, blocking systems must be in place to prevent inadvertent transfer of solutions.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
25. Are reliable, accurate level indicators installed?	General Table 4	• All level indicators must be checked regularly and calibrated every 6 months, where appropriate. • Calibration records must be kept on file.
26. Is mechanical impact protection functional on sight glasses?	General Table 4	• Protection system must prevent sight glasses from being damaged or accidentally disconnected.
27. Are shut-off valves functional on all rupturable lines and gauges?	General Table 4	• Any line or gauge that can be easily damaged or accidentally disconnected must be fitted with an automatic shut-off valve. • Examples include sight glasses, instrument tubing, etc. • Vulnerable sampling valves on tanks must be physically protected.
28. Is overflow piping provided from tanks to containment?	General Table 4	• Preferred design is to connect all tanks to a dedicated PCP/oil overflow tank, otherwise, overflow piping must extend to a contained sump with provision for recycling to a storage tank. • Overflow tanks and pipes must be vented to the exterior with provision to prevent the release of entrained liquids or overflow. • Open manholes on tanks are not permitted.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
29. Are independent high-level alarms installed on tanks?	General Table 4 PCPP Table 9	• All tanks must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly. Test records must be kept on file.
30. Are high-level alarms interlocked to the pump auto-shut off?	General Table 4	• Alarms must immediately prevent any increase in the solution level in the tank, either by shutting off the pump or by closing the appropriate valve.
31. Is there a 24-hr. monitoring alarm?	General Table 4	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly. Test records must be kept on file.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
32. Are there manual alarm buttons at potential major spill points?	General Table 4	• The chemical receiving, storage and treating cylinder areas must be adequately protected by manual alarms. • The function of all alarms must be tested and recorded weekly. Test records must be kept on file.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT**		
33. Are containment floors, dykes and joints structurally sound?	General Table 4 PCPP Table 9	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer.
34. Are containment surfaces and joints sealed?	General Table 4 PCPP Table 9	• Tank farm containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.
35. Is a secondary containment barrier built into the containment area? (e.g. impermeable top coat or liner under the containment area).	General Table 4	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. The membrane liner must be resistant to PCP/oil solutions. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath tanks, together with a leak detection system, as per 2.4.36. • The coating must comply with the requirements defined in Section 1.2.9.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
36. Is subsurface leak detection provided?	General Table 4	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. • Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.
37. Is the spill containment volume in compliance with NFCC?	General Table 4 PCPP Table 9	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
38. Are there provisions to direct, collect and transfer spills, washdown liquids, and infiltrating water to tankage?	General Table 4	• Provisions must ensure the immediate transfer of all liquids to the appropriate tank. There must be no free-standing PCP/oil solution or effluent, anywhere in the plant. • Centrifugal pumps must not be used to transfer oil-contaminated water, to minimize emulsion formation, as per Section 3.12 of CCME-EPC-LST-71E.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
39. Is local collection/containment of incidental drips in place (pumps, valves etc.)?	General Table 4	• The tank farm floor must be kept clean and dry to prevent tracking and air contamination and to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid must be cleaned out. • All pumps handling oil or PCP/oil solutions must have self-contained spill trays large enough to prevent contamination of the containment area. Spill trays must be inspected daily and any free liquid must be cleaned out.
40. Is containment area designed to minimize tracking of liquids and contaminated dust?	General Table 4	• The containment area must be kept free from preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by authorized personnel, as designated by the Plant Manager. • Walkways, boot-changing facilities, etc. must be provided to prevent dirt and dust being tracked to and from the plant.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
41. Are PCP blocks/bags stored in a secure, enclosed, roofed and paved area?	PCPP Table 9	• PCP must be stored in sealed bags, drums or block packages inside a secure, enclosed, roofed, ventilated, non-combustible building or other structure, which is locked at all times. The building or structure must have an impervious paved floor.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.5 PENTACHLOROPHENOL STORAGE**		
42. Is storage area close to the delivery and mixing area?	PCPP Table 9	• The PCP storage area must be as close as possible to the delivery and mixing areas. • PCP block packages and steel drums containing PCP must be securely sealed during transport to the mixing operation. Bags and drums manufactured from easily damaged materials such as paper, plastic and cardboard must not be transported over unpaved ground unless they are transported in a contained carrier. For oil transfer, the vehicle, piping, valves and transfer pumps must be contained.
43. Is storage segregated from other chemicals?	PCPP Table 9	• PCP storage must be segregated from other chemicals. PCP must be stored as per Section 2.4.41. PCP storage building or structure must be constructed from non-combustible materials.
44. Does ventilation exist for routine and emergency situations?	PCPP Table 6 PCPP Table 9	• The PCP storage building or structure must have a ventilation system which maintains the PCP in the air below the TLV-TWA values published by the American Conference of Governmental Industrial Hygienists (ACGIH).

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.5 PENTACHLOROPHENOL STORAGE CONT'D**		
45. Is storage pad paved, dyked and without a drain?	PCPP Table 9	• The PCP storage building or structure must have an impervious paved floor, which is curbed or dyked and has no floor drains. • To ensure that it is impervious, a paved floor must have a coating or sealer which has the performance requirements defined in Section 1.2.9.
46. Is a vacuum cleaner system (with filtered exhaust) in place?	PCPP Table 9	• A vacuum cleaner with a filtered exhaust must be readily available for unloading, storage and mixing operations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.6 BULK SLUDGES**		
47. Is storage in exterior or well ventilated area?	PCPP Table 9	• Bulk sludges must be stored in an exterior or well-ventilated location. • Interior storage must be ventilated as per Section 2.5.44. • Note that provincial regulations may mandate requirements for waste storage areas, including ventilation, containment, security, signing, etc.
48. Are sludges stored in closed and sound tanks/drums?	PCPP Table 9	• Bulk sludges must be stored in closed tanks or sealed drums in sound condition.
49. Are storage tanks/drums in a contained area with impermeable floors?	PCPP Table 9	• Interior and exterior bulk sludge storage must be in a contained area with an impermeable floor, which can be readily cleaned.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.6 BULK SLUDGES CONT'D**		
50. Is containment adequately sized?	PCPP Table 9	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the containment volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
51. Are all drains blocked and containment sized to accommodate infiltrate?	PCPP Table 9	• Preferably, the containment should have no drains, otherwise all drains must be blocked. • If storm water cannot be collected and treated to the applicable limits, prior to discharge, the sludge containment area must be roofed.
52. Is storage area secure?	PCPP Table 9	• Interior and exterior sludge storage areas must be secure against unauthorized access.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS**		
1. Is transfer equipment (pumps) in a contained, enclosed, heated area?	General Table 5 PCPP Table 10	• The containment for transfer equipment must be as defined in Section 2.4, Criteria 33 – 40 inclusive. The area must be maintained at a suitable temperature to allow correct equipment operation.
2. Is permanent, closed transfer system used?	General Table 5 PCPP Table 10	• A permanent, closed mixing system must be used. • The mixing system must be rigidly piped from tank to tank.
3. Is a high level alarm installed to prevent mix tank overflow?	General Table 5 PCPP Table 10	• The mix tank must have a high-level alarm. • The alarm must be audible throughout the plant. • The alarm must trigger visible identification of a specific high-level emergency in the mixing vessel. • The alarm must be tested weekly. Tests must be recorded and kept on file.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS CONT'D**		
4. Are high-level alarms linked to feed pump shut off?	General Table 5 PCPP Table 10	• Alarms must immediately prevent any increase in the solution level in the mixing tank, either by shutting off the mix pump or by closing the appropriate valve.
5. In case of any open transfer operations, is reliable splash protection in place?	General Table 5 PCPP Table 10	• Open transfer of solution is not allowed. • Working solutions must be mixed in a closed system.
6. Is transfer equipment mechanized (minimum of worker contact/spill potential)?	General Table 5 PCPP Table 10	• Equipment and practices for handling bulk PCP must prevent worker contact with the chemical and minimize spill potential.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT**		
7. Are containment floors, dykes and joints structurally sound?	General Table 5 PCPP Table 10	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer with prior relevant experience.
8. Are containment surfaces and joints sealed?	General Table 5 PCPP Table 9	• Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.
9. Is a secondary containment barrier built into a tank containment area?	General Table 5	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the mix tanks, together with a leak detection system as per 2.4.36. • The coating must comply with the requirements defined in Section 1.2.9.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
10. Is subsurface leak detection provided?	General Table 5	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. • Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.
11. Is there a subsurface leak containment and collection system?	General Table 5	• For an existing plant, if the monitoring well system detects a leak, a recovery well system must be designed and installed by a qualified hydrogeologist, to ensure containment and collection. • The double liner system described in Section 3.2.9 above is the preferred approach for new plants or additions to existing plants.
12. Is the spill containment volume in accordance with NFCC?	General Table 5 PCPP Table 9	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
13. Is mix tank covered to prevent infiltrating precipitation?	General Table 5 PCPP Table 10	• The preferred location for mix tanks is inside a secure, locked building. • Exterior mix tanks must be roofed if the storm water that enters the tank or the tank containment is not collected, contained and treated prior to controlled discharge, as per applicable regulations.
14. Does containment have alarms to identify spills?	General Table 5	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly Alarm tests must be recorded and kept on file.
15. Is the containment area visible?	General Table 5	• The containment must be well-lit, as per provincial requirements of the Workers' Compensation Board, Ministry of Labour, etc., and must not be obstructed by being used as an equipment storage area.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
16. Is accessible storage for spill response equipment, absorbents and personnel protection nearby?	PCPP Table 7 General Table 5	• Personal protection equipment must comply with TRD Reference PCPP, Table 7. • Spill response equipment must be site specific and must be selected in accordance with the preservative supplier's recommendations. • Equipment inventory must be checked weekly and recorded and must be complete at all times. • Location of equipment storage must allow prompt response to emergency situations.
17. Is the mix area adequately ventilated?	PCPP Table 10	• The mix area must be ventilated to maintain the PCP in the air below the TLV-TWA values published by the American Conference of Governmental Industrial Hygienists (ACGIH). • Ventilation must conform to NFCC Section 4.1.7.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.3 SOLIDS HANDLING**		
18. Is mechanized handling equipment used to minimize worker exposure?	PCPP Table 10	• Equipment and practices for handling bulk PCP must prevent worker contact with the chemical and minimize spill potential.
19. Is the area for removal of wraps/bags paved and sheltered?	PCPP Table 10	• The area where PCP wraps, bags and drums are opened must be paved and roofed and the surface must be easily cleaned.
20 Is a vacuum system installed to clean up dust/PCP particles?	PCPP Table 8	• A vacuum cleaner with a filtered exhaust must be readily available for unloading, storage and mixing operations.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION**		
1. Are the treatment vessel, controls and ancillary equipment in an enclosed structure and protected from freezing?	General Table 6	• The treating cylinder, controls and ancillary equipment must be located in an enclosed winterized structure that is maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
2. Are the treatment cylinder and process tanks within a contained area?	General Table 6	• The treating cylinder and process tanks must be located in containment areas with continuous, structurally sound concrete floors and dykes. • The details of the containment must be as defined in Section 2.4, Criteria 33-40 inclusive.
3. Does the spill containment capacity comply with NFCC requirements?	General Table 6	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
4. Are the floors and dykes reinforced, structurally sound and with sealed joints?	General Table 6	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with Section 1.2.9. • Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing.
5. Are surfaces graded to facilitate drainage?	General Table 6	• Containment floors should be graded to ensure efficient drainage to a collection system. • Free standing liquid is not permitted in the containment area.
6. Are walkway grates or other designs in place to minimize worker contact and tracking of preservative residues?	General Table 6	• The containment area must be kept free from preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by those personnel authorized by the Plant Manager. • Walkways or other facilities must be provided to prevent dirt and dust being tracked to and from the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
7. Does the entire process area have a secondary containment provision (e.g. impermeable top coat on floors and dykes or liner under the containment area)?	General Table 6	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • The liner must be resistant to PCP/oil solutions. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the tanks. • The coating must comply with the requirements defined in Section 1.2.9.
8. Is control and transfer equipment isolated to avoid damage from spills?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that a spill equal to the containment volume (as defined in Section 4.1.3) or flooding will not prevent their operation or create an electrical hazard.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.2 SUMPS**		
9. Are sumps leakproof (impermeable surfaces, sealed joints)?	General Table 7	• Sump surfaces must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and be resistant to PCP/oil solutions. • All joints in the sump must be liquid-tight. • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, all sump joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.
10. Are sumps equipped with a secondary containment (e.g. steel lining)?	General Table 7	• The surfaces of concrete sumps must have an impermeable coating and also be lined with steel or other suitable material. • To ensure impermeability, the surface coating and lining material must have a permeability rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m.
11. Are sumps protected by independent high-level alarms?	General Table 7	• All sumps must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly. Tests must be recorded and kept on file.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING CYLINDER**		
12. Are all pressure vessel inspection certificates current?	General Table 7	• The plant must have a current certificate to show that the treating cylinder and all pressurized components meet all requirements of the provincial ministry responsible. • If there is no provincial requirement, the treating cylinder and all pressurized components must be inspected annually by an accredited testing company or agency.
13. Is the retort door protected from opening, when full?	General Table 7	• Retorts must be equipped with an effective protection device to prevent doors being opened when retort is pressurized, filled or partially filled with preservative. • Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to the impact wrench compressor.
14. Are independent interlock/alarms installed on the doors?	General Table 7	• Retorts must be equipped with an effective protection device to prevent doors being opened when retort is pressurized, filled or partially filled with preservative. • Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to the impact wrench compressor.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING CYLINDER CONT'D**		
15. Is the cylinder designed to facilitate drainage of excessive preservative?	General Table 7	• The alignment of the treating cylinder and/or the pump-out procedures must ensure that the minimum amount of preservative drains from the cylinder door opening.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS**		
16. Is the operator control area segregated from retort and tank spill containment areas?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that spills or flooding will not prevent their operation or create an electrical hazard. • In the case of hydraulic doors, the hydraulic pump controls must be located or shielded so that the operator is not directly exposed to any liquid or vapour releases from the cylinder.
17. Is the control area winterized?	General Table 6	• The process control area must be winterized and maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
18. Is the control area well lit and located for maximum visibility of treatment systems?	General Table 6	• All operating and control areas must have proper lighting as per provincial requirements, so that all equipment is totally visible at all times. • The location of the control area must allow the best possible visibility of the treatment system, for the operation concerned. • Mirrors or closed circuit TV may solve specific problems, particularly for those plants where the cylinder doors are hidden from view.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS CONT'D**		
19. Are process controls simple and properly functioning to provide accurate feedback?	General Table 7	• The process controls must be installed, maintained and calibrated in accordance with CSA 080-M3, Clause 3.0. • Calibration records must be kept on file.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.5 AIR EMISSION CONTROL**		
20. Are pumps, tank or other exhausts vented to outside or to recovery system?	General Table 4 General Table 6	• Pumps, tanks, cylinders and other exhausts must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Equipment must not vent directly into the workplace. All vents must be provided with vapour control as per NFCC Section 4.3.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM**		
21. Are traps installed on vents (to remove entrained liquids)?	General Table 4 General Table 6	• All vents must have traps to remove entrained liquids as per Section 4.5.20.
22. Is the system designed to effectively contain and recycle all chemicals with minimal potential for releases?	General Table 6 General Table 7	• The system must be able to contain and recycle all chemicals used by the plant. • There must be no routine release of chemicals into the containment from process equipment.
23. Is all transfer equipment in a contained area?	General Table 7	• All piping and pumps must be contained as defined in Section 2.4, Criteria 33-40 inclusive.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM CONT'D**		
24. Are pipes and valves clearly identified?	General Table 4	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves must be clearly labeled to identify their function in accordance with the piping schematic. • Identification must be in accordance with NFCC Section 4.4.4.
25. Are delivery lines rigid, accessible and visible?	General Table 4	• All piping must be of the appropriate material and schedule. • Plastic piping or flexible hoses must not be used. • Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.
26. Is piping protected from mechanical damage?	General Table 4	• All piping must be protected to prevent damage by any means, such as the oil or PCP delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.1 GENERAL DESIGN**		
1. Does the area have efficient drip and run-off collection and containment?	General Table 8 PCPP Table 12	• The drip pad must be fully contained with sufficient grade to minimize the retention of free liquid so that tracking and air contamination are avoided.
2. Is dispersal of liquids from tracking by personnel and vehicles minimized?	General Table 8	• The drip pad must be designed to minimize the dispersal of PCP/oil solution by vehicles or foot traffic.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.2 DRIP PROTECTION**		
3. Is the area sufficiently sized to hold all freshly-treated wood until visible dripping has stopped?	General Table 8 PCPP Table 12	• The area must be large enough to hold all freshly-treated wood until visible dripping has stopped.
4. Is the area where wood is stored an open structure with proper containment?	PCPP Table 12	• Freshly treated wood should be stored in an open, roofed and contained area. • If roofing is not feasible, then the area should have provision for collecting and containing runoff water prior to treatment and controlled discharge.
5. Is the area roofed?	PCPP Table 12 General Table 8	• The area must be roofed if storm water and wash water cannot be collected, contained and treated for controlled discharge as per regulatory standards.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.3 CONTAINMENT**		
6. Are the unloading areas provided with impermeable floor and curb?	General Table 8 PCPP Table 12	• The unloading track pad must be constructed to completely contain all drips from the wood and the trams. • The unloading area surface must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and be resistant to PCP/oil solutions. • Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior relevant experience.
7. Are the floors sloped to facilitate collection of all contaminated liquids?	General Table 8	• The drip pad must be fully contained with sufficient grade to direct any free liquid to a collection and recycling system, or to a wastewater treatment system.
8. Are the floors and curbs covered with an impermeable top coat or is a liner installed underneath the entire area?	General Table 8	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all drip pad surfaces, together with a leak detection system, as per Section 2.4.36. • The coating must comply with the requirements defined in Section 1.2.9.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS**		
1. Is the wood completely drip dry prior to placing it in unprotected storage?	PCPP Table 13 General Table 9	• Freshly-treated wood must be drip dry before being placed in unprotected storage. If there is a risk of further dripping or leaching that will cause soil and run-off contamination in excess of applicable standards, the wood must be stored under cover or on a paved surface. • If there are no provincial standards for soil and run-off contamination, the soil limits defined in 1997 CCME Soil Quality Guidelines for PCP,"; and the water quality standards published in: www.elp.gov.bc.ca/epda/contam_sites/guidance/technical/9.html. shall apply.
2. Are treated wood packages elevated above ground (placed on stringers)?	PCPP Table 13 General Table 9	• All treated wood packages/bundles must be elevated at least 6" above ground to minimize contamination of soil and surface run-off water.
3. Are treated wood storage areas segregated from uncontaminated yard areas?	PCPP Table 13 General Table 9	• Treated wood storage areas must be consolidated and segregated to minimize yard contamination and ensure efficient collection of any surface run-off water containing PCP residues in excess of regulatory limits. • The evaluation of options for storage area surfaces must consider several factors, including groundwater usage, precipitation levels, etc.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS** **CONT'D**		
4. Are unsurfaced storage areas remote from water bodies?	General Table 9 PCPP Table 13	• The run-off from surfaced and unsurfaced storage areas must not cause any water body, surface water or ground water system to exceed regulatory guidelines or standards.
5. Is storage in compliance with NFCC requirements (lack of vegetation, separation of wood from buildings)?	General Table 9	• Storage areas must be separated from plant operations and other structures by an acceptable clear space permanently available for fire-fighting operations. • Storage areas must be maintained free of combustible vegetation, including grass and weeds, for at least 4.5 m from the stored material and at least 30 m from bush and forested areas. • Lumber treated with combustible liquids must be stored in piles separated from other stored material by a distance of not less than 4.5 m. • At least two fire department access routes must be provided.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.1 PROCEDURES**		
1. Is an operations manual available with written instructions for all aspects of chemical use?	General Table 10	• A current, site-specific manual must be available containing clear instructions for all aspects of chemical use, plant operation, equipment maintenance, housekeeping, accident prevention, first aid and emergency response procedures, and all applicable regulations. • The manual must be readily available to all employees. • There must also be up to date blueprints of the plant and current specifications for all equipment.
2. Are all operating personnel informed of the potential hazards and precautionary measures?	General Table 10	• Training in all aspects of chemical use and plant operation must be provided and updated, at least annually. Training programs must be plant specific and should at least include: o Chemical substances and their hazards, including personal hygiene. o Safe operation and maintenance of equipment and processes. o Spill and fire prevention procedures. o Proper use of personal protective equipment. o Proper use of all safety equipment for controlling spills and fires. o Emergency response and first aid and rescue procedures. o Handling, storage and disposal of waste materials. • Individual employee training must be documented.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.2 PERSONNEL**		
3. Are all operating personnel trained in good work practices?	General Table 10	• Operating personnel must be trained as defined in Section 7.1.2. • In addition, training in emergency procedures, unloading operations, location of valves, visual inspections, operational tests and maintenance procedures must be in accordance with NFCC Section 4.11. • The operations and procedures in Part 5 of CCME-EPC-LST-71E must also be implemented.
4. Is periodic review and update of training implemented?	General Table 10	• Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment.
5. Is a pre-employment medical check-up and on-going annual medical surveillance carried out?	General Table 10 General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed to verify that they are able to carry out their assigned duties. • Provided new employees are not exposed to chemicals, their pre-employment medicals may follow completion of their probationary period. • Employees must also have an annual medical check-up, specifically designed to assess any effects of exposure to the chemicals in use at the plant.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.3 SIGNING**		
6. Are the contents and functions of the tanks identified (e.g. PCP work tank)?	General Table 10	• The contents and functions of all tanks must be clearly identified by large, permanent signs.
7. Are personnel safety precautions and first aid procedures prominently displayed?	General Table 10	• Prominent, easy to read signs must be displayed in the chemical receiving and storage areas, the treating process area, all control stations and the plant office.
8. Are emergency response procedures and emergency telephone numbers prominently displayed?	General Table 10	• Plant specific emergency response procedures must be summarized and displayed in the form of a prominent notice. • Notices must also show phone numbers for company contacts, police, fire, ambulance, chemical supplier, etc., not just 911.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY**		
9. Are food, drink or tobacco products prohibited in working areas?	General Table 1	• Food, drink and tobacco products must be prohibited in working areas. • Designated lunch rooms and smoking areas must be separate from work areas and must be provided with washing facilities.
10. Are all personnel familiar with basic hygiene requirements?	General Table 1	• Specific training must be provided as defined in Section 7.1.2. • Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment. • Individual employee training must be documented. • New employees must be fully trained before they can assume full responsibility for any aspect of plant operation.
11. Are soiled clothes promptly removed?	General Table 1	• Operators and other employees who come into contact with preservative chemicals must wear appropriate work clothing which must be changed immediately if splashed with chemicals. • Work clothes must stay at the plant and must be laundered separately from other clothing.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY CONT'D**		
12. Are correct safety clothes (gloves, masks, boots, etc.) worn for respective operations?	General Table 1 PCPP Table 7	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Table 7, of the PCPP section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
13. Are first aid personnel familiar with emergency response procedures?	General Table 1 PCPP Table 5	• First aid training must address the specific emergency response procedures for PCP and the other chemicals used in the plant. • First aid supplies must include all items required to treat PCP exposure, including ingestion, as per the PCP supplier's recommendations.
14. Are changing rooms and showers provided?	General Table 1 PCPP Table 7	• Changing rooms must be provided with lockers which allow street clothes to be stored separately from work clothing and PPE. • Hot showers must be provided and operators and other employees who come into contact with preservative chemicals must shower before leaving the plant after work.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING**		
15. Does the plant have a defined housekeeping plan?	General Table 10	• Housekeeping standards aimed at maintaining a clean and orderly plant must be defined in writing and included in the plant operations manual. • The responsibility for maintaining the standards in different areas must be clearly assigned to specific individuals.
16. Are generation and accumulation of wastes minimized?	General Table 17	• To minimize the generation of wastes, the recommendations contained in Table 17 of the General section of the TRD must be followed. • Special attention must be given to all factors affecting solution cleanliness and solution concentration.
17. Is equipment regularly inspected for leaks?	General Table 12	• All process components must be inspected for leaks by every shift in accordance with NFCC Section 4.4.11.5 and Section 5.3 of CCME-EPC-LST-71R. • Immediate action must be taken to stop leaks.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING CONT'D**		
18. Are leaks properly contained and repaired promptly?	General Table 12	• Leaks must be repaired promptly as per NFCC 4.4.11.5. • There must be no uncontained leaks. • The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
19. Are daily records maintained for chemical delivery, use and inventory?	General Table 10	• To provide a secondary level of control for chemical losses, records must be maintained as follows: o Transfers to and from the oil storage tank as they occur. o Transfers to and from the work tanks as they occur. o Inventory of oil, solid PCP and working solution volumes, monthly. All tank levels must be checked against the last recorded level, every two days, when the plant is not operating.
20. Are daily records maintained for equipment condition and maintenance?	General Table 10	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation and ensures immediate attention to any problems. • PMP records must be maintained in a daily log and monitored to identify the need for special attention to persistent problems. • Records of alarm tests, leak detection tests and other inspections must be maintained for 5 years as per CCME-EPC-LST-71E.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
21. Are chemical volume discrepancies promptly investigated?	General Table 10 General Table 12	• To provide a secondary level of control for chemical losses, chemical use and inventory records must be reconciled monthly, to ensure that they are in balance. • Any unexplained loss of 1% or more of monthly throughput must be reported to the authority having jurisdiction as per CCME-EPC-LST-71E and NFCC Section 4.3.16.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.7 SPILL RESPONSE**		
22. Does a written spill contingency plan exist?	General Table 10 General Section 12.1	• A written spill contingency plan must be prepared and maintained in accordance with Section 12.1 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the components of the plan. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc. • Police and fire departments must be provided with copies of the plan together with complete details of all aspects of the operation related to the implementation of the plan.
23. Are regular spill response drills carried out, including an annual spill enactment drill?	General Table 10	• Spill response drills and annual enactments or rehearsals must be part of the spill contingency plan and must be planned in advance by the person responsible. • Annual rehearsals should be planned in collaboration with relevant agencies, such as police, fire and ambulance services and provincial authorities, with a view to gaining their involvement to make the enactment as real as possible. • Drills must be monitored and reviewed by all participants to determine the need for any improvement to emergency response procedures.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING**		
24. Does a written fire contingency plan exist?	General Table 10 General Section 12.2	• A written fire contingency plan must be prepared and maintained in accordance with Section 12.2 of the General section of the TRD and NFCC Sections 2.8, 4.3.2.5 and Part 6. • The plan must be site specific and must identify the individuals responsible for implementing the various components. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc.
25. Has the local fire department been made aware of the chemicals in use?	General Table 10	• The fire contingency plan must be prepared in consultation with the local fire department. Fire and police departments must be provided with the plan, and complete details of all aspects of the operation related to its implementation. • The fire department should visit the plant at least annually, to maintain their knowledge of the operation and also identify any improvements that are needed to update the contingency plan.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
26. Is sufficient self-contained breathing equipment available?	General Table 10 General Table 12	• If it is decided to use self-contained breathing apparatus (SCBA) for fire fighting and/or vessel entry, there must be two sets available and personnel must be properly trained in their use. • Responsibility must be assigned for the inspection and maintenance of SCBA and also for the annual review and update of training. • The plant may decide that the fire department should be responsible for SCBA and also may elect to use oxygen sensors for safe vessel entry or hire contractors for this purpose.
27. Is appropriate fire extinguishing material (e.g. foam) readily available?	PCPP Table 2	• Fire extinguishing materials and procedures must be reviewed with the local fire department. Normally, dry chemical or foam systems must be used to extinguish fires involving PCP/oil. Water spray must be used to cool fire exposed surfaces and protect fire-fighting personnel.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
28. Are adequate material/procedures on hand to contain and dispose of fire residues?	General Table 10	• The fire contingency plan must define the procedures to be followed to contain and dispose of all residues created by fire fighting. • The procedures should be developed in collaboration with the local fire department and should include allowing the treating plant to burn down if there is any risk of a release of chemical or contaminated water from the containment. • The procedures should also include provision for constructing berms and ditches and blocking storm drains in yard areas to contain contaminated water and solid residues. • Plant fire crews must be designated and trained to the level necessary to implement the company's Fire Contingency Plan. Training programs must be developed in conjunction with local Fire Departments and where possible should be in accordance with National Fire Protection Association (NFPA) Standard No. 472, "Hazardous Materials Response". • This advanced level of training is provided at institutions across Canada, accredited under the International Fire Service Accreditation Congress. Specific information re location of institutions and NFPA Std. No. 472 can be obtained from local Fire Departments.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS**		
1. Is personnel trained in emergency response procedures?	General Table 11 PCPP Table 14	• All personnel must be formally trained in emergency response procedures for spills and fires. • Individual employee training must be documented and updated annually. Training must be reinforced during the year by spill response drills.
2. Is access to unloading area restricted during unloading operations?	General Table 11 PCPP Table 14	• All vehicles, including contractors' trucks and visitors' vehicles must be prohibited from the off-loading area by DANGER signs, barriers and constant supervision. • The unloading operation must be attended by a trained operator, wearing full PPE. The truck driver must also wear full PPE. First aid personnel must be available. Solid PCP and oil must not be delivered outside normal working hours.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS CONT'D**		
3. Is there ready access to emergency aid?	General Table 11 PCPP Table 14	• As defined in Section 8.1.2 above, the unloading operation must be attended by a trained operator. This operator must be trained in chemical handling, chemical hazards, emergency response procedures and first aid. • Additional first aid personnel, trained to deal with emergencies involving solid PCP and Petroleum oil must be on site and must be given advance notice of chemical unloading. • Prior to chemical delivery, first aid supplies must be checked and eye wash fountains and emergency showers must be operational. • An emergency response team, trained in chemical spill procedures must be available and all alarms and spill control equipment must be in good order.
4. Are transfer operations attended at all times?	General Table 11 PCPP Table 14	• The unloading of solid PCP and Petroleum Oil must be attended at all times and personnel responsible must be trained as per Section 4.4.11 of the NFCC. Transfers must occur as per Section 4.11 of the NFCC.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS**		
5. Are equipment used and procedures followed to avoid worker contact with preservative chemicals?	General Table 1 General Table 11 PCPP Table 7	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Table 7 of the PCPP section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
6. Is responsibility of storage area assigned to trained personnel?	General Table 11 PCPP Table 14	• All activities in the chemical storage area must be carried out by personnel trained in all aspects of chemical handling, system operation, hazard identification and emergency response. • The chemical storage area must be off-limits to all other personnel.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
7. Is a visual inspection routine of equipment storing and transferring chemicals instituted?	General Table 11 General Table 12 PCPP Table 14	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation, including chemical storage and transfer and ensures immediate attention to any problems, as per NFCC Section 4.4.11.5 and Section 5.3 of CCME-EPC-LST-71E. • PMP records must be maintained and monitored to identify the need for special attention to persistent problems.
8. Are valves tested regularly?	General Table 12 PCPP Table 14	• The functionality of all valves must be tested in accordance with the Preventive Maintenance Program defined in Section 8.2.7 above. • NFCC Section 4.4.11.6 requires tests of all safety shut-off valves and other fire safety devices, with particular attention to normally open fusible-link operated valves, float valves and automatic controls.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
9. Are drips and spills cleaned up promptly?	General Table 11	• There must be no uncontained drips or spills. • The operating objective must be to be drip and spill-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
10. Are bags/block wraps, pallets, hooks, etc. suitably cleaned and properly disposed of?	PCPP Table 16 PCPP Section 9.4	• Bags, wraps, drums, pallets, hooks etc. must be cleaned, stored and disposed of in accordance with provincial regulatory requirements. Materials used in the shipment of solid PCP should be returned to the supplier, wherever possible.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS**		
1. Are quantities of stored chemicals regularly checked and recorded?	General Table 12	• All chemicals must be checked and recorded as defined in Sections 7.6.19, 7.6.20 and 7.6.21, above.
2. Is the solution strength regularly tested?	General Table 12	• The strength of PCP/oil solutions must be determined after every mixing operation, in accordance with AWPA Standard A-5.
3. Is the solution free from contamination?	PCPP Table 15	• If the PCP/oil solution cannot be kept free from carbon and other contaminants and its water and sediment content kept below 0.5%, as per CSA 080.201, then the solution must be processed through a filter press to ensure cleanliness.
4. Is the system regularly checked for leaks and are those leaks promptly stopped?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately as per NFCC Section 4.4.11.5. An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
5. Are sludge levels in tanks and retort regularly checked and removed?	General Table 13	• Whenever there is evidence of excess surface contamination, sludges in cylinder and tanks should be checked and removed. • All process tanks must be checked, at least annually and any sludge must be removed. • Sludge must be removed from retorts regularly to prevent operational problems and/or surface deposits on the finished product. Checks must be recorded and kept on file. • All precautions for safe vessel entry must be followed.
6. Are tank vents tested for blockage at least once a month?	General Table 12	• Tank vents must be tested at least monthly, if there is any risk of restriction or blockage of the vent pipe due to deposits.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
7. Are wood loads stacked to allow good drainage of preservative?	General Table 12	• Lumber and timbers must be stickered and stacked on an angle to maximize the rate of preservative drainage in the cylinder.
8. Are cylinder door seals in good order?	General Table 12	• Cylinder door seals must be cleaned and checked for damage and wear before every charge. • Spare seals must be available to allow immediate replacement when required. • Cylinder doors must be checked during the pressure cycle to ensure that they are properly sealed.
9. Are filters checked regularly, cleaned or replaced when necessary?	General Table 12	• Filter presses and strainers must be checked and cleaned in accordance with the schedule established in the written Preventive Maintenance Program.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
10. Are tanks free of debris, soil or other contamination?	General Table 12	• Trams and charges must be free from debris, soil and other contamination before loading into the cylinder. • Return lines from the cylinder to the working tanks must be fitted with strainers.
11. Are trams, pipes/pumps and cylinder thoroughly cleaned on preservative switch-overs?	General Table 12	• Common treating systems in multi-preservative plants should be avoided. If unavoidable, common systems, including trams, piping, pumps, cylinder etc. must be thoroughly cleaned before switching to another preservative. Blocking systems must be in place to prevent inadvertent transfer of solutions. All wash water, condensate etc. generated in the cleaning process must be collected and contained for recycling or treatment, prior to controlled discharge as per applicable regulations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT**		
12. Is process system monitored for leaks during operation?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
13. Are recording and indicator instruments in proper order?	General Table 12	• All recording and indicator instruments must be installed and calibrated in accordance with CSA 080-M3, Clause 3.0 and CSA 080.1, Clause 2.2. • Calibration records must be kept on file.
14. Is the treatment closely monitored to ensure that maximum limits are not exceeded with a minimum of over-treatment?	General Table 12 PCPP Table 15	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits, in accordance with CSA 080.1. • Manual control without instrumentation does not allow close monitoring.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT CONT'D**		
15. Are detailed records kept of all process steps and conditions?	General Table 12	• There must be a record of each charge showing wood species, products, sizes, volumes, treating cycle stages and duration, tank gauge readings and chemical consumption. • The treatment record and process charts and print outs must be kept on file, together with the results of solution and product testing, in accordance with CSA 080-M3, Clause 1.5.
16. Are records kept of abnormal operating situations (e.g. equipment breakdown)?	General Table 12	• Abnormal operating situations must be recorded in the daily log and also entered on the treatment record. • Abnormal operating situations must be reviewed with a Supervisor, to ensure that corrective action is taken as soon as possible.
17. Is a final expansion bath/steam cycle and effective vacuum applied after completion of the pressure cycle (level/duration)?	PCPP Table 15	• To minimize bleeding, it is strongly recommended that a final expansion bath/steam cycle/vacuum process be applied after completion of the pressure cycle, as per CSA 080.1. The final vacuum must be 22" Hg or more to be effective.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS**		
18. Are safeguards in place to disallow retort opening when liquid or pressure remains?	General Table 12	• Retorts must be equipped with an effective protection device to prevent doors being inadvertently opened, when retort is pressurized, filled or partially filled with preservative. Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to the impact wrench compressor.
19. Are goggles and other appropriate safety equipment worn by operators opening retort doors?	General Table 12 PCPP Table 7	• Operators must wear full PPE when opening cylinder doors and removing and unloading charges. Full PPE includes, rain suit, rubber boots, impermeable gauntlets, face shield or goggles and respirator, if emissions are unknown, or at, or above the TLV. • Hydraulic door controls must be located or shielded so that the operator is not directly exposed to liquid and/or vapour releases from the cylinder.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
20. Are impermeable gauntlets worn on handling freshly treated wood?	General Table 12 PCPP Table 7	• Impermeable gauntlets must be worn for handling freshly treated wood and for all activities in the treating plant where protection is required. • Leather gloves and impermeable gloves with permeable cuffs must not be worn. • The TRD also recommends the use of an impermeable apron and boots.
21. Are instructions followed to avoid exposure to preservative vapours/mists?	PCPP Table 7 PCPP Table 15	When there is any risk of exposure to preservative vapours or mists in any operation, the PPE specified in Table 7 of the PCPP section of the TRD must be worn.
22. Are charges allowed to essentially drip dry before they are pulled from the retort?	General Table 12 PCPP Table 15	Charges must not be pulled from the retort until the excess solution has drained and the wood, as a result, is essentially drip free.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
23. Are personnel trained in safety procedures for vessel entry?	General Table 12	• Treating plant personnel must be trained in confined space entry procedures as defined in WCB and provincial labour regulations. • If personnel are not trained, an approved contractor must be hired for this activity. • Note that this guideline also applies to tram jams in the cylinder. • There are several safety procedures for vessel entry, including self contained breathing apparatus (SCBA) or oxygen sensors.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 EQUIPMENT MAINTENANCE**		
24. Is all equipment in good operating condition?	General Table 13	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all equipment and ensures immediate attention to any problems. • Records of daily inspections must be maintained and monitored to identify the need for special attention to persistent problems.
25. Are NFCC maintenance recommendations adhered to?	General Table 13	• All maintenance practices must be in accordance with Sections 2.5.3.3, 4.4.11 and 6.0 of the National Fire Code of Canada
26. Do written maintenance instructions exist?	General Table 13	• The Preventive Maintenance Program must contain written, plant specific instructions for all equipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 EQUIPMENT MAINTENANCE CONT'D**		
27. Are all necessary precautions taken when contaminated equipment is welded?	PCPP Table 7 General Table 13	• The precautions that must be taken include: o Obtaining a Hot Work permit from the Supervisor responsible. o Blocking or disconnecting lines from tanks. o Draining and rinsing tanks and lines. o Ensuring that surfaces are free from cleaning solvent residues. o Wearing an approved respirator. o Providing good ventilation in the work area. o Containing all sparks and removing flammable materials. o Complying with all additional provincial workplace safety rules. o Using special precautions in view of the high explosion hazard.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 EQUIPMENT MAINTENANCE CONT'D**		
28. Is all equipment drained/cleaned of oil or PCP solutions prior to maintenance?	General Table 13	• Prior to maintenance, contaminated equipment must be drained of oil or PCP/oil solution and thoroughly cleaned. • Cleaning solvent or condensate from steam cleaning must be collected and contained.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 CLEAN-OUT**		
29. Are written safety procedures in place?	General Table 1 General Table 13	• Safety procedures for clean-out must be included in the Plant Operations Manual and must address the details contained in Tables 1 and 13 of the General section of the TRD.
30. Are drip pads clean (what is the frequency of cleaning)?	General Table 13	• Drip pads must be kept clean and free from liquids and residues. • Drip pads must be inspected daily and cleaned at least weekly. • The volume and dispersion of wash water must be kept to a minimum.
31. Is wash water treated prior to discharge?	General Table 4 General Table 13	• All wash water must be collected, contained and treated to applicable regulatory limits, prior to controlled discharge.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION**		
1. Is wood properly seasoned prior to treatment?	General Table 17	• Every effort must be made to season wood properly. • A moisture content above the fibre saturation point (~25% dry wt.) will promote sludge formation.
2. Are trams and wood load free of debris, soil on charging?	General Table 17	• Trams and charges must be inspected before loading the cylinder and cleaned where necessary.
3. Is the treatment solution clean and are the components balanced?	General Table 12 PCPP Table 15	• If the PCP/oil solution cannot be kept free from carbon and other contaminants and its water and sediment content kept below 0.5%, as per CSA 080.201, then the solution must be processed through a filter press to ensure cleanliness. • The strength of PCP/oil solutions must be determined after every mixing operation, in accordance with AWPA Standard A-5.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION CONT'D**		
4. Are close controls exercised on treatment parameters (are limits not exceeded)?	General Table 17	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits in accordance with CSA 080-M3, Clause 3.0. • Manual control without instrumentation does not allow close monitoring.
5. Are storm run-offs collected and treated?	General Table 9	• Storm water run-off from paved yards shown to contain levels of PCP in excess of regulatory limits must be collected, contained, and treated to comply with regulatory limits, prior to controlled discharge. • In the case of unpaved yards, soil and groundwater samples must be taken to determine the environmental impact of storm water. • If contamination above the standards or guidelines listed in Section 6.1 is present, site remediation followed by paving may be necessary.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE**		
6. Are personnel trained in hazards and handling methods?	General Table 17	• Training in all aspects of waste handling and disposal must be provided and updated, at least annually. • Training programs must be plant specific and must address all aspects of provincial regulation related to waste handling. • Individual employee training must be documented.
7. Are wastes and sludges stored in sealed drums?	General Table 17	• Dewatering and/or drying of wastes and sludges must take place in an area, which is roofed, ventilated and contained. • Appropriate signs must be posted and operators must wear the correct PPE, when processing wastes and sludges. • When wastes and sludges are ready for shipment, they must be in sealed containers, which must conform to Transportation of Dangerous Goods (TDG) regulations. • The storage and handling of wastes and sludges must conform to provincial regulations.
8. Is waste storage area roofed, enclosed and with a paved surface?	General Table 17	• The waste dewatering, drying and storage areas must be roofed, paved, contained, well ventilated and separate from the normal work areas.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
9. Are all drums labeled by contents?	General Table 17	• Drum and container labels must conform to TDG regulations.
10. Are records kept of inventory for solid wastes and sludges stored on site?	General Table 17	• An up to date inventory of containers, including their volumes and contents must be maintained. • Regulations in some Provinces require accurate inventories of wastes.
11. Are disposal activities reported as per regulations?	General Table 18	• Disposal activities must be reported by the plant or by the disposal contractor, in accordance with TDG regulations. • The plant must maintain disposal records as per TDG regulations.
12. Has the waste been classified under TDGA?	General Table 17	• The waste has already been classified under the TDG Act. • Labels must show the correct classification. PCP waste is designated as a Class 6.1 and Class 9.2 substance.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING**		
1. Does a specific site monitoring plan exist?	General Table 14	• A site specific monitoring plan must be prepared by a qualified environmental consultant. • The plan must be designed to address provincial standards for soil, groundwater and storm water run-off, if applicable. If there are no provincial standards, the plant must develop site specific standards in consultation with provincial environmental authorities. • The plan must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices.
2. Are reporting requirements clearly defined?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective management of the chemicals used.
3. Do monitoring areas include all areas: • Where preservative chemicals are stored, processed and handled? • All treated wood storage areas? • Drainage ditches and areas exposed to run-off?	General Table 14	• A risk evaluation study must be completed to determine the monitoring methodology required for soil, groundwater and storm water in the specified areas.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
4. Are sampling frequency and constituents defined?	General Table 14	• The site monitoring plan must define sampling frequency, as per the risk evaluation study and/or the reporting requirements. • All preservative constituents must be monitored and checked against the applicable regulatory limits.
5. Is a program in place to monitor adjacent waterbodies?	General Table 14	• The risk evaluation study in Section 11.1.3 must also address the need to monitor adjacent water bodies, based on an evaluation of site characteristics and plant operations.
6. Is a program in place to monitor groundwater or on-site wells?	General Table 14	• The TRD states "consider implementing a groundwater monitoring program using permanent monitoring points…" • Exceptions to this consideration would be plants located on sites for which such a program would not be effective. Any exceptions must be determined by the risk evaluation study in Section 11.1.3, based on a detailed evaluation of site characteristics and plant operations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
7. Are all air emission sources defined?	General Table 14	• The peak and average levels of PCP in air, for significant points of emission, must be determined. • Significant points of emission include, cylinder door openings, vent stacks, receiving areas for vents, enclosed plant areas and freshly treated wood storage areas. • The assessment must be updated if there are any changes in plant design and/or operating practices.
8. Are air emissions monitored as per permits?	Geneal Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If permits apply, air emissions must be monitored accordingly. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective control of all air emissions • Monitoring must determine all preservative constituents in air emissions.

PCP PRESSURE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
9. Are all liquid waste discharges identified (volumes, contamination levels)?	General Table 14	• Liquid waste discharges include storm water run-off. • The concentrations and total mass emission rates for all preservative constituents in discharges and run-off must be determined by a qualified consultant, as part of the overall site monitoring program defined in Section 11.
10. Are all liquid waste discharges monitored as per permits?	General Table 14	• If permits apply, discharges and run-off must be monitored accordingly. • Monitoring must determine the concentrations of all preservative constituents in discharges and run-off. • If permits do not apply, the plant shall develop site specific monitoring protocol and waste discharge limits in consultation with provincial environmental authorities.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING**		
11. Does a facility specific monitoring plan exist?	General Table 15	• A site specific workplace monitoring plan and program shall be prepared by a qualified industrial hygienist. • The plan and program must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices. • The plan shall address the requirements defined in Sections 11.1.7 and 11.1.8.
12. Are reporting requirements clearly defined?	General Table 15	• The regulations and reporting requirements which apply to the plant must be determined and defined in the workplace monitoring plan.
13. Are sources of skin exposure identified periodically?	General Table 15	• Existing and potential sources of skin exposure shall be identified by monthly inspections of all operating areas of the plant, from chemical receiving to shipment of treated products. • Skin exposure hazards shall be a topic for discussion at all safety committee meetings. • Safe working practices, training programs and PPE requirements must be modified when new sources of skin exposure are identified.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
14. Is a monitoring program defined: • Sampling techniques? • Frequency? • Items sampled for?	General Table 15	• The workplace monitoring plan and program defined in Sections 11.2.11 and 11.2.12 above must define the sampling techniques and sampling frequency required for all preservative constituents and other toxic chemicals used by the plant. • The requirements defined in Sections 11.1.7 and 11.1.8 also apply.
15. Are peak levels of preservative exposure from air known for all significant points of worker exposure (cylinder doors, exhaust vents, enclosed preservative process areas, freshly treated charges)?	General Table 15	• Peak levels of exposure shall be determined as per the requirements defined in Sections 11.1.7 and 11.1.8 above. • Peak levels must be monitored annually under worst case conditions, e.g. when operating areas are enclosed during winter months.
16. Are pre-employment medical exams carried out?	General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed by an occupational physician to verify that they are able to carry out their assigned duties. • Provided new employees are not exposed to chemicals, their pre-employment medicals may follow completion of their probationary period.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
17. Does a plan exist for follow-up medicals?	General Table 15	• The plant must prepare a plan, in consultation with an occupational physician, which defines: o Jobs for which pre-employment and annual or more frequent medical examinations are mandatory, based on the degree of exposure to specific chemicals. o The person responsible for scheduling medical appointments o Responsibility for record keeping. o Responsibility for follow-up with physician and employee.
18. Are follow-up medicals and biological monitoring (e.g. urine) carried out?	General Table 15	• As specified in the plan outlined in Section 11.2.17, designated employees must be periodically examined by an occupational physician to assess the effects of exposure to the chemicals in use at the plant. • As a result, medical examinations may include x-rays, nasal and skin evaluation, and urine and blood testing. • Medical examinations must address all preservative constituents and other toxic chemicals.

CREOSOTE FACILITY TECHNICAL GUIDELINES

2004

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.1 ACCESS/SECURITY**		
1. Is off-loading area located away from high yard traffic routes?	General Table 3	• Ideally, off-loading area for creosote and oil delivery should be located away from any traffic. • If relocation is impractical, traffic must be controlled by DANGER signs, barriers and constant supervision during unloading operations.
2. Is vehicle access restricted during delivery?	General Table 3	• All vehicles, including contractors' trucks and visitors' vehicles must be restricted from the off-loading area by DANGER signs, barriers and constant supervision during unloading operations.
3. Are there locking valves on liquid delivery lines?	General Table 3	• Delivery lines must be securely locked when not in use.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT**		
4. Is an unloading pad and catchment sump used?	General Table 3 CREO Table 9	• The truck or rail tanker must be unloaded on an impervious pad, large enough in area to hold the full length of the truck or rail tanker. • The pad must drain to a leak-proof sump and/or containment, large enough to handle the entire volume of creosote contained in the truck or rail tanker. • Ship unloading must achieve objective noted in Table 9, and must be in accordance to Section 4.7 of the NFCC, and Section 3.12 of the CCME-EPC-LST-71E.
5. Are impervious construction materials used?	General Table 3 CREO Table 9	• The unloading pad and sump surfaces must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cms/sec, or less, under a hydraulic head of 3m and be resistant to creosote. • Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT CONT'D**		
6. Are liquid-tight joints sealed with chemical resistant material?	General Table 3	• All joints in the pad must be sealed with caulking that complies with the requirements defined in Section 1.2.10. • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, all sump joints must be sealed with creosote resistant caulking that complies with the requirements defined in Section 1.2.9.
7. Are pads designed to contain large (tanker) spills or does diversion to contained area exist?	General Table 3 CREO Table 9	• The pad must be constructed so that it will allow containment of the entire volume of creosote in the transport tanker.
8. Are pads and sumps free of settling and cracks?	General Table 3	• Pads and sumps must be designed to prevent settling and/or cracking. • Any visibly open cracks must be repaired with creosote resistant caulking, using procedures that will ensure a liquid-tight seal. Any indication of settling must be evaluated by a certified engineer to determine the structural integrity of the pad and/or sump.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT CONT'D**		
9. Are pads and sumps lined?	General Table 3	• Secondary containment for this area is good practice and is required by some Provinces. • Secondary containment may be achieved by installing a subsurface membrane liner or by applying an impervious coating to the pad and sump surfaces. • Surface sealers, surface coatings, joint and crack sealants must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m. In addition they must be resistant to the chemicals in use at the plant and must have the physical properties (compressive, tensile and flexural strength), the abrasion and wear resistance and the lifetime requirements, suitable for the intended application. • The performance requirements for sealers and coatings will vary in different areas of the plant. For example, the drip pad represents the most severe application, due to constant exposure to chemical solutions, vehicle traffic and cleaning processes, while cylinder and tank farm containment areas, with occasional chemical exposure and foot traffic, represent a less stringent application. Sealers, coatings and sealants and their application technology must be determined in consultation with a manufacturer with experience in the field. A list of experienced manufacturers of sealers, coatings and sealants may be obtained from the chemical supplier. • See Introduction for further details.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT**		
10. Is all equipment/piping in accordance with NFCC?	CREO Table 9	• Equipment and piping must be installed in accordance with the National Fire Code of Canada (NFCC) Section 4.4 and 4.6. Facilities must be available to enable unloading procedures as outlined in Section 4.11 of the NFCC.
11. Is all transfer equipment in a contained area?	General Table 3 CREO Table 9	• Transfer equipment includes the entire length of the delivery tanker, the delivery hose and the valves and piping between the host connection and the creosote storage tank. • All this equipment must be contained as defined in Sections 1.2 and 2.4.
12. Are pipes and valves clearly identified?	General Table 3 CREO Table 9	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves and caplocks must be clearly labeled. • Identification must also be in accordance with NFCC Section 4.4.4.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
13. Are delivery lines rigid, accessible and visible?	General Table 3 CREO Table 9	• There must be easy access to allow inspection, leak detection and maintenance of delivery lines. • Flexible hoses to connect railcars and trucks to tank piping must be shielded All remaining piping must be of the appropriate material and schedule. • New and replacement lines must not be buried. All existing buried piping must have secondary containment with provision for leak detection, designed by a qualified engineer.
14. Is piping protected from mechanical damage?	General Table 3 CREO Table 9	• All piping must be protected to prevent damage by any means, such as the creosote delivery truck, rail activities, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
15. Are hose and pipe connections designed to be secure?	General Table 3 CREO Table 9	• All hose and pipe connections must be leak tight. • Connections must be in accordance to NFCC Section 4.3.6.4.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
16. Are pipes connected for top delivery to tanks?	General Table 3	• Different approaches are used including bottom delivery, top delivery or top delivery into a drop tube that extends to the bottom of the tank. Systems with bottom delivery must have a double system of back flow preventors, approved by a qualified engineer. • The piping from the connection point between the storage tank and the delivery truck, rail or ship must be configured to prevent spillage when the lines are disconnected.
17. Are back-flow preventors installed on delivery lines?	General Table 3 CREO Table 9	• Ensure back-flow of creosote cannot occur under any circumstances or install a reliable back-flow preventor. • NFCC 4.6.4.3 requires that systems through which tank cars or tank vehicles discharge into above ground storage tanks by means of pumps shall be provided with check valves at the appropriate location in the system.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
18. Is the delivery system totally visible from the point of off-loading to tankage?	General Table 3	• "Totally visible" means from the point of unloading to the creosote storage tank.
19. If visibility is limited, are audible alarms installed on tanks to detect overflow?	General Table 3 CREO Table 10	• Alarms must be audible at a location where personnel are constantly on duty during the product transfer operation; and must be able to promptly stop or divert the flow (CCME-EPC-LST-71E). Alarm function must be tested weekly and prior to delivery of creosote and oil. Alarm tests must be recorded.
20. Is spill response equipment, absorbents and personnel protection equipment available and readily accessible?	General Table 3 CREO Table 8 CREO Section 12.1	• Personal protection equipment must comply with TRD Reference CREO, Table 8. • Spill response equipment and absorbents should be selected on a site specific basis and upon the preservative supplier's recommendations. • Equipment inventory must be checked weekly and recorded and must be complete at all times. • Location of equipment storage must allow prompt response to emergency situations..

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
21. Is the off-loading area equipped with a phone or a manual alarm switch?	General Table 3	• There must be a manual alarm in the off-loading area that is audible throughout the plant. • The alarm function must be tested weekly and prior to the delivery of creosote. Alarm tests must be recorded. • A phone and/or 2-way radio is also required to arrange any assistance that may be required.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY**		
1. Is there 24-hour security?	General Table 4	• Systems and procedures must be in place to prevent unauthorized access to the chemical storage area on a 24 hour basis. • Examples include, a restricted area policy, locked buildings with security monitoring alarms, locked buildings with security patrols, fencing of the storage areas as per NFCC 3.3.2.6 or fencing of a larger area that includes the storage area.
2. Are tank drain valves locked?	General Table 4	• Any valve that could cause the release of chemical, as a result of unauthorized use, must be locked. • Examples include, sampling valves, drain valves and unloading and loading line valves.
3. Are tanks protected from mechanical impact?	General Table 4	• All tanks must be protected to prevent damage by any means, such as the creosote delivery truck, plant mobile equipment, wood piles, stored equipment, etc. • Tanks installed close to external walls that could be breached by mobile equipment and/or truck accidents require special attention.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE**		
4. Are tanks in sound physical condition, with no rust or damage?	General Table 4 General Table 11	• All tanks must comply with NFCC Section 4.3 and "Technical Guidelines for Above Ground Storage Tank Systems Containing Petroleum Products," Canada Gazette, Part 1, August 17, 1996 • CCME-EPC-LST-71E requires daily inspections with annual thorough inspections. API 653 requires ultrasonic thickness testing at 5 year intervals, and internal inspections at intervals not exceeding 20 years. Inspections and tests must be recorded and kept on file.
5. Are underground tanks leak tested at least annually?	General Table 4 General Table 11 CREO Table 10	• It should be noted that leak testing will not prevent chemical release as leaks of 0.5 gals/hour and less cannot be detected. • Underground tanks should be removed and replaced with above ground tanks and must not be used in new construction. • If removal and replacement is impractical for an existing tank, it must have a leak detection system designed by a certified engineer. • All underground tanks must be tested annually and certified as suitable for the intended use, by an accredited testing company or agency. Tests must be recorded and kept on file.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
6. Are aboveground tanks mounted on containment pad surfaces?	General Table 4 CREO Table 10	• Tanks should be installed as per Section 4.3 of the NFCC and Section 3.5 of the CCME-EPC-LST-71E. Existing tanks should be managed as per Section 4.3 of the NFCC and Part 4 of CCMS-EPC-LST-71E. • Tank bases must not be embedded in, or be encased by concrete. • Preferably, vertical tanks should be mounted on raised supports on containment pad surfaces. • If tanks must be in contact with pad surfaces, monthly visual inspections of external corrosion must be carried out with ultrasonic testing at 5 year intervals. Inspections and tests must be recorded and kept on file. • The tank containment floor must be kept clean and dry, to allow immediate detection of leaks.
7. Are tanks mounted in stable positions and anchored securely?	General Table 4	• Tanks must be mounted in stable positions and must be anchored if flooding of the containment by storm water or a spill would exert uplift forces (NFCC 4.3.3). • Tanks installed in deep containments are particularly vulnerable particularly if they are normally maintained at low liquid levels.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
8. Are tanks sheltered from weather by a fixed roof?	General Table 4 CREO Table10	• Contaminated surface waters must be controlled. • Exterior tanks must be roofed if the storm water that enters the tank containment is of potential regulatory concern. • Roofing is not required provided that contaminated storm water is treated to comply with regulatory limits prior to controlled discharge.
9. Are tanks located in dyked area?	General Table 4 CREO Table 10	• All chemical storage tanks must be installed in a dyked containment. • In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
10. Are tanks protected from freezing?	General Table 4 CREO Table 10	• Heating may be used to enhance transfer of solutions, and if so, must be in accordance with Section 4.4.9 of the NFCC.
11. Are all interior tanks vented outside (or into recovery system)??	General Table 4 CREO Table 10	• Tanks must be provided with vent piping for vapour control as per NFCC Section 4.3. • Interior tanks must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. Interior tanks must not be vented directly into the workplace.
12. Are all insulated tanks provided with inspection points?	General Table 4	• Preferably, tanks should be raised on supports to allow leaks to be readily detected. • Whether tanks are raised or not, the tank farm floor must be kept clean and dry to allow immediate leak detection. • The lower 6" of insulated tanks must not be insulated to allow leaks to be readily detected or tanks must be provided with inspection points.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
13. Are tank vents controlled?	General Table 4 CREO Table 10	• Tanks must be provided with vent piping for vapour control, as per NFCC Section 4.3. • Vents must be protected against release of entrained liquids or overflow. • Tanks must not vent directly into the workplace.
14. Are tanks equipped with electric bonding?	CREO Table 10	• Electric bonding/grounding must be provided on all tanks in accordance with NFCC, Sections 4.3.12.10; 4.6.4.5; and, 4.11.3.2. The bonding systems must be checked for electrical continuity on a monthly basis.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT**		
15. Is piping rigid and permanent throughout the operation?	General Table 4 CREO Table 10	• With the exception of the connection between the transport vehicle/vessel and the storage tank system, all piping must be rigid, permanent and of the appropriate material and schedule and must conform to Section 4.4 of the NFCC.
16. Is piping visible and accessible with a simple layout?	General Table 4 CREO Table 10	• Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT**		
17. Is piping above ground?	General Table 4 CREO Table 10	• All piping must be visible and readily accessible for leak detection and maintenance. • Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or the piping must be brought above ground. • Underground piping is not allowed in new or replacement construction. • If there is no alternative to underground piping in existing construction, it must be installed in appropriate containment with provision for leak detection designed by a qualified engineer. • Sub-grade piping should meet the requirements listed in Section 3.9 of CCME-EPC-LST-71E and maintenance.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
18. Is containment provided for sub-grade piping?	General Table 4 CREO Table 10	• Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or the piping must be brought above ground. • Underground piping must be installed in appropriate containment with provision for leak detection as per Section 3.9 of CCME-EPC-LST-71E.
19. Are piping and fixtures chemically compatible?	General Table 4	• Piping and fixtures must be compatible with creosote and petroleum oil. • Any questions and/or uncertainties must be resolved with the chemical supplier.
20. Are valves identified by labeling or colour-coding?	General Table 4	• Valves must be labeled or colour-coded. • The label or colour-code must identify the valve function in accordance with the piping schematic in 2.3.16. • Color coding should consider requirements of NFCC Section 4.4.2.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
21. Are valves and pipes protected from impact?	General Table 4 CREO Table 9	• All valves and piping must be protected to prevent damage by any means, such as plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
22. Are lines protected from freezing (where applicable)?	General Table 4 CREO Table 10	• Heating may be used to enhance transfer of solutions, and if so, must be in accordance to Section 4.4.9 of the NFCC.
23. Do valves have local drip/spill catch trays?	General Table 4	• Valves must be installed properly and maintained regularly to prevent leakage. • The tank farm floor must be kept clean and dry to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid must be cleaned out.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
24. Do pumps have local drip/spill catch trays?	General Table 4	• All pumps handling creosote and petroleum oil must have self-contained spill trays large enough to prevent contamination of the containment area. • There must be no free liquids on the containment floor. • Spill trays must be inspected daily and any free liquid must be cleaned out.
25. Are back flow preventors on all water supply lines?	General Table 4	• Reduced pressure type backflow preventors must be installed on all water supply lines as a secondary protection system. • Backflow preventors must be inspected and tested annually or as recommended by the manufacturer. Tests must be recorded and kept on file.
26. Is piping system designed to protect against inadvertent transfers?	General Table 4	• Pipes and valves must be clearly identified and operating instructions explicitly defined. • Manual systems must not be operated by untrained personnel. • Where there is common piping in multi-preservative plants, blocking systems must be in place to prevent inadvertent transfer of solutions.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
27. Are reliable, accurate level indicators installed?	General Table 4	• All level indicators must be checked regularly and calibrated every 6 months, where appropriate. • Calibration records must be kept on file.
28. Is mechanical impact protection functional on sight glasses??	General Table 4	• Protection system must prevent sight glasses from being damaged or disconnected.
29. Are shut-off valves functional on all rupturable lines and gauges?	General Table 4	• Any line or gauge that can be easily damaged or disconnected must be fitted with an automatic shut-off valve. • Examples include sight glasses, instrument tubing, etc. • Vulnerable sampling valves on tanks must be physically protected.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
30. Is overflow piping provided from tanks to containment?	General Table 4 CREO Table 10	• Preferred design is to connect all tanks to a dedicated CREO or CREO/OIL overflow tank; otherwise, overflow piping must extend to a contained sump with provision for recycling to a storage tank. • Overflow tanks and pipes must be vented to the exterior with provision to prevent the release of entrained liquids or overflow. • Open manholes on tanks are not permitted.
31. Are independent high-level alarms installed on tanks?	General Table 4 CREO Table 10	• All tanks must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly and test details must be recorded and kept on file.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
32. Are high-level alarms interlocked to the pump auto-shut off?	General Table 4	• Alarms must immediately prevent any increase in the solution level in the tank, either by shutting off the pump or by closing the appropriate valve
33. Is there a 24-hour monitoring alarm?	General Table 4 CREO Table 10	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly. Alarm tests must be recorded and kept on file.
34. Are there manual alarm buttons at potential major spill points?	General Table 4 CREO Table 10	• The chemical receiving, storage and treating cylinder areas must be adequately protected by manual alarms. • The function of all alarms must be tested weekly. Alarm tests must be recorded and kept on file.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT**		
35. Are containment floors, dykes and joints structurally sound?	General Table 4 CREO-18 Table 10	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer.
36. Are containment surfaces and joints sealed?	General Table 4	• All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.
37. Is a secondary containment barrier built into the containment area? (e.g. impermeable top coat or liner under the containment area).	General Table 4	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath tanks, together with a leak detection system, as per 2.4.38. • The coating must comply with the requirements defined in Section 1.2.9.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
38. Is subsurface leak detection provided?	General Table 4	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. • Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.
39. Is the spill containment volume in compliance with NFCC?	General Table 4 CREO Table 10	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
40. Are there provisions to direct, collect and transfer spills to tankage?	General Table 4	• Provisions must ensure the immediate transfer of all liquids to the appropriate tank. • There must be no free-standing liquids anywhere in the plant. • Centrifugal pumps must not be used to transfer oil-contaminated water from dykes or sumps, to minimize the formation of emulsions as per CCME-EPC-LST-71E, Section 3.12.
41. Is local collection/containment of incidental drips in place (pumps, valves etc.)?	General Table 4	• The tank farm floor must be kept clean and dry to prevent tracking and air contamination and to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid must be cleaned out. • All pumps handling creosote solutions must have self-contained spill trays large enough to prevent contamination of the containment area. • Spill trays must be inspected daily and any free liquid must be cleaned out.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
42. Is containment area designed to minimize tracking of liquids and contaminated dust?	General Table 4	• The containment area must be kept free from preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by authorized personnel, as designated by the Plant Manager. • Walkways, boot-changing facilities etc. must be provided to prevent dirt and dust being tracked to and from the plant.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS**		
1. Is transfer equipment (pumps) in a contained, enclosed, heated area?	General Table 5	• The containment for mixing vessels must be as defined in Section 2.4, Criteria 35-42 inclusive. • Temperatures should enable ready transfer and mixing as well as maintaining all components in solution.
2. Is permanent, closed transfer system used?	General Table 5	• A permanent, closed mixing system must be used. • The mixing system must be rigidly piped from tank to tank.
3. Is a high level alarm installed to prevent mix tank overflow?	General Table 5	• The mix tank must have a high-level alarm. • The alarm must be audible throughout the plant. • The alarm must trigger visible identification of a specific high-level emergency in the mixing vessel. • The alarm function must be tested weekly and the test must be recorded and kept on file.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS CONT'D**		
4. Are high-level alarms linked to feed pump shut off?	General Table 5	• Alarms must immediately prevent any increase in the solution level in the mixing tank, either by shutting off the mix pump or by closing the appropriate valve.
5. In case of any open transfer operations, is reliable splash protection in place?	General Table 5	• Open transfer of solution is not allowed. • Working solutions must be mixed in a closed system.
6. Is transfer equipment mechanized (minimum of worker contact/spill potential)?	General Table 5	• To the greatest degree possible, valves and pumps should be controlled via the control panel.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT**		
7. Are containment floors, dykes and joints structurally sound?	General Table 5 CREO Table 10	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer with prior relevant experience.
8. Are containment surfaces and joints sealed?	General Table 5 CREO Table 10	• Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.
9. Is a secondary containment barrier built into a tank containment area?	General Table 5	• New plants, and modifications or additions to existing plants, must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the mix tanks, together with a leak detection system as per 2.4.39. • The coating must comply with the requirements defined in Section 1.2.9.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
10. Is subsurface leak detection provided?	General Table 4	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. • Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.
11. Is there a subsurface leak containment and collection system?	General Table 4	• For an existing plant, if the monitoring well system detects a leak, a recovery well system must be designed and installed by a qualified hydrogeologist, to ensure containment and collection. • The double liner system described in Section 3.2.9 above is the preferred approach for new plants or additions to existing plants.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
12. Is the spill containment volume in accordance with NFCC?	General Table 5 General Table 4 CREO Table 10	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
13. Is tank farm covered to prevent infiltrating precipitation?	General Table4 CREO Table 10	• Exterior tanks must be roofed if the storm water that enters the tank containment is of potential regulatory concern. • Roofing is not required if storm water is treated to comply with regulatory limits prior to controlled discharge.
14. Does containment have alarms to identify spills?	General Table 5	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly and the test must be recorded and kept on file.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
15. Is the containment area visible?	General Table 5	• The containment must be well-lit, as per provincial requirements of the Workers' Compensation Board, Ministry of Labour, etc, and must not be obstructed by being used as an equipment storage area.
16. Is accessible storage for spill response equipment, absorbents and personnel protection nearby?	General Table 3 CREO Table 8 CREO Section 12.1	• Personal protection equipment must comply with TRD Reference CREO, Table 8. • Spill response equipment and absorbents should be selected on a site specific basis and upon the preservative supplier's recommendations. • Equipment inventory must be checked weekly and recorded and must be complete at all times • Location of equipment storage must allow prompt response to emergency situations.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
17. Is the mix area adequately ventilated?	CREO Table 8	• Workplace air quality should be within regulatory limits. • Ventilation must conform to NFCC Section 4.1.7.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION**		
1. Are the treatment vessel, controls and ancillary equipment in an enclosed structure and protected from freezing?	General Table 6	• The treating cylinder, controls and ancillary equipment must be located in an enclosed winterized structure that is maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
2. Are the treatment cylinder and process tanks within a contained area?	General Table 6	• The treating cylinder and process tanks must be located in a containment area with continuous, structurally sound concrete floors and dykes. • The details of the containment must be as defined in Section 2.4, Criteria 35-42 inclusive.
3. Does the spill containment capacity comply with NFCC requirements?	General Table 6	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
4. Are the floors and dykes reinforced, structurally sound and with sealed joints?	General Table 6	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9. • Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing.
5. Are surfaces graded to facilitate drainage?	General Table 6	• Provisions must ensure the immediate transfer of all liquids to the appropriate tank. • There must be no free-standing liquids anywhere in the plant. • Section 3.12 of CCME-EPC-LST-71E states that centrifugal pumps must not be used to transfer oil-contaminated water from dykes or sumps, to minimize the formation of emulsions.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
6. Are walkway grates or other designs in place to minimize worker contact and tracking of preservative residues?	General Table 6	• The containment area must be kept free from preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by those personnel authorized by the Plant Manager. • Walkways, footwear exchanges etc. must be provided to prevent dirt and dust being tracked to and from the plant.
7. Does the entire process area have a secondary containment provision (e.g. impermeable top coat on floors and dykes or liner under the containment area)?	General Table 6	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection, if applicable. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the tanks. • The coating must comply with the requirements defined in Section 1.2.9.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
8. Is control and transfer equipment isolated to avoid damage from spills?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that a spill equal to the containment volume defined in Section 4.1.3 or flooding will not prevent their operation or create an electrical hazard.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.2 SUMPS**		
9. Are sumps leakproof (impermeable surfaces, sealed joints)?	General Table 7	• Sump surfaces must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cm/sec, or less, and be resistant to creosote solutions. • All joints in the sump must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, sump joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.
10. Are sumps equipped with a secondary containment (e.g. steel lining)?	General Table 7	• The surfaces of concrete sumps must have an impermeable coating and must also be lined with steel or other suitable impermeable material. • "Impermeable" is defined as meeting a permeability rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.2 SUMPS**		
11. Are sumps protected by independent high-level alarms?	General Table 7	• All sumps must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly and tests must be recorded and kept on file.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING CYLINDER**		
12. Are all pressure vessel inspection certificates current?	General Table 7	• The plant must have a current certificate to show that the treating cylinder and all pressurized components meet all requirements of the provincial ministry responsible. • If there is no provincial requirement, the treating cylinder and all pressurized components must be inspected annually by an accredited testing company or agency. Inspection records must be kept on file.
13. Is the retort door protected from opening, when full?	General Table 7	• Retorts must be equipped with an effective protection device to prevent doors being opened when retort is pressurized, filled or partially filled with preservative. The device must be effective against vandalism or sabotage. • Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to the impact wrench compressor.
14. Are independent interlock/alarms installed on the doors?	General Table 7	• Independent interlock/alarms must be installed as described in 4.3 #13.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING CYLINDER CONT'D**		
15. Is the cylinder designed to facilitate drainage of excessive preservative?	General Table 7	• The alignment of the treating cylinder and/or the pump-out procedures must ensure that the minimum amount of preservative drains from the cylinder door opening.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS**		
16. Is the operator control area segregated from retort and tank spill containment areas?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that spills or flooding will not prevent their operation or create an electrical hazard. • In the case of hydraulic doors, the hydraulic pump controls must be located or shielded so that the operator is not directly exposed to any liquid or vapour releases from the cylinder.
17. Is the control area winterized?	General Table 6	• The process control area must be winterized and maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
18. Is the control area well lit and located for maximum visibility of treatment systems?	General Table 6	• All operating and control areas must have proper lighting in accordance to provincial requirements, so that all equipment is totally visible at all times. • The location of the control area must allow the best possible visibility of the treatment system, for the operation concerned. • Mirrors or closed circuit TV may solve specific problems, particularly for those plants where the cylinder doors are hidden from view.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS CONT'D**		
19. Are process controls simple and properly functioning to provide accurate feedback?	General Table 7	• The process controls must be installed, maintained and calibrated in accordance with CSA 080-M3, Clause 3.0.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.5 AIR EMISSION CONTROL**		
20. Are pumps, tank or other exhausts vented to outside or to recovery system?	CREO Table 10	• Pumps, tanks, cylinders and other exhausts must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Equipment must not vent directly into the workplace.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM**		
21. Are traps installed on vents (to remove entrained liquids)?	CREO Table 10	• All vents must have traps to remove entrained liquids as per Section 4.5.20.
22. Is the system designed to effectively contain and recycle all chemicals with minimal potential for releases?	General Table 6 General Table 7	• The system must be able to contain and recycle all chemicals used by the plant. • There must be no routine release of chemicals into the containment from process equipment.
23. Is all transfer equipment in a contained area?	General Table 7	• All piping and pumps must be contained as defined in Section 2.4, Criteria 35-42 inclusive. • Transfer equipment must be kept above 0°C.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM CONT'D**		
24. Are pipes and valves clearly identified?	General Table 4	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves must be clearly labeled to identify their function in accordance with the piping schematic. • NFCC Section 4.4.4 should also be used for reference.
25. Are delivery lines rigid, accessible and visible?	General Table 4	• All treatment process piping must be rigid, permanent and of the appropriate material and schedule with the required compatibility. • Plastic piping or flexible hoses must not be used. • Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available
26. Is piping protected from mechanical damage?	General Table 4	• All piping must be protected to prevent damage by any means, such as worker traffic, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.1 GENERAL DESIGN**		
1. Does the area have efficient drip and run-off collection and containment?	General Table 8 CREO Table 11	• The drip pad must be fully contained with sufficient grade to minimize the retention of free liquid so that tracking and air contamination are avoided.
2. Is dispersal of liquids from tracking by personnel and vehicles minimized?	General Table 8 CREO Table 11	• The drip pad must be designed to minimize the dispersal of creosote or creosote/oil solution by vehicles or foot traffic.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.2 DRIP PROTECTION**		
3. Is the area sufficiently sized to hold all freshly-treated wood until visible dripping has stopped?	General Table 8 CREO Table 11	• The area must be large enough to hold all freshly-treated wood until visible dripping has stopped.
4. Is the area where wood is stored an open structure with proper containment?	CREO Table 11	• Wood treated with creosote should be stored in an open-roofed and contained area. If roofing is not feasible, then the area should have provision for collecting and containing runoff water (for treatment and controlled discharge).
5. Is the area roofed?	General Table 8 CREO Table 11	• The area must be roofed if storm water and wash water cannot be collected, contained and treated for controlled discharge as per regulatory standards.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.3 CONTAINMENT**		
6. Are the unloading areas provided with impermeable floor and curb?	General Table 8 CREO Table 11	• The unloading track pad must be constructed to completely contain all drips from the wood and the trams. • The unloading area surface must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cm/sec, or less, under a head of 3m and be resistant to creosote solutions. • Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer with previous relevant experience.
7. Are the floors sloped to facilitate collection of all contaminated liquids?	General Table 8 CREO Table 11	• The drip pad must be fully contained with sufficient grade to direct any free liquid to a collection and recycling system, or wastewater treatment system.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.3 CONTAINMENT**		
8. Are the floors and curbs covered with an impermeable top coat or is a liner installed underneath the entire area?	General Table 8	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection, if applicable. • Existing plants without liners must have an impermeable top coat on all drip pad surfaces, together with a leak detection system, as per Section 2.4.39. • The coating must comply with the requirements defined in Section 1.2.9.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS**		
1. Is the wood completely drip free prior to placing it in unprotected storage?	CREO Table 11	• Freshly-treated wood must be drip dry before being placed in unprotected storage. If there is a risk of further dripping or leaching that will cause soil and run-off contamination in excess of applicable standards, the wood must be stored under cover or on a paved surface. If there are no provincial standards for soil contamination, the interim remediation criteria for soil defined in the 1991 CCME "Interim Canadian Environmental Quality Criteria for Contaminated Sites" shall apply. Run-off limits shall be determined in consultation with the provincial Ministry of Environment.
2. Are treated wood packages elevated above ground (placed on stringers)?	General Table 9	• All treated wood packages/bundles must be elevated at least 6 inches above ground to minimize contamination of soil and surface run-off water.
3. Are treated wood storage areas segregated from uncontaminated yard areas?	General Table 9 CREO Table 12	• Treated wood storage areas must be consolidated and segregated to minimize yard contamination and ensure efficient collection of any surface run-off water containing creosote residues in excess of regulatory limits. • As per Table 12 in CREO, options for storage area surfaces must be evaluated on the basis of several factors including groundwater usage, precipitation levels, etc.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS** **CONT'D**		
4. Are unsurfaced storage areas remote from water bodies?	General Table 9 CREO Table 12	• The run-off from surfaced and unsurfaced storage areas must not cause any water body, surface water or groundwater system to exceed regulatory guidelines or standards.
5. Is storage in compliance with NFCC requirements (lack of vegetation, separation of wood from buildings)?	General Table 9	• Storage areas must be separated from plant operations and other structures by an acceptable clear space permanently available for fire-fighting operations. • Storage areas must be maintained free of combustible vegetation, including grass and weeds, for at least 4.5 m from the stored material and at least 30 m from bush and forested areas. • Lumber treated with combustible liquids must be stored in piles separated from other stored material by a distance of not less than 4.5 m. • At least two fire department access routes must be provided.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.1 PROCEDURES**		
1. Is an operations manual available with written instructions for all aspects of chemical use?	General Table 10	• A current, site-specific manual must be available containing clear instructions for all aspects of chemical use, plant operation, equipment maintenance, housekeeping, accident prevention, first aid and emergency response procedures, and all applicable regulations. • The manual must be readily available to all employees. • There must also be up to date blueprints of the plant and current specifications for all equipment.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.1 PROCEDURES**		
2. Are all operating personnel informed of the potential hazards and precautionary measures?	General Table 10 CREO Table 14	• Training in all aspects of chemical use and plant operation must be provided and updated, at least annually. Training programs must be plant specific and should at least include: o Chemical substances and their hazards, including personal hygiene. o Safe operation and maintenance of equipment and processes. o Spill and fire prevention procedures. o Proper use of personal protective equipment. o Proper use of all safety equipment for controlling spills and fires. o Emergency response and first aid and rescue procedures. o Handling, storage and disposal of waste materials. • Individual employee training must be documented.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.2 PERSONNEL**		
3. Are all operating personnel trained in good work practices?	General Table 10 CREO Table 14	• Operating personnel must be trained as defined in Section 7.1#2 of this document. NFCC Section 4.4.11 describes operating procedures for piping systems which address training in emergency procedures, importance of constant attendance during unloading operations, location of valves, visual inspections, operational tests and maintenance. • Operations and procedures outlined in Part 5 of the CCME-EPC-LST-71E should also be implemented.
4. Is periodic review and update of training implemented?	General Table 10 CREO Table 14	• Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment.
5. Is a pre-employment medical check-up and on-going annual medical surveillance carried out?	General Table 10 General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed to verify that they are able to carry out their assigned duties. Provided new employees are not exposed to chemicals, their pre-employment medicals may follow completion of their probationary period. • Employees must also have an annual medical check-up, specifically designed to assess any effects of exposure to the chemicals in use at the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.3 SIGNING**		
6. Are the contents and functions of the tanks identified (e.g. creosote storage, 50:50)?	General Table 10 CREO Table 14	• The contents and functions of all tanks must be clearly identified by large, permanent signs.
7. Are personnel safety precautions and first aid procedures prominently displayed?	General Table 10 CREO Table 14	• Prominent, easy to read signs must be displayed in the chemical receiving and storage areas, the treating process area, all control stations and the plant office. • Refer to requirements for unloading, in NFCC 4.6, 4.7 and 4.11; and precautions listed in Tables 7 and 14 in the CREO section of the TRD.
8. Are emergency response procedures and emergency telephone numbers prominently displayed?	General Table 10 CREO Table 14	• Plant specific emergency response procedures must be summarized and displayed in the form of a prominent notice. • Notices must also show phone numbers for company contacts, police, fire, ambulance, chemical supplier, etc., not just 911.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY**		
9. Are food, drink or tobacco products prohibited in working areas?	General Table 1	• Food, drink and tobacco products must be prohibited in working areas. • Designated lunch rooms and smoking areas must be separate from work areas and must be provided with washing facilities.
10. Are all personnel familiar with basic hygiene requirements?	General Table 1 CREO Table 14	• Specific training must be provided as defined in Section 7.1.2. • Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment. • Individual employee training must be documented. • New employees must be fully trained before they can assume full responsibility for any aspect of plant operation.
11. Are soiled clothes promptly removed?	General Table 1	• Operators and other employees who come into contact with preservative chemicals must wear appropriate work clothing which must be changed immediately if splashed with chemicals. • Work clothes must stay at the plant and must be laundered separately from other clothing.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY CONT'D**		
12. Are correct safety clothes (gloves, masks, boots, etc.) worn for respective operations?	General Table 1 CREO Table 8	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Table 8 of the CREO section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
13. Are first aid personnel familiar with emergency response procedures?	General Table 1 CREO Table 8	• First aid training must address the specific emergency response procedures for creosote, petroleum oil and the other chemicals used in the plant. • First aid supplies must include all items required to treat creosote exposure, including ingestion, as per the creosote supplier's recommendations.
14. Are changing rooms and showers provided?	General Table 1	• Changing rooms must be provided with lockers which allow street clothes to be stored separately from work clothing and PPE. • Hot showers must be provided and operators and other employees who come into contact with preservative chemicals must shower before leaving the plant after work.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING**		
15. Does the plant have a defined housekeeping plan?	General Table 10	• Housekeeping standards aimed at maintaining a clean and orderly plant must be defined in writing and included in the operations manual. • The responsibility for maintaining the standards in different areas must be clearly assigned to specific individuals.
16. Are generation and accumulation of wastes minimized?	General Table 17 CREO Table 15	• To minimize the generation of wastes, the recommendations contained in Table 17 of the General section of the TRD must be followed. • Special attention must be given to all factors affecting preservative cleanliness, particularly water content, debris, soil and any other foreign matter which may create sludge.
17. Is equipment regularly inspected for leaks?	General Table 12	• All process components must be inspected for leaks by every shift (NFCC Section 4.4.11.5; Section 5.3 of CCME-EPC-LST-71E). • Immediate action must be taken to stop leaks.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING CONT'D**		
18. Are leaks properly contained and repaired promptly?	General Table 12	• Leaks shall be repaired as quickly as practicable (NFCC 4.4.11.5). • There must be no uncontained leaks. • The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
19. Are daily records maintained for chemical delivery, use and inventory?	General Table 10	• To provide a secondary level of control for chemical losses, records must be maintained as follows: o Transfers to and from the concentrate tank as they occur. o Transfers to and from the work tanks as they occur. o Inventory of concentrate and working solution volumes, monthly. o All tank levels must be checked against the last recorded level, every two days, when the plant is not operating.
20. Are daily records maintained for equipment condition and maintenance?	General Table 10	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation and ensures immediate attention to any problems. • PMP records must be maintained in a daily log and monitored to identify the need for special attention to persistent problems. • CCME-EPC-LST-71E requires the owner of a petroleum product storage tank system to retain records of overfill alarm tests, leak detection tests, and other inspections for 5 years.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
21. Are chemical volume discrepancies promptly investigated?	General Table 10 General Table 12	• To provide a secondary level of control for chemical losses, chemical use and inventory records must be reconciled monthly, to ensure that they are in balance. Section 5.2 of CCME-EPC-LST-71E requires notification of authority having jurisdiction of any unexplained loss of 1% or more throughput in one month, as well as other conditions. Also refer to NFCC 4.3.16.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.7 SPILL RESPONSE**		
22. Does a written spill contingency plan exist?	General Table 10 General Section 12.1 CREO Table 14	• A written spill contingency plan must be prepared and maintained in accordance with Section 12.1 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the components of the plan. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc. • Local police and fire departments must be provided with copies of the plan together with complete details of those aspects of the operation related to the implementation of the plan.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.7 SPILL RESPONSE**		
23. Are regular spill response drills carried out, including an annual spill enactment drill?	General Table 10 CREO Table 14	• Spill response drills and annual enactments or rehearsals must be part of the spill contingency plan and must be planned in advance by the person responsible. • Annual rehearsals should be planned in collaboration with relevant agencies, such as police, fire and ambulance services and provincial authorities, with a view to gaining their involvement to make the enactment as real as possible. • Drills must be monitored and reviewed by all participants to determine the need for any improvement to emergency response procedures.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING**		
24. Does a written fire contingency plan exist?	General Table 10 General Section 12.2 CREO Table 14	• A written fire contingency plan must be prepared and maintained in accordance with Section 12.2 of the General section of the TRD and NFCC Sections 2.8 and 4.3.2.5, and Part 6. • The plan must be site specific and must identify the individuals responsible for implementing the various components. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc.
25. Has the local fire department been made aware of the chemicals in use?	General Table 10	• The fire contingency plan must be prepared in consultation with the local fire department. • Local police and fire departments must be provided with copies of the plan together with complete details of those aspects of the operation related to the implementation of the plan. • The fire department should visit the plant at least annually, to maintain their knowledge of the operation and also identify any improvements that are needed to update the contingency plan.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
26. Is sufficient self-contained breathing equipment available?	General Table 10 General Table 12 CREO Table 8	• If it is decided to use self-contained breathing apparatus (SCBA) for fire fighting and/or vessel entry, there must be two sets available and personnel must be properly trained in their use. • Responsibility must be assigned for the inspection and maintenance of SCBA and also for the annual review and update of training. • The plant may decide that the fire department should be responsible for SCBA and also may elect to hire contractors for vessel entry.
27. Is appropriate fire extinguishing material (e.g. foam) readily available?	CREO Table 13	• Fire extinguishing materials and procedures must be reviewed with the local fire department. Normally, dry chemical or foam systems must be used to extinguish fires involving creosote/oil. Water spray must be used to cool fire exposed surfaces and protect fire-fighting personnel. Ability to use the system requires an appropriate training program. NFCC sections on fire-fighting should be consulted, e.g. Section 2.8, 4.3.2 and Part 6.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
28. Are adequate material/procedures on hand to contain and dispose of fire residues?	General Table 10 CREO Table 18	• The fire contingency plan must define the procedures to be followed to contain and dispose of all residues created by fire fighting. The procedures should be developed in collaboration with the local fire department and should include allowing the treating plant to burn down if there is any risk of a release of chemical or contaminated water from the containment. The procedures should also include provision for constructing berms and ditches and blocking storm drains in yard areas to contain contaminated water and solid residues. • Plant fire crews must be designated and trained to the level necessary to implement the company's Fire Contingency Plan. Training programs must be developed in conjunction with local Fire Departments and where possible should be in accordance with National Fire Protection Association (NFPA) Standard No. 472, "Hazardous Materials Response". This advanced level of training is provided at institutions across Canada, accredited under the International Fire Service Accreditation Congress. • Specific information re location of institutions and NFPA Std. No. 472 can be obtained from local Fire Departments.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS**		
1. Is personnel trained in emergency response procedures?	General Table 11 CREO Table 8 CREO Table 14	• All personnel must be formally trained in emergency response procedures for spills and fires. • Individual employee training must be documented and updated annually. • Training must be reinforced during the year by spill response drills.
2. Is access to unloading area restricted during unloading operations?	General Table 11 CREO Table 8	• All vehicles, including contractors' trucks and visitors' vehicles must be prohibited from the off-loading area by DANGER signs, barriers and constant supervision. • The unloading operation must be attended by a trained operator, wearing PPE as specified in CREO, Table 8. First aid personnel must be available. • Truck deliveries should not occur outside normal working hours.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS CONT'D**		
3. Is there ready access to emergency aid?	General Table 11 CREO Table 8 CREO Table 14	• As defined in Section 8.1.2 above, the unloading operation must be attended by a trained operator. This operator must be trained in chemical handling, chemical hazards, emergency response procedures and first aid. • Additional first aid personnel, trained to deal with emergencies involving creosote must be on site and must be given advance notice of chemical unloading. • Prior to chemical delivery, first aid supplies must be checked and eye wash fountains and emergency showers must be operational. • An emergency response team, trained in chemical spill procedures must be available and all alarms and spill control equipment must be in good order.
4. Are transfer operations attended at all times?	CREO Table 14	• The unloading of creosote and petroleum oil must be attended at all times and personnel responsible must be trained as per Section 4.4.11 of the NFCC. Transfers must occur as per Section 4.11 of the NFCC.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS**		
5. Are equipment used and procedures followed to avoid worker contact with preservative chemicals?	General Table 11 General Table 1 CREO Table 8	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Table 8 of the CREO section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced
6. Is responsibility of storage area assigned to trained personnel?	General Table 11 CREO Table 14	• All activities in the chemical storage area must be carried out by personnel trained in all aspects of chemical handling, system operation, hazard identification and emergency response. • The chemical storage area must be off-limits to all other personnel.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS**		
7. Is a visual inspection routine of equipment storing and transferring chemicals instituted?	General Table 11 General Table 12 General Table 13 CREO Table 14	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation, including chemical storage and transfer and ensures immediate attention to any problems as per NFCC Section 4.4.11.5 and Section 5.3 of the CCME-EPC-LST-71E. • PMP records must be maintained and monitored to identify the need for special attention to persistent problems.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
8. Are valves tested regularly?	General Table 12	• The functionality of all valves must be tested in accordance with the Preventive Maintenance Program defined in Section 8.2.6 above. • NFCC Section 4.4.11.6 requires tests of all safety shut-off valves and other fire safety devices with particular attention to normally open fusible-link operated valves, float valves and automatic controls.
9. Are drips and spills cleaned up promptly?	General Table 11	• There must be no uncontained drips or spills. • The operating objective must be to be drip and spill-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately as per NFCC 4.4.11.5.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS**		
1. Are quantities of stored chemicals regularly checked and recorded?	General Table 12	• All chemicals must be checked and recorded as defined in Section 7.6.19 and Section 7.6.20, above. The information shall be interpreted as per Section 7.6.21, above.
2. Is the solution free from contamination?	General Table 12	• The surfaces of treated products must be checked to ensure they are free from residues. The treatment solution should meet the AWPA P1/13 Standard, which states that the solutions must have no more than 3.0% water and 1.5% matter insoluble in xylene. Testing procedures are prescribed in the AWPA A1 standard.
3. Is the system regularly checked for leaks and are those leaks promptly stopped?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately as per NFCC 4.4.11.5. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
4. Are sludge levels in tanks and retort regularly checked and removed?	General Table 12	• Whenever there is evidence of excess surface contamination, the presence of sludge in the cylinders and tanks should be checked, and removed if necessary. Nonetheless all tanks must be checked, at least annually and any sludge must be removed. • Sludge must be removed from retorts regularly to prevent operational problems and/or surface deposits on the finished product. Inspections must be recorded and kept on file. • All precautions for safe vessel entry must be followed.
5. Are tank vents tested for blockage at least once a month?	General Table 12	• Tank vents must be tested at least monthly, if there is any risk of restriction or blockage of the vent pipe due to deposits.
6. Are wood loads stacked to allow good drainage of preservative?	General Table 12 CREO Table 12	• Timbers must be stickered and stacked on an angle to maximize the rate of preservative drainage, in the cylinder after treatment. • The need for drainage can be minimized with the use of proper conditioning of wood, maintaining specified levels of net retention, and application of an effective expansion bath or final steam/vacuum cycle.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
7. Are cylinder door seals in good order?	General Table 12	• Cylinder door seals must be cleaned and debris removed prior to each charge. The seals should be checked for damage and wear before every charge. • Spare seals must be available to allow immediate replacement when required. • Cylinder doors must be checked during the pressure cycle to ensure that they are properly sealed.
8. Are filters checked regularly, cleaned or replaced when necessary?	General Table 12	• Keep strainers clean in accordance to the Preventive Maintenance Program.
9. Are tanks free of debris, soil or other contamination?	General Table 12	• Trams and charges must be free from debris, soil and other contamination before loading into the cylinder. • Return lines from the cylinder to the working tanks must be fitted with strainers.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
10. Are trams, pipes/pumps and cylinder thoroughly cleaned on preservative switch-overs?	General Table 12	• Common treating systems in multi-preservative plants should be avoided. If unavoidable, common systems, including trams, piping, pumps, cylinder etc. must be thoroughly cleaned before switching to another preservative. Blocking systems must be in place to prevent inadvertent transfer of solutions. All wash water, condensate etc. generated in the cleaning process must be collected and contained for recycling or treatment, prior to controlled discharge as per applicable regulations.
11. Is process system monitored for leaks during operation?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
12. Are recording and indicator instruments in proper order?	General Table 12	• All recording and indicator instruments must be installed and calibrated in accordance with CSA 080-M3, Clause 3.0 and CSA 080.1, Clause 2.2 • Calibration records must be kept on file.
13. Is the treatment closely monitored to ensure that maximum limits are not exceeded?	General Table 12	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits, in accordance with CSA 080.1. • Manual control without instrumentation does not allow close monitoring.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT CONT'D**		
14. Are detailed records kept of all process steps and conditions?	General Table 12	• There must be a record of each charge showing wood species, products, sizes, volumes, treating cycle stages and duration, tank gauge readings and chemical consumption. • The treatment record and process charts and print outs must be kept on file, together with the results of solution and product testing, in accordance with CSA 080-M3, Clause 1.5.
15. Are records kept of abnormal operating situations (e.g. equipment breakdown)?	General Table 12	• Abnormal operating situations must be recorded in the daily log and also entered on the treatment record. • Abnormal operating situations must be reviewed with a Supervisor, to ensure that corrective action is taken as soon as possible
16. Is an effective final expansion bath/steam cycle and effective vacuum applied after completion of the pressure cycle (level/duration)?	General Table 12	• To minimize bleeding, it is strongly recommended that a final expansion bath/steam cycle/vacuum process be applied after completion of the pressure cycle, as per CSA 080.1. The final vacuum must be 22" Hg or more to be effective.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS**		
17. Are safeguards in place to disallow retort opening when liquid or pressure remains?	General Table 12	• Retorts must be equipped with an effective protection device to prevent doors being inadvertently opened, when retort is pressurized, filled or partially filled with preservative. Examples include liquid sensors, pressure switches and laser "eye" controls. Bolted doors could be protected by interlocking the protection device to the impact wrench compressor.
18. Are goggles and other appropriate safety equipment worn by operators opening retort doors?	General Table 12 CREO Table 8	• Operators must wear full PPE when opening cylinder doors and removing and unloading charges. Full PPE includes, impermeable overalls, rubber boots, impermeable gauntlets, face shield or goggles and respirator, if emissions are unknown, or at/above the TLV. Hydraulic door controls must be located or shielded so that the operator is not directly exposed to liquid and/or vapour releases from the cylinder.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
19. Are impermeable gauntlets worn on handling freshly treated wood?	General Table 12 CREO Table 8	• Impermeable gauntlets must be worn for handling freshly treated wood and for all activities in the treating plant where protection is required. Leather gloves and impermeable gloves with permeable cuffs must not be worn. • The TRD also recommends impermeable apron and boots. • A respirator must be worn if wood is handled in enclosed areas (e.g. box cars).
20. Are instructions followed to avoid exposure to preservative vapours/mists?	CREO Table 8 CREO Table 16	• When there is any risk of exposure to preservative vapours or mists in any operation, the PPE specified in Table 8 of the CREO section of the TRD must be worn. • Approved respiratory equipment must be worn if airborne concentrations are unknown, or at/above TLVs.
21. Are charges allowed to essentially drip dry before they are pulled from the retort?	General Table 12	• The procedures defined in Section 9.2.16, above, must be followed to ensure that charges are essentially dripped dry before removal from the retort. .

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
22. Are personnel trained in safety procedures for vessel entry?	General Table 12 CREO Table 8	• Treating plant personnel must be trained in confined space entry procedures as defined in WCB and provincial labour regulations. • If personnel are not trained, an approved contractor must be hired for this activity. • Note that this guideline also applies to tram jams in the cylinder. • Safety precautions are outlined in CREO, Table 8.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 EQUIPMENT MAINTENANCE**		
23. Is all equipment in good operating condition?	General Table 13	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all equipment and ensures immediate attention to any problems. • Records of daily inspections must be maintained and monitored to identify the need for special attention to persistent problems. • The need for documentation is also specified in CCME-EPC-LST-71E.
24. Are NFCC maintenance recommendations adhered to?	General Table 13	• All maintenance practices must be in accordance with the National Fire Code of Canada, including Sections 2.5, 3.3, 4.4.11 and 6.0.
25. Do written maintenance instructions exist?	General Table 13	• The Preventive Maintenance Program must contain written, plant specific instructions for all equipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 EQUIPMENT MAINTENANCE CONT'D**		
26. Are all necessary precautions taken when contaminated equipment is welded?	General Table 13 CREO Table 8	• The precautions that must be taken include: o Obtaining a Hot Work permit from the Supervisor responsible. o Blocking or disconnecting lines from tanks. o Draining and rinsing tanks and lines. o Ensuring that surfaces are free from cleaning solvent residues. o Wearing an approved respirator. o Providing good ventilation in the work area. o Containing all sparks and removing flammable materials. o Complying with all additional provincial workplace safety rules.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 EQUIPMENT MAINTENANCE CONT'D**		
27. Is all equipment drained/cleaned of creosote/oil prior to maintenance?	CREO Table 8	• Equipment should be steam-cleaned or flushed with solvent prior to handling. • Solvents are to be contained. • Wear impermeable apron, gloves and boots during cleaning.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 CLEAN-OUT**		
28. Are written safety procedures in place?	General Table 13 General Table 1	• Safety procedures for clean-out must be included in the Plant Operations Manual and must address the details contained in Tables I and 13 of the General section of the TRD.
29. Are drip pads clean (what is the frequency of cleaning)?	General Table 13	• Drip pads must be kept clean and free from liquids and residues. • Drip pads must be inspected daily and cleaned at least weekly. • The volume and dispersion of wash water must be kept to a minimum.
30. Is wash water treated prior to discharge?	General Table 13 General Table 4	• If wash waters are generated (e.g. by steam cleaning), then they must be collected, contained and stored for treatment.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION**		
1. Is wood properly seasoned prior to treatment?	General Table 17 CREO Table 15	• Every effort must be made to season wood properly. A moisture content above the fibre saturation point (~25% dry wt.) will promote sludge formation.
2. Are trams and wood load free of debris, soil on charging?	General Table 17	• Trams and charges must be inspected before loading the cylinder and cleaned where necessary.
3. Is the treatment solution clean and are the components balanced?	General Table 17	• The treated product surfaces must be free from residues in accordance to AWPA P1/13 Standard for water content and insoluble matter. • No tests currently exist to determine the actual creosote:oil ratios.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION CONT'D**		
4. Are close controls exercised on treatment parameters (are limits not exceeded)?	General Table 17	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits in accordance with CSA 080-M3, Clause 3.0. • Manual control without instrumentation does not allow close monitoring.
5. Are storm run-offs collected and treated?	General Table 9 CREO Table 11 CREO Table 12	• Storm water run-off from paved yards shown to contain levels of creosote components in excess of regulatory limits must be collected, contained, and treated to comply with regulatory limits, prior to controlled discharge. • In the case of unpaved yards, soil and groundwater samples must be taken to determine the environmental impact of storm water. • If contamination above the standards or guidelines listed in Section 6.1 is present, site remediation followed by paving may be necessary.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE**		
6. Are personnel trained in hazards and handling methods?	General Table 17 CREO Table 8	• Training in all aspects of waste handling and disposal must be provided and updated, at least annually. • Training programs must be plant specific and must address all aspects of provincial regulation related to waste handling. • Individual employee training must be documented.
7. Are wastes and sludges stored in sealed drums?	General Table 17 CREO Table 18	• Dewatering of wastes and sludges must take place in an enclosed area, which is roofed and contained. • Appropriate signs must be posted and operators must wear the correct PPE, when processing wastes and sludges. • When wastes and sludges are ready for shipment, they must be in sealed containers, which must conform to Transportation of Dangerous Goods (TDG) regulations. • The storage and handling of wastes and sludges must conform to provincial regulations.
8. Is waste storage area roofed, enclosed and with a paved surface?	General Table 17	• The waste dewatering and storage areas must be roofed, contained, well ventilated and separate from the normal work areas. • Storage areas must comply with Provincial regulations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
9. Are all drums labeled by contents?	General Table 17 CREO Table 18	• Drum and container labels must conform to TDG regulations.
10. Are records kept of inventory for solid wastes and sludges stored on site?	General Table 17	• An up to date inventory of containers, including their volumes and contents must be maintained. • Regulations in some Provinces do require accurate inventories of wastes.
11. Are disposal activities reported as per regulations?	General Table 17	• Disposal activities must be reported by the plant or by the disposal contractor, in accordance with TDG and Provincial regulations. • The plant must maintain disposal records as per TDG regulations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
12. Has the waste been classified under TDGA?	General Table 17	• The waste has been classified under the TDG Act. • Labels must show the correct TDG classification. Creosote waste is designated as a Class 9.3 substance.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING**		
1. Does a specific site monitoring plan exist?	General Table 14	• A site specific monitoring plan must be prepared by a qualified environmental consultant. • The plan must be designed to address provincial standards for soil, groundwater and storm water run-off, if applicable. If there are no provincial standards, the plant must develop site specific standards in consultation with provincial environmental authorities. • The plan must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices.
2. Are reporting requirements clearly defined?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective management of the chemicals used.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
3. Do monitoring areas include all areas: • Where preservative chemicals are stored, processed and handled? • All treated wood storage areas? • Drainage ditches and areas exposed to run-off?	General Table 14	• A risk evaluation study must be completed to determine the monitoring methodology required for soil, groundwater and storm water in the specified areas.
4. Are sampling frequency and constituents defined?	General Table 14	• The site monitoring plan must define sampling frequency, as per the risk evaluation study and/or the reporting requirements. • Preservative constituents governed by current regulations must be monitored and checked against the applicable regulatory limits.
5. Is a program in place to monitor adjacent waterbodies?	General Table 14	• The risk evaluation study in Section 11.1.3 must also address the need to monitor adjacent water bodies, based on an evaluation of site characteristics and plant operations.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
6. Is a program in place to monitor groundwater or on-site wells?	General Table 14	• The TRD states: "consider implementing a groundwater monitoring program using permanent monitoring points…" • Exceptions to this consideration would be plants located on sites for which such a program would not be effective. Any exceptions must be determined by the risk evaluation study in Section 11.1.3, based on a detailed evaluation of site characteristics and plant operations.
7. Are all air emission sources defined?	General Table 14	• The peak and average levels of those preservative constituents governed by current regulations (e.g. coal tar pitch volatiles, cresols, naphthalene and other parameters which are applicable) in air, for significant points of emission, must be determined. • Significant points of emission include, cylinder door openings, vent stacks, receiving areas for vents, enclosed plant areas, freshly treated wood storage areas, and wastewater treatment areas. • The assessment must be updated if there are any changes in plant design and/or operating practices.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
8. Are air emissions monitored as per permits?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If permits apply, air emissions must be monitored accordingly. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective control of all air emissions • Monitoring must determine applicable preservative constituents in air emissions.
9. Are all liquid waste discharges identified (volumes, contamination levels)?	General Table 1 CREO Table 18	• Sources of liquid waste discharges are defined in CREO-23, Table 18. The concentrations and total mass emission rates for applicable preservative constituents in discharges and run-off must be determined by a qualified consultant, as part of the overall site monitoring program defined in Section 11.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
10. Are all liquid waste discharges monitored as per permits?	General Table 14	• If permits apply, discharges and run-off must be monitored accordingly. • Monitoring must determine the concentrations of applicable preservative constituents in discharges and run-off. In the case of creosote use, this would suggest that the analysis must include numerous polycyclic aromatic hydrocarbons (PAHs). • If permits do not apply, the plant shall develop site specific monitoring protocol and waste discharge limits in consultation with provincial environmental authorities.

CREOSOTE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING**		
11. Does a facility specific monitoring plan exist?	General Table 15	• A site specific workplace monitoring plan and program shall be prepared by a qualified industrial hygienist. • The plan and program must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices. • The plan shall address the requirements defined in Sections 11.1.7 and 11.1.8.
12. Are reporting requirements clearly defined?	General Table 15	• The regulations and reporting requirements which apply to the plant must be determined and defined in the workplace monitoring plan.
13. Are sources of skin exposure identified periodically?	General Table 15 CREO Table 7	• Existing and potential sources of skin exposure shall be identified by monthly inspections of all operating areas of the plant, from chemical receiving to shipment of treated products. • Skin exposure hazards shall be a topic for discussion at all safety committee meetings. • Safe working practices, training programs and PPE requirements must be modified when new sources of skin exposure are identified.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
14. Is a monitoring program defined: • Sampling techniques? • Frequency? • Items sampled for?	General Table 15	• The workplace monitoring plan and program defined in Sections 11.2.11 and 11.2.12 above must define the sampling techniques and sampling frequency required for applicable preservative constituents and other toxic chemicals used by the plant. • The requirements defined in Sections 11.1.7 and 11.1.8 also apply.
15. Are peak levels of preservative exposure from air known for all significant points of worker exposure (cylinder doors, exhaust vents, enclosed preservative process areas, freshly treated charges)?	General Table 15	• Peak levels of exposure shall be determined as per the requirements defined in Sections 11.1.7 and 11.1.8 above. • Peak levels shall be determined annually under worst case conditions, e.g. during winter months when plant areas are enclosed.
16. Are pre-employment medical exams carried out?	General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed by an occupational physician to verify that they are able to carry out their assigned duties. • Provided new employees are not exposed to chemicals, their pre-employment medicals may follow completion of their probationary period.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
17. Does a plan exist for follow-up medicals?	General Table 15	• The plant must prepare a plan, in consultation with an occupational physician, which defines: o Jobs for which pre-employment and annual or more frequent medical examinations are mandatory, based on the degree of exposure to specific chemicals. o The person responsible for scheduling medical appointments has responsibility for record keeping. o Responsibility for follow-up with physician and employee.
18. Are follow-up medicals and biological monitoring (e.g. urine) carried out?	General Table 15	• As specified in the plan outlined in Section 11.2.17, designated employees must be periodically examined by an occupational physician to assess the effects of exposure to the chemicals in use at the plant. • As a result, medical examinations may include x-rays, nasal and skin evaluation, and urine and blood testing. • Medical examinations must address all preservative constituents and other toxic chemicals.

Chromated Copper Arsenate (CCA)
FACILITY
TECHNICAL GUIDELINES

2004

CCA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.1 ACCESS/SECURITY**		
1. Is off-loading area located away from high yard traffic routes?	General Table 3 CCA Table 7	• Ideally, off-loading area should be located away from any traffic. • If relocation is impractical, traffic must be controlled by DANGER signs, barriers and constant supervision during chemical unloading operations.
2. Is vehicle access restricted during delivery?	General Table 3 CCA Table 7	• All vehicles, including contractors' trucks and visitors' vehicles must be restricted from the off-loading area by DANGER signs, barriers and constant supervision during chemical unloading operations.
3. Are there locking valves on liquid delivery lines?	General Table 3 CCA Table 7	• CCA concentrate delivery lines must be securely locked when not in use.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT**		
4. Is an unloading pad and catchment sump used?	General Table 3 CCA Table 7	• The truck must be unloaded on an impervious pad, large enough in area to hold the full length of the truck. • The pad must drain to a leak-proof sump and/or containment, large enough to handle the entire volume of CCA concentrate contained in the truck.
5. Are impervious construction materials used?	General Table 3	• The surfaces of the unloading pad and sump must meet a hydraulic conductivity or permeability to water rating of $1x10^{-7}$ cm/sec or less, under a hydraulic head of 3 m, and must be resistant to CCA solutions. • Materials and specifications should be developed in consultation with manufacturers, suppliers and a certified civil/materials engineer who has prior relevant experience. .
6. Are liquid-tight joints sealed with chemical resistant material?	General Table 3	• All joints in the pad must be sealed with caulking that meets the requirements defined in Section 1.2.10. • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, sump joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT CONT'D**		
7. Are surfaces sealed to enhance ability to keep clean?	General Table 3	• Sealing is required if unloading pad surfaces cannot be kept clean by normal methods, such as vacuuming and/or washing.
8. Are pads designed to contain large (tanker) spills?	General Table 3	• The pad must be constructed so that it will allow containment of the entire volume of CCA concentrate in the truck.
9. Are pads and sumps free of settling and cracks?	General Table 3	• Pads and sumps must be designed to prevent settling and/or cracking. • Any visibly open cracks must be repaired with chemically resistant caulking, using procedures that will ensure a liquid-tight seal. • Evident or suspected settling must be evaluated by a certified engineer to determine the structural integrity of the pad and/or sump.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT CONT'D**		
10. Are pads and sumps lined?	General Table 3	• Secondary containment for this area is good practice and is required by some Provinces. • Secondary containment may be achieved by installing a subsurface membrane liner or by applying an impervious coating to the pad and sump surfaces. • Surface sealers, surface coatings, joint and crack sealants must meet a hydraulic conductivity or permeability rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3 m. In addition they must be resistant to the chemicals in use at the plant and must have the physical properties (compressive, tensile and flexural strength), the abrasion and wear resistance and the lifetime requirements, suitable for the intended application. The performance requirements for sealers and coatings will vary in different areas of the plant. For example, fixation chambers and drip pads represent the most severe application, due to constant exposure to chemical solutions, vehicle traffic and cleaning processes, while cylinder and tank farm containment areas, with occasional chemical exposure and foot traffic, represent a less stringent application. Sealers, coatings and sealants and their application technology must be determined in consultation with a manufacturer with experience in the field. A list of experienced manufacturers/applicators of sealers, coatings and sealants may be obtained from the chemical supplier. • See Introduction for further information.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT**		
11. Is all transfer equipment in a contained area?	General Table 3	• Transfer equipment includes the entire length of the CCA concentrate truck, the delivery hose and the valves and piping between the hose connection and the CCA concentrate storage tank. • All this equipment must be contained as defined in Sections 1.2 and 2.4.
12. Are pipes and valves clearly identified?	General Table 3	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves and caplocks must be clearly labeled.
13. Are delivery lines rigid, accessible and visible?	General Table 3	• There must be easy access to allow inspection, leak detection and maintenance of delivery lines. • Flexible hoses connecting trucks to tank piping must be shielded. All other piping must be of the appropriate material and schedule with the required compatibility. • Any buried piping must have secondary containment and provision for leak detection designed by a qualified engineer.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
14. Is piping protected from mechanical damage?	General Table 3	• All piping must be protected to prevent damage by any means, such as the CCA delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
15. Are hose and pipe connections designed to be secure?	General Table 3	• All hose and pipe connections must be leak tight. Couplings must have safety measures to prevent improper connections and to ensure integrity of connection throughout the unloading process. Couplings must not result in back-flow when the hose is disconnected.
16. Are pipes connected for top delivery to tanks?	General Table 3	• The delivery line must be connected to the top of the CCA concentrate tank, above the high-level alarm sensor.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
17. Are back-flow preventors installed on delivery lines?	General Table 3	• An effective check valve must be installed in the CCA concentrate delivery line.
18. Is the delivery system totally visible from the point of off-loading to tankage?	General Table 3	• "Totally visible" means from the truck controls to the CCA concentrate storage tank.
19. If visibility is limited, are audible alarms installed on tanks to detect overflow?	General Table 3	• Alarms must be audible both in the tank farm and also at the off-loading station. • Alarms must be tested at least every 6 months or as defined in the plant's Preventive Maintenance Program. Alarms must also be tested prior to startup after an extended plant shutdown period. Alarm tests must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
20. Is local drip catchment available?	General Table 3	• Drip catchment must be used under the hose connection at the truck and also under the hose connection to the line to the CCA concentrate storage tank, during the off-loading process.
21. Is spill response equipment, absorbents and personnel protection equipment available and readily accessible?	General Table 3 CCA Table 7 CCA Section 12.1	• Personal protection equipment must comply with TRD Reference CCA, Table 7. • Spill response equipment must be site specific and must be selected in accordance with the preservative supplier's recommendations. • Equipment inventory must be checked weekly and logged and must be complete at all times. • Location of equipment storage must allow prompt response to emergency situations.
22. Is the off-loading area equipped with a phone or a manual alarm switch?	General Table 3	• There must be a manual alarm in the off-loading area that is audible throughout the plant. • The alarm function must be tested and logged prior to the delivery of concentrate. • A phone and/or 2-way radio is also required to arrange any assistance that may be required.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY**		
1. Is there 24-hour security?	General Table 4	• Systems and procedures must be in place to prevent unauthorized access to the chemical storage area on a 24 hour basis. • Examples include, a restricted area policy, locked buildings with security monitoring alarms, locked buildings with security patrols, etc.
2. Are bulk solid and liquid chemicals in locked areas?	General Table 4 CCA Table 9	• If the tank farm cannot be located in a secure, locked building, precautions must be taken to ensure that there can be no unauthorized access to the chemical storage area.
3. Are tank drain valves locked?	General Table 4	• Any valve that could cause the release of chemical, as a result of unauthorized use, must be locked. • Examples include, sampling valves, drain valves and unloading and loading line valves.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY CONT'D**		
4. Are tanks protected from mechanical impact?	General Table 4	• All tanks must be protected to prevent damage by any means, such as the CCA delivery truck, plant mobile equipment, wood piles, stored equipment, etc. • Tanks installed close to external walls that could be breached by mobile equipment and/or truck accidents require special attention.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE**		
5. Are tanks in sound physical condition, with no rust or damage?	General Table 4 General Table 11	• All chemical storage tanks, including effluent tanks must be tested annually and certified as suitable for the intended use, by an accredited testing company or agency.
6. Are underground tanks leak tested at least annually?	General Table 4 General Table 11	• It should be noted that leak testing will not prevent chemical release as leaks of .0.5 gals/hour and less cannot be detected. • Underground tanks should be removed and replaced with above ground tanks and must not be used in new construction. • If removal and replacement is impractical for an existing tank, it must have a leak detection system designed by a certified engineer. • All underground tanks must be tested annually and certified as suitable for the intended use, by an accredited testing company or agency.
7. Are aboveground tanks mounted on containment pad surfaces?	General Table 4	• Tank bases must not be embedded in, or be encased by concrete. • Preferably, vertical tanks should be mounted on raised supports on containment pad surfaces. • If tanks must be in contact with pad surfaces, an annual assessment of external corrosion must be carried out. • The tank containment floor must be kept clean and dry, to allow immediate detection of leaks.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
8. Are tanks mounted in stable positions and anchored securely?	General Table 4	• Tanks must be mounted in stable positions and must be anchored if flooding of the containment by storm water or a spill would exert uplift forces. • CCA concentrate tanks installed in deep containments are particularly vulnerable as they are normally maintained at low liquid levels.
9. Are tanks sheltered from weather by a fixed roof?	General Table 4	• The preferred location for tanks is inside a secure, locked building. • If relocation is impractical, exterior tanks must be roofed if the storm water that enters the tank containment is not recycled to the process.
10. Are tanks located in dyked area?	General Table 4	• All chemical storage tanks must be installed in a dyked containment. • In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
11. Are tanks protected from freezing?	General Table 4 CCA Table 1	• All chemical storage tanks must be kept above 0°C.
12. Are all tank surfaces accessible for detecting leaks and insulated tanks provided with inspection points?	General Table 4	• The tank farm floor must be kept clean and dry to allow immediate leak detection. Preferably, tanks should be raised on supports to allow leaks to be readily detected. • The lower 6" of insulated tanks must not be insulated or insulated tanks must be provided with inspection points, to allow leaks to be readily detected.
13. Are tank vents controlled?	General Table 4	• Interior tanks must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior tanks may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Tanks must not vent directly into the workplace.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
14. Are storage areas fire protected?	General Table 6	• Fire protection must conform to applicable codes, such as the National Fire Code of Canada, the National Building Code, provincial and municipal codes, etc. • Conformance must be certified by an accredited inspector, such as the local Fire Department, building inspector, insurance company, etc.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT**		
15. Is piping rigid and permanent throughout the operation?	General Table 4	• Piping materials must be suitable for the intended application. Process piping must be rigid, permanent and of the appropriate material and schedule but flexible piping is allowed for CCA concentrate delivery and for Kathon drum and additive tote connections. Rigid PVC piping is allowed for vent piping. All piping must be securely connected and flexible piping must be protected from mechanical damage.
16. Is piping visible and accessible with a simple layout?	General Table 4	• Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.
17. Is piping above ground?	General Table 4	• In general, all piping must be visible and readily accessible for leak detection and maintenance. • Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or the piping must be brought above grade. • Underground piping is not allowed in new construction. However, If there is no alternative to underground piping in existing construction, it must be provided with containment and leak detection designed by a qualified engineer.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
18. Is containment provided for sub-grade piping?	General Table 4	• Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or the piping must be brought above grade. • Underground piping is not allowed in new construction. However, If there is no alternative to underground piping in existing construction, it must be installed in appropriate containment with provision for leak detection as per 2.3.17.
19. Are piping and fixtures chemically compatible?	General Table 4	• Piping and fixtures must be compatible with CCA solutions. • Any questions and/or uncertainties must be resolved with the chemical supplier.
20. Are valves identified by labeling or colour-coding?	General Table 4	• Valves must be labeled or colour-coded. • The label or colour-code must identify the valve function in accordance with the piping schematic in 2.3.16.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
21. Are valves and pipes protected from impact?	General Table 4	• All valves and piping must be protected to prevent damage by any means, such as the CCA delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
22. Are lines protected from freezing (where applicable)?	General Table 4	• All piping used for CCA solutions must be kept above 0°C.
23. Do valves have local drip/spill catch trays?	General Table 4	• Valves must be installed properly and maintained regularly to prevent leakage. • The tank farm floor must be kept clean and dry to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid must be cleaned out. .

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
24. Do pumps have local drip/spill catch trays?	General Table 4	• All pumps handling CCA solutions must have self-contained spill trays large enough to prevent contamination of the containment area. • There must be no free CCA on the containment floor. • Spill trays must be inspected daily and any free liquid must be cleaned out.
25. Are back flow preventors on all water supply lines?	General Table 4 CCA Table 8	• Reduced pressure type backflow preventors must be installed on all water supply lines as a secondary protection system. • Backflow preventors must be inspected and tested annually or as recommended by the manufacturer.
26. Are waterlines connected via top entry to tanks?	CCA Table 8	• Water supply lines must be connected to the top of tanks above the high-level alarm sensor.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
27. Is piping system designed to protect against inadvertent transfers?	General Table 4	• Pipes and valves must be clearly identified and operating instructions explicitly defined. • Manual systems must not be operated by untrained personnel. • Where there is common piping in multi-preservative plants, blocking systems must be in place to prevent inadvertent transfer of solutions.
28. Are reliable, accurate level indicators installed?	General Table 4	• All level indicators must be checked regularly and calibrated every 6 months, where appropriate. • Calibration records must be kept on file.
29. Is mechanical impact protection functional on sight glasses?	General Table 4	• A durable physical protection system must be installed to prevent sight glasses from being damaged or accidentally disconnected.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
30. Are shut-off valves functional on all rupturable lines and gauges?	General Table 4	• Any line or gauge that can be easily damaged or accidentally disconnected must be fitted with an automatic shut-off valve. • Examples include sight glasses, instrument tubing, etc. • Vulnerable sampling valves on tanks must be physically protected.
31. Is overflow piping provided from tanks to containment?	General Table 4	• Preferred design is to connect all tanks to a dedicated CCA overflow tank; otherwise, overflow piping must extend to a contained sump. Overflow tanks and pipes must be vented to the exterior with provision to prevent the release of entrained liquids or overflow. • Open manholes on tanks are not permitted.
32. Are independent high-level alarms installed on tanks?	General Table 4	• All tanks must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested at least every 6 months or as defined in the plant's Preventive Maintenance Program. Alarms must also be tested prior to startup after an extended plant shutdown period. Alarm tests must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
33. Are high-level alarms interlocked to the pump auto-shut off?	General Table 4	• Alarms must immediately prevent any increase in the solution level in the tank, either by shutting off the pump or by closing the appropriate valve.
34. Is there a 24-hour monitoring alarm?	General Table 4	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested at least every 6 months or as defined in the plant's Preventive Maintenance Program. Alarm must also be tested prior to startup after an extended plant shutdown period. • Alarm tests must be recorded.
35. Are there manual alarm buttons at potential major spill points?	General Table 4	• The chemical receiving, storage and treating cylinder areas must be adequately protected by manual alarms. • The function of all alarms must be tested and recorded as per 2.3.34.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT**		
36. Are containment floors, dykes and joints structurally sound?	General Table 4	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer.
37. Are containment surfaces and joints sealed?	General Table 4	• Tank farm containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight (e.g., water stop inserts, and caulking of concrete joints as per requirements defined in Section 1.2.10. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10 and inspected on an annual basis for integrity.
38. Is a secondary containment barrier built into the containment area? (e.g. impermeable top coat or liner under the containment area).	General Table 4	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath tanks, together with a leak detection system, as per 2.4.39. • The coating must comply with the requirements defined in Section 1.2.10.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
39. Is subsurface leak detection provided?	General Table 4	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.
40. Is the spill containment volume in compliance with NFCC?	General Table 4	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
41. Are there provisions to direct, collect and transfer spills, washdown liquids, infiltrate to tankage?	General Table 4	• Provisions must ensure the immediate transfer of all liquids to the appropriate tank. • There must be no free-standing CCA solution or effluent, anywhere in the plant.
42. Is local collection/containment of incidental drips in place (pumps, valves etc.)?	General Table 4	• The tank farm floor must be kept clean and dry to prevent tracking and air contamination and to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid must be cleaned out. All pumps handling CCA solutions must have self-contained spill trays large enough to prevent contamination of the containment area. • Spill trays must be inspected daily and any free liquid must be cleaned out.
43. Is containment area designed to minimize tracking of liquids and contaminated dust?	General Table 4	• The containment area must be kept free from preservative liquids and residues to prevent tracking and air contamination. • Access to the containment area should be highly restricted and limited only to authorized personnel, as designated by the Plant Manager. • Means such as walkways, footwear exchanges, etc. must be provided to prevent dirt and dust being tracked to and from the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS**		
1. Is mixing equipment in a contained, enclosed, heated area?	General Table 5 CCA Table 9	• The containment for mixing vessels must be as defined in Section 2.4, Criteria 36-43 inclusive. • Mixing vessels must be kept above 0°C.
2. Is permanent, closed mixing system used?	General Table 5	• A permanent, closed mixing system must be used. • The mixing system must be rigidly piped from tank to tank.
3. Is a high level alarm installed to prevent mix tank overflow?	General Table 5	• The mix tank must have a high-level alarm. • The alarm must be audible throughout the plant. • The alarm must trigger visible identification of a specific high-level emergency in the mixing vessel. • The alarm function must be tested and recorded as per 2.3.34.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS CONT'D**		
4. Are high-level alarms linked to feed pump shut off?	General Table 5	• Alarms must immediately prevent any increase in the solution level in the mixing tank, either by shutting off the mix pump or by closing the appropriate valve.
5. In case of any open transfer operations, is reliable splash protection in place?	General Table 5	• Open transfer of solution is not allowed. • Working solutions must be mixed in a closed system.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT**		
6. Are containment floors, dykes and joints structurally sound?	General Table 5	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer.
7. Are containment surfaces and joints sealed?	General Table 5	• The surfaces of containments with membrane liners must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10.
8. Is a secondary containment barrier built into a tank containment area?	General Table 5	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the mix tanks, together with a leak detection system as per 2.4.39. • The coating must comply with the requirements defined in Section 1.2.10.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
9. Is subsurface leak detection provided?	General Table 5	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.
10. Is there a subsurface leak containment and collection system?	General Table 5	• For an existing plant, if the monitoring well system detects a leak, a recovery well system must be designed and installed by a qualified hydrogeologist, to ensure containment and collection. • The double liner system described in Section 3.2.9 above is the preferred approach for new plants or additions to existing plants.
11. Is the spill containment volume in accordance with NFCC?	General Table 5	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
12. Is tank farm covered to prevent infiltration precipitation?	General Table 5	• The preferred location for tanks is inside a secure, locked building. • If relocation is impractical, exterior tanks must be roofed if the storm water that enters the tank containment is not recycled to the process.
13. Does containment have alarms to identify spills?	General Table 5	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested and recorded as per 2.3.34.
14. Is the containment area visible?	General Table 5	• The containment must be well-lit as per provincial requirements of the Workers' Compensation Board, Ministry of Labour, etc., and must not be used as an equipment storage area.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION**		
1. Are the treatment vessel, controls and ancillary equipment in an enclosed structure and protected from freezing?	General Table 6	• The treating cylinder, controls and ancillary equipment must be located in an enclosed winterized structure that is maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
2. Are the treatment cylinder and process tanks within a contained area?	General Table 6	• The treating cylinder and process tanks must be located in a containment area with continuous, structurally sound concrete floors and dykes. • The details of the containment must be as defined in Section 2.4, Criteria 36-43 inclusive.
3. Does the spill containment capacity comply with NFCC requirements?	General Table 6	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
4. Are the floors and dykes reinforced, structurally sound and with sealed joints?	General Table 6	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10. • Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing.
5. Are surfaces graded to facilitate drainage?	General Table 6	• Containment floors should be graded to ensure efficient drainage to a collection system. • Free standing liquid is not permitted in the containment area.
6. Are walkway grates or other designs in place to minimize worker contact and tracking of preservative residues?	General Table 6	• The containment area must be kept free from preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by those personnel authorized by the Plant Manager. • Walkways, footwear exchanges, etc. must be provided to prevent dirt and dust being tracked to and from the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
7. Does the entire process area have a secondary containment provision (e.g. impermeable top coat on floors and dykes or liner under the containment area)?	General Table 6	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection, if applicable. The liner must be resistant to CCA solutions. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the tanks. • The coating must comply with the requirements defined in Section 1.2.10.
8. Is control and transfer equipment isolated to avoid damage from spills?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that a spill equal to the containment volume (as defined in Section 4.1.3) or flooding will not prevent their operation or create an electrical hazard.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.2 SUMPS**		
9. Are sumps leakproof (impermeable surfaces, sealed joints)?	General Table 7	• Sump surfaces must have a hydraulic conductivity or permeability rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and be resistant to CCA solutions. • All joints in the sump must be liquid-tight. • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10.
10. Are sumps equipped with a secondary containment (e.g. steel lining)?	General Table 7	• The surfaces of concrete sumps must have an impermeable coating and also be lined with steel or other suitable impermeable material. • "Impermeable" is defined as meeting a permeability rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m.
11. Are sumps protected by independent high-level alarms?	General Table 7	• All sumps must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • The function of alarms must be tested and recorded as per 2.3.34.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING CYLINDER**		
12. Are all pressure vessel inspection certificates current?	General Table 7	• The plant must have a current certificate to show that the treating cylinder and all pressurized components meet all requirements of the provincial ministry responsible. • If there is no provincial requirement, the treating cylinder and all pressurized components must be inspected annually by an accredited testing company or agency.
13. Is the retort door protected from opening, when full?	General Table 7	• Retorts must be equipped with an effective protection device to prevent doors being opened when retort is pressurized, filled or partially filled with preservative. • Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to impact wrench compressors.
14. Is the cylinder designed to facilitate drainage of excessive preservative?	General Table 7	• The alignment of the treating cylinder and/or the pump-out procedures must ensure that the minimum amount of preservative drains from the cylinder door opening.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS**		
15. Is the operator control area segregated from retort and tank spill containment areas?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that spills or flooding will not prevent their operation or create an electrical hazard. • In the case of hydraulic doors, the hydraulic pump controls must be located or shielded so that the operator is not directly exposed to any liquid or vapour releases from the cylinder.
16. Is the control area winterized?	General Table 6	• The process control area must be winterized and maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
17. Is the control area well lit and located for maximum visibility of treatment systems?	General Table 6	• All operating and control areas must have proper lighting, as per provincial requirements, so that all equipment is totally visible at all times. • The location of the control area must allow the best possible visibility of the treatment system, for the operation concerned. • Mirrors or closed circuit TV may solve specific problems, particularly for those plants where the cylinder doors are hidden from view.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS CONT'D**		
18. Are process controls simple and properly functioning to provide accurate feedback?	General Table 7	• The process controls must be installed, maintained and calibrated in accordance with CSA 080-M3, Clause 3.0.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.5 AIR EMISSION CONTROL**		
19. Are pumps, tank or other exhausts vented to outside or to recovery system?	General Table 6 General Table 4	• Pumps, tanks, cylinders and other exhausts must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior equipment may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Equipment must not vent directly into the workplace.
20. Does general area ventilation exist to keep containment levels below regulatory limits?	General Table 6	• Ventilation must be provided to maintain air emissions below the levels specified by the American Conference of Governmental Industrial Hygienists (ACGIH) for chromium, copper and arsenic, or as specified by provincial regulations. • Air emissions must be monitored at least annually and whenever there is a change in equipment and/or procedures that may affect emission levels. Annual monitoring should take place under worst case conditions, e.g. when operating areas are enclosed during winter months.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM**		
21. Is the system designed to effectively contain and recycle all chemicals with minimal potential for releases?	General Table 6 General Table 7	• The system must be able to contain and recycle all chemicals used by the plant, including additives for CCA solutions. • There must be no routine release of chemicals into the containment from process equipment.
22. Is all transfer equipment in a contained area?	General Table 7	• All piping and pumps must be contained as defined in Section 2.4, Criteria 36-43 inclusive. • Transfer equipment must be kept above 0°C.
23. Are pipes and valves clearly identified?	General Table 4	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves must be clearly labeled to identify their function in accordance with the piping schematic.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM CONT'D**		
24. Are delivery lines rigid, accessible and visible?	General Table 4	• Delivery lines must be of the appropriate material and schedule and must be visible. • Plastic piping or flexible hoses must not be used in the treatment process area except for delivery of additives such as Kathon, or wax mixtures. • Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.
25. Is piping protected from mechanical damage?	General Table 4	• All piping must be protected to prevent damage by any means, such as the CCA delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.1 GENERAL DESIGN**		
1. Is the area sheltered from precipitation and dust?	General Table 8	• The primary wood drip area must be sheltered from precipitation and dust, unless the generation and disposal of contaminated run-off water and contaminated dust can be controlled by other means.
2. Does the area have efficient drip and run-off collection and containment?	General Table 8	• The drip pad must be fully contained with sufficient grade to minimize the retention of free liquid so that problems related to tracking and air contamination are avoided.
3. Is dispersal of liquids from tracking by personnel and vehicles minimized?	General Table 8	• Vehicles involved in loading, unloading and stacking charges on the drip pad must be dedicated to the drip pad. • All vehicles, including the CCA delivery and contractors' trucks must be thoroughly washed before leaving the drip pad. • Tracking by personnel can be minimized by restricting foot traffic, keeping the pad clean, installing drainage channels in the storage area and providing perimeter walkways or a boot changing station.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.2 DRIP PROTECTION**		
4. Is the area sufficiently sized to hold all freshly-treated wood until visible dripping has stopped?	General Table 8 CCA Table 10	• The area must be large enough to hold all freshly-treated wood until visible dripping has stopped. • This question also applies to those plants where the fixation chamber or the ambient fixation area is remote from the drip pad. • In these plants, the wood cannot be moved from the drip pad until it is absolutely drip dry. Once drip dry, the wood cannot be moved during periods of precipitation.
5. Is the area where wood is stored prior to application of accelerated fixation properly contained and roofed?	General Table 8 CCA Table 10	• Prior to accelerated fixation, the wood must be stored in a properly contained and roofed area. • Roofing may not be required in areas of low precipitation, provided that peak volumes of storm water collected in the containment can be handled by recycling to the treating process, without any risk of release. • Storm water processing capability must be evaluated and documented by a certified engineer.
6. Is the area where treated wood is undergoing fixation at ambient conditions completely contained and roofed?	CCA Table 10	• The storage area for ambient fixation must be completely contained and roofed. • . Roofing may not be required in areas of low precipitation, provided that peak volumes of storm water collected in the containment can be handled by recycling to the treating process, without any risk of release. • Storm water processing capability must be evaluated and documented by a certified engineer.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.3 CONTAINMENT**		
7. Are the unloading areas provided with impermeable floor and curb?	General Table 8	• The unloading track pad must be constructed to completely contain all drips from the wood and the trams. • The unloading area floor must have a hydraulic conductivity or permeable rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and be resistant to CCA solutions. • Floor specifications should be developed in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior applicable experience.
8. Are the floors sloped to facilitate collection of all contaminated liquids?	General Table 8	• The drip pad must be fully contained with sufficient grade to direct any free liquid to a collection and recycling system.
9. Are the floors and curbs covered with an impermeable top coat or is a liner installed underneath the entire area?	General Table 8	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all drip pad surfaces, together with a leak detection system, as per Section 2.4.39. • The coating must comply with the requirements defined in Section 1.2.10.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.4 FIXATION**		
10. Does the storage area used for fixation under ambient conditions have an impermeable floor and containment with recovery provisions for drips and infiltration?	CCA Table 10	• The storage area floor must have a hydraulic conductivity or permeability rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and must be resistant to the chemicals in use at the plant. Floor specifications should be developed in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior applicable experience. • The storage pad must be fully contained with sufficient grade and an efficient drainage system to direct any free liquid to a collection and recycling system, to prevent tracking and air contamination.
11. Is the fixation area roofed?	CCA Table 10	• The storage area for ambient fixation must be completely contained and roofed. • The containment must have provision for the recovery and recycling of any drips, wash water and storm water to the treating process.
12. Does the fixation chamber have an impermeable floor?	CCA Table 10	• The fixation chamber floor must have a hydraulic conductivity or permeability rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and must be resistant to the chemicals in use at the plant. • Floor specifications should be developed in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior applicable experience.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.4 FIXATION CONT'D**		
13. Does the fixation chamber have provisions for collection of drips?	CCA Table 10	• The fixation chamber must be fully contained with sufficient grade to direct any free liquid to a collection and recycling system. • The fixation chamber must be designed so that any residues may easily be cleaned up. • Floor surfaces must be sealed if they cannot be cleaned by normal methods. • Note that liquids and residues recovered from the fixation chamber may cause problems with solution cleanliness and component balance, when recycled to the treating process.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS**		
1. Is the preservative fixed prior to placing the wood in unprotected storage (is fixation verified by standard methods)?	General Table 9	• Preservative fixation must be verified in accordance with the sampling and testing methods specified in CSA 080.1, Clause 3.4.5 and CSA 080, page 11. • Representative samples must be taken from every cylinder charge or every fixation chamber charge, in accordance with CSA 080, as referenced above. (For the purpose of determining the number of samples for verification, the Steering Committee has ruled that as a minimum, a "fixation chamber charge" is equivalent to a "cylinder charge").
2. Are treated wood packages elevated above ground (placed on stringers)?	General Table 9	• All treated wood packages/bundles must be elevated above ground to minimize contamination of soil and surface run-off water.
3. Are treated wood storage areas segregated from uncontaminated yard areas?	General Table 9	• Treated wood storage areas must be consolidated and segregated to minimize yard contamination and ensure efficient collection of any surface run-off water containing CCA residues in excess of regulatory limits. • The evaluation of options for storage area surfaces must consider several factors, including groundwater usage, precipitation levels, etc.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS** **CONT'D**		
4. Are unsurfaced storage areas remote from water bodies?	General Table 9	• The run-off from surfaced and unsurfaced storage areas must not cause any water body, surface water or ground water system to exceed regulatory guidelines or standards..
5. Is storage in compliance with NFCC requirements (lack of vegetation, separation of wood from buildings)?	General Table 9	• Storage areas must be separated from plant operations and other structures by an acceptable clear space permanently available for fire-fighting operations. • Storage areas must be maintained free of combustible vegetation, including grass and weeds, for at least 4.5 m from the stored material and at least 30 m from bush and forested areas. • Lumber treated with combustible liquids must be stored in piles separated from other stored material by a distance of not less than 4.5 m. • At least two fire department access routes must be provided.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.1 PROCEDURES**		
1. Is an operations manual available with written instructions for all aspects of chemical use?	General Table 10	• A current, site-specific manual must be available containing clear instructions for all aspects of chemical use, plant operation, equipment maintenance, housekeeping, accident prevention, first aid and emergency response procedures, and all applicable regulations. • The manual must be readily available to all employees. • There must also be up to date blueprints of the plant and current specifications for all equipment.
2. Are all operating personnel informed of the potential hazards and precautionary measures?	General Table 10	• Training in all aspects of chemical use and plant operation must be provided and updated, at least annually. Training programs must be plant specific and should at least include: o Chemical substances and their hazards, including personal hygiene. o Safe operation and maintenance of equipment and processes. o Spill and fire prevention procedures. o Proper use of personal protective equipment. o Proper use of all safety equipment for controlling spills and fires. o Emergency response and first aid and rescue procedures. o Handling, storage and disposal of waste materials. • Individual employee training must be documented.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.2 PERSONNEL**		
3. Are all operating personnel trained in good work practices?	General Table 10	• Operating personnel must be trained as defined in Section 7.1.2.
4. Is periodic review and update of training implemented?	General Table 10	• Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment.
5. Is a pre-employment medical check-up and on-going annual medical surveillance carried out?	General Table 10 General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed to verify that they are able to carry out their assigned duties. • Provided new employees are not directly exposed to chemicals, their pre-employment medicals may follow the completion of their probationary period. • Employees must also have an annual medical check-up, specifically designed to assess the effects of exposure to the chemicals in use at the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.3 SIGNING**		
6. Are the contents and functions of the tanks identified (e.g. CCA storage, CCA concentrate)?	General Table 10	• The contents and functions of all tanks must be clearly identified by large, permanent signs.
7. Are personnel safety precautions and first aid procedures prominently displayed?	General Table 10	• Prominent, easy to read signs must be displayed in the chemical receiving and storage areas, the treating process area, all control stations and the plant office.
8. Are emergency response procedures and emergency telephone numbers prominently displayed?	General Table 10	• Plant specific emergency response procedures must be summarized and displayed in the form of a prominent notice. • Notices must also show phone numbers for company contacts, police, fire, ambulance, chemical supplier, etc., not just 911.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY**		
9. Are food, drink or tobacco products prohibited in working areas?	General Table 1	• Food, drink and tobacco products must be prohibited in working areas. • Designated lunch rooms and smoking areas must be separate from work areas and must be provided with washing facilities.
10. Are all personnel familiar with basic hygiene requirements?	General Table 1	• Specific training must be provided as defined in Section 7.1.2. • Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment. • Individual employee training must be documented. • New employees must be fully trained before they can assume full responsibility for any aspect of plant operation.
11. Are soiled clothes promptly removed?	General Table 1	• Operators and other employees who come into contact with chemicals must wear appropriate work clothing which must be changed immediately if splashed by chemicals. • Work clothes must stay at the plant and must be laundered separately from other clothing.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY CONT'D**		
12. Are correct safety clothes (gloves, masks, boots, etc.) worn for respective operations?	General Table 1 CCA Table 7	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Table 7of the CCA section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
13. Are first aid personnel familiar with emergency response procedures?	General Table 1	• First aid training must address the specific emergency response procedures for CCA and the other chemicals used in the plant. • First aid supplies must include all items required to treat CCA exposure, including ingestion, as per the CCA supplier's recommendations.
14. Are changing rooms and showers provided?	General Table 1	• Changing rooms must be provided with lockers which allow street clothes to be stored separately from work clothing and PPE. • Hot showers must be provided and operators and other employees who come into contact with chemicals must shower before leaving the plant after work.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING**		
15. Does the plant have a defined housekeeping plan?	General Table 10	• Housekeeping standards aimed at maintaining a clean and orderly plant must be defined in writing and included in the plant operations manual. • The responsibility for maintaining the standards in different areas must be clearly assigned to specific individuals.
16. Are generation and accumulation of wastes minimized?	General Table 17	• To minimize the generation of wastes, the recommendations contained in Table 17 of the General section of the TRD must be followed. • Special attention must be given to all factors affecting solution cleanliness and solution component balance.
17. Is equipment regularly inspected for leaks?	General Table 12	• All process components must be inspected for leaks by every shift. • Immediate action must be taken to stop leaks.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING CONT'D**		
18. Are leaks properly contained and repaired promptly?	General Table 12	• There must be no uncontained leaks. • The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
19. Are daily records maintained for chemical delivery, use and inventory?	General Table 10	• To provide a secondary level of control for chemical losses, records must be maintained as follows: o Transfers to and from the concentrate tank as they occur. o Transfers to and from the work tanks as they occur. o Inventory of concentrate and working solution volumes, monthly. • All tank levels must be checked against the last recorded level, every two days, when the plant is not operating.
20. Are daily records maintained for equipment condition and maintenance?	General Table 10	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation and ensures immediate attention to any problems. • PMP records must be maintained in a daily log and monitored to identify the need for special attention to persistent problems.

SECTION/CRITERIA	TRD REF.	GUIDELINE
21. Are chemical volume discrepancies promptly investigated?	General Table 10 General Table 12	• To provide a secondary level of control for chemical losses, chemical use and inventory records must be reconciled monthly, to ensure that they are in balance.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.7 SPILL RESPONSE**		
22. Does a written spill contingency plan exist?	General Table 10 General Section 12.1	• A written spill contingency plan must be prepared and maintained in accordance with Section 12.1 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the components of the plan. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc. • Police and fire departments must be provided with copies of the plan, together with complete details of those aspects of the operation related to its implementation.
23. Are regular spill response drills carried out, including an annual spill enactment drill?	General Table 10	• Spill response drills and annual enactments or rehearsals must be part of the spill contingency plan and must be planned in advance by the person responsible. • Annual rehearsals should be planned in collaboration with relevant agencies, such as police, fire and ambulance services and provincial authorities, with a view to gaining their involvement to make the enactment as real as possible. • Drills must be monitored and reviewed by all participants to determine the need for any improvement to emergency response procedures.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING**		
24. Does a written fire contingency plan exist?	General Table 10 General Section 12.2	• A written fire contingency plan must be prepared and maintained in accordance with Section 12.2 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the various components. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc.
25. Has the local fire department been made aware of the chemicals in use?	General Table 10	• The fire contingency plan must be prepared in consultation with the local fire department. Police and fire departments must be provided with copies of the plan together with complete details of those aspects of the operation related to its implementation. The fire department should visit the plant at least annually, to maintain their knowledge of the operation and also identify any improvements that are needed to update the contingency plan.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
26. Is sufficient self-contained breathing equipment available?	General Table 10 General Table 12	• If it is decided to use self-contained breathing apparatus (SCBA) for fire fighting and/or vessel entry, there must be two sets available and personnel must be properly trained in their use. • Responsibility must be assigned for the inspection and maintenance of SCBA and also for the annual review and update of training. The plant may decide that the fire department should be responsible for SCBA and also may elect to use oxygen sensors for safe vessel entry or hire contractors for this purpose.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
27. Are adequate material/procedures on hand to contain and dispose of fire residues?	General Table 10	• The fire contingency plan must define the procedures to be followed to contain and dispose of all residues created by fire fighting. • The procedures should be developed in collaboration with the local fire department and should include allowing the treating plant to burn down if there is any risk of a release of chemical or contaminated water from the containment. • The procedures should also include provision for constructing berms and ditches and blocking storm drains in yard areas to contain contaminated water and solid residues. • Plant fire crews must be designated and trained to the level necessary to implement the company's Fire Contingency Plan. Training programs should be developed in consultation with local Fire Departments and where possible should be in accordance with National Fire Protection Association (NFPA) Standard No. 472, "Hazardous Materials Response". • This advanced level of training is provided at institutions across Canada, accredited under the International Fire Service Accreditation Congress. • Specific information re location of institutions and NFPA Std. No. 472 can be obtained from local Fire Departments.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS**		
1. Is personnel trained in emergency response procedures?	General Table 11	• All personnel must be formally trained in emergency response procedures for spills and fires. • Individual employee training must be documented and updated annually. • Training must be reinforced during the year by spill response drills.
2. Is access to unloading area restricted during unloading operations?	General Table 11	• All vehicles, including contractors' trucks and visitors' vehicles must be prohibited from the off-loading area by DANGER signs, barriers and constant supervision. • The unloading operation must be attended by a trained operator, wearing full PPE. The truck driver must also wear full PPE. First aid personnel must be available. • CCA concentrate must not be delivered outside normal working hours.
3. Is there ready access to emergency aid?	General Table 11	• As defined in Section 8.1.2 above, the unloading operation must be attended by a trained operator. This operator must be trained in chemical handling, chemical hazards, emergency response procedures and first aid. • Additional first aid personnel, trained to deal with emergencies involving CCA concentrate must be on site and must be given advance notice of chemical unloading. • Prior to chemical delivery, first aid supplies must be checked and eye wash fountains and emergency showers must be

SECTION/CRITERIA	TRD REF.	GUIDELINE
		operational. • An emergency response team, trained in chemical spill procedures must be available and all alarms and spill control equipment must be in good order.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS**		
4. Are equipment used and procedures followed to avoid worker contact with preservative chemicals?	General Table 11 General Table 1	The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 and Table 7 of the General section of the TRD. Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. The PPE policy must be strictly enforced.
5. Is responsibility of storage area assigned to trained personnel?	General Table 11	All activities in the chemical storage area must be carried out by personnel trained in all aspects of chemical handling, system operation, hazard identification and emergency response. The chemical storage area must be off-limits to all other personnel.
6. Is a visual inspection routine of equipment storing and transferring chemicals instituted?	General Table 11 General Table 12 General Table 13	There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation, including chemical storage and transfer and ensures immediate attention to any problems. PMP records must be maintained and monitored to identify the need for special attention to persistent problems.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
7. Are valves tested regularly?	General Table 12	• The functionality of all valves must be tested in accordance with the Preventive Maintenance Program defined in Section 8.2.6 above.
8. Are drips and spills cleaned up promptly?	General Table 11	• There must be no uncontained drips or spills. • The operating objective must be to be drip and spill-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
9. Are safeguards in place to prevent contact of CCA concentrate with reducing agents or with combustibles?	CCA Table 11	• There must be strict safeguards in place to prevent CCA concentrate contacting any flammable liquids, such as oilborne preservatives, fuels, lubricants, paints, etc. In addition there must be no contact with galvanized metal, aluminum, brass, zinc, sawdust and shavings. • The CCA supplier should be contacted for further details.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS**		
1. Are quantities of stored chemicals regularly checked and recorded?	General Table 12	• All chemicals must be checked and recorded as defined in Section 7.6.19 and Section 7.6.21, above.
2. Is the solution strength regularly tested?	General Table 12	• The strength of working solutions must be determined after every mixing operation, either by x-ray fluorescence (XRF) analysis or by hydrometer readings. Hydrometers must be clean, temperature correction factors must be used and readings must be verified regularly by XRF analysis or other suitable analytical methodology in conjunction with the balance check in Section 9.1.3. • XRF analyzers must be calibrated and leak tested as per instructions.
3. Is the solution free from contamination?	General Table 12	• Recycled solutions and effluents must be processed through a bag filter unit before being used to prepare working solutions. • Ideally, the contents of working tanks should also be filtered. • The component balance of a **filtered** sample of working solution must be determined regularly, to ensure that the solution is always in compliance with CSA 080 and the surfaces of treated products must be checked to ensure they are free from residues.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
4. Is the system regularly checked for leaks and are those leaks promptly stopped?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
5. Are sludge levels in tanks and retort regularly checked and removed?	General Table 12	• All tanks must be checked, at least annually and any sludge must be removed. • Sludge must be removed from retorts regularly to prevent operational problems and/or surface deposits on the finished product. • All precautions for safe vessel entry must be followed.
6. Are tank vents tested for blockage at least once a month?	General Table 12	• Tank vents must be tested at least monthly, if there is any risk of restriction or blockage of the vent pipe due to deposits.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
7. Are wood loads stacked to allow good drainage of preservative?	General Table 12	• Lumber components, timbers, plywood, shingles and shakes must be stickered and stacked on an angle to maximize the rate of preservative drainage in the cylinder.
8. Are cylinder door seals in good order?	General Table 12	• Cylinder door seals must be washed and checked for damage and wear before every charge. • Spare seals must be available to allow immediate replacement when required. • Cylinder doors must be checked during the pressure cycle to ensure that they are properly sealed.
9. Are filters checked regularly, cleaned or replaced when necessary?	General Table 12	• Bag filter units must be fitted with a pressure gauge to indicate when the bag filter should be cleaned or replaced. • It is strongly recommended that bag filters are replaced rather than cleaned, to avoid the health hazards involved in handling and disposing of sludge.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
10. Are tanks free of debris, soil or other contamination?	General Table 12	• Trams and charges must be free from debris, soil and other contamination before loading into the cylinder. • Return lines from the cylinder to the working tanks must be fitted with strainers.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT**		
11. Is process system monitored for leaks during operation?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
12. Are recording and indicator instruments in proper order?	General Table 12	• All recording and indicator instruments must be installed and calibrated in accordance with CSA 080-M3, Clause 3.0 and CSA 080.1, Clause 2.2
13. Is the treatment closely monitored to ensure that maximum limits are not exceeded?	General Table 12	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits, in accordance with CSA 080.1. • Manual control without instrumentation does not allow close monitoring.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT CONT'D**		
14. Are detailed records kept of all process steps and conditions?	General Table 12	• There must be a record of each charge showing wood species, products, sizes, volumes, treating cycle stages and duration, tank gauge readings and chemical consumption. • The treatment record and process charts and print outs must be kept on file, together with the results of solution and product testing, in accordance with CSA 080-M3, Clause 1.5.
15. Are records kept of abnormal operating situations (e.g. equipment breakdown)?	General Table 12	• Abnormal operating situations must be recorded in the daily log and also entered on the treatment record. • Abnormal operating situations must be reviewed with a Supervisor, to ensure that corrective action is taken as soon as possible.
16. Is an effective final vacuum applied after completion of the pressure cycle (level/duration)?	General Table 12	• To be effective, the level and duration of the final vacuum must ensure that dripping is minimized when the charge is pulled from the cylinder. • Note that CSA 080 specifies that the final vacuum cannot be less than 22" Hg.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS**		
17. Are safeguards in place to disallow retort opening when liquid or pressure remains?	General Table 12	• Retorts must be equipped with an effective protection device to prevent doors being inadvertently opened, when retort is pressurized, filled or partially filled with preservative. • Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection devices to impact wrench compressors.
18. Are goggles and other appropriate safety equipment worn by operators opening retort doors?	General Table 12	• Operators must wear full PPE when opening cylinder doors and removing and unloading charges. Full PPE includes, rain suit, rubber boots, impermeable gauntlets, face shield or goggles and respirator, if emissions are unknown or above the TLV. • Hydraulic door controls must be located or shielded so that the operator is not directly exposed to liquid and/or vapour releases from the cylinder.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
19. Are impermeable gauntlets worn on handling freshly treated wood?	General Table 12	• Impermeable gauntlets must be worn for handling freshly treated wood and for all activities in the treating plant where protection is required. Leather gloves and impermeable gloves with permeable cuffs must not be worn. • The TRD also recommends the use of an impermeable apron and boots.
20. Are charges allowed to essentially drip dry before they are pulled from the retort?	General Table 12	• Lumber components, timbers, plywood, shingles and shakes must be stickered and stacked on an angle to maximize the rate of preservative drainage . • The level and duration of the final vacuum must ensure that dripping is minimized when the charge is pulled from the cylinder. • Note that CSA 080 specifies that the final vacuum cannot be less than 22" Hg.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
21. Are personnel trained in safety procedures for vessel entry?	General Table 12	• Treating plant personnel must be trained in confined space entry procedures as defined in WCB and provincial labour regulations. • If personnel are not trained, an approved contractor must be hired for this activity. • Note that this guideline also applies to tram jams in the cylinder. • There are several safety procedures for vessel entry, including self contained breathing apparatus (SCBA) or oxygen sensors.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 FIXATION**		
22. If accelerated fixation is applied, is sufficient process humidity applied?	CCA Table 12	• The relative humidity level in the accelerated fixation chamber must be high enough to prevent drying of the freshly treated wood.
23. Is wood to be fixed stored in a protected (roofed) and contained area?	CCA Table 12	• Prior to accelerated fixation, the wood must be stored in a properly contained and roofed area. • The storage area for ambient fixation must also be completely contained and roofed. • In either case, roofing may not be required in areas of low precipitation, provided that peak volumes of storm water collected in the containment can be handled by recycling to the treating process, without any risk of release. • Storm water processing capability must be determined and documented by a certified engineer.

SECTION/CRITERIA	TRD REF.	GUIDELINE
24. Is wood released to an unprotected area only after fixation has been verified by a standard procedure?	CCA Table 12	• Preservative fixation must be verified in accordance with the sampling and testing methods specified in CSA 080.1, Clause 3.4.5 and CSA 080, page 11. • Every cylinder charge or every fixation chamber charge must be sampled and verified before the wood is released to an unprotected area.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 EQUIPMENT MAINTENANCE**		
25. Is all equipment in good operating condition?	General Table 13	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all equipment and ensures immediate attention to any problems. • Records of daily inspections must be maintained and monitored to identify the need for special attention to persistent problems
26. Are NFCC maintenance recommendations adhered to?	General Table 13	• All maintenance practices must be in accordance with Sections 2.5, 3.3, 4.4.11 and 6.0 of the National Fire Code of Canada.
27. Do written maintenance instructions exist?	General Table 13	• The Preventive Maintenance Program must contain written, plant specific instructions for all equipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 EQUIPMENT MAINTENANCE CONT'D**		
28. Are all necessary precautions taken when contaminated equipment is welded?	General Table 13 CCA Table 7	• The precautions that must be taken include: o Obtaining a Hot Work permit from the Supervisor responsible. o Blocking or disconnecting lines from tanks. o Draining and rinsing tanks and lines. o Ensuring that surfaces are free from cleaning solvent residues. o Wearing an approved respirator. o Providing good ventilation in the work area. o Containing all sparks and removing flammable materials. o Complying with all additional provincial workplace safety rules.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.6 CLEAN-OUT**		
29. Are written safety procedures in place?	General Table 13 General Table 1	• Safety procedures for clean-out must be included in the Plant Operations Manual and must address the details contained in Tables I and 13 of the General section of the TRD.
30. Are drip pads clean (what is the frequency of cleaning)?	General Table 13	• Drip pads must be kept clean and free from liquids and residues. • Drip pads must be inspected daily and cleaned at least weekly. • The volume and dispersion of wash water must be kept to a minimum.
31. Is wash water recycled?	General Table 13 General Table 4	• All wash water must be collected, contained and filtered before being recycled to the treating process.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION**		
1. Is wood properly seasoned prior to treatment?	General Table 17	• Every effort must be made to season wood properly. • Moisture content above the fibre saturation point (~25% dry wt.) will promote sludge formation.
2. Are trams and wood load free of debris, soil on charging?	General Table 17	• Trams and charges must be inspected before loading the cylinder and cleaned where necessary.
3. Is the treatment solution clean and are the components balanced?	General Table 17	• An unfiltered sample of working solution must be perfectly clear and treated product surfaces must be free from residues. • The component balance of a filtered sample of working solution must conform to the minimum levels specified in CSA 080 (chromium 45%, copper 17%, arsenic 28%). • The component balance must be determined regularly to ensure that the solution always conforms to CSA 080.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION CONT'D**		
4. Are close controls exercised on treatment parameters (are limits not exceeded)?	General Table 17	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits in accordance with CSA 080-M3, Clause 3.0. • Manual control without instrumentation does not allow close monitoring.
5. Are drips, leaks and washdowns reused in process?	General Table 13	• All drips, leaks and wash water must be collected, contained and filtered before being recycled to the treating process. • Collection sumps must be kept clean and free from debris.
6. Are storm run-offs collected and reused in process?	General Table 9	• Storm water run-off from paved yards shown to contain levels of CCA in excess of regulatory limits must be collected, contained, filtered and re-used in the process. • In the case of unpaved yards, soil and groundwater samples must be taken to determine the environmental impact of storm water. • If contamination is present above regulatory levels, site remediation followed by paving may be necessary.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE**		
7. Are personnel trained in hazards and handling methods?	General Table 17	• Training in all aspects of waste handling and disposal must be provided and updated, at least annually. • Training programs must be plant specific and must address all aspects of provincial regulation related to waste handling. • Individual employee training must be documented.
8. Are wastes and sludges stored in sealed drums?	General Table 17	• Dewatering and/or drying of wastes and sludges must take place in an enclosed area, which is roofed, ventilated and contained. • Appropriate signs must be posted and operators must wear the correct PPE, when processing wastes and sludges. • When wastes and sludges are ready for shipment, they must be in sealed containers, which must conform to Transportation of Dangerous Goods (TDG) regulations. • The storage and handling of wastes and sludges must conform to provincial regulations.
9. Is waste storage area roofed, enclosed and on a paved surface?	General Table 17	• The waste dewatering, drying and storage areas must be roofed, enclosed, paved, contained, well ventilated and separate from the normal work areas.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
10. Are all drums labeled by contents?	General Table 17	• Drum and container labels must conform to TDG regulations.
11. Are records kept of inventory for solid wastes and sludges stored on site?	General Table 17	• An up to date inventory of containers, including their volumes and contents must be maintained. • Regulations in some Provinces require accurate inventories of wastes.
12. Are disposal activities reported as per regulations?	General Table 17	• Disposal activities must be reported by the plant or by the disposal contractor, in accordance with TDG regulations. • The plant must maintain disposal records as per TDG regulations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
13. Has the waste been classified under TDGA?	General Table 17	• CCA wastes have already been classified under the TDG Act. • Labels must show the correct classification, which is Section 6.1 and 9.2 of the TDG regulations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING**		
1. Does a specific site monitoring plan exist?	General Table 14	• A site specific monitoring plan must be prepared by a qualified environmental consultant. • The plan must be designed to address provincial standards for soil, groundwater and storm water run-off, if applicable. If there are no provincial standards, the plant must develop site specific standards in consultation with provincial environmental authorities. ("1997 CCME Soil Quality Guidelines" should be used as a reference). • The plan must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices.
2. Are reporting requirements clearly defined?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective management of the chemicals used.

SECTION/CRITERIA	TRD REF.	GUIDELINE
3. Do monitoring areas include all areas: • Where preservative chemicals are stored, processed and handled? • All treated wood storage areas? • Drainage ditches and areas exposed to run-off?	General Table 14	• A risk evaluation study must be completed to determine the monitoring methodology required for soil, groundwater and storm water in the specified areas.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
4. Are sampling frequency and constituents defined?	General Table 14	• The site monitoring plan must define sampling frequency, as per the risk evaluation study and/or the reporting requirements. • All preservative constituents must be monitored and checked against the applicable regulatory limits. • If no regulatory limits exist, the plant must develop site specific limits in consultation with provincial environmental authorities.
5. Is a program in place to monitor adjacent waterbodies?	General Table 14	• The risk evaluation study in Section 11.1.3 must also address the need to monitor adjacent water bodies, based on an evaluation of site characteristics and plant operations.
6. Is a program in place to monitor groundwater or on-site wells?	General Table 14	• The TRD states: "consider implementing a groundwater monitoring program using permanent monitoring points…". Exceptions to this consideration would be plants located on sites for which such a program would not be effective. Any exceptions must be determined by the risk evaluation study in Section 11.1.3, based on a detailed evaluation of site characteristics and plant operations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
7. Are all air emission sources defined?	General Table 14	• The peak and average levels of all preservative constituents (Cr, Cu, As) in air, for significant points of emission, must be determined. • Significant points of emission include, cylinder door openings, fixation chambers, vent stacks, receiving areas for vents, enclosed plant areas and freshly treated wood storage areas. • The assessment must be updated if there are any changes in plant design and/or operating practices.
8. Are air emissions monitored as per permits?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If permits apply, air emissions must be monitored accordingly. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective control of all air emissions • Monitoring must determine all preservative constituents in air emissions.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
9. Are all liquid waste discharges identified (volumes, contamination levels)?	General Table 14	• Liquid waste discharges include storm water run-off. • The concentrations and total mass emission rates for all preservative constituents in discharges and run-off must be determined by a qualified consultant, as part of the overall site monitoring program defined in Section 11.
10. Are all liquid waste discharges monitored as per permits?	General Table 14	• If permits apply, discharges and run-off must be monitored accordingly. • Monitoring must determine the concentrations of all preservative constituents in discharges and run-off. • If permits do not apply, site specific monitoring protocol and waste discharge limits shall be developed in consultation with provincial environmental authorities.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING**		
11. Does a facility specific monitoring plan exist?	General Table 15	• A site specific workplace monitoring plan and program shall be prepared by a qualified industrial hygienist. • The plan and program must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices. • The plan shall address the requirements defined in Sections 11.1.7 and 11.1.8.
12. Are reporting requirements clearly defined?	General Table 15	• The regulations and reporting requirements which apply to the plant must be determined and defined in the workplace monitoring plan.
13. Are sources of skin exposure identified periodically?	General Table 15	• Existing and potential sources of skin exposure shall be identified by monthly inspections of all operating areas of the plant, from chemical receiving to shipment of treated products. • Skin exposure hazards shall be a topic for discussion at all safety committee meetings. • Safe working practices, training programs and PPE requirements must be modified when new sources of skin exposure are identified.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
14. Is a monitoring program defined: • Sampling techniques? • Frequency? • Items sampled for?	General Table 15	• The workplace monitoring plan and program defined in Sections 11.2.11 and 11.2.12 above must define the sampling techniques and sampling frequency required for all preservative constituents and other toxic chemicals used by the plant. • The requirements defined in Sections 11.1.7 and 11.1.8 also apply.
15. Are peak levels of preservative exposure from air known for all significant points of worker exposure (cylinder doors, kiln interiors, fixation chamber, exhaust vents, enclosed preservative process areas, freshly treated charges)?	General Table 15	• Peak levels of exposure shall be determined as per the requirements defined in Sections 11.1.7 and 11.1.8 above. • Peak levels shall be determined annually under worst case conditions, e.g. during winter months when plant areas are enclosed.
16. Are pre-employment medical exams carried out?	General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed by an occupational physician to verify that they are able to carry out their assigned duties. • Provided new employees are not directly exposed to chemicals, their pre-employment medicals may follow the completion of their probationary period.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
17. Does a plan exist for follow-up medicals?	General Table 15	• The plant must prepare a plan, in consultation with an occupational physician, which defines: o Jobs for which pre-employment and annual or more frequent medical examinations are mandatory, based on the degree of exposure to specific chemicals. o The person responsible for scheduling medical appointments o Responsibility for record keeping. o Responsibility for follow-up with physician and employee.
18. Are follow-up medicals and biological monitoring (e.g. urine) carried out?	General Table 15	• As specified in the plan outlined in Section 11.2.17, designated employees must be periodically examined by an occupational physician to assess the effects of exposure to the chemicals in use at the plant. • As a result, medical examinations may include x-rays, nasal and skin evaluation, and urine and blood testing. • Medical examinations must address all preservative constituents and other toxic chemicals.

COPPER AZOLE (CA-B) FACILITY TECHNICAL GUIDELINES

2004

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 1.CHEMICAL RECEIVING AND UNLOADING AREA **1.1 ACCESS/SECURITY**		
1. Is off-loading area located away from high yard-traffic routes?	General Table 3	• Ideally, off-loading area should be located away from any traffic. If relocation is impractical, traffic must be controlled by DANGER signs, barriers and constant supervision during chemical unloading operations.
2. Is vehicle access restricted during delivery?	General Table 3	• All vehicles, including contractors' trucks and visitors' vehicles must be restricted from the off-loading area by DANGER signs, barriers and constant supervision during chemical unloading operations.
3. Are there locking valves on liquid delivery lines?	General Table 3	• Concentrate delivery lines must be securely locked when not in use.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 1.CHEMICAL RECEIVING AND UNLOADING AREA **1.2 CONTAINMENT**		
4. Is an unloading pad and catchment sump used (ammonia)?	General Table 3	• The concentrate truck must be unloaded on an impervious pad large enough in area to hold the full length of the truck. • The pad must drain to a leak-proof sump and/or containment, large enough to hold the entire volume of concentrate contained in the truck.
5. Are impervious construction materials used?	General Table 3	• The surfaces of the pad and sump must have a hydraulic conductivity, or permeable rating to water, of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3 m and be resistant to CA-B solutions. • Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer.
6. Are liquid-tight joints sealed with chemical resistant material?	General Table 3	• All joints in the pad must be sealed with caulking that complies with the requirements defined in section 1.2.10. • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, all sump joints must be sealed with caulking that complies with the requirements defined in section 1.2.10.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 1.CHEMICAL RECEIVING AND UNLOADING AREA **1.2 CONTAINMENT CONT'D**		
7. For tote delivery, is off-loading area near the storage area?	General Table 3	• Unloading should be close to the storage area and any transportation of totes must be over a paved and contained area. Arrange for unloading to require minimum handling.
8. Are pads designed to contain large (tanker) spills?	General Table 3	• The pad must be constructed so that it will allow containment of the entire volume of concentrate in the truck.
9. Are pads and sumps free of settling and cracks?	General Table 3	• Pads and sumps must be designed to prevent settling and/or cracking. Any visible cracks must be repaired with CA-B-resistant caulking, using procedures that will ensure a liquid-tight seal. • Evident or suspected settling must be evaluated by a certified engineer to determine the structural integrity of the pad and/or sump.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 1.CHEMICAL RECEIVING AND UNLOADING AREA **1.2 CONTAINMENT CONT'D**		
10. Are pads and sumps lined?	General Table 3	• Secondary containment for this area is good practice and is required by some provinces. • Secondary containment may be achieved by installing a subsurface membrane liner or by applying an impervious coating to the pad and sump surfaces. • Surface sealers, surface coatings, and joint and crack sealants must have a hydraulic conductivity, or permeability rating to water, of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m. In addition, they must be resistant to the chemicals in use at the plant and must have the physical properties (compressive, tensile and flexural strength), the abrasion and wear resistance and the lifetime requirements, suitable for the intended application. The performance requirements for sealers and coatings will vary in different areas of the plant. For example, the drip pad represents the most severe application, due to constant exposure to chemical solutions, vehicle traffic and cleaning processes, whereas cylinder and tank farm containment areas, with occasional chemical exposure and foot traffic, represent a less stringent application. Sealers, coatings and sealants and their application technology must be determined in consultation with a manufacturer with experience in the field. A list of experienced manufacturers of sealers, coatings and sealants may be obtained from the chemical supplier.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 1.CHEMICAL RECEIVING AND UNLOADING AREA **1.3 DELIVERY/TRANSFER EQUIPMENT**		
11. Is all transfer equipment in a contained area?	General Table 3	• Transfer equipment includes the entire length of the concentrate truck, the delivery hose and the valves and piping between the hose connection and the concentrate storage tank. • All this equipment must be contained as defined in sections 1.2 and 2.4.
12. Are pipes and valves clearly identified?	General Table 3	• All piping must be colour-coded and/or clearly labelled. • Flow direction must be shown. • All valves and caplocks must be clearly labelled.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 1.CHEMICAL RECEIVING AND UNLOADING AREA **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
13. Are delivery lines rigid, accessible and visible?	General Table 3	• There must be easy access to allow inspection, leak detection and maintenance of delivery lines. • Flexible hoses connecting delivery vehicles to tank piping must be shielded. All other piping must be of the appropriate material and schedule with the required compatibility. • Any buried piping must have secondary containment together with provision for leak detection designed by a qualified engineer.
14. Is piping protected from mechanical damage?	General Table 3	• All piping must be protected to prevent damage by any means, such as the concentrate delivery trucks, plant mobile equipment, contractor's vehicles, wood piles, stored equipment, etc.
15. Are hose and pipe connections designed to be secure?	General Table 3	• All hose and pipe connections must be leak tight. Couplings must have safety measures to prevent improper connections and to ensure integrity of the connection throughout the unloading process. Couplings must not result in backflow when the hose is disconnected.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 1.CHEMICAL RECEIVING AND UNLOADING AREA **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
16. Are pipes connected for top delivery to tanks?	General Table 3	• The concentrate delivery line must be connected to the top of the concentrate tank, above the high-level alarm sensor.
17. Are back-flow preventers installed on delivery lines?	General Table 3	• An effective check valve must be installed in the delivery line.
18. Is the delivery system totally visible from the point of off-loading to tankage?	General Table 3	• "Totally visible" means from the truck controls to the concentrate storage tank.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 1.CHEMICAL RECEIVING AND UNLOADING AREA **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
19. If visibility is limited, are audible alarms installed on tanks to detect overflow?	General Table 3	• Alarms must be audible both in the tank farm and also at the off-loading station. • Alarm function must be tested weekly and prior to delivery of concentrate.
20. Is local drip catchment available?	General Table 3	• Drip catchment must be used under the hose connection at the truck and also under the hose connection to the line to the CA-B concentrate storage tank, during the off-loading process.
21. Are spill-response equipment, absorbents and personnel protection equipment available and readily accessible?	General Table 3 CA-B Table 20	• Personnel protection equipment must comply with TRD reference CA-B, Table 11. • Spill response equipment must be site specific and must be selected in accordance with the preservative supplier's recommendations. • Equipment inventory must be checked weekly and recorded and must be complete at all times. • Location of equipment storage must allow prompt response to emergency situations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 1.CHEMICAL RECEIVING AND UNLOADING AREA **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
22. Is the off-loading area equipped with a phone or a manual alarm switch?	General Table 3	• There must be a manual alarm in the off-loading area that is audible throughout the plant. • The alarm function must be tested weekly and prior to the delivery of concentrate. Alarm tests must be recorded. • A phone and/or 2-way radio is also required to arrange any assistance that may be required.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.1 ACCESS/SECURITY**		
1. Is there 24-hour security?	General Table 4	• Systems and procedures must be in place to prevent unauthorized access to the chemical storage area on a 24-hour basis. • Examples include a restricted area policy, locked buildings with security monitoring alarms, locked buildings with security patrols, etc.
2. Are bulk liquid and solid chemicals stored in locked area?	General Table 4	• If the tank farm cannot be located in a secure, locked building, precautions must be taken to ensure that there can be no unauthorized access to the chemical storage area.
3. Are tank drain valves locked?	General Table 4	• Any valve that could cause the release of chemical, as a result of unauthorized use, must be locked. • Examples include sampling valves on tanks and manually operated valves between tanks and between the tanks and the cylinder.
4. Are tanks protected from mechanical impact?	General Table 4	• All tanks must be protected to prevent damage by any means, such as the ammonia delivery truck, plant mobile equipment, wood piles, stored equipment, etc. • Tanks installed close to external walls that could be breached by mobile equipment and/or truck accidents require special attention.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.2 TANKAGE**		
5. Are tanks in sound physical condition, with no rust or damage?	General Table 4 General Table 11	• All chemical storage tanks, including effluent tanks, must be tested annually and certified as suitable for the intended use by an accredited testing company or agency.
6. Are underground tanks leak-tested at least annually?	General Table 4 General Table 11	• It should be noted that leak-testing will not prevent chemical release as leaks of 0.5 gal/hour and less cannot be detected. • Underground tanks should be removed and replaced with aboveground tanks and must not be used in new construction. • If removal and replacement is impractical for an existing tank, it must have a leak detection system designed by a certified engineer. • All underground tanks must be tested annually and certified as suitable for the intended use by an accredited testing company or agency.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.2 TANKAGE CONT'D**		
7. Are aboveground tanks mounted on containment pad?	General Table 4	• Tank bases must not be embedded in, or be encased by concrete. • Preferably, vertical tanks should be mounted on raised supports on containment pad surfaces. • If tanks must be in contact with pad surfaces, an annual assessment of external corrosion must be carried out. • The tank containment floor must be kept clean and dry to allow immediate detection of leaks.
8. Are tanks mounted in stable positions and anchored securely?	General Table 4	• Tanks must be mounted in stable positions and must be anchored if flooding of the containment by storm water or a spill would exert uplift forces.
9. Are tanks sheltered from weather by a fixed roof?	General Table 4	• The preferred location for tanks is inside a secure, locked building. • If relocation is impractical, exterior tanks must be roofed if the storm water that enters the tank containment is not recycled to the process.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.2 TANKAGE CONT'D**		
10. Are tanks located in dyked area?	General Table 4	• All chemical storage tanks must be installed in a dyked containment. • In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
11. Are tanks protected from freezing?	General Table 4 CA-B Table 12	• The contents of all chemical storage tanks and totes must be kept above 0°C.
12. Are all tank surfaces accessible for detecting leaks and are insulated tanks provided with inspection points?	General Table 4	• Preferably, tanks should be raised on supports to allow leaks to be readily detected. • Whether tanks are raised or not, the tank farm floor must be kept clean and dry to allow immediate leak detection. • The lower 6 inches of insulated tanks must not be insulated to allow leaks to be readily detected or the tank must be provided with inspection points.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.2 TANKAGE CONT'D**		
13. Are tank vents controlled?	General Table 4 CA-B Table 14	• Interior tanks must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior tanks may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Tanks must not vent directly into the workplace.
14. Are storage areas fire-protected?	General Table 6	• Fire protection must conform to applicable codes, such as the National Fire Code of Canada, the National Building Code, provincial and municipal codes, etc. • Conformance must be certified by an accredited inspector, such as the local fire department, building inspector, insurance company, etc.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.3 TRANSFER EQUIPMENT**		
15. Is piping rigid and permanent throughout the operation?	General Table 4	• With the exception of the connection between the delivery vehicle and the storage tank, piping must be of the required material and schedule with the required compatibility.
16. Is piping visible and accessible with a simple layout?	General Table 4	• Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up-to-date piping schematic must be available.
17. Is piping aboveground?	General Table 4	• In general, all piping must be visible and readily accessible for leak detection and maintenance. • Visible subgrade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or piping must be brought above grade. • Underground piping is not allowed in new construction. • If there is no alternative to underground piping in existing construction, it must be installed in appropriate containment with provision for leak detection designed by a qualified engineer.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.3 TRANSFER EQUIPMENT CONT'D**		
18. Is containment provided for sub-grade piping?	General Table 4	• Visible subgrade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected, or piping must be brought above grade. • Underground piping must be installed in appropriate containment with provision for leak detection as per 2.3.17.
19. Are piping and fixtures chemically compatible?	General Table 4 CA-B Table 2	• Piping and fixtures must be compatible with CA-B solutions. Table 2 of the CA-B chapter of the TRD provides some information. Any questions and/or uncertainties must be resolved with the chemical supplier.
20. Are valves identified by labelling or colour-coding?	General Table 4	• Valves must be labelled or colour-coded. • The label or colour code must identify the valve function in accordance with the piping schematic mandated in 2.3.16.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.3 TRANSFER EQUIPMENT CONT'D**		
21. Are valves and pipes protected from impact?	General Table 4	• All valves and piping must be protected to prevent damage by any means, such as the ammonia delivery truck, plant mobile equipment, contractors' vehicles, wood piles and stored equipment.
22. Are lines protected from freezing (where applicable)?	General Table 4 CA-B Table 14	• All piping used for CA-B solutions must be kept above 0ºC.
23. Do valves have local drip/spill catch trays?	General Table 4	• Valves must be installed properly and maintained regularly to prevent leakage. • The tank farm floor must be kept clean and dry to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. • Containers are also required under any unprotected valves located outside the containment area • Containers must be inspected daily and any free liquid must be cleaned out.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.3 TRANSFER EQUIPMENT CONT'D**		
24. Do pumps have local drip/spill catch trays?	General Table 4	• All pumps handling CA-B solutions must have self-contained spill trays large enough to prevent contamination of the containment area. There must be no free CA-B on the containment floor. • Spill trays must be inspected daily and any free liquid must be cleaned out.
25. Are backflow preventers on all water supply lines?	General Table 4 CA-B Table 12	• Reduced pressure-type backflow preventers must be installed on all water supply lines as a secondary protection system. • Backflow preventers must be inspected and tested annually or as recommended by the manufacturer.
26. Are waterlines connected via top entry to tanks?	CA-B Table 12	• Water supply lines must be connected to the top of tanks above the high-level alarm sensor.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.3 TRANSFER EQUIPMENT CONT'D**		
27. Is piping system designed to protect against inadvertent transfers?	General Table 4	• Pipes and valves must be clearly identified and operating instructions explicitly defined. • Manual systems must not be operated by untrained personnel. • Where there is common piping in multi-preservative plants, blocking systems must be in place to prevent inadvertent transfer of solutions.
28. Are reliable, accurate level indicators installed?	General Table 4	• All level indicators must be checked regularly and calibrated and recorded every 6 months. • Calibration records must be kept on file.
29. Is mechanical impact protection functional on sight glasses?	General Table 4	• Protection system must prevent sight glasses from being damaged or accidentally disconnected.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.3 TRANSFER EQUIPMENT CONT'D**		
30. Are shut-off valves functional on all rupturable lines and gauges?	General Table 4	• Any line or gauge that can be easily damaged or accidentally disconnected must be fitted with an automatic shut-off valve. • Examples include sight glasses, instrument tubing, etc. • Vulnerable sampling valves on tanks must be physically protected.
31. Is overflow piping provided from tanks to containment or dedicated overflow tank?	General Table 4	• Preferred design is to connect all tanks to a dedicated overflow tank, otherwise, overflow piping must extend to a contained sump. • Overflow tanks and pipes must be vented to the exterior with provision to prevent the release of entrained liquids or overflow. • Open manholes on tanks are not permitted.
32. Are independent high-level alarms installed on tanks?	General Table 4	• All tanks must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly and the test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.3 TRANSFER EQUIPMENT CONT'D**		
33. Are high-level alarms interlocked to the pump auto-shutoff?	General Table 4	• Alarms must immediately prevent any increase in the solution level in the tank, either by shutting off the pump or by closing the appropriate valve.
34. Is there a 24-hour monitoring alarm?	General Table 4	• The containment must be protected by a system that is able to detect a chemical release in the tank farm and trigger an alarm that is monitored on a 24-hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly and the test details must be recorded.
35. Are there manual alarm buttons at potential major spill points?	General Table 4	• The chemical receiving, storage and treating cylinder areas must be adequately protected by manual alarms. • The function of all alarms must be tested weekly and the test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.4 CONTAINMENT**		
36. Are containment floors, dykes and joints structurally sound?	General Table 4 General Table 4	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications or reinforcement, are unknown, then the structural integrity of the containment must be verified by a certified engineer.
37. Are containment surfaces and joints sealed?	General Table 4	• Tank farm containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods, such as water-stop inserts, have been used, joints must be sealed with caulking that complies with the requirements defined in section 1.2.10.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.4 CONTAINMENT CONT'D**		
38. Is a secondary containment barrier (e.g. an impermeable top coat or a liner under the containment area) built into the containment area?	General Table 4	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath tanks, together with a leak detection system. • The coating must comply with the requirements defined in section 1.2.10.
39. Is subsurface leak detection provided?	General Table 4	• A subsurface leak detection system designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double-liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak-detection system.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.4 CONTAINMENT CONT'D**		
40. Is the spill containment volume in compliance with the National Fire Code of Canada (NFCC)?	General Table 4	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
41. Are there provisions to direct, collect and transfer spills, washdown liquids and infiltrate to tankage?	General Table 4	• Provisions must ensure the immediate transfer of all liquids to the appropriate tank. • There must be no free-standing CA-B solution or effluent, anywhere in the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.4 CONTAINMENT CONT'D**		
42. Is local collection/containment of incidental drips in place (pumps, valves, etc.)?	General Table 4	• The tank farm floor must be kept clean and dry to prevent tracking and air contamination and to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid cleaned out. All pumps handling CA-B solutions must have self-contained spill trays large enough to prevent contamination of the containment area. • Spill trays must be inspected daily and any free liquid must be cleaned out.
43. Is containment area designed to minimize tracking of liquids and contaminated dust?	General Table 4	• The containment area must be kept free from ethanolamine fumes and preservative liquids and residues to prevent tracking and air contamination. • The containment area must be accessed only by authorized personnel, as designated by the plant manager. • Walkways, footware exchanges and so on must be provided to prevent dirt and dust being tracked to and from the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 2. CHEMICAL STORAGE AREA **2.4 CONTAINMENT CONT'D**		
44. Are there provisions for water spray and/or ventilation to control ammonia/amine vapours (in enclosed facilities)?	CA-B Table 12	• Storage and operating areas must be equipped with provisions for water spray and/or ventilation to maintain ethanolamine and preservative constituent levels in the air below regulated limits.
45. Are totes stored in a secure, enclosed, paved area?	CA-B Table 12	• The storage areas for CA-B concentrates must be secure, roofed and paved. Totes must be elevated from the floor of the storage facility.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 3. CHEMICAL MIXING SYSTEMS **3.1 TANKAGE/MIXING VESSELS**		
1. Is mixing equipment in a contained, enclosed, heated area?	General Table 5 CA-B Table 13	• The containment for mixing vessels must be as defined in section 2.4, criteria 36-43 inclusive. • Mixing systems must be kept above 0ºC.
2. Is permanent, closed mixing system used?	General Table 5	• A permanent, closed mixing system must be used. • The mixing system must be rigidly piped from tank to tank.
3. Is a high-level alarm installed to prevent mix tank overflow?	General Table 5	• The mix tank must have a high-level alarm. • The alarm must be audible throughout the plant. • The alarm must trigger visible identification of a specific high-level emergency in the mixing vessel. • The alarm must be tested prior to every mix and test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 3. CHEMICAL MIXING SYSTEMS **3.1 TANKAGE/MIXING VESSELS CONT'D**		
4. Are high-level alarms linked to feed-pump shut off?	General Table 5	• Alarms must immediately prevent any increase in the solution level in the mixing tank, either by shutting off the mix pump or by closing the appropriate valve.
5. In case of any open transfer operations, is reliable splash protection in place?	General Table 5	• Open transfer of solution is not allowed. • Working solutions must be mixed in a closed system.
6. Is transfer equipment mechanized (minimum of worker contact and spill potential)?	CA-B Table 13	• The transfer of tote contents must be mechanized to minimize the potential for worker contact and spills.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 3. CHEMICAL MIXING SYSTEMS **3.2 CONTAINMENT**		
7. Are containment floors, dykes and joints structurally sound?	General Table 5	• If containment is cracked or damaged in any way or if construction details, such as concrete specifications or reinforcement, are unknown, then the structural integrity of the containment must be verified by a certified engineer.
8. Are containment surfaces and joints sealed?	General Table 5	• Surfaces of containments with membrane liners must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods, such as water-stop inserts, have been used, all joints must be sealed with caulking that complies with the requirements defined in section 1.2.10.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 3. CHEMICAL MIXING SYSTEMS **3.2 CONTAINMENT CONT'D**		
9. Is a secondary containment barrier built into the tank containment area?	General Table 5	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the tanks, together with a leak-detection system as per 3.2.10. • The coating must comply with the requirements defined in section 1.2.10.
10. Is subsurface leak detection provided?	General Table 5	• A subsurface leak-detection system designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double-liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. • Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak-detection system.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 3. CHEMICAL MIXING SYSTEMS **3.2 CONTAINMENT CONT'D**		
11. Is there a subsurface leak containment and collection system?	General Table 5	• For an existing plant, if the monitoring well system detects a leak, a recovery well system must be designed and installed by a qualified hydrogeologist, to ensure containment and collection. • The double-liner system described in section 3.2.10 above is the preferred approach for new plants or additions to existing plants.
12. Is the spill containment volume in accordance with NFCC?	General Table 5	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
13. Is tank farm covered to prevent infiltration precipitation?	General Table 5	• The preferred location for tanks is inside a secure, locked building. • If relocation is impractical, exterior tanks must be roofed if the stormwater that enters the tank containment is not recycled to the process.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 3. CHEMICAL MIXING SYSTEMS **3.2 CONTAINMENT CONT'D**		
14. Does containment have alarms to identify spills?	General Table 5	• The containment must be protected by a system that is able to detect a chemical release in the tank farm and trigger an alarm that is monitored on a 24-hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly, and the test details must be recorded.
15. Is the containment area visible?	General Table 5	• The containment area must be well-lit, as per provincial requirements of the Workers' Compensation Board, Ministry of Labour and so on, and must not be used as an equipment storage area.
16. Is the mix area equipped with adequate ventilation?	CA-B Table 13	• Positive ventilation must be in place to keep ethanolamine and preservative constituent levels below regulatory limits. • The mix tank must be equipped with an efficient scrubber to control air emissions.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.1 CONTAINMENT/LOCATION**		
1. Are the treatment vessel, controls and ancillary equipment in an enclosed structure and protected from freezing?	General Table 6	• The treating cylinder, controls and ancillary equipment must be located in an enclosed winterized structure that is maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
2. Are the treatment cylinder and process tanks within a contained area?	General Table 6	• The treating cylinder and process tanks must be located in a containment area with continuous, structurally sound concrete floors and dykes. • The details of the containment must be as defined in section 2.4, criteria 36-43 inclusive.
3. Does the spill containment capacity comply with NFCC requirements?	General Table 6	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.1 CONTAINMENT/LOCATION CONT'D**		
4. Are the floors and dykes reinforced, structurally sound and with sealed joints?	General Table 6	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods, such as water-stop inserts, have been used, joints must be sealed with caulking that complies with section 1.2.10. • Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing.
5. Are surfaces graded to facilitate drainage?	General Table 6	• Containment floors should have at least 2% grade to ensure efficient drainage to a collection system. • Free-standing liquid is not permitted in the containment area.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.1 CONTAINMENT/LOCATION CONT'D**		
6. Are walkway grates or other designs in place to minimize worker contact and tracking of preservative residues?	General Table 6	• The containment area must be kept free from ethanolamine fumes and preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by those personnel authorized by the plant manager. • Walkways, footware exchanges and so on must be provided to prevent dirt and dust being tracked to and from the plant.
7. Does the entire process area have a secondary containment provision (e.g. an impermeable top coat on floors and dykes or a liner under the containment area)?	General Table 6	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. The liner must be resistant to CA-B solutions. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the tanks. • The coating must comply with the requirements defined in section 1.2.10.
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.1 CONTAINMENT/LOCATION CONT'D**		
	General	• To recover any releases that may occur, the control and

SECTION/CRITERIA	TRD REF.	GUIDELINE
8. Is control and transfer equipment isolated to avoid damage from spills?	Table 6	transfer equipment must be located so that a spill equal to the containment volume defined in section 4.1.3 or flooding will not prevent their operation or create an electrical hazard.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.2 SUMPS**		
9. Are sumps leakproof (impermeable surfaces, sealed joints)?	General Table 7	• Sump surfaces must have a hydraulic conductivity, or permeability rating to water, of $1x10^{-7}$ cm/sec or less, under a hydraulic head of 3m and must be resistant to CA-B solutions. • All joints in the sump must be liquid-tight. • If it is not known whether liquid-tight construction methods, such as water-stop inserts, have been used, joints must be sealed with caulking that complies with section 1.2.10.
10. Are sumps equipped with tertiary containment (e.g. a steel lining)?	General Table 7	• Sumps must have primary containment as per section 4.2.9; plus secondary containment, consisting of a liner or an impermeable coating; plus tertiary containment, consisting of a steel lining or other suitable material.
11. Are sumps protected by independent high-level alarms?	General Table 7	• All sumps must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly, and test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.3 TREATING CYLINDER**		
12. Are all pressure-vessel inspection certificates current?	General Table 7	• The plant must have a current certificate to show that the treating cylinder and all pressurized components meet all requirements of the provincial ministry responsible. • If there is no provincial requirement, the treating cylinder and all pressurized components must be inspected annually by an accredited testing company or agency.
13. Is the retort door protected from opening when full or under pressure?	General Table 7	• Retorts must be equipped with an effective protection device to prevent doors being opened when retort is pressurized, filled or partially filled with preservative. Examples include, liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to impact wrench compressors.
14. Is the cylinder designed to facilitate drainage of excessive preservative?	General Table 7	• The alignment of the treating cylinder and/or the pump-out procedures must prevent any preservative draining from the cylinder door opening.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.4 PROCESS CONTROLS**		
15. Is the operator control area segregated from retort and tank spill-containment areas?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that spills or flooding will not prevent their operation or create an electrical hazard. • In the case of hydraulic doors, the hydraulic pump controls must be located or shielded so that the operator is not directly exposed to any liquid or vapour releases from the cylinder.
16. Is the control area winterized?	General Table 6	• The process control area must be winterized and maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
17. Is the control area well lit and located for maximum visibility of treatment systems?	General Table 6	• All operating and control areas must have proper lighting, as per provincial requirements, so that all equipment is totally visible at all times. • The location of the control area must allow the best possible visibility of the treatment system, for the operation concerned. • Mirrors or closed circuit TV may solve specific problems, particularly for those plants where the cylinder doors are hidden from view.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.4 PROCESS CONTROLS**		
18. Are process controls simple and properly functioning to provide accurate feedback?	General Table 7	• The process controls must be installed, maintained and calibrated in accordance with CSA 080-M3, Clause 3.0.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.5 AIR EMISSION CONTROL**		
19. Are pumps, tank or other exhausts vented to outside or to recovery system?	General Table 6 CA-B Table 14	• Pumps, tanks, cylinders and other exhausts must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior equipment may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Equipment must not vent directly into the workplace.
20. Does general area ventilation exist to keep contaminant levels below regulatory limits?	General Table 6 CA-B Table 14	• Ventilation must be provided to maintain air emissions below the levels specified by the American Conference of Governmental Industrial Hygienists (ACGIH) for ethanolamine, copper and tebuconazole or those specified by provincial regulations. • Air emissions must be monitored in all work areas at least annually, and whenever there is a change in equipment and/or procedures that may affect emission levels.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.6 PIPING AND RECYCLE SYSTEM**		
21. Are traps installed on vents (to remove entrained liquids)?	CA-B Table 14	• An effective scrubbing system must be in place and operative.
22. Is the system designed to effectively contain and recycle all chemicals with minimal potential for releases?	General Table 6 General Table 7	• The system must be able to contain and recycle all chemicals used by the plant. There must be no routine release of chemicals into the containment from process equipment.
23. Is all transfer equipment in a contained area?	General Table 7	• All piping and pumps must be contained as defined in section 2.4, criteria 36-43 inclusive. • Transfer equipment must be kept above 0°C.
24. Are pipes and valves clearly identified?	General Table 4	• All piping must be colour-coded and/or clearly labelled. • Flow direction must be shown. • All valves must be clearly labelled to identify their function in accordance with the piping schematic.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 4. TREATMENT PROCESS SYSTEMS **4.6 PIPING AND RECYCLE SYSTEM CONT'D**		
25. Are delivery lines rigid, accessible and visible?	General Table 4	• All piping must be of the appropriate material and schedule with the required compatibility. • Plastic piping or flexible hoses must not be used. • Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up-to-date piping schematic must be available.
26. Is piping protected from mechanical damage?	General Table 4	• All piping must be protected to prevent damage by any means, for example, by means of the concentrate delivery truck, plant mobile equipment, contractors' vehicles, wood piles or stored equipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 5. PRIMARY WOOD DRIP AREA **5.1 GENERAL DESIGN**		
1. Is the area sheltered from precipitation and dust?	General Table 8 CA-B Table 15	• The primary wood drip area must be sheltered from precipitation and dust, unless the generation and disposal of contaminated runoff water and contaminated dust can be controlled by other means.
2. Does the area have efficient drip and run-off collection and containment?	General Table 8	• The drip pad must be fully contained with sufficient grade to minimize the retention of free liquid so that tracking and air contamination are avoided.
3. Is dispersal of liquids from tracking by personnel and vehicles minimized?	General Table 8	• Vehicles involved in loading, unloading and stacking charges on the drip pad must be dedicated to the drip pad. • All vehicles, including the concentrate delivery and contractors' trucks, must be thoroughly washed before leaving the drip pad. • Tracking by personnel can be minimized by restricting foot traffic, keeping the pad clean, installing drainage channels in the storage area, and providing perimeter walkways or a boot-changing station.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 5. PRIMARY WOOD DRIP AREA **5.2 DRIP PROTECTION**		
4. Is the area large enough to hold all freshly treated wood for at least 48 hours and until visible dripping has stopped?	General Table 8 CA-B Table 15	• The area must be large enough to hold all freshly treated wood for at least 48 hours and until visible dripping has stopped. • This criteria also applies to those plants where the stabilization process (48 hours protected storage) is carried out in an area remote from the drip pad. In these plants, the wood cannot be moved from the drip pad until it is absolutely drip-dry. Once drip-dry, the wood cannot be moved during periods of precipitation.
5. Is the area where wood is stored prior to application of accelerated fixation properly contained and roofed?	General Table 8 CA-B Table 15	• Wood stored for preservative stabilization must be stored in a roofed, open-sided structure with containment for all preservative drippage and infiltrating precipitation.
6. Is the area where treated wood is undergoing fixation/stabilization at ambient conditions completely contained and roofed?	General Table 8 CA-B Table 15	• The storage area where preservative stabilization is undertaken must be roofed.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 5. PRIMARY WOOD DRIP AREA **5.3 CONTAINMENT**		
7. Are the unloading areas provided with impermeable floor and curb?	General Table 8	• The unloading track pad must be constructed to completely contain all drips from the wood and the trams. • The unloading area floor must meet a hydraulic conductivity, or permeability rating to water, of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and be resistant to CA-B solutions. • Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior relevant experience.
8. Are the floors sloped to facilitate collection of all contaminated liquids?	General Table 8	• The drip pad must be fully contained with sufficient grade to direct any free liquid to a collection and recycling system.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 5. PRIMARY WOOD DRIP AREA **5.3 CONTAINMENT**		
9. Are the floors and curbs covered with an impermeable top coat or is a liner installed underneath the entire area?	General Table 8	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all drip pad surfaces, together with a leak-detection system, as per section 2.4.38. • The coating must comply with the requirements defined in section 1.2.10.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 5. PRIMARY WOOD DRIP AREA **5.4 CONTAINMENT: FIXATION/STABILIZATION AREA**		
10. Does the storage area used for fixation/stabilization under ambient conditions have an impermeable floor and containment with recovery provisions for drips and infiltration?	CA-B Table 15	• The storage area floor must have a hydraulic conductivity, or permeability rating to water, of 1x 10^{-7} cm/sec or less, under a hydraulic head of 3m and must be resistant to the chemicals in use at the plant. Floor specifications should be developed in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior applicable experience. • The storage pad must be fully contained with sufficient grade and an efficient drainage system to direct any free liquid to a collection and recycling system to prevent tracking and air contamination.
11. Is the fixation/stabilization area roofed?	CA-B Table 15	• The storage area for fixation/stabilization under ambient conditions must be roofed.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 6. TREATED WOOD STORAGE AREAS		
1. Has the wood been stored for a minimum of 48hours in a protected area, prior to placing it in unprotected storage (is storage period documented for every charge)?	General Table 9 CA-B Table 15	• Treated material must not be placed into unprotected storage or shipped unless it has undergone a stabilizing process (CA-B, Table 15) and is completely drip free.
2. Are treated wood packages elevated above ground (placed on stringers)?	General Table 9	• All treated wood packages/bundles must be elevated above ground to minimize contamination of soil and surface run-off water. The minimum ground separation must be 6 inches.
3. Are treated wood storage areas segregated from uncontaminated yard areas?	General Table 9	• Treated wood storage areas must be consolidated and segregated to minimize yard contamination and ensure efficient collection of any surface runoff water containing CA-B residues. • The evaluation of options for storage area surfaces must consider several factors, including groundwater usage and precipitation levels.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN 6. TREATED WOOD STORAGE AREAS **CONT'D**		
4. Are unsurfaced storage areas remote from water bodies?	General Table 9	• The runoff from surfaced and unsurfaced storage areas must not cause any waterbody or surfacewater or groundwater system to exceed regulatory guidelines or standards.
5. Is storage in compliance with NFCC requirements (e.g., lack of vegetation, separation of wood from buildings)?	General Table 9	• Storage areas must be separated from plant operations and other structures by an acceptable clear space permanently available for firefighting operations. • Storage areas must be maintained free of combustible vegetation, including grass and weeds, for at least 4.5 m from the stored material and at least 30 m from bush and forested areas. • Lumber treated with combustible liquids must be stored in piles separated from other stored material by a distance of not less than 4.5 m. • At least two fire department access routes must be provided.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.1 PROCEDURES**		
1. Is an operations manual available with written instructions for all aspects of chemical use?	General Table 10	• A current, site-specific manual must be available containing clear instructions for all aspects of chemical use, plant operation, equipment maintenance, housekeeping, accident prevention, first aid and emergency response procedures, and all applicable regulations. • The manual must be readily available to all employees. • There must also be up-to-date blueprints of the plant and current specifications for all equipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.1 PROCEDURES**		
2. Are all operating personnel informed of the potential hazards and precautionary measures?	General Table 10	• Training in all aspects of chemical use and plant operation must be provided and updated, at least annually. Training programs must be plant specific and should at least include: o chemical substances and their hazards, including: personal hygiene,, o safe operation and maintenance of equipment and processes, o spill and fire prevention procedures, o proper use of personnel protective equipment, o proper use of all safety equipment for controlling spills and fires, o emergency response and first aid and rescue procedures, and o handling, storage and disposal of waste materials. • Individual employee training must be documented.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.2 PERSONNEL**		
3. Are all operating personnel trained in good work practices?	General Table 10	• Operating personnel must be trained as defined in section 7.1.2.
4. Is periodic review and update of training implemented?	General Table 10	• Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment.
5. Is a company policy and enforcement system in place to ensure that all safety measures are adhered to?	CA-B Table 17	• The operating manual must clearly describe the required safety measures and protective equipment to be worn. All operating personnel must be thoroughly trained and must sign off that they would follow all safety rules.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.3 SIGNING**		
6. Are the contents and functions of the tanks identified (e.g. CA-B concentrate storage, CA-B work solution, makeup water)?	General Table 10	• The contents and functions of all tanks must be clearly identified by large permanent signs.
7. Are personnel safety precautions and first aid procedures prominently displayed?	General Table 10	• Prominent, easy-to-read signs must be displayed in the chemical receiving and storage areas, the treating-process area, all control stations, and the plant office.
8. Are emergency response procedures and emergency telephone numbers prominently displayed?	General Table 10	• Plant-specific emergency response procedures must be summarized and displayed in the form of a prominent notice. • Notices must also show phone numbers for company contacts, police, fire, ambulance, chemical supplier, and so on, not just 911.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.4 PERSONAL HYGIENE AND SAFETY**		
9. Are food, drink and tobacco products prohibited in working areas?	General Table 1	• Food, drink and tobacco products must be prohibited in working areas. • Designated lunch rooms and smoking areas must be separate from work areas and must be provided with washing facilities.
10. Are all personnel familiar with basic hygiene requirements?	General Table 1	• Specific training must be provided as defined in section 7.1.2. • Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment. • Individual employee training must be documented. • New employees must be fully trained before they can assume full responsibility for any aspect of plant operation.
11. Is a system in place that ensures that soiled clothes are promptly removed?	General Table 1	• Operators and other employees who come into contact with chemicals must wear appropriate work clothing, which must be changed immediately if splashed with chemicals. • Work clothes must stay at the plant and must be laundered separately from other clothing.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.4 PERSONAL HYGIENE AND SAFETY CONT'D**		
12. Is a system in place that ensures that correct safety clothes (gloves, masks, boots, etc.) are worn for respective operations?	General Table 1 CA-B Table 11	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the general chapter and Table 18 of the CA-B chapter of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
13. Are first aid personnel familiar with emergency response procedures?	General Table 1 CA-B Tables 8-10	• First aid training must address the specific emergency response procedures for CA-B and the other chemicals used in the plant. • First aid supplies must include all items required to treat CA-B exposure, including ingestion, as per the CA-B supplier's recommendations.
14. Are changing rooms and showers provided?	General Table 1	• Changing rooms must be provided with lockers that allow street clothes to be stored separately from work clothing and PPE. • Hot showers must be provided, and operators and other employees who come into contact with preservative chemicals must shower before leaving the plant after work.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.5 HOUSEKEEPING**		
15. Does the plant have a defined housekeeping plan?	General Table 10	• Housekeeping standards aimed at maintaining a clean and orderly plant must be defined in writing and included in the plant operations manual. • The responsibility for maintaining the standards in different areas must be clearly assigned to specific individuals.
16. Are generation and accumulation of wastes minimized?	General Table 18	• To minimize the generation of wastes, the recommendations contained in Table 18 of the general chapter of the TRD must be followed. • Special attention must be given to all factors affecting solution cleanliness and solution component balance.
17. Is equipment regularly inspected for leaks?	General Table 12	• All process components must be inspected for leaks by every shift. • Immediate action must be taken to stop leaks.
18. Are leaks properly contained and repaired promptly?	General Table 12	• There must be no uncontained leaks. • The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals and valve components, must be maintained, so that leaking equipment may be repaired immediately.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.6 RECORD KEEPING**		
19. Are daily records maintained for chemical delivery, use and inventory?	General Table 10	• To provide a secondary level of control for chemical losses, records must be maintained as follows: o transfers to and from the concentrate tank as they occur, o transfers to and from the work tanks as they occur, and o inventory of concentrate and working solution volumes, monthly. • All tank levels must be checked against the last recorded level, every two days, when the plant is not operating.
20. Are daily records maintained for equipment condition and maintenance?	General Table 10	• There must be a written preventive maintenance program (PMP), which requires daily inspections of all aspects of the treating operation and ensures immediate attention to any problems. • PMP records must be maintained in a daily log and monitored to identify the need for special attention to persistent problems.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.6 RECORD KEEPING**		
21. Are chemical volume discrepancies promptly investigated?	General Table 10 General Table 12	• To provide a secondary level of control for chemical losses, chemical use and inventory records must be reconciled monthly, to ensure that they are in balance.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.7 SPILL RESPONSE**		
22. Does a written spill contingency plan exist?	General Table 10 General Section 12.1 CA-B Section 12.1	• A written spill contingency plan must be prepared and maintained in accordance with section 12.1 of the general chapter of the TRD. • The plan must be site-specific and must identify the individuals responsible for implementing the components of the plan. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, and so on. • Local police and fire departments must be provided with copies of the plan together with complete details of those aspects of the operation related to the implementation of the plan.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.7 SPILL RESPONSE**		
23. Are regular spill response drills carried out, including an annual spill enactment drill?	General Table 10	• Spill response drills and annual enactments or rehearsals must be part of the spill contingency plan and must be planned in advance by the person responsible. • Annual rehearsals should be planned in collaboration with relevant agencies, such as police, fire and ambulance services and provincial authorities, with a view to gaining their involvement to make the enactment as real as possible. • Drills must be monitored and reviewed by all participants to determine the need for any improvement to emergency response procedures.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.8 FIREFIGHTING**		
24. Does a written fire contingency plan exist?	General Table 10 General Section 12.2 CA-B Section 12.2	• A written fire contingency plan must be prepared and maintained in accordance with section 12.2 of the general chapter of the TRD. • The plan must be site-specific and must identify the individuals responsible for implementing the various components. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, and so on.
25. Has the local fire department been made aware of the chemicals in use?	General Table 10	• The fire contingency plan must be prepared in consultation with the local fire and police departments, which must receive copies, together with complete details of those aspects of the operation related to implementation of the plan. • The fire department should visit the plant at least annually, to maintain their knowledge of the operation and also to identify any improvements that are needed to update the contingency plan.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 7. GENERAL PRACTICES **7.8 FIREFIGHTING CONT'D**		
26. Is sufficient self-contained breathing equipment available (also for confined space entry)?	General Table 10 General Table 12	• If it is decided to use self-contained breathing apparatus (SCBA) for firefighting and/or vessel entry, there must be two sets available and personnel must be properly trained in their use. • Responsibility must be assigned for the inspection and maintenance of SCBA and also for the annual review and update of training. • The plant may decide that the fire department should be responsible for SCBA and also may elect to use oxygen sensors for safe vessel entry or hire contractors for this purpose.

SECTION/CRITERIA	TRD REF.	GUIDELINE
27. Are adequate material/procedures on hand to contain and dispose of fire residues?	General Table 10	• The fire contingency plan must define the procedures to be followed to contain and dispose of all residues created by firefighting. • The procedures should be developed in collaboration with the local fire department and should include allowing the treating plant to burn down if there is any risk of a release of chemical or contaminated water from the containment. • The procedures should also include provision for constructing berms and ditches and blocking storm drains in yard areas to contain contaminated water and solid residues. • Plant fire crews must be designated and trained to the level necessary to implement the company's fire contingency plan. Training programs must be developed in conjunction with local fire departments and where possible should meet National Fire Protection Association (NFPA) Standard No. 472, "Hazardous Materials Response." • This advanced level of training is provided across Canada at institutions, accredited under the International Fire Service Accreditation Congress. • Specific information re location of institutions and NFPA Standard No. 472 can be obtained from local fire departments.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 8. CHEMICAL HANDLING AND STORAGE **8.1 UNLOADING CHEMICALS**		
1. Are personnel trained in emergency response procedures?	General Table 11	• All personnel must be formally trained in emergency response procedures for spills and fires. • Individual employee training must be documented and updated annually. • Training must be reinforced during the year by spill response drills.
2. Is access to unloading area restricted during unloading operations?	General Table 11	• All vehicles, including contractors' trucks and visitors' vehicles, must be prohibited from the off-loading area by DANGER signs, barriers and constant supervision. • The unloading operation must be attended by a trained operator, wearing full PPE. The truck driver must also wear full PPE. First aid personnel must be available. • CA-B concentrate must not be delivered outside normal working hours.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 8. CHEMICAL HANDLING AND STORAGE **8.1 UNLOADING CHEMICALS**		
3. Is there ready access to emergency aid?	General Table 11	• As defined in section 8.1.2 above, the unloading operation must be attended by a trained operator. This operator must be trained in chemical handling, chemical hazards, emergency response procedures and first aid. • Additional first aid personnel, trained to deal with emergencies involving CA-B concentrate must be on site and must be given advance notice of chemical unloading. • Prior to chemical delivery, first aid supplies must be checked, and eye wash fountains and emergency showers must be operational. • An emergency response team, trained in chemical spill procedures must be available, and all alarms and spill control equipment must be in good order.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 8. CHEMICAL HANDLING AND STORAGE **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS**		
4. Are equipment used and procedures followed to avoid worker contact with preservative chemicals?	General Table 11 General Table 1 CA-B Table 11	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section and Table 11 of the CA-B section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
5. Is responsibility for storage area assigned to trained personnel?	General Table 11	• All activities in the chemical storage area must be carried out by personnel trained in all aspects of chemical handling, system operation, hazard identification and emergency response. • The chemical storage area must be off-limits to all other personnel.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 8. CHEMICAL HANDLING AND STORAGE **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
6. Are there routine visual inspections of equipment storage and transfers of chemicals?	General Table 11 General Table 12 General Table 13	• There must be a written Preventive Maintenance Program (PMP) that requires daily inspections of all aspects of the treating operation, including chemical storage and transfer and ensures immediate attention to any problems. • PMP records must be maintained and monitored to identify persistent problems that need special attention.
7. Are drips and spills cleaned up promptly?	General Table 11	• There must be no uncontained drips or spills. • The operating objective must be to be drip and spill-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
8. Are safeguards in place to prevent contact of CA-B concentrate with incompatible materials?	CA-B Table 2	• Incompatible materials, such as strong oxidizing agents, strong acids and combustibles, must not be stored near CA-B concentrates. When not sure, consult material safety data sheets (MSDSs) and with suppliers.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 8. CHEMICAL HANDLING AND STORAGE **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
9. Are concentrate containers thoroughly cleaned?	CA-B Table 18	• Totes need to be triple-rinsed and all rinsate must be collected and reused for make up of CA-B solution.
10. Is rinse water recycled and totes returned to supplier or appropriately land filled?	CA-B Table 18	• Use rinsate for make-up of work solution. • Return totes to supplier or dispose of in an approved disposal facility. •

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.1 ROUTINE CHECKS**		
1. Are quantities of stored chemicals regularly checked and recorded?	General Table 12	• All chemicals must be checked and recorded as defined in section 7.6.19 and section 7.6.21, above.
2. Is the solution strength regularly tested?	General Table 12	• The strength of the working solution must be determined after every mix as per American Wood-Preservers Association (AWPA) A standards. Analytical instrumentation must be calibrated as per manufacturer's instructions.
3. Is the solution free from contamination?	General Table 12	• Recycled solutions and effluents must be processed through a bag filter unit before being used to prepare working solutions. Ideally the contents of working tanks should also be filtered. • The surfaces of treated products must be checked to ensure that they are free from residues.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.1 ROUTINE CHECKS CONT'D**		
4. Is the system regularly checked for leaks and are those leaks promptly stopped?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals and valve components, must be maintained, so that leaking equipment may be repaired immediately.
5. Are sludge levels in tanks and retorts regularly checked and is sludge removed?	General Table 12	• All tanks must be checked, at least annually, and any sludge must be removed. • Retorts must be checked at least weekly, and any sludge must be removed. • All precautions for safe vessel entry must be followed.
6. Are tank vents tested for blockage at least once a month?	General Table 12	• Tank vents must be tested at least monthly if there is any risk of restriction or blockage of the vent pipe due to deposits.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.1 ROUTINE CHECKS CONT'D**		
7. Are wood loads stacked to allow good drainage of preservative?	General Table 12	• Lumber components, timbers, plywood, shingles and shakes must be stickered and stacked on an angle to maximize the rate of preservative drainage.
8. Are cylinder door seals in good order?	General Table 12	• Cylinder door seals must be washed and checked for damage and wear before every charge. • Spare seals must be available to allow immediate replacement when required. • Cylinder doors must be checked during the pressure cycle to ensure that they are properly sealed.
9. Are filters checked regularly and cleaned or replaced when necessary?	General Table 12	• Bag filter units must be fitted with a pressure gauge to indicate when the bag filter should be cleaned or replaced. • It is strongly recommended that bag filters are replaced rather than cleaned, to avoid the health hazards involved in handling and disposing of sludge.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.1 ROUTINE CHECKS CONT'D**		
10. Are tanks free of debris, soil or other contamination?	General Table 12	• Trams and charges must be free from debris, soil and other contamination before they are loaded into the cylinder. • Return lines from the cylinder to the working tanks must be fitted with strainers.
11. Are trams, pipes, pumps and cylinders thoroughly cleaned on preservative switch-overs?	General Table 12	• Prior to switching the CA-B system to or from another preservative system (e.g. CCA), all involved equipment must be thoroughly cleaned and all lines to the alternative system must be blocked off.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.2 CHECKS DURING TREATMENT**		
12. Is process system monitored for leaks during operation?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals and valve components, must be maintained, so that leaking equipment may be repaired immediately.
13. Are recording and indicator instruments in proper order?	General Table 12	• All recording and indicator instruments must be installed and calibrated in accordance with CSA 080-M3, Clause 3.0 and CSA 080.1, Clause 2.2. • Calibration records must be kept on file.
14. Is the treatment closely monitored to ensure that maximum limits are not exceeded?	General Table 12	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits, in accordance with CSA 080.1. • Manual control without instrumentation does not allow close monitoring.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.2 CHECKS DURING TREATMENT CONT'D**		
15. Are detailed records kept of all process steps and conditions?	General Table 12	• There must be a record of each charge showing wood species, products, sizes, volumes, treating-cycle stages and duration, tank-gauge readings and chemical consumption. • The treatment record and process charts and printouts must be kept on file, together with the results of solution and product testing, in accordance with CSA 080-M3, Clause 1.5.
16. Are records kept of abnormal operating situations (e.g. equipment breakdown)?	General Table 12	• Abnormal operating situations must be recorded in the daily log and also entered on the treatment record. • Abnormal operating situations must be reviewed with a supervisor, to ensure that corrective action is taken as soon as possible.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.2 CHECKS DURING TREATMENT CONT'D**		
17. Is an effective final vacuum applied after completion of the pressure cycle (level/duration)?	General Table 12	• To be effective, the level and duration of the final vacuum must ensure that dripping is minimized when the charge is pulled from the cylinder. • Note that CSA 080 specifies that the final vacuum cannot be less than 22 inches of mercury. • An effective final vacuum is extremely important in attaining preservative stabilization.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.3 POST TREATING CHECKS**		
18. Are safeguards in place to disallow retort opening when liquid or pressure remains?	General Table 12	• Retorts must be equipped with an effective protection device to prevent doors being inadvertently opened when retort is pressurized and/or filled or partially filled with preservative. The device must be effective against vandalism or sabotage. • Examples include, liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to impact wrench compressors.
19. Are goggles and other appropriate safety equipment worn by operators opening retort doors?	General Table 12	• Operators must wear full PPE when opening cylinder doors and removing and unloading charges. Full PPE includes, rain suit, rubber boots, impermeable gauntlets, and face shield or goggles and respirator, if emissions are unknown or above the threshold limit value (TLV). • Hydraulic door controls must be located or shielded so that the operator is not directly exposed to liquid and/or vapour releases from the cylinder.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.3 POST TREATING CHECKS CONT'D**		
20. Are impermeable gauntlets worn on handling freshly treated wood?	General Table 12	• Impermeable gauntlets must be worn for handling freshly treated wood and for all activities in the treating plant where protection is required. Leather gloves and impermeable gloves with permeable cuffs must not be worn. • The TRD also recommends the use of an impermeable apron and boots.
21. Are instructions in place and followed to avoid exposure to ethanolamine vapours/mists?	CA-B Table 9	• Avoid breathing preservative mists. Operators must stay upwind of freshly treated charges and an approved respirator must be worn if airborne concentrations are unknown or at or above the TLV.
22. Are charges allowed to essentially drip-dry before they are pulled from the retort?	General Table 12	• Lumber components, timbers, plywood, shingles and shakes must be stickered and stacked on an angle to maximize the rate of preservative drainage. • The level and duration of the final vacuum must ensure that dripping is minimized when the charge is pulled from the cylinder. • Note that CSA 080 specifies that the final vacuum cannot be less than 22 inches of mercury.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.3 POST TREATING CHECKS CONT'D**		
23. Are personnel trained in safety procedures for vessel entry?	General Table 12	• Treating plant personnel must be trained in confined space entry procedures as defined in Workers Compensation Board (WCB) and provincial labour regulations. • If personnel are not trained, an approved contractor must be hired for this activity. • Note that this guideline also applies to tram jams in the cylinder. • There are several safety procedures for vessel entry, including self-contained breathing apparatus (SCBA) or oxygen sensors.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.4 FIXATION/STABILIZATION**		
24. Is best available practice applied to ensure optimum fixation/stabilization?	CA-B Table 19	• The preservative fixation/stabilization is a function of time and temperature. Accelerated processes utilize extended vacuums or vacuums at elevated temperature. Chemical suppliers are still experimenting with various procedures. As for now, a minimum storage period of 48 hours for treated wood removed from the cylinder is to be applied. This storage must be in a roofed and contained area.
25. Is wood released to an unprotected area only after optimum fixation/stabilization has been achieved?	CA-B Table 19	• Treated wood must be stored for at least 48 hours in a contained and roofed area prior to release to an unprotected area or shipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.5 EQUIPMENT MAINTENANCE**		
25. Is all equipment in good operating condition?	General Table 13	• There must be a written Preventive Maintenance Program (PMP) that requires daily inspections of all equipment and ensures immediate attention to any problems. • Records of daily inspections must be maintained and monitored to identify the need for special attention to persistent problems.
26. Are NFCC maintenance recommendations adhered to?	General Table 13	• All maintenance practices must be in accordance with sections 2.5, 3.3, 4.4.11 and 6.0 of the National Fire Code of Canada.
27. Do written maintenance instructions exist?	General Table 13	• The PMP must contain written, plant-specific instructions for all equipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.5 EQUIPMENT MAINTENANCE**		
28. Are all necessary precautions taken when contaminated equipment is welded?	General Table 13 CA-B Table 11	• The precautions that must be taken include: o obtaining a Hot Work permit from the supervisor responsible, o blocking or disconnecting lines from tanks, o draining and rinsing tanks and lines, o ensuring that surfaces are free from cleaning solvent residues, o wearing an approved respirator, o providing good ventilation in the work area, o containing all sparks and removing flammable materials, and o complying with all additional provincial workplace safety rules.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEANOUT AND SHUTDOWN **9.6 CLEANOUT**		
29. Are written safety procedures in place?	General Table 13 General Table 1	• Safety procedures for cleanout must be included in the plant operations manual and must address the details contained in Tables I and 13 in the general chapter of the TRD.
30. Are drip pads clean (what is the frequency of cleaning)?	General Table 13	• Drip pads must be kept clean and free from liquids and residues. • Drip pads must be cleaned daily. • The volume and dispersion of wash water must be kept to a minimum.
31. Is wash water recycled?	General Table 13 General Table 4	• All wash water must be collected, contained and filtered before being recycled to the treating process.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 10. WASTE HANDLING AND DISPOSAL **10.1 MINIMIZATION**		
1. Is wood properly seasoned prior to treatment?	General Table 17	• Every effort must be made to season wood properly. • A moisture content above the fibre saturation point (~25% dry weight) will promote sludge formation.
2. Are trams and wood load free of debris and soil on charging?	General Table 17	• Trams and charges must be inspected before loading the cylinder and cleaned where necessary.
3. Is the treatment solution clean and are the components balanced?	General Table 17	• An unfiltered sample of working solution must be perfectly clear, and treated product surfaces must be free from residues. • The solution component balance of a filtered sample of working solution must conform to the minimum levels specified in CSA-080. • The component balance must be checked at least weekly.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 10. WASTE HANDLING AND DISPOSAL **10.1 MINIMIZATION CONT'D**		
4. Are close controls exercised on treatment parameters (are limits not exceeded)?	General Table 17	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits in accordance with CSA 080-M3, Clause 3.0. • Manual control without instrumentation does not allow close monitoring.
5. Are drips, leaks and washdowns reused in process?	General Table 13	• All drips, leaks and wash water must be collected, contained and filtered before being recycled to the treating process. • Collection sumps must be kept clean and free from debris.
6. Are storm run-offs collected and reused in process?	General Table 9	• Storm water runoff from paved yards shown to contain levels of CA-B in excess of regulatory limits must be collected, contained, filtered and reused in the process. • In the case of unpaved yards, soil and groundwater samples must be taken to determine the environmental impact of storm water. • If contamination is present above regulatory levels, site remediation followed by paving may be necessary.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 10. WASTE HANDLING AND DISPOSAL **10.2 COLLECTION AND STORAGE**		
7. Are personnel trained in hazards and handling methods?	General Table 17	• Training in all aspects of waste handling and disposal must be provided and updated, at least annually. • Training programs must be plant-specific and must address all aspects of provincial regulation related to waste handling. • Individual employee training must be documented.
8. Are wastes and sludges stored in sealed drums?	General Table 17	• Dewatering and/or drying of wastes and sludges must take place in an enclosed area that is ventilated, roofed and contained. • During the processing of wastes and sludges, appropriate signs must be posted, and operators must wear the correct PPE. • When wastes and sludges are ready for shipment, they must be in sealed containers, which must conform to Transportation of Dangerous Goods Regulations (TDGR). • The storage and handling of wastes and sludges must conform to provincial regulations.
9. Is waste storage area roofed, enclosed and on a paved surface?	General Table 17	• The waste dewatering, drying and storage areas must be roofed, enclosed, contained, well ventilated and separate from the normal work areas.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 10. WASTE HANDLING AND DISPOSAL **10.2 COLLECTION AND STORAGE CONT'D**		
10. Are all drums labelled by contents?	General Table 17	• Drum and container labels must conform to TDGR.
11. Are records kept of inventory for solid wastes and sludges that are stored on site?	General Table 17	• An up-to-date inventory of containers, including their volumes and contents must be maintained. • Regulations in some Provinces require accurate inventories of wastes.
12. Are disposal activities reported as per regulations?	General Table 17	• Disposal activities must be reported by the plant or by the disposal contractor, in accordance with the TDGR. • The plant must maintain disposal records as per the TDGR.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 11. ROUTINE MONITORING **11.1 ENVIRONMENTAL MONITORING**		
1. Does a site-specific monitoring plan exist?	General Table 14	• A site-specific monitoring plan must be prepared by a qualified environmental consultant. The plan must be designed to address provincial standards for soil, groundwater and stormwater runoff, if applicable. If there are no provincial standards, the plant must develop site-specific standards in consultation with provincial environmental authorities. The plan must be reviewed annually and modified, when necessary, to reflect any changes in design and/or operating practices.
2. Are reporting requirements clearly defined?	General Table 14	• The regulations and reporting requirements that apply to the plant must be determined and defined in the site-monitoring plan. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records that clearly demonstrate effective management of the chemicals used.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 11. ROUTINE MONITORING **11.1 ENVIRONMENTAL MONITORING CONT'D**		
3. Do monitoring areas include the following: • all areas where preservative chemicals are stored, processed and handled? • all treated wood storage areas? • drainage ditches and areas exposed to run-off?	General Table 14	• A risk evaluation study must be completed to determine the monitoring methodology required for soil, groundwater and stormwater in the specified areas.
4. Are sampling frequency and constituents defined?	General Table 14	• The site monitoring plan must define sampling frequency, as per the risk evaluation study and/or the reporting requirements. • All preservative constituents must be monitored and checked against the applicable regulatory limits. • If there are no regulatory limits, the plant shall develop site specific limits in conjunction with provincial environmental authorities.
5. Is a program in place to monitor adjacent waterbodies?	General Table 14	• The risk evaluation study in section 11.1.3 must also address the need to monitor adjacent water bodies, based on an evaluation of site characteristics and plant operations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 11. ROUTINE MONITORING **11.1 ENVIRONMENTAL MONITORING CONT'D**		
6. Is a program in place to monitor groundwater or on-site wells?	General Table 14	• The TRD states "consider implementing a groundwater monitoring program using permanent monitoring points…." • Exceptions to this consideration would be plants located on sites for which such a program would not be effective. • Any exceptions must be determined by the risk evaluation study in section 11.1.3, based on a detailed evaluation of site characteristics and plant operations.
7. Are all air emission sources defined?	General Table 14	• The peak and average levels of all preservative constituents (ethanolamine, Cu, Tebuconazole) in air, for significant points of emission, must be determined. • Significant points of emission include cylinder door openings, stabilization areas, vent stacks, receiving areas for vents, enclosed plant areas and freshly treated wood storage areas. • The assessment must be updated if there are any changes in plant design and/or operating practices.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 11. ROUTINE MONITORING **11.1 ENVIRONMENTAL MONITORING CONT'D**		
8. Are air emissions monitored as per permits?	General Table 14	• The regulations and reporting requirements that apply to the plant must be determined and defined in the site monitoring plan. • If permits apply, air emissions must be monitored accordingly. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records that clearly demonstrate effective control of all air emissions. • Monitoring must determine all preservative constituents in air emissions.
9. Are all liquid waste discharges identified (volumes, contamination levels)?	General Table 14	• Liquid waste discharges include storm water run-off. • The concentrations and total mass emission rates for all preservative constituents in discharges and run-off must be determined by a qualified consultant, as part of the overall site monitoring program defined in section 11.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 11. ROUTINE MONITORING **11.1 ENVIRONMENTAL MONITORING CONT'D**		
10. Are all liquid waste discharges monitored as per permits?	General Table 14	• If permits apply, discharges and runoff must be monitored accordingly. • Monitoring must determine the concentrations of all preservative constituents in discharges and runoff. • If permits do not apply, the plant shall develop site- specific monitoring protocol and waste discharge limits in consultation with provincial environmental authorities.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 11. ROUTINE MONITORING **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
11. Does a facility-specific monitoring plan exist?	General Table 15	• A site-specific workplace monitoring plan and program shall be prepared by a qualified industrial hygienist. • The plan and program must be reviewed annually and modified when necessary to reflect any changes in design and/or operating practices. • The plan shall address the requirements defined in sections 11.1.7 and 11.1.8.
12. Are reporting requirements clearly defined?	General Table 15	• The regulations and reporting requirements that apply to the plant must be determined and defined in the workplace monitoring plan.
13. Are sources of skin exposure identified periodically?	General Table 15	• Existing and potential sources of skin exposure shall be identified by monthly inspections of all operating areas of the plant, from chemical receiving to shipment of treated products. • Skin exposure hazards shall be a topic for discussion at all safety committee meetings. • Safe working practices, training programs and PPE requirements must be modified when new sources of skin exposure are identified.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 11. ROUTINE MONITORING **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
14. Does the workplace monitoring program define the following: • sampling techniques, • frequency, • items sampled for?	General Table 15	• The workplace monitoring plan and program defined in sections 11.2.11 and 11.2.12 above must define the sampling techniques and sampling frequency required for all preservative constituents and other toxic chemicals used by the plant. • The requirements defined in sections 11.1.7 and 11.1.8 also apply.
15. Are peak levels of preservative exposure from air known for all significant points of worker exposure (cylinder doors, kiln interiors, exhaust vents, enclosed preservative process areas, freshly treated charges)?	General Table 15	• Peak levels of exposure shall be determined as per the requirements defined in sections 11.1.7 and 11.1.8 above.
16. Are pre-employment medical exams carried out?	General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed by an occupational physician to verify that they are not medically sensitive to any of the chemicals used at the plant. • Provided new employees are not exposed to chemicals, their pre-employment medicals may follow completion of their probationary period.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES 11. ROUTINE MONITORING **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
17. Does a plan exist for follow-up medicals?	General Table 15	• The plant must prepare a plan, in consultation with an occupational physician, that defines the following: o jobs for which pre-employment and annual or more frequent medical examinations are mandatory, based on the degree of exposure to specific chemicals; o the person responsible for scheduling medical appointments; o responsibility for record keeping; and o responsibility for follow-up with physician and employee.
18. Are follow-up medicals and biological monitoring (e.g. urine) carried out?	General Table 15	• As specified in the plan outlined in section 11.2.17, designated employees must be periodically examined by an occupational physician to assess the effects of exposure to the chemicals in use at the plant. • As a result, medical examinations may include x-rays, nasal and skin evaluation, and urine and blood testing. • Medical examinations must address all preservative constituents and other toxic chemicals.

INORGANIC BORON (BORATE) FACILITY TECHNICAL GUIDELINES

2004

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.1 ACCESS/SECURITY**		
1. Is off-loading area located away from high yard traffic routes?	General Table 3 BORATE Table 7	• Ideally, off-loading area should be located away from any traffic. • If relocation is impractical, traffic must be controlled by DANGER signs, barriers and constant supervision during chemical unloading operations.
2. Is vehicle access restricted during delivery?	General Table 3 BORATE Table 7	• All vehicles, including contractors' trucks and visitors' vehicles must be restricted from the off-loading area by DANGER signs, barriers and constant supervision during chemical unloading operations.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT**		
3. Is an unloading pad and catchment sump used?	General Table 3 BORATE Table 7	• The truck must be unloaded on an impervious pad, large enough in area to hold the full length of the truck. • The pad must drain to a leak-proof sump and/or containment.
4. Are impervious construction materials used?	General Table 3	• The surfaces of the unloading pad and sump must meet a hydraulic conductivity or permeability to water rating of $1x10^{-7}$ cm/sec or less, under a hydraulic head of 3 m, and must be resistant to BORATE solutions. • Materials and specifications should be developed in consultation with manufacturers, suppliers and a certified civil/materials engineer who has prior relevant experience.
5. Are liquid-tight joints sealed with chemical resistant material?	General Table 3	• All joints in the pad must be sealed with caulking that meets the requirements defined in Section 1.2.9. • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, sump joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT CONT'D**		
6. Are surfaces sealed to enhance ability to keep clean?	General Table 3	• Sealing is required if unloading pad surfaces cannot be kept clean by normal methods, such as vacuuming and/or washing.
7. Are pads covered by a roof?	Borate Table 7	• The unloading pad must be covered by a roof.
8. Are pads and sumps free of settling and cracks?	General Table 3	• Pads and sumps must be designed to prevent settling and/or cracking. • Any visibly open cracks must be repaired with chemically resistant caulking, using procedures that will ensure a liquid-tight seal. • Evident or suspected settling must be evaluated by a certified engineer to determine the structural integrity of the pad and/or sump.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT CONT'D**		
9. Are pads and sumps lined?	General Table 3	• Secondary containment for this area is good practice and is required by some Provinces. • Secondary containment may be achieved by installing a subsurface membrane liner or by applying an impervious coating to the pad and sump surfaces. • Surface sealers, surface coatings, joint and crack sealants must meet a hydraulic conductivity or permeability rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3 m. In addition they must be resistant to the chemicals in use at the plant and must have the physical properties (compressive, tensile and flexural strength), the abrasion and wear resistance and the lifetime requirements, suitable for the intended application. The performance requirements for sealers and coatings will vary in different areas of the plant. For example, drip pads represent the most severe application, due to constant exposure to chemical solutions, vehicle traffic and cleaning processes, while cylinder and tank farm containment areas generally represent a less stringent application. Sealers, coatings and sealants and their application technology must be determined in consultation with a manufacturer with experience in the field.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT**		
10. Is all transfer equipment in a contained and roofed area?	General Table 3 Borate Table 7	• Transfer equipment includes the entire length of the BORATE delivery truck and the transport area to the bag storage. • This entire area must be contained as defined in Sections 1.2 and 2.4. The entire area must be roofed.
11. Are back-flow preventers installed on water delivery lines?	General Table 3	• An effective check valve must be installed on the water line.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
12. Is personnel protective equipment available and readily accessible?	General Table 3 Borate Table 6	• Personal protection equipment must comply with TRD Reference BORATE, Table 6. • Spill response equipment must be site specific and must be selected in accordance with the preservative supplier's recommendations. • Equipment inventory must be checked weekly and logged and must be complete at all times • Location of equipment storage must allow prompt response to emergency situations.
13. Is a vacuum cleaner available?	Borate Table 7	• An industrial vacuum cleaner must be available to clean up any Borate dust.
14. Is the off-loading area equipped with a phone or a manual alarm switch?	General Table 3	• There must be a manual alarm in the off-loading area that is audible throughout the plant. • The alarm function must be tested and logged prior to the delivery of concentrate. • A phone and/or 2-way radio is also required to arrange any assistance that may be required.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY**		
1. Is there 24-hour security?	General Table 4	• Systems and procedures must be in place to prevent unauthorized access to the chemical storage area on a 24 hour basis. • Examples include a restricted area policy, locked buildings with security monitoring alarms, locked buildings with security patrols, etc.
2. Are bulk solid and liquid chemicals in locked areas?	General Table 4 BORATE Table 8	• If the tank farm cannot be located in a secure, locked building, precautions must be taken to ensure that there can be no unauthorized access to the chemical storage area.
3. Are tank drain valves locked?	General Table 4	• Any valve that could cause the release of chemical, as a result of unauthorized use, must be locked. • Examples include, sampling valves, drain valves and unloading and loading line valves.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY CONT'D**		
4. Are tanks protected from mechanical impact?	General Table 4	• All tanks must be protected to prevent damage by any means, such as the BORATE delivery truck, plant mobile equipment, wood piles, stored equipment, etc. • Tanks installed close to external walls that could be breached by mobile equipment and/or truck accidents require special attention.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE**		
5. Are tanks in sound physical condition, with no rust or damage?	General Table 4 General Table 11	• All chemical storage tanks, including effluent tanks must be tested annually and certified as suitable for the intended use, by an accredited testing company or agency.
6. Are tanks mounted on containment pad surfaces?	General Table 4	• Tank bases must not be embedded in, or be encased by concrete. • Preferably, vertical tanks should be mounted on raised supports on containment pad surfaces. • If tanks must be in contact with pad surfaces, an annual assessment of external corrosion must be carried out. • The tank containment floor must be kept clean and dry, to allow immediate detection of leaks.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
7. Are tanks mounted in stable positions and anchored securely?	General Table 4	• Tanks must be mounted in stable positions and must be anchored if flooding of the containment by storm water or a spill would exert uplift forces. • Tanks at low liquid levels and installed in deep containments are particularly vulnerable due to their buoyancy.
8. Are tanks sheltered from weather by a fixed roof?	General Table 4	• The preferred location for tanks is inside a secure, locked building. • If relocation is impractical, exterior tanks must be roofed if the storm water that enters the tank containment is not recycled to the process. • Borate bags must be stored in a roofed and contained area.
9. Are tanks located in a dyked area?	General Table 4	• All chemical storage tanks must be installed in a dyked containment. • In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
10. Are tanks protected from freezing?	General Table 4	• All chemical storage tanks must be kept above 0°C.
11. Are all tank surfaces accessible for detecting leaks and insulated tanks provided with inspection points?	General Table 4	• The tank farm floor must be kept clean and dry to allow immediate leak detection. Preferably, tanks should be raised on supports to allow leaks to be readily detected. • The lower 6" of insulated tanks must not be insulated or insulated tanks must be provided with inspection points, to allow leaks to be readily detected.
12. Are tank vents controlled?	General Table 4	• Interior tanks must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior tanks may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Tanks must not vent directly into the workplace.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
14. Are storage areas fire protected?	General Table 6	• Fire protection must conform to applicable codes, such as the National Fire Code of Canada, the National Building Code, provincial and municipal codes, etc. • Conformance must be certified by an accredited inspector, such as the local Fire Department, building inspector, insurance company, etc.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT**		
14. Is piping rigid and permanent throughout the operation?	General Table 4	• Piping materials must be suitable for the intended application. Process piping must be rigid, permanent and of the appropriate material and schedule. Rigid PVC piping is allowed for vent piping. All piping must be securely connected and flexible piping must be protected from mechanical damage.
15. Is piping visible and accessible with a simple layout?	General Table 4	• Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.
16. Is piping above ground?	General Table 4	• In general, all piping must be visible and readily accessible for leak detection and maintenance. • Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or the piping must be brought above grade. • Underground piping is not allowed in new construction. However, if there is no alternative to underground piping in existing construction, it must be provided with containment and leak detection designed by a qualified engineer.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
17. Is containment provided for sub-grade piping?	General Table 4	• Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or the piping must be brought above grade. • Underground piping is not allowed in new construction. However, if there is no alternative to underground piping in existing construction, it must be installed in appropriate containment with provision for leak detection as per 2.3.16.
18. Are valves identified by labeling or colour-coding?	General Table 4	• Valves must be labeled or colour coded. • The label or colour code must identify the valve function in accordance with the piping schematic in 2.3.15.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
19. Are valves and pipes protected from impact?	General Table 4	• All valves and piping must be protected to prevent damage by any means, such as the BORATE delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
20. Are lines protected from freezing?	General Table 4	• All piping used for BORATE solutions must be kept above 0°C.
21. Do valves have local drip/spill catch trays?	General Table 4	• Valves must be installed properly and maintained regularly to prevent leakage. • The tank farm floor must be kept clean and dry to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid must be cleaned out.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
22. Do pumps have local drip/spill catch trays?	General Table 4	• All pumps handling BORATE solutions must have self-contained spill trays large enough to prevent contamination of the containment area. • There must be no free BORATE or BORATE solution on the containment floor. • Spill trays must be inspected daily and any free liquid must be cleaned out.
23. Are back flow preventors on all water supply lines?	General Table 4	• Reduced pressure type backflow preventors must be installed on all water supply lines as a secondary protection system. • Backflow preventors must be inspected and tested annually or as recommended by the manufacturer.
24. Are waterlines connected via top entry to tanks?	General Table 4	• Water supply lines must be connected to the top of tanks above the high-level alarm sensor.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
25. Is piping system designed to protect against inadvertent transfers?	General Table 4	• Pipes and valves must be clearly identified and operating instructions explicitly defined. • Manual systems must not be operated by untrained personnel. • Where there is common piping in multi-preservative plants, blocking systems must be in place to prevent inadvertent transfer of solutions.
26. Are reliable, accurate level indicators installed?	General Table 4	• All level indicators must be checked regularly and calibrated every 6 months, where appropriate. • Calibration records must be kept on file.
27. Is mechanical impact protection functional on sight glasses?	General Table 4	• A durable physical protection system must be installed to prevent sight glasses from being damaged or accidentally disconnected.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
28. Are shut-off valves functional on all rupturable lines and gauges?	General Table 4	• Any line or gauge that can be easily damaged or accidentally disconnected must be fitted with an automatic shut-off valve. • Examples include sight glasses, instrument tubing, etc. • Vulnerable sampling valves on tanks must be physically protected.
29. Is overflow piping provided from tanks to containment?	General Table 4	• Preferred design is to connect all tanks to a dedicated BORATE overflow tank; otherwise, overflow piping must extend to a contained sump. Overflow tanks and pipes must be vented to the exterior with provision to prevent the release of entrained liquids or overflow. • Open manholes on tanks are not permitted.
30. Are independent high-level alarms installed on tanks?	General Table 4	• All tanks must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested at least every 6 months or as defined in the plant's Preventive Maintenance Program. Alarms must also be tested prior to startup after an extended plant shutdown period. Alarm tests must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
31. Are high-level alarms interlocked to the pump auto-shut off?	General Table 4	• Alarms must immediately prevent any increase in the solution level in the tank, either by shutting off the pump or by closing the appropriate valve.
32. Is there a 24-hour monitoring alarm?	General Table 4	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested at least every 6 months or as defined in the plant's Preventive Maintenance Program. Alarm must also be tested prior to startup after an extended plant shutdown period. • Alarm tests must be recorded.
33. Are there manual alarm buttons at potential major spill points?	General Table 4	• The chemical receiving, storage and treating cylinder areas must be adequately protected by manual alarms. • The function of all alarms must be tested and recorded as per 2.3.32.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT**		
34. Are Borate bags stored in a contained, dyked area with no floor drains?	Borate Table 8	• Borate bags must be stored in a paved, curbed or dyked area with no floor drains (or with positive blocks for drains).
35. Are containment floors, dykes and joints structurally sound?	General Table 4	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer.
36. Are containment surfaces and joints sealed?	General Table 4	• Tank farm containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight (e.g., water stop inserts, and caulking of concrete joints as per requirements defined in Section 1.2.9. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9 and inspected on an annual basis for integrity.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
37. Is a secondary containment barrier built into the containment area? (e.g. impermeable top coat or liner under the containment area).	General Table 4	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath tanks, together with a leak detection system, as per 2.4.38. • The coating must comply with the requirements defined in Section 1.2.9.
38. Is subsurface leak detection provided?	General Table 4	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
39. Is the spill containment volume in compliance with NFCC?	General Table 4	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
40. Are there provisions to direct, collect and transfer spills, washdown liquids, infiltrate to tankage?	General Table 4	• Provisions must ensure the immediate transfer of all liquids to the appropriate tank. • There must be no free-standing BORATE solution or effluent, anywhere in the plant.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
41. Is local collection/containment of incidental drips in place (pumps, valves etc.)?	General Table 4	• The tank farm floor must be kept clean and dry to prevent tracking and air contamination and to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid must be cleaned out. All pumps handling BORATE solutions must have self-contained spill trays large enough to prevent contamination of the containment area. • Spill trays must be inspected daily and any free liquid must be cleaned out.
42. Is containment area designed to minimize tracking of liquids and contaminated dust?	General Table 4	• The containment area must be kept free from preservative liquids and residues to prevent tracking and air contamination. • Access to the containment area should be highly restricted and limited only to authorized personnel, as designated by the Plant Manager. • Means such as walkways, footwear exchanges, etc. must be provided to prevent dirt and dust being tracked to and from the plant.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
43. Is adequate ventilation installed for routine operation?	Borate Table 8	• Ventilation must be provided to maintain air emissions below the levels specified by the American Conference of Governmental Industrial Hygienists (ACGIH) for Borate or as specified by provincial regulations. • Air emissions must be monitored at least annually and whenever there is a change in equipment and/or procedures that may affect emission levels. • Annual monitoring should take place under worst case conditions, e.g. when operating areas are enclosed during winter months.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS**		
1. Is mixing equipment in a contained, enclosed, heated area?	General Table 5 BORATE Table 9	• The containment for mixing vessels must be as defined in Section 2.4. • Mixing vessels must be kept above 0°C.
2. Is permanent, closed mixing system used?	General Table 5	• A permanent, closed mixing system must be used. • The mixing system must be rigidly piped from tank to tank.
3. Is a high-level alarm installed to prevent mix tank overflow?	General Table 5	• The mix tank must have a high-level alarm. • The alarm must be audible throughout the plant. • The alarm must trigger visible identification of a specific high-level emergency in the mixing vessel. • The alarm function must be tested and recorded as per 2.3.30.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS CONT'D**		
4. Are high-level alarms linked to feed pump shut off?	General Table 5	• Alarms must immediately prevent any increase in the solution level in the mixing tank, either by shutting off the mix pump or by closing the appropriate valve.
5. Does good ventilation for bag opening operation exist?	Borate Table 9	• Ventilation must be provided to maintain air emissions below the levels specified by the American Conference of Governmental Industrial Hygienists (ACGIH) for Borate or as specified by provincial regulations. • Air emissions must be monitored at least annually and whenever. • There is a change in equipment and/or procedures that may affect emission levels. • Annual monitoring should take place under worst case conditions, e.g. when operating areas are enclosed during winter months.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT**		
6. Are containment floors, dykes and joints structurally sound?	General Table 5	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer.
7. Are containment surfaces and joints sealed?	General Table 5	• The surfaces of containments with membrane liners must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.
8. Is a secondary containment barrier built into the tank containment area?	General Table 5	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the mix tanks, together with a leak detection system as per 2.4.38. • The coating must comply with the requirements defined in Section 1.2.9.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
9. Is subsurface leak detection provided?	General Table 5	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.
10. Is there a subsurface leak containment and collection system?	General Table 5	• For an existing plant, if the monitoring well system detects a leak, a recovery well system must be designed and installed by a qualified hydrogeologist, to ensure containment and collection. • The double liner system described in Section 3.2.9 above is the preferred approach for new plants or additions to existing plants.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
11. Is the spill containment volume in accordance with NFCC?	General Table 5	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
12. Are bag opening area and tank farm covered to prevent infiltration precipitation?	General Table 5	• The preferred location for tanks is inside a secure, locked building. • If relocation is impractical, exterior tanks must be roofed if the storm water that enters the tank containment is not recycled to the process.
13. Does containment have alarms to identify spills?	General Table 5	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested and recorded as per 2.3.34.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
14. Is the containment area visible?	General Table 5	• The containment must be well-lit as per provincial requirements of the Workers' Compensation Board, Ministry of Labour, etc., and must not be used as an equipment storage area.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION**		
1. Are the treatment vessel, controls and ancillary equipment in an enclosed structure and protected from freezing?	General Table 6	• The treating cylinder, controls and ancillary equipment must be located in an enclosed winterized structure that is maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
2. Are the treatment cylinder and process tanks within a contained area?	General Table 6	• The treating cylinder and process tanks must be located in a containment area with continuous, structurally sound concrete floors and dykes. • The details of the containment must be as defined in Section 2.4.
3. Does the spill containment capacity comply with NFCC requirements?	General Table 6	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
4. Are the floors and dykes reinforced, structurally sound and with sealed joints?	General Table 6	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9. • Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing.
5. Are surfaces graded to facilitate drainage?	General Table 6	• Containment floors should be graded to ensure efficient drainage to a collection system. • Free standing liquid is not permitted in the containment area.
6. Are walkway grates or other designs in place to minimize worker contact and tracking of preservative residues?	General Table 6	• The containment area must be kept free from preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by those personnel authorized by the Plant Manager. • Walkways, footwear exchanges, etc. must be provided to prevent dirt and dust being tracked to and from the plant.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
7. Does the entire process area have a secondary containment provision (e.g. impermeable top coat on floors and dykes or liner under the containment area)?	General Table 6	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection, if applicable. The liner must be resistant to BORATE solutions. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the tanks. • The coating must comply with the requirements defined in Section 1.2.9.
8. Is control and transfer equipment isolated to avoid damage from spills?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that a spill equal to the containment volume (as defined in Section 4.1.3) or flooding will not prevent their operation or create an electrical hazard.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.2 SUMPS**		
9. Are sumps leakproof (impermeable surfaces, sealed joints)?	General Table 7	• Sump surfaces must have a hydraulic conductivity or permeability rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and be resistant to BORATE solutions. • All joints in the sump must be liquid-tight. • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.
10. Are sumps equipped with a tertiary containment (e.g. steel lining)?	General Table 7	• The surfaces of concrete sumps must have an impermeable coating and also be lined with steel or other suitable impermeable material. • "Impermeable" is defined as meeting a permeability rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m.
11. Are sumps protected by independent high-level alarms?	General Table 7	• All sumps must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • The function of alarms must be tested and recorded as per 2.3.30.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING CYLINDER**		
12. Are all pressure vessel inspection certificates current?	General Table 7	• The plant must have a current certificate to show that the treating cylinder and all pressurized components meet all requirements of the provincial ministry responsible. • If there is no provincial requirement, the treating cylinder and all pressurized components must be inspected annually by an accredited testing company or agency.
13. Is the retort door protected from opening, when full?	General Table 7	• Retorts must be equipped with an effective protection device to prevent doors being opened when retort is pressurized, filled or partially filled with preservative. • Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to impact wrench compressors.
14. Is the cylinder designed to facilitate drainage of excessive preservative?	General Table 7	• The alignment of the treating cylinder and/or the pump-out procedures must ensure that the minimum amount of preservative drains from the cylinder door opening.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS**		
15. Is the operator control area segregated from retort and tank spill containment areas?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that spills or flooding will not prevent their operation or create an electrical hazard. • In the case of hydraulic doors, the hydraulic pump controls must be located or shielded so that the operator is not directly exposed to any liquid or vapour releases from the cylinder.
16. Is the control area winterized?	General Table 6	• The process control area must be winterized and maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
17. Is the control area well lit and located for maximum visibility of treatment systems?	General Table 6	• All operating and control areas must have proper lighting, as per provincial requirements, so that all equipment is totally visible at all times. • The location of the control area must allow the best possible visibility of the treatment system, for the operation concerned. • Mirrors or closed circuit TV may solve specific problems, particularly for those plants where the cylinder doors are hidden from view.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS CONT'D**		
18. Are process controls simple and properly functioning to provide accurate feedback?	General Table 7	• The process controls must be installed, maintained and calibrated in accordance with CSA 080-M3, Clause 3.0.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.5 AIR EMISSION CONTROL**		
19. Are pumps, tank or other exhausts vented to outside or to recovery system?	General Table 6 General Table 4	• Pumps, tanks, cylinders and other exhausts must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior equipment may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Equipment must not vent directly into the workplace.
20. Does general area ventilation exist to keep containment levels below regulatory limits?	General Table 6	• Ventilation must be provided to maintain air emissions below the levels specified by the American Conference of Governmental Industrial Hygienists (ACGIH) for borate or as specified by provincial regulations. • Air emissions must be monitored at least annually and whenever there is a change in equipment and/or procedures that may affect emission levels. Annual monitoring should take place under worst case conditions, e.g. when operating areas are enclosed during winter months.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM**		
21. Is the system designed to effectively contain and recycle all chemicals with minimal potential for releases?	General Table 6 General Table 7	• The system must be able to contain and recycle all chemicals used by the plant, including additives for BORATE solutions. • There must be no routine release of chemicals into the containment from process equipment.
22. Is all transfer equipment in a contained area?	General Table 7	• All piping and pumps must be contained as defined in Section 2. • Transfer equipment must be kept above 0°C.
23. Are pipes and valves clearly identified?	General Table 4	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves must be clearly labeled to identify their function in accordance with the piping schematic.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM CONT'D**		
24. Are delivery lines rigid, accessible and visible?	General Table 4	• Delivery lines must be of the appropriate material and schedule and must be visible. • Plastic piping or flexible hoses must not be used in the treatment process. • Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.
25. Is piping protected from mechanical damage?	General Table 4	• All piping must be protected to prevent damage by any means, such as the BORATE delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.1 GENERAL DESIGN**		
1. Is the area sheltered from precipitation and dust?	General Table 8	• The primary wood drip area must be sheltered from precipitation and dust, unless the generation and disposal of contaminated run-off water and contaminated dust can be controlled by other means.
2. Does the area have efficient drip and run-off collection and containment?	General Table 8	• The drip pad must be fully contained with sufficient grade to minimize the retention of free liquid so that problems related to tracking and air contamination are avoided.
3. Is dispersal of liquids from tracking by personnel and vehicles minimized?	General Table 8	• Vehicles involved in loading, unloading and stacking charges on the drip pad must be dedicated to the drip pad. • All vehicles, including the BORATE delivery and contractors' trucks must be thoroughly washed before leaving the drip pad. • Tracking by personnel can be minimized by restricting foot traffic, keeping the pad clean, installing drainage channels in the storage area and providing perimeter walkways or a boot changing station.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.2 DRIP PROTECTION**		
4. Is the area sufficiently sized to hold all freshly-treated wood until visible dripping has stopped?	General Table 8 BORATE Table 11	• The area must be large enough to hold all freshly-treated wood until visible dripping has stopped. • This question also applies to those plants where the wrapping area is remote from the drip pad. • In these plants, the wood cannot be moved from the drip pad until it is absolutely drip dry. Once drip dry, the wood cannot be moved during periods of precipitation.
5. Is the area where wood is stored prior to application of wrapping properly contained and roofed?	General Table 8 BORATE Table 11	• Prior to wrapping, the wood must be stored in a properly contained and roofed area.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.3 CONTAINMENT**		
6. Are the unloading areas provided with impermeable floor and curb?	General Table 8	• The unloading track pad must be constructed to completely contain all drips from the wood and the trams. • The unloading area floor must have a hydraulic conductivity or permeable rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and be resistant to BORATE solutions. • Floor specifications should be developed in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior applicable experience.
7. Are the floors sloped to facilitate collection of all contaminated liquids?	General Table 8	• The drip pad must be fully contained with sufficient grade to direct any free liquid to a collection and recycling system.
8. Are the floors and curbs covered with an impermeable top coat or is a liner installed underneath the entire area?	General Table 8	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all drip pad surfaces, together with a leak detection system, as per Section 2.4.36. • The coating must comply with the requirements defined in Section 1.2.9.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS**		
1. Is the treated wood wrapped prior to placing it in unprotected storage?	BORATE Table 12	• Wrapping must be applied to all borate treated wood prior to placing it in an open, non-contained area.
2. Are treated wood packages elevated above ground (placed on stringers)?	General Table 9	• All treated wood packages/bundles must be elevated above ground to minimize contamination of soil and surface run-off water.
3. Are treated wood storage areas segregated from uncontaminated yard areas?	General Table 9	• Treated wood storage areas must be consolidated and segregated to minimize yard contamination and ensure efficient collection of any surface run-off water containing BORATE residues in excess of regulatory limits. • The evaluation of options for storage area surfaces must consider several factors, including groundwater usage, precipitation levels, etc.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS** **CONT'D**		
4. Are unsurfaced storage areas remote from water bodies?	General Table 9	• The run-off from surfaced and unsurfaced storage areas must not cause any water body, surface water or ground water system to exceed regulatory guidelines or standards.
5. Is storage in compliance with NFCC requirements (lack of vegetation, separation of wood from buildings)?	General Table 9	• Storage areas must be separated from plant operations and other structures by an acceptable clear space permanently available for fire-fighting operations. • Storage areas must be maintained free of combustible vegetation, including grass and weeds, for at least 4.5 m from the stored material and at least 30 m from bush and forested areas. • Lumber treated with combustible liquids must be stored in piles separated from other stored material by a distance of not less than 4.5 m. • At least two fire department access routes must be provided.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.1 PROCEDURES**		
1. Is an operations manual available with written instructions for all aspects of chemical use?	General Table 10	• A current, site-specific manual must be available containing clear instructions for all aspects of chemical use, plant operation, equipment maintenance, housekeeping, accident prevention, first aid and emergency response procedures, and all applicable regulations. • The manual must be readily available to all employees. • There must also be up to date blueprints of the plant and current specifications for all equipment.
2. Are all operating personnel informed of the potential hazards and precautionary measures?	General Table 10	• Training in all aspects of chemical use and plant operation must be provided and updated, at least annually. Training programs must be plant specific and should at least include: o Chemical substances and their hazards, including personal hygiene. o Safe operation and maintenance of equipment and processes. o Spill and fire prevention procedures. o Proper use of personal protective equipment. o Proper use of all safety equipment for controlling spills and fires. o Emergency response and first aid and rescue procedures. o Handling, storage and disposal of waste materials. • Individual employee training must be documented.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.2 PERSONNEL**		
3. Are all operating personnel trained in good work practices?	General Table 10	• Operating personnel must be trained as defined in Section 7.1.2.
4. Is periodic review and update of training implemented?	General Table 10	• Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment.
5. Is a pre-employment medical check-up and on-going annual medical surveillance carried out?	General Table 10 General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed to verify that they are able to carry out their assigned duties. • Provided new employees are not directly exposed to chemicals, their pre-employment medicals may follow the completion of their probationary period. • Employees must also have an annual medical check-up, specifically designed to assess the effects of exposure to the chemicals in use at the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.3 SIGNING**		
6. Are the contents and functions of the tanks identified (e.g. BORATE storage, BORATE concentrate, work solution)?	General Table 10	• The contents and functions of all tanks must be clearly identified by large, permanent signs.
7. Are personnel safety precautions and first aid procedures prominently displayed?	General Table 10	• Prominent, easy to read signs must be displayed in the chemical receiving and storage areas, the treating process area, all control stations and the plant office.
8. Are emergency response procedures and emergency telephone numbers prominently displayed?	General Table 10	• Plant specific emergency response procedures must be summarized and displayed in the form of a prominent notice. • Notices must also show phone numbers for company contacts, police, fire, ambulance, chemical supplier, etc., not just 911.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY**		
9. Are food, drink or tobacco products prohibited in working areas?	General Table 1	• Food, drink and tobacco products must be prohibited in working areas. • Designated lunch rooms and smoking areas must be separate from work areas and must be provided with washing facilities.
10. Are all personnel familiar with basic hygiene requirements?	General Table 1	• Specific training must be provided as defined in Section 7.1.2. • Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment. • Individual employee training must be documented. • New employees must be fully trained before they can assume full responsibility for any aspect of plant operation.
11. Are soiled clothes promptly removed?	General Table 1	• Operators and other employees who come into contact with chemicals must wear appropriate work clothing, which must be changed immediately if splashed by chemicals. • Work clothes must stay at the plant and must be laundered separately from other clothing.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY CONT'D**		
12. Are correct safety clothes (gloves, masks, boots, etc.) worn for respective operations?	General Table 1 BORATE Table 6	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Table 4 of the BORATE section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
13. Are first aid personnel familiar with emergency response procedures?	General Table 1	• First aid training must address the specific emergency response procedures for BORATE and the other chemicals used in the plant. • First aid supplies must include all items required to treat BORATE exposure, including ingestion, as per the BORATE supplier's recommendations.
14. Are changing rooms and showers provided?	General Table 1	• Changing rooms must be provided with lockers, which allow street clothes to be stored separately from work clothing and PPE. • Hot showers must be provided and operators and other employees who come into contact with chemicals must shower before leaving the plant after work.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING**		
15. Does the plant have a defined housekeeping plan?	General Table 10	• Housekeeping standards aimed at maintaining a clean and orderly plant must be defined in writing and included in the plant operations manual. • The responsibility for maintaining the standards in different areas must be clearly assigned to specific individuals.
16. Are generation and accumulation of wastes minimized?	General Table 17	• To minimize the generation of wastes, the recommendations contained in Table 17 in the General section of the TRD must be followed. • Special attention must be given to all factors affecting solution cleanliness and solution component balance.
17. Is equipment regularly inspected for leaks?	General Table 12	• All process components must be inspected for leaks by every shift. • Immediate action must be taken to stop leaks.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING CONT'D**		
18. Are leaks properly contained and repaired promptly?	General Table 12	• There must be no uncontained leaks. • The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
19. Are daily records maintained for chemical delivery, use and inventory?	General Table 10	• To provide a secondary level of control for chemical losses, records must be maintained as follows: o Transfers from the bag storage as they occur. o Transfers to and from the work tanks as they occur. o Inventory of concentrate and working solution volumes, monthly. • All tank levels must be checked against the last recorded level, every two days, when the plant is not operating.
20. Are daily records maintained for equipment condition and maintenance?	General Table 10	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation and ensures immediate attention to any problems. • PMP records must be maintained in a daily log and monitored to identify the need for special attention to persistent problems.
21. Are chemical volume discrepancies promptly investigated?	General Table 10 General Table 12	• To provide a secondary level of control for chemical losses, chemical use and inventory records must be reconciled monthly, to ensure that they are in balance.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.7 SPILL RESPONSE**		
22. Does a written spill contingency plan exist?	General Table 10 General Section 12.1	• A written spill contingency plan must be prepared and maintained in accordance with Section 12.1 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the components of the plan. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc. • Police and fire departments must be provided with copies of the plan, together with complete details of those aspects of the operation related to its implementation.
23. Are regular spill response drills carried out, including an annual spill enactment drill?	General Table 10	• Spill response drills and annual enactments or rehearsals must be part of the spill contingency plan and must be planned in advance by the person responsible. • Annual rehearsals should be planned in collaboration with relevant agencies, such as police, fire and ambulance services and provincial authorities, with a view to gaining their involvement to make the enactment as real as possible. • Drills must be monitored and reviewed by all participants to determine the need for any improvement to emergency response procedures.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING**		
24. Does a written fire contingency plan exist?	General Table 10 General Section 12.2	• A written fire contingency plan must be prepared and maintained in accordance with Section 12.2 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the various components. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc.
25. Has the local fire department been made aware of the chemicals in use?	General Table 10	• The fire contingency plan must be prepared in consultation with the local fire department. Police and fire departments must be provided with copies of the plan together with complete details of those aspects of the operation related to its implementation. • The fire department should visit the plant at least annually, to maintain their knowledge of the operation and also identify any improvements that are needed to update the contingency plan.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
26. Is sufficient self-contained breathing equipment available?	G-eneral Table 10 General Table 12	• If it is decided to use self-contained breathing apparatus (SCBA) for fire fighting and/or vessel entry, there must be two sets available and personnel must be properly trained in their use. • Responsibility must be assigned for the inspection and maintenance of SCBA and also for the annual review and update of training. The plant may decide that the fire department should be responsible for SCBA and also may elect to use oxygen sensors for safe vessel entry or hire contractors for this purpose.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
27. Are adequate material/procedures on hand to contain and dispose of fire residues?	General Table 10	• The fire contingency plan must define the procedures to be followed to contain and dispose of all residues created by fire fighting. • The procedures should be developed in collaboration with the local fire department and should include allowing the treating plant to burn down if there is any risk of a release of chemical or contaminated water from the containment. • The procedures should also include provision for constructing berms and ditches and blocking storm drains in yard areas to contain contaminated water and solid residues. • Plant fire crews must be designated and trained to the level necessary to implement the company's Fire Contingency Plan. Training programs should be developed in consultation with local Fire Departments and where possible should be in accordance with National Fire Protection Association (NFPA) Standard No. 472, "Hazardous Materials Response". • This advanced level of training is provided at institutions across Canada, accredited under the International Fire Service Accreditation Congress. • Specific information re location of institutions and NFPA Std. No. 472 can be obtained from local Fire Departments.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS**		
1. Is personnel trained in emergency response procedures?	General Table 11	• All personnel must be formally trained in emergency response procedures for spills and fires. • Individual employee training must be documented and updated annually. • Training must be reinforced during the year by spill response drills.
2. Is access to unloading area restricted during unloading operations?	General Table 11	• All vehicles, including contractors' trucks and visitors' vehicles must be prohibited from the off-loading area by DANGER signs, barriers and constant supervision. • The unloading operation must be attended by a trained operator, wearing PPE as per Borate TRD Table 6. The truck driver must also wear such PPE. First aid personnel must be available.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS CON'T**		
3. Is there ready access to emergency aid?	General Table 11	• As defined in Section 8.1.2 above, the unloading operation must be attended by a trained operator. This operator must be trained in chemical handling, chemical hazards, emergency response procedures and first aid. • Prior to chemical delivery, first aid supplies must be checked and eye wash fountains and emergency showers must be operational. • An emergency response team, trained in chemical spill procedures must be available and all alarms and spill control equipment must be in good order.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS**		
4. Are equipment used and procedures followed to avoid worker contact with preservative chemicals?	General Table 11 General Table 1 BORATE Table 4	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1of the General section, and Table 6 of the BORATE section of theTRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
5. Is responsibility of storage area assigned to trained personnel?	General Table 11	• All activities in the chemical storage area must be carried out by personnel trained in all aspects of chemical handling, system operation, hazard identification and emergency response. • The chemical storage area must be off-limits to all other personnel.
6. Is a visual inspection routine of equipment storing and transferring chemicals instituted?	General Table 11 General Table 12 General Table 13	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation, including chemical storage and transfer and ensures immediate attention to any problems. • PMP records must be maintained and monitored to identify the need for special attention to persistent problems.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
7. Are valves tested regularly?	General Table 12	• The functionality of all valves must be tested in accordance with the Preventive Maintenance Program defined in Section 8.2.6 above.
8. Are drips and spills cleaned up promptly?	General Table 11	• There must be no uncontained drips or spills. • The operating objective must be to be drip and spill-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
9. Are safeguards in place to prevent contact of BORATE concentrate with strong reducing agents or with combustibles?	BORATE Table 2	• There must be strict safeguards in place to prevent BORATE contacting strong reducing agents, such as metal hydrides or alkali metals. Such contact will generate hydrogen gas, which could create an explosive hazard. • The BORATE supplier should be contacted for further details.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS**		
1. Are quantities of stored chemicals regularly checked and recorded?	General Table 12	• All chemicals must be checked and recorded as defined in Section 7.6.19 and Section 7.6.21, above.
2. Is the solution strength regularly tested?	General Table 12	• The strength of working solutions must be determined after every mixing operation, either by x-ray fluorescence (XRF) analysis or by hydrometer readings. Hydrometers must be clean, temperature correction factors must be used and readings must be verified regularly by XRF analysis or other suitable analytical methodology in conjunction with the balance check in Section 9.1.3. • XRF analyzers must be calibrated and leak tested as per instructions.
3. Is the solution free from contamination?	General Table 12	• Recycled solutions and effluents must be processed through a bag filter unit before being used to prepare working solutions. • Ideally, the contents of working tanks should also be filtered. • The component balance of a **filtered** sample of working solution must be determined regularly to ensure that the solution is always in compliance with CSA 080 and the surfaces of treated products must be checked to ensure they are free from residues.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
4. Is the system regularly checked for leaks and are those leaks promptly stopped?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
5. Are sludge levels in tanks and retort regularly checked and removed?	General Table 12	• All tanks must be checked, at least annually and any sludge must be removed. • Sludge must be removed from retorts regularly to prevent operational problems and/or surface deposits on the finished product. • All precautions for safe vessel entry must be followed.
6. Are tank vents tested for blockage at least once a month?	General Table 12	• Tank vents must be tested at least monthly, if there is any risk of restriction or blockage of the vent pipe due to deposits.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
7. Are wood loads stacked to allow good drainage of preservative?	General Table 12	• Lumber components and plywood must be stickered and stacked on an angle to maximize the rate of preservative drainage in the cylinder.
8. Are cylinder door seals in good order?	General Table 12	• Cylinder door seals must be washed and checked for damage and wear before every charge. • Spare seals must be available to allow immediate replacement when required. • Cylinder doors must be checked during the pressure cycle to ensure that they are properly sealed.
9. Are filters checked regularly, cleaned or replaced when necessary?	General Table 12	• Bag filter units must be fitted with a pressure gauge to indicate when the bag filter should be cleaned or replaced. • It is strongly recommended that bag filters are replaced rather than cleaned, to avoid the health hazards involved in handling and disposing of sludge.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
10. Are tanks free of debris, soil or other contamination?	General Table 12	• Trams and charges must be free from debris, soil and other contamination before loading into the cylinder. • Return lines from the cylinder to the working tanks must be fitted with strainers.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT**		
11. Is process system monitored for leaks during operation?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
12. Are recording and indicator instruments in proper order?	General Table 12	• All recording and indicator instruments must be installed and calibrated in accordance with CSA 080-M3, Clause 3.0 and CSA 080.1, Clause 2.2.
13. Is the treatment closely monitored to ensure that maximum limits are not exceeded?	General Table 12	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits, in accordance with CSA 080.1. • Manual control without instrumentation does not allow close monitoring.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT CONT'D**		
14. Are detailed records kept of all process steps and conditions?	General Table 12	• There must be a record of each charge showing wood species, products, sizes, volumes, treating cycle stages and duration, tank gauge readings and chemical consumption. • The treatment record and process charts and print outs must be kept on file, together with the results of solution and product testing, in accordance with CSA 080-M3, Clause 1.5.
15. Are records kept of abnormal operating situations (e.g. equipment breakdown)?	General Table 12	• Abnormal operating situations must be recorded in the daily log and also entered on the treatment record. • Abnormal operating situations must be reviewed with a Supervisor, to ensure that corrective action is taken as soon as possible.
16. Is the final vacuum in accordance with chemical supplier's recommendation?	General Table 12	• To be effective, the level and duration of the final vacuum must ensure that dripping is minimized when the charge is pulled from the cylinder. • Note that CSA 080 specifies that the final vacuum cannot be less than 22" Hg. However, the chemical supplier may recommend a lesser vacuum for better treatment results.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS**		
17. Are safeguards in place to disallow retort opening when liquid or pressure remains?	General Table 12	• Retorts must be equipped with an effective protection device to prevent doors being inadvertently opened, when retort is pressurized, filled or partially filled with preservative. • Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection devices to impact wrench compressors.
18. Are goggles and other appropriate safety equipment worn by operators opening retort doors?	General Table 12	• Operators must wear full PPE when opening cylinder doors and removing and unloading charges. Full PPE includes, rain suit, rubber boots, impermeable gauntlets, face shield or goggles and respirator, if emissions are unknown or above the TLV. • Hydraulic door controls must be located or shielded so that the operator is not directly exposed to liquid and/or vapour releases from the cylinder.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
19. Are impermeable gauntlets worn on handling freshly treated wood?	General Table 12	• Impermeable gauntlets must be worn for handling freshly treated wood and for all activities in the treating plant where protection is required. Leather gloves and impermeable gloves with permeable cuffs must not be worn. • The TRD also recommends the use of an impermeable apron and boots.
20. Are charges allowed to essentially drip dry before they are pulled from the retort?	General Table 12	• Lumber components and plywood must be stickered and stacked on an angle to maximize the rate of preservative drainage • The level and duration of the final vacuum must ensure that dripping is minimized when the charge is pulled from the cylinder. • Note that CSA 080 specifies that the final vacuum cannot be less than 22" Hg.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
21. Are personnel trained in safety procedures for vessel entry?	General Table 12	• Treating plant personnel must be trained in confined space entry procedures as defined in WCB and provincial labour regulations. • If personnel are not trained, an approved contractor must be hired for this activity. • Note that this guideline also applies to tram jams in the cylinder. • There are several safety procedures for vessel entry, including self contained breathing apparatus (SCBA) or oxygen sensors.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 WRAPPING**		
22. Is wrapping done in a roofed and contained area?	BORATE Table 10	• Wrapping must be done in a roofed and contained area. Personnel must wear PPE as outlined in Section 9.3.19.
23. Is wood released to an unprotected area only after wrapping?	BORATE Table 10	• Treated wood must not be released into an unprotected area or be shipped unless it has been completely wrapped.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 EQUIPMENT MAINTENANCE**		
25. Is all equipment in good operating condition?	General Table 13	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all equipment and ensures immediate attention to any problems. • Records of daily inspections must be maintained and monitored to identify the need for special attention to persistent problems.
26. Are NFCC maintenance recommendations adhered to?	General Table 13	• All maintenance practices must be in accordance with Sections 2.5, 3.3, 4.4.11 and 6.0 of the National Fire Code of Canada.
27. Do written maintenance instructions exist?	General Table 13	• The Preventive Maintenance Program must contain written, plant specific instructions for all equipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 EQUIPMENT MAINTENANCE CONT'D**		
28. Are all necessary precautions taken when contaminated equipment is welded?	General Table 13 BORATE Table 6	• The precautions that must be taken include: o Obtaining a Hot Work permit from the Supervisor responsible. o Blocking or disconnecting lines from tanks. o Draining and rinsing tanks and lines. o Ensuring that surfaces are free from cleaning solvent residues. o Wearing an approved respirator. o Providing good ventilation in the work area. o Containing all sparks and removing flammable materials. o Complying with all additional provincial workplace safety rules.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.6 CLEAN-OUT**		
29. Are written safety procedures in place?	General Table 13 General Table 1	• Safety procedures for clean-out must be included in the Plant Operations Manual and must address the details contained in Tables I and 13 of the General section of the TRD.
30. Are drip pads clean (what is the frequency of cleaning)?	General Table 13	• Drip pads must be kept clean and free from liquids and residues. • Drip pads must be inspected daily and cleaned at least weekly. • The volume and dispersion of wash water must be kept to a minimum.
31. Is wash water recycled?	General Table 13 General Table 4	• All wash water must be collected, contained and filtered before being recycled to the treating process.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION**		
1. Is wood at recommended moisture level prior to treatment?	General Table 17	• Every effort must be made to season wood properly.
2. Are trams and wood load free of debris, soil on charging?	General Table 17	• Trams and charges must be inspected before loading the cylinder and cleaned where necessary.
3. Is the treatment solution clean and are the components balanced?	General Table 17	• An unfiltered sample of working solution must be perfectly clear and treated product surfaces must be free from residues. • The ingredient concentration of a filtered sample of working solution must conform to the minimum levels specified in CSA 080. • The concentration must be determined regularly to ensure that the solution always conforms to CSA 080.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION CONT'D**		
4. Are close controls exercised on treatment parameters (are limits not exceeded)?	General Table 17	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits in accordance with CSA 080-M3, Clause 3.0. • Manual control without instrumentation does not allow close monitoring.
5. Are drips, leaks and washdowns reused in process?	General Table 13	• All drips, leaks and wash water must be collected, contained and filtered before being recycled to the treating process. • Collection sumps must be kept clean and free from debris.
6. Are storm run-offs collected and reused in process?	General Table 9	• Storm water run-off from paved yards shown to contain levels of BORATE in excess of regulatory limits must be collected, contained, filtered and re-used in the process. • In the case of unpaved yards, soil and groundwater samples must be taken to determine the environmental impact of storm water. • If contamination is present above regulatory levels, site remediation followed by paving may be necessary.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE**		
7. Are personnel trained in hazards and handling methods?	General Table 17	• Training in all aspects of waste handling and disposal must be provided and updated, at least annually. • Training programs must be plant specific and must address all aspects of provincial regulation related to waste handling. • Individual employee training must be documented.
8. Are wastes and sludges stored in sealed drums?	General Table 17	• Dewatering and/or drying of wastes and sludges must take place in an enclosed area, which is roofed, ventilated and contained. • Appropriate signs must be posted and operators must wear the correct PPE, when processing wastes and sludges. • When wastes and sludges are ready for shipment, they must be in sealed containers, which must conform to Transportation of Dangerous Goods (TDG) regulations. • The storage and handling of wastes and sludges must conform to provincial regulations.
9. Is the waste storage area roofed, enclosed and on a paved surface?	General Table 17	• The waste dewatering, drying and storage areas must be roofed, enclosed, paved, contained, well ventilated and separate from the normal work areas.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
10. Are all drums labeled by contents?	General Table 17	• Drum and container labels must conform to TDG regulations.
11. Are records kept of inventory for solid wastes and sludges stored on site?	General Table 17	• An up to date inventory of containers, including their volumes and contents must be maintained. • Regulations in some Provinces also require accurate inventories of wastes.
12. Are disposal activities reported as per regulations?	General Table 17	• Disposal activities must be reported by the plant or by the disposal contractor, in accordance with TDG regulations. • The plant must maintain disposal records as per TDG regulations.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING**		
1. Does a specific site monitoring plan exist?	General Table 14	• A site specific monitoring plan must be prepared by a qualified environmental consultant. • The plan must be designed to address provincial standards for soil, groundwater and storm water run-off, if applicable. If there are no provincial standards, the plant must develop site specific standards in consultation with provincial environmental authorities. ("1997 CCME Soil Quality Guidelines" should be used as a reference). • The plan must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices.
2. Are reporting requirements clearly defined?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective management of the chemicals used. .

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
3. Do monitoring areas include all areas: • Where preservative chemicals are stored, processed and handled? • All treated wood storage areas? • Drainage ditches and areas exposed to run-off?	General Table 14	• A risk evaluation study must be completed to determine the monitoring methodology required for soil, groundwater and storm water in the specified areas.
4. Are sampling frequency and constituents defined?	General Table 14	• The site monitoring plan must define sampling frequency, as per the risk evaluation study and/or the reporting requirements. • All preservative constituents must be monitored and checked against the applicable regulatory limits. • If no regulatory limits exist, the plant must develop site specific limits in consultation with provincial environmental authorities.
5. Is a program in place to monitor adjacent waterbodies?	General Table 14	• The risk evaluation study in Section 11.1.3 must also address the need to monitor adjacent water bodies, based on an evaluation of site characteristics and plant operations.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
6. Is a program in place to monitor groundwater or on-site wells?	General Table 14	• The TRD states: "consider implementing a groundwater monitoring program using permanent monitoring points…". Exceptions to this consideration would be plants located on sites for which such a program would not be effective. Any exceptions must be determined by the risk evaluation study in Section 11.1.3, based on a detailed evaluation of site characteristics and plant operations.
7. Are all air emission sources defined?	General Table 14	• The peak and average levels of all preservative constituents in air, for significant points of emission, must be determined. • Significant points of emission include, cylinder door openings, vent stacks, receiving areas for vents, enclosed plant areas and freshly treated wood storage areas. • The assessment must be updated if there are any changes in plant design and/or operating practices.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
8. Are air emissions monitored?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If permits apply, air emissions must be monitored accordingly. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective control of all air emissions • Monitoring must determine all preservative constituents in air emissions.
9. Are all liquid waste discharges identified (volumes, contamination levels)?	General Table 14	• Liquid waste discharges include storm water run-off. • The concentrations and total mass emission rates for all preservative constituents in discharges and run-off must be determined by a qualified consultant, as part of the overall site monitoring program defined in Section 11.

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
10. Are all liquid waste discharges monitored as per permits?	General Table 14	• If permits apply, discharges and run-off must be monitored accordingly. • Monitoring must determine the concentrations of all preservative constituents in discharges and run-off. • If permits do not apply, site specific monitoring protocol and waste discharge limits shall be developed in consultation with provincial environmental authorities.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING**		
11. Does a facility specific monitoring plan exist?	General Table 15	• A site specific workplace monitoring plan and program shall be prepared by a qualified industrial hygienist. • The plan and program must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices. • The plan shall address the requirements defined in Sections 11.1.7 and 11.1.8.
12. Are reporting requirements clearly defined?	General Table 15	• The regulations and reporting requirements, which apply to the plant must be determined and defined in the workplace monitoring plan.
13. Are sources of skin exposure identified periodically?	General Table 15	• Existing and potential sources of skin exposure shall be identified by monthly inspections of all operating areas of the plant, from chemical receiving to shipment of treated products. • Skin exposure hazards shall be a topic for discussion at all safety committee meetings. • Safe working practices, training programs and PPE requirements must be modified when new sources of skin exposure are identified.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
14. Is a monitoring program defined: • Sampling techniques? • Frequency?	General Table 15	• The workplace monitoring plan and program defined in Sections 11.2.11 and 11.2.12 above must define the sampling techniques and sampling frequency required for all preservative constituents and other toxic chemicals used by the plant. • The requirements defined in Sections 11.1.7 and 11.1.8 also apply.
15. Are peak levels of preservative exposure from air known for all significant points of worker exposure (cylinder doors, kiln interiors, exhaust vents, enclosed preservative process areas, freshly treated charges)?	General Table 15	• Peak levels of exposure shall be determined as per the requirements defined in Sections 11.1.7 and 11.1.8 above. • Peak levels shall be determined annually under worst case conditions, e.g. during winter months when plant areas are enclosed.
16. Are pre-employment medical exams carried out?	General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed by an occupational physician to verify that they are able to carry out their assigned duties. • Provided new employees are not directly exposed to chemicals, their pre-employment medicals may follow the completion of their probationary period. .

BORATE FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
17. Does a plan exist for follow-up medicals?	General Table 15	• The plant must prepare a plan, in consultation with an occupational physician, which defines: o Jobs for which pre-employment and annual or more frequent medical examinations are mandatory, based on the degree of exposure to specific chemicals. o The person responsible for scheduling medical appointments o Responsibility for record keeping. o Responsibility for follow-up with physician and employee.
18. Are follow-up medicals and biological monitoring (e.g. urine) carried out?	General Table 15	• As specified in the plan outlined in Section 11.2.17, designated employees must be periodically examined by an occupational physician to assess the effects of exposure to the chemicals in use at the plant. • As a result, medical examinations may include x-rays, nasal and skin evaluation, and urine and blood testing. • Medical examinations must address all preservative constituents and other toxic chemicals used in the plant.

Ammoniacal Copper Zinc Arsenate (ACZA) FACILITY TECHNICAL GUIDELINES

2004

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.1 ACCESS/SECURITY**		
1. Is off-loading area located away from high yard traffic routes?	General Table 3	• Ideally, off-loading area should be located away from any traffic. If relocation is impractical, traffic must be controlled by DANGER signs, barriers and constant supervision during chemical unloading operations.
2. Is vehicle access restricted during delivery?	General Table 3	• All vehicles, including contractors' trucks and visitors' vehicles must be restricted from the off-loading area by DANGER signs, barriers and constant supervision during chemical unloading operations.
3. Are there locking valves on liquid delivery lines?	General Table 3	• Ammonia delivery lines must be securely locked when not in use.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT**		
4. Is an unloading pad and catchment sump used (ammonia)?	General Table 3	• The ammonia truck must be unloaded on an impervious pad large enough in area to hold the full length of the truck. • The pad must drain to a leak-proof sump and/or containment, large enough to handle the entire volume of the ammonia concentrate contained in the truck.
5. Are impervious construction materials used?	General Table 3	• The surfaces of the pad and sump must have a hydraulic conductivity or permeable rating to water of $1x10^{-7}$ cms/sec, or less, under a hydraulic head of 3m and be resistant to ammonia solutions. • Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT CONT'D**		
6. Are liquid-tight joints sealed with chemical resistant material?	General Table 3	• All joints in the pad must be sealed with caulking that complies with the requirements defined in Section 1.2.10. • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, all sump joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10.
7. Are surfaces sealed to enhance ability to keep clean?	General Table 3	• Sealing is required if unloading pad surfaces cannot be kept clean by normal methods, such as vacuuming and/or washing.
8. Are pads designed to contain large (tanker) spills?	General Table 3	• The pad must be constructed so that it will allow containment of the entire volume of ammonia in the truck.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT CONT'D**		
9. Are pads and sumps free of settling and cracks?	General Table 3	• Pads and sumps must be designed to prevent settling and/or cracking. Any visibly open cracks must be repaired with ACZA resistant caulking, using procedures that will ensure a liquid-tight seal. • Evident or suspected settling must be evaluated by a certified engineer to determine the structural integrity of the pad and/or sump.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
10. Are pads and sumps lined?	General Table 3	• Secondary containment for this area is good practice and is required by some Provinces. • Secondary containment may be achieved by installing a subsurface membrane liner or by applying an impervious coating to the pad and sump surfaces. • Surface sealers, surface coatings, joint and crack sealants must have a hydraulic conductivity or permeability rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m. In addition they must be resistant to the chemicals in use at the plant and must have the physical properties (compressive, tensile and flexural strength), the abrasion and wear resistance and the lifetime requirements, suitable for the intended application. The performance requirements for sealers and coatings will vary in different areas of the plant. For example, the drip pad represents the most severe application, due to constant exposure to chemical solutions, vehicle traffic and cleaning processes, while cylinder and tank farm containment areas, with occasional chemical exposure and foot traffic, represent a less stringent application. Sealers, coatings and sealants and their application technology must be determined in consultation with a manufacturer with experience in the field. A list of experienced manufacturers of sealers, coatings and sealants may be obtained from the chemical supplier. • See Introduction for further information.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT**		
11. For drums, is the off loading area near the storage?	General Table 3	• Arrange unloading to require a minimum of drum handling and transport through sensitive plant areas.
12. Is all transfer equipment in a contained area?	General Table 3	• Transfer equipment includes the entire length of the ammonia concentrate truck, the delivery hose and the valves and piping between the hose connection and the ammonia storage tank. • All this equipment must be contained as defined in Sections 1.2 and 2.4.
13. Are pipes and valves clearly identified?	General Table 3	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves and caplocks must be clearly labeled.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
14. Are delivery lines rigid, accessible and visible?	General Table 3	• There must be easy access to allow inspection, leak detection and maintenance of delivery lines. • Flexible hoses connecting delivery vehicles to tank piping must be shielded. All other piping must be of the appropriate material and schedule with the required compatibility. • Any buried piping must have secondary containment together with provision for leak detection designed by a qualified engineer.
15. Is piping protected from mechanical damage?	General Table 3	• All piping must be protected to prevent damage by any means, such as the ammonia and solids delivery trucks, plant mobile equipment, contractor's vehicles, wood piles, stored equipment, etc.
16. Are hose and pipe connections designed to be secure?	General Table 3	• All hose and pipe connections must be leak tight. Couplings must have safety measures to prevent improper connections and to ensure integrity of the connection throughout the unloading process. Couplings must not result in backflow when the hose is disconnected.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
17. Are pipes connected for top delivery to tanks?	General Table 3	• The ammonia delivery line must be connected to the top of the ammonia concentrate tank, above the high-level alarm sensor.
18. Are back-flow preventors installed on delivery lines?	General Table 3	• An effective check valve must be installed in the delivery line.
19. Is the delivery system totally visible from the point of off-loading to tankage?	General Table 3	• "Totally visible" means from the truck controls to the ammonia storage tank.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
20. If visibility is limited, are audible alarms installed on tanks to detect overflow?	General Table 3	• Alarms must be audible both in the tank farm and also at the off-loading station. • Alarm function must be tested weekly and prior to delivery of concentrate. Alarm tests must be recorded.
21. Is spill response equipment, absorbents and personnel protection equipment available and readily accessible?	General Table 3 AZCA Table 20 ACZA Table 21	• Personal protection equipment must comply with TRD reference ACZA; Table 20 and Table 21. • Spill response equipment must be site specific and must be selected in accordance with the preservative supplier's recommendations. • Equipment inventory must be checked weekly and recorded and must be complete at all times. Location of equipment storage must allow prompt response to emergency situations.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
22. Is the off-loading area equipped with a phone or a manual alarm switch?	General Table 3	• There must be a manual alarm in the off-loading area that is audible throughout the plant. • The alarm function must be tested weekly and prior to the delivery of concentrate. Alarm tests must be recorded. • A phone and/or 2-way radio is also required to arrange any assistance that may be required.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY**		
1. Is there 24-hour security?	General Table 4	• Systems and procedures must be in place to prevent unauthorized access to the chemical storage area on a 24-hour basis. • Examples include, a restricted area policy, locked buildings with security monitoring alarms, locked buildings with security patrols, etc.
2. Are tank drain valves locked?	General Table 4	• Any valve that could cause the release of chemical, as a result of unauthorized use, must be locked. • Examples include, sampling valves, drain valves and unloading and loading line valves.
3. Are tanks protected from mechanical impact?	General Table 4	• All tanks must be protected to prevent damage by any means, such as the ammonia delivery truck, plant mobile equipment, wood piles, stored equipment, etc. • Tanks installed close to external walls that could be breached by mobile equipment and/or truck accidents require special attention.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE**		
4. Are tanks in sound physical condition, with no rust or damage?	General Table 4 General Table 11	• All chemical storage tanks, including effluent tanks must be tested annually and certified as suitable for the intended use, by an accredited testing company or agency.
5. Are underground tanks leak tested at least annually?	General Table 4 General Table 11	• It should be noted that leak testing will not prevent chemical release as leaks of 0.5 gals/hour and less cannot be detected. • Underground tanks should be removed and replaced with above ground tanks and must not be used in new construction. • If removal and replacement is impractical for an existing tank, it must have a leak detection system designed by a certified engineer. • All underground tanks must be tested annually and certified as suitable for the intended use, by an accredited testing company or agency.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
6. Are aboveground tanks mounted on containment pad surfaces?	General Table 4	• Tank bases must not be embedded in, or be encased by concrete. • Preferably, vertical tanks should be mounted on raised supports on containment pad surfaces. • If tanks must be in contact with pad surfaces, an annual assessment of external corrosion must be carried out. • The tank containment floor must be kept clean and dry, to allow immediate detection of leaks.
7. Are tanks mounted in stable positions and anchored securely?	General Table 4	• Tanks must be mounted in stable positions and must be anchored if flooding of the containment by storm water or a spill would exert uplift forces.
8. Are tanks sheltered from weather by a fixed roof?	General Table 4	• The preferred location for tanks is inside a secure, locked building. • If relocation is impractical, exterior tanks must be roofed if the storm water that enters the tank containment is not recycled to the process.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
9. Are tanks located in dyked area?	General Table 4	• All chemical storage tanks must be installed in a dyked containment. • In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
10. Are tanks protected from freezing?	General Table 4 ACZA Table 23	• All chemical storage tanks must be kept above 0ºC.
11. Are all tank surfaces accessible for detecting leaks and insulated tanks provided with inspection points?	General Table 4	• Preferably, tanks should be raised on supports to allow leaks to be readily detected. • Whether tanks are raised or not, the tank farm floor must be kept clean and dry to allow immediate leak detection. • The lower 6" of insulated tanks must not be insulated to allow leaks to be readily detected or the tank must be provided with inspection points.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
12. Are tank vents controlled?	General Table 4 ACZA Table 22	• Interior tanks must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior tanks may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Tanks must not vent directly into the workplace.
13. Are storage areas fire protected?	General Table 6	• Fire protection must conform to applicable codes, such as the National Fire Code of Canada, the National Building Code, provincial and municipal codes, etc. • Conformance must be certified by an accredited inspector, such as the local Fire Department, building inspector, insurance company, etc.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT**		
14. Is piping rigid and permanent throughout the operation?	General Table 4	• With the exception of the connection between the delivery vehicle and the storage tank, all other piping must be of the required material and schedule with the required compatibility.
15. Is piping visible and accessible with a simple layout?	General Table 4	• Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.
16. Is piping above ground?	General Table 4	• In general all piping must be visible and readily accessible for leak detection and maintenance. • Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or piping must be brought above grade. • Underground piping is not allowed in new construction. • If there is no alternative to underground piping in existing construction, it must be installed in appropriate containment with provision for leak detection designed by a qualified engineer.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
17. Is containment provided for sub-grade piping?	General Table 4	• Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or piping must be brought above grade. • Underground piping must be installed in appropriate containment with provision for leak detection as per 2.3.16.
18. Are piping and fixtures chemically compatible?	General Table 4 ACZA Tables 2/3 ACZA Table 4	• Note that ammonia is highly corrosive to many materials. • Piping and fixtures must be compatible with ammonia and ACZA solutions. Tables 2 and 3 of the ACZA TRD provide some information. Any questions and/or uncertainties must be resolved with the chemical supplier. • Arsenic acid must not contact aluminum or zinc.
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
19. Are valves identified by labeling or colour-coding?	General Table 4	• Valves must be labeled or colour coded. • The label or colour-code must identify the valve function in accordance with the piping schematic in 2.3.15.

SECTION/CRITERIA	TRD REF.	GUIDELINE
20. Are valves and pipes protected from impact?	General Table 4	• All valves and piping must be protected to prevent damage by any means, such as the ammonia delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
21. Are lines protected from freezing (where applicable)?	General Table 4 ACZA Table 23	• All piping used for ammonia and ACZA solutions must be kept above 0°C.
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
22. Do valves have local drip/spill catch trays?	General Table 4	• Valves must be installed properly and maintained regularly to prevent leakage. • The tank farm floor must be kept clean and dry to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. • Containers are also required under any unprotected valves located outside the containment area • Containers must be inspected daily and any free liquid must be cleaned out.

SECTION/CRITERIA	TRD REF.	GUIDELINE
23. Do pumps have local drip/spill catch trays?	General Table 4	• All pumps handling ACZA solutions must have self-contained spill trays large enough to prevent contamination of the containment area. There must be no free ACZA on the containment floor. • Spill trays must be inspected daily and any free liquid must be cleaned out.
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
24. Are back flow preventors on all water supply lines?	General Table 4 ACZA Table 22	• Reduced pressure type backflow preventors must be installed on all water supply lines as a secondary protection system. • Backflow preventors must be inspected and tested annually or as recommended by the manufacturer.
25. Are waterlines connected via top entry to tanks?	ACZA Table 22	• Water supply lines must be connected to the top of tanks above the high-level alarm sensor.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
26. Is piping system designed to protect against inadvertent transfers?	General Table 4	• Pipes and valves must be clearly identified and operating instructions explicitly defined. • Manual systems must not be operated by untrained personnel. • Where there is common piping in multi-preservative plants, blocking systems must be in place to prevent inadvertent transfer of solutions.
27. Are reliable, accurate level indicators installed?	General Table 4	• All level indicators must be checked regularly and calibrated and recorded every 6 months, where appropriate. • Calibration records must be kept on file.
28. Is mechanical impact protection functional on sight glasses?	General Table 4	• Protection system must prevent sight glasses from being damaged or accidentally disconnected.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
29. Are shut-off valves functional on all rupturable lines and gauges?	General Table 4	• Any line or gauge that can be easily damaged or accidentally disconnected must be fitted with an automatic shut-off valve. • Examples include sight glasses, instrument tubing, etc. • Vulnerable sampling valves on tanks must be physically protected.
30. Is overflow piping provided from tanks to containment?	General Table 4	• Preferred design is to connect all tanks to a dedicated CCA overflow tank, otherwise, overflow piping must extend to a contained sump, with provision for recycling to a storage tank. • Overflow tanks and pipes must be vented to the exterior with provision to prevent the release of entrained liquids or overflow. • Open manholes on tanks are not permitted.
31. Are independent high-level alarms installed on tanks?	General Table 4	• All tanks must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly and the test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
32. Are high-level alarms interlocked to the pump auto-shut off?	General Table 4	• Alarms must immediately prevent any increase in the solution level in the tank, either by shutting off the pump or by closing the appropriate valve.
33. Is there a 24-hour monitoring alarm?	General Table 4	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly and the test details must be recorded.
34. Are there manual alarm buttons at potential major spill points?	General Table 4	• The chemical receiving, storage and treating cylinder areas must be adequately protected by manual alarms. • The function of all alarms must be tested weekly and the test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT**		
35. Are containment floors, dykes and joints structurally sound?	General Table 4 General Table 4	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer.
36. Are containment surfaces and joints sealed?	General Table 4	• Tank farm containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
37. Is a secondary containment barrier built into the containment area? (e.g. impermeable top coat or liner under the containment area).	General Table 4	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath tanks, together with a leak detection system, as per 2.4.38. • The coating must comply with the requirements defined in Section 1.2.10.
38. Is subsurface leak detection provided?	General Table 4	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
39. Is the spill containment volume in compliance with NFCC?	General Table 4	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
40. Are there provisions to direct, collect and transfer spills, washdown liquids, infiltrate to tankage?	General Table 4	• Provisions must ensure the immediate transfer of all liquids to the appropriate tank. • There must be no free-standing AZCA solution or effluent, anywhere in the plant.
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
41. Is local collection/containment of incidental drips in place (pumps, valves etc.)?	General Table 4	• The tank farm floor must be kept clean and dry to prevent tracking and air contamination and to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area.

SECTION/CRITERIA	TRD REF.	GUIDELINE
		• Containers must be inspected daily and any free liquid cleaned out. All pumps handling ammoniacal solutions must have self-contained spill trays large enough to prevent contamination of the containment area. Spill trays must be inspected daily and any free liquid must be cleaned out.
42. Is containment area designed to minimize tracking of liquids and contaminated dust?	General Table 4	• The containment area must be kept free from ammonia fumes and preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by authorized personnel, as designated by the Plant Manager. • Walkways, footwear exchanges etc., must be provided to prevent dirt and dust being tracked to and from the plant.
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
43. Are there provisions for water spray and/or ventilation to control ammonia vapours (in enclosed facilities)?	ACZA Table 22	• Storage and operating areas must be equipped with provisions for water spray and/or ventilation to maintain ammonia and preservative constituent levels in the air below regulated limits.
44. Are drums stored in a secure, enclosed, paved area?	ACZA Table 22	• The storage areas for ACZA solids must be secure, roofed and paved. Bags and drums must be elevated from the floor of the storage facility.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS**		
1. Is mixing equipment in a contained, enclosed, heated area?	General Table 5 ACZA Table 23	• The containment for mixing vessels must be as defined in Section 2.4, Criteria 35-42 inclusive. • Mixing systems must be kept above 0°C.
2. Is permanent, closed mixing system used?	General Table 5	• A permanent, closed mixing system must be used. • The mixing system must be rigidly piped from tank to tank.
3. Is a high level alarm installed to prevent mix tank overflow?	General Table 5	• The mix tank must have a high-level alarm. • The alarm must be audible throughout the plant. • The alarm must trigger visible identification of a specific high-level emergency in the mixing vessel. • The alarm must be tested prior to every mix and test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS CONT'D**		
4. Are high-level alarms linked to feed pump shut off?	General Table 5	• Alarms must immediately prevent any increase in the solution level in the mixing tank, either by shutting off the mix pump or by closing the appropriate valve
5. In case of any open transfer operations, is reliable splash protection in place?	General Table 5	• Open transfer of solution is not allowed. • Working solutions must be mixed in a closed system.
6. Is transfer equipment mechanized (minimum of worker contact/spill potential)?	ACZA Table 23	• The transfer of drum and bag contents must be mechanized to minimize the potential for worker contact and spills.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT**		
7. Are containment floors, dykes and joints structurally sound?	General Table 5	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer
8. Are containment surfaces and joints sealed?	General Table 5	• Surfaces of containments with membrane liners must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, all joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
9. Is a secondary containment barrier built into a tank containment area?	General Table 5	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the mix tanks, together with a leak detection system as per 2.4.38. • The coating must comply with the requirements defined in Section 1.2.10.
10. Is subsurface leak detection provided?	General Table 5	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. • Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
11. Is there a subsurface leak containment and collection system?	General Table 5	• For an existing plant, if the monitoring well system detects a leak, a recovery well system must be designed and installed by a qualified hydrogeologist, to ensure containment and collection. • The double liner system described in Section 3.2.10 above is the preferred approach for new plants or additions to existing plants.
12. Is the spill containment volume in accordance with NFCC?	General Table 5	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
13. Is tank farm covered to prevent infiltration precipitation?	General Table 5	• The preferred location for tanks is inside a secure, locked building. • If relocation is impractical, exterior tanks must be roofed if the storm water that enters the tank containment is not recycled to the process.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
14. Does containment have alarms to identify spills?	General Table 5	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly and the test details must be recorded.
15. Is the containment area visible?	General Table 5	• The containment must be well-lit, as per provincial requirements of the Workers' Compensation Board, Ministry of Labour, etc., and must not be used as an equipment storage area.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
16. Is accessible storage for spill response equipment, absorbents and personnel protection nearby?	ACZA Table 22 ACZA Table 20	• Personal protection equipment must comply with TRD reference ACZA, Table 20 and,Table 22. • Spill response equipment must be site specific and must be selected in accordance with the chemical suppliers' recommendations. • Equipment inventory must be checked weekly and recorded and must be complete at all times. • Location of equipment storage must allow prompt response to emergency situations.
17. Is the mix room equipped with adequate ventilation?	ACZA Table 22 ACZA Table 23	• Positive ventilation must be in place to keep ammonia and preservative constituent levels below regulatory limits. • The mix tank must be equipped with an efficient scrubber to control air emissions.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION**		
1. Are the treatment vessel, controls and ancillary equipment in an enclosed structure and protected from freezing?	General Table 6	• The treating cylinder, controls and ancillary equipment must be located in an enclosed winterized structure that is maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
2. Are the treatment cylinder and process tanks within a contained area?	General Table 6	• The treating cylinder and process tanks must be located in a containment area with continuous, structurally sound concrete floors and dykes. • The details of the containment must be as defined in Section 2.4, Criteria 35-42 inclusive.
3. Does the spill containment capacity comply with NFCC requirements?	General Table 6	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
4. Are the floors and dykes reinforced, structurally sound and with sealed joints?	General Table 6	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with Section 1.2.10. • Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing.
5. Are surfaces graded to facilitate drainage?	General Table 6	• Containment floors must be graded to ensure efficient drainage to a collection system. • Free standing liquid is not permitted in the containment area.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
6. Are walkway grates or other designs in place to minimize worker contact and tracking of preservative residues?	General Table 6	• The containment area must be kept free from ammonia fumes and preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by those personnel authorized by the Plant Manager. • Walkways, footwear exchanges etc. must be provided to prevent dirt and dust being tracked to and from the plant.
7. Does the entire process area have a secondary containment provision (e.g. impermeable top coat on floors and dykes or liner under the containment area)?	General Table 6	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. The liner must be resistant to ACZA solutions. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the tanks. • The coating must comply with the requirements defined in Section 1.2.10.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
8. Is control and transfer equipment isolated to avoid damage from spills?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that a spill equal to the containment volume defined in Section 4.1.3 or flooding will not prevent their operation or create an electrical hazard.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.2 SUMPS**		
9. Are sumps leakproof (impermeable surfaces, sealed joints)?	General Table 7	• Sump surfaces must have a hydraulic conductivity or permeability rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and must be resistant to ACZA solutions. • All joints in the sump must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with Section 1.2.10.
10. Are sumps equipped with a secondary containment (e.g. steel lining)?	General Table 7	• The surfaces of concrete sumps must have an impermeable coating and also must be lined with steel or other suitable material. • The surface coating and lining material must have a permeability rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and be resistant to ACZA.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.2 SUMPS**		
11. Are sumps protected by independent high-level alarms?	General Table 7	• All sumps must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly and test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING CYLINDER**		
12. Are all pressure vessel inspection certificates current?	General Table 7	• The plant must have a current certificate to show that the treating cylinder and all pressurized components meet all requirements of the provincial ministry responsible. • If there is no provincial requirement, the treating cylinder and all pressurized components must be inspected annually by an accredited testing company or agency.
13. Is the retort door protected from opening, when full?	General Table 7	• Retorts must be equipped with an effective protection device to prevent doors being opened when retort is pressurized, filled or partially filled with preservative. Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to impact wrench compressors.
14. Is the cylinder designed to facilitate drainage of excessive preservative?	General Table 7	• The alignment of the treating cylinder and/or the pump-out procedures must ensure that the minimum amount of preservative drains from the cylinder door opening.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS**		
15. Is the operator control area segregated from retort and tank spill containment areas?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that spills or flooding will not prevent their operation or create an electrical hazard. • In the case of hydraulic doors, the hydraulic pump controls must be located or shielded so that the operator is not directly exposed to any liquid or vapour releases from the cylinder.
16. Is the control area winterized?	General Table 6	• The process control area must be winterized and maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
17. Is the control area well lit and located for maximum visibility of treatment systems?	General Table 6	• All operating and control areas must have proper lighting, as per provincial requirements, so that all equipment is totally visible at all times. • The location of the control area must allow the best possible visibility of the treatment system, for the operation concerned. • Mirrors or closed circuit TV may solve specific problems, particularly for those plants where the cylinder doors are hidden from view.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS CONT'D**		
18. Are process controls simple and properly functioning to provide accurate feedback?	General Table 7	• The process controls must be installed, maintained and calibrated in accordance with CSA 080-M3, Clause 3.0.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.5 AIR EMISSION CONTROL**		
19. Are pumps, tank or other exhausts vented to outside or to recovery system?	General Table 6 ACZA Table 24	• Pumps, tanks, cylinders and other exhausts must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior equipment may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Equipment must not vent directly into the workplace.
20. Is adequate routine and emergency ventilation to control ammonia vapours installed in all work areas?	General Table 6 ACZA Table 24	• Ventilation must be provided to maintain air emissions below the levels specified by the American Conference of Governmental Industrial Hygienists (ACGIH) for ammonia, copper, zinc and arsenic, or as specified by provincial regulations. • Air emissions must be monitored in all work areas at least every 6 months, or whenever there is a change in equipment and/or procedures that may affect emission levels.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.5 AIR EMISSION CONTROL CON'T**		
21. Are all emissions vented to the building exterior (or collected/recovered)?	General Table 6 ACZA Table 24	• Pumps, tanks, cylinders and other exhausts must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior equipment may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Equipment must not vent directly into the workplace.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM**		
22. Is control equipment to comply with air emission limits for ammonia installed?	ACZA Table 24	• Air emission control equipment must be installed and ammonia levels must be monitored on a routine basis to ensure that it is effective.
23. Are traps installed on vents (to remove entrained liquids)?	ACZA Table 24	• An effective scrubbing system must be in place and operative.
24. Is the system designed to effectively contain and recycle all chemicals with minimal potential for releases?	General Table 6 General Table 7	• The system must be able to contain and recycle all chemicals used by the plant. There must be no routine release of chemicals into the containment from process equipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM CONT'D**		
25. Is all transfer equipment in a contained area?	General Table 7	• All piping and pumps must be contained as defined in Section 2.4, Criteria 35-42 inclusive. • Transfer equipment must be kept above 0°C.
26. Are pipes and valves clearly identified?	General Table 4	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves must be clearly labeled to identify their function in accordance with the piping schematic.
27. Are delivery lines rigid, accessible and visible?	General Table 4	• All piping must be of the appropriate material and schedule with the required compatibility. • Plastic piping or flexible hoses must not be used • Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM CONT'D**		
28. Is piping protected from mechanical damage?	General Table 4	• All piping must be protected to prevent damage by any means, such as the ammonia delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.1 GENERAL DESIGN**		
1. Is the area sheltered from precipitation and dust?	General Table 8 ACZA Table 25	• The primary wood drip area must be sheltered from precipitation and dust, unless the generation and disposal of contaminated run-off water and contaminated dust can be controlled by other means.
2. Does the area have efficient drip and run-off collection and containment?	General Table 8	• The drip pad must be fully contained with sufficient grade to minimize the retention of free liquid so that tracking and air contamination are avoided.
3. Is dispersal of liquids from tracking by personnel and vehicles minimized?	General Table 8	• Vehicles involved in loading, unloading and stacking charges on the drip pad must be dedicated to the drip pad. • All vehicles, including the ammonia delivery and contractors' trucks must be thoroughly washed before leaving the drip pad. • Tracking by personnel can be minimized by restricting foot traffic, keeping the pad clean, installing drainage channels in the storage area and providing perimeter walkways or a boot changing station.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.2 DRIP PROTECTION**		
4. Is the area sufficiently sized to hold all freshly treated wood until visible dripping has stopped?	General Table 8	• The area must be large enough to hold all freshly-treated wood until visible dripping has stopped. • This question also applies to those plants where the stabilization process is carried out in an area remote from the drip pad. • In these plants, the wood cannot be moved from the drip pad until it is absolutely drip dry. Once drip dry, the wood cannot be moved during periods of precipitation.
5. Is the area where wood is stored an open structure with proper containment?	General Table 8 ACZA Table 25	• Wood stored for preservative stabilization must be stored in a roofed, open-sided structure with containment for all preservative drippage and infiltrating precipitation.
6. Is the area roofed?	General Table 8 ACZA Table 25	• The storage area where preservative stabilization is undertaken must be roofed.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.3 CONTAINMENT**		
7. Are the unloading areas provided with impermeable floor and curb?	General Table 8	• The unloading track pad must be constructed to completely contain all drips from the wood and the trams. • The unloading area floor must meet a hydraulic conductivity or permeability rating to water of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and be resistant to ACZA solutions. • . Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior relevant experience.
8. Are the floors sloped to facilitate collection of all contaminated liquids?	General Table 8	• The drip pad must be fully contained with sufficient grade to direct any free liquid to a collection and recycling system.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.3 CONTAINMENT CON't**		
9. Are the floors and curbs covered with an impermeable top coat or is a liner installed underneath the entire area?	General Table 8	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all drip pad surfaces, together with a leak detection system, as per Section 2.4.38. • The coating must comply with the requirements defined in Section 1.2.10.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS**		
1. Is the preservative stabilized prior to placing the wood in unprotected storage (drippage has to have stopped completely)?	General Table 9 ACZA Table 25	Treated material must not be placed into unprotected storage or shipped unless it has undergone a stabilizing process (ACZA, Table 29) and is completely drip free.
2. Are treated wood packages elevated above ground (placed on stringers)?	General Table 9	All treated wood packages/bundles must be elevated above ground to minimize contamination of soil and surface run-off water. The minimum ground separation must be 6”.
3. Are treated wood storage areas segregated from uncontaminated yard areas?	General Table 9	• Treated wood storage areas must be consolidated and segregated to minimize yard contamination and ensure efficient collection of any surface run-off water containing ACZA residues in excess of regulatory limits. • The evaluation of options for storage area surfaces must consider several factors, including groundwater usage, precipitation levels, etc.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS** **CONT'D**		
4. Are unsurfaced storage areas remote from water bodies?	General Table 9	• The run-off from surfaced and unsurfaced storage areas must not cause any water body, surface water or groundwater system to exceed regulatory guidelines or standards.
5. Is storage in compliance with NFCC requirements (lack of vegetation, separation of wood from buildings)?	General Table 9	• Storage areas must be separated from plant operations and other structures by an acceptable clear space permanently available for fire-fighting operations. • Storage areas must be maintained free of combustible vegetation, including grass and weeds, for at least 4.5 m from the stored material and at least 30 m from bush and forested areas. • Lumber treated with combustible liquids must be stored in piles separated from other stored material by a distance of not less than 4.5 m. • At least two fire department access routes must be provided.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.1 PROCEDURES**		
1. Is an operations manual available with written instructions for all aspects of chemical use?	General Table 10	• A current, site-specific manual must be available containing clear instructions for all aspects of chemical use, plant operation, equipment maintenance, housekeeping, accident prevention, first aid and emergency response procedures, and all applicable regulations. • The manual must be readily available to all employees. • There must also be up to date blueprints of the plant and current specifications for all equipment.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.1 PROCEDURES CON'T**		
2. Are all operating personnel informed of the potential hazards and precautionary measures?	General Table 10	• Training in all aspects of chemical use and plant operation must be provided and updated, at least annually. Training programs must be plant specific and should at least include: o Chemical substances and their hazards, including personal hygiene. o Safe operation and maintenance of equipment and processes. o Spill and fire prevention procedures. o Proper use of personal protective equipment. o Proper use of all safety equipment for controlling spills and fires. o Emergency response and first aid and rescue procedures. o Handling, storage and disposal of waste materials. • Individual employee training must be documented.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.2 PERSONNEL**		
3. Are all operating personnel trained in good work practices?	General Table 10	• Operating personnel must be trained as defined in Section 7.1.2.
4. Is periodic review and update of training implemented?	General Table 10	• Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment.
5. Is a pre-employment medical check-up and on-going annual medical surveillance carried out?	General Table 10 General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed to verify that they are able to carry out their assigned duties. • Provided new employees are not exposed to chemicals, their pre-employment medicals may follow completion of their probationary period. • Employees must also have an annual medical check-up, specifically designed to assess the effects of exposure to the chemicals in use at the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.3 SIGNING**		
6. Are the contents and functions of the tanks identified (e.g. ammonia storage, ACZA concentrate)?	General Table 10	• The contents and functions of all tanks must be clearly identified by large, permanent signs.
7. Are personnel safety precautions and first aid procedures prominently displayed?	General Table 10	• Prominent, easy to read signs must be displayed in the chemical receiving and storage areas, the treating process area, all control stations and the plant office.
8. Are emergency response procedures and emergency telephone numbers prominently displayed?	General Table 10	• Plant specific emergency response procedures must be summarized and displayed in the form of a prominent notice. • Notices must also show phone numbers for company contacts, police, fire, ambulance, chemical supplier, etc., not just 911.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY**		
9. Are food, drink or tobacco products prohibited in working areas?	General Table 1	• Food, drink and tobacco products must be prohibited in working areas. • Designated lunch rooms and smoking areas must be separate from work areas and must be provided with washing facilities.
10. Are all personnel familiar with basic hygiene requirements?	General Table 1	• Specific training must be provided as defined in Section 7.1.2. • Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment. • Individual employee training must be documented. • New employees must be fully trained before they can assume full responsibility for any aspect of plant operation.
11. Are soiled clothes promptly removed?	General Table 1	• Operators and other employees who come into contact with chemicals must wear appropriate work clothing which must be changed immediately if splashed with chemicals. • Work clothes must stay at the plant and must be laundered separately from other clothing.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY CONT'D**		
12. Are correct safety clothes (gloves, masks, boots, etc.) worn for respective operations?	General Table 1 ACZA Table 20 ACZA Table 21	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Tables 20 and 21 of the ACZA section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
13. Are first aid personnel familiar with emergency response procedures?	General Table 1	• First aid training must address the specific emergency response procedures for ACZA and the other chemicals used in the plant. • First aid supplies must include all items required to treat ACZA exposure, including ingestion, as per the ACZA supplier's recommendations.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY CONT'D**		
14. Are changing rooms and showers provided?	General Table 1	• Changing rooms must be provided with lockers which allow street clothes to be stored separately from work clothing and PPE. • Hot showers must be provided and operators and other employees who come into contact with preservative chemicals must shower before leaving the plant after work.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING**		
15. Does the plant have a defined housekeeping plan?	General Table 10	• Housekeeping standards aimed at maintaining a clean and orderly plant must be defined in writing and included in the plant operations manual. • The responsibility for maintaining the standards in different areas must be clearly assigned to specific individuals.
16. Are generation and accumulation of wastes minimized?	General Table 17	• To minimize the generation of wastes, the recommendations contained in Table 17 of the General section of the TRD must be followed. • Special attention must be given to all factors affecting solution cleanliness and solution component balance.
17. Is equipment regularly inspected for leaks?	General Table 12	• All process components must be inspected for leaks by every shift. • Immediate action must be taken to stop leaks.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING CONT'D**		
18. Are leaks properly contained and repaired promptly?	General Table 12	• There must be no uncontained leaks. • The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
19. Are daily records maintained for chemical delivery, use and inventory?	General Table 10	• To provide a secondary level of control for chemical losses, records must be maintained as follows: • Transfers to and from the concentrate tank as they occur. • Transfers to and from the work tanks as they occur. • Inventory of concentrate and working solution volumes, monthly. • All tank levels must be checked against the last recorded level, every two days, when the plant is not operating.
20. Are daily records maintained for equipment condition and maintenance?	General Table 10	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation and ensures immediate attention to any problems. • PMP records must be maintained in a daily log and monitored to identify the need for special attention to persistent problems.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
21. Are chemical volume discrepancies promptly investigated?	General Table 10 General Table 12	• To provide a secondary level of control for chemical losses, chemical use and inventory records must be reconciled monthly, to ensure that they are in balance.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.7 SPILL RESPONSE**		
22. Does a written spill contingency plan exist?	General Table 10 General Section 12.1 ACZA Section 12.1	• A written spill contingency plan must be prepared and maintained in accordance with Section 12.1 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the components of the plan. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc. • Local police and fire departments must be provided with copies of the plan together with complete details of those aspects of the operation related to the implementation of the plan.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.7 SPILL RESPONSE**		
23. Are regular spill response drills carried out, including an annual spill enactment drill?	General Table 10	• Spill response drills and annual enactments or rehearsals must be part of the spill contingency plan and must be planned in advance by the person responsible. • Annual rehearsals should be planned in collaboration with relevant agencies, such as police, fire and ambulance services and provincial authorities, with a view to gaining their involvement to make the enactment as real as possible. • Drills must be monitored and reviewed by all participants to determine the need for any improvement to emergency response procedures.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING**		
24. Does a written fire contingency plan exist?	General Table 10 General Section 12.2 ACZA Section 12.2	• A written fire contingency plan must be prepared and maintained in accordance with Section 12.2 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the various components. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc.
25. Has the local fire department been made aware of the chemicals in use?	General Table 10	• The fire contingency plan must be prepared in consultation with the local fire and police departments who must receive copies together with complete details of those aspects of the operation related to implementation of the plan. • The fire department should visit the plant at least annually, to maintain their knowledge of the operation and also identify any improvements that are needed to update the contingency plan.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
26. Is sufficient self-contained breathing equipment available?	General Table 10 General Table 12	• If it is decided to use self-contained breathing apparatus (SCBA) for fire fighting and/or vessel entry, there must be two sets available and personnel must be properly trained in their use. • Responsibility must be assigned for the inspection and maintenance of SCBA and also for the annual review and update of training. • The plant may decide that the fire department should be responsible for SCBA and also may elect to use oxygen sensors for safe vessel entry or hire contractors for this purpose.

SECTION/CRITERIA	TRD REF.	GUIDELINE
27. Are adequate material/procedures on hand to contain and dispose of fire residues?	General Table 10	• The fire contingency plan must define the procedures to be followed to contain and dispose of all residues created by fire fighting. • The procedures should be developed in collaboration with the local fire department and should include allowing the treating plant to burn down if there is any risk of a release of chemical or contaminated water from the containment. • The procedures should also include provision for constructing berms and ditches and blocking storm drains in yard areas to contain contaminated water and solid residues. • Plant fire crews must be designated and trained to the level necessary to implement the company's Fire Contingency Plan. Training programs must be developed in conjunction with local Fire Departments and where possible should meet National Fire Protection Association (NFPA) Standard No. 472, "Hazardous Materials Response". • This advanced level of training is provided at institutions across Canada, accredited under the International Fire Service Accreditation Congress. • Specific information re location of institutions and NFPA Std. No. 472 can be obtained from local Fire Departments.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS**		
1. Is personnel trained in emergency response procedures?	General Table 11	• All personnel must be formally trained in emergency response procedures for spills and fires. • Individual employee training must be documented and updated annually. • Training must be reinforced during the year by spill response drills.
2. Is access to unloading area restricted during unloading operations?	General Table 11	• All vehicles, including contractors' trucks and visitors' vehicles must be prohibited from the off-loading area by DANGER signs, barriers and constant supervision. • The unloading operation must be attended by a trained operator, wearing full PPE. The truck driver must also wear full PPE. First aid personnel must be available. • Ammonia concentrate must not be delivered outside normal working hours.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS**		
3. Is there ready access to emergency aid?	General Table 11	• As defined in Section 8.1.2 above, the unloading operation must be attended by a trained operator. This operator must be trained in chemical handling, chemical hazards, emergency response procedures and first aid. • Additional first aid personnel, trained to deal with emergencies involving ammonia concentrate must be on site and must be given advance notice of chemical unloading. • Prior to chemical delivery, first aid supplies must be checked and eye wash fountains and emergency showers must be operational. • An emergency response team, trained in chemical spill procedures must be available and all alarms and spill control equipment must be in good order.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS**		
4. Are equipment used and procedures followed to avoid worker contact with preservative chemicals?	General Table 11 General Table 1 ACZA Table 20	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Table 20 of the ACZA section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
5. Is responsibility of storage area assigned to trained personnel?	General Table 11	• All activities in the chemical storage area must be carried out by personnel trained in all aspects of chemical handling, system operation, hazard identification and emergency response. • The chemical storage area must be off-limits to all other personnel.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
6. Is a visual inspection routine of equipment storing and transferring chemicals instituted?	General Table 11 General Table 12 General Table 13	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation, including chemical storage and transfer and ensures immediate attention to any problems. • PMP records must be maintained and monitored to identify the need for special attention to persistent problems.
7. Are valves tested regularly?	General Table 2	• The functionality of all valves must be tested in accordance with the Preventive Maintenance Program defined in Section 8.2.6 above.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
8. Are drips and spills cleaned up promptly?	General Table 11	• There must be no uncontained drips or spills. • The operating objective must be to be drip and spill-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
9. Are arsenic drums vented periodically (as recommended)??	ACZA Table 26	• Arsenic acid drums must be vented as per suppliers' recommendation.
10. Are preservative containers thoroughly cleaned?	ACZA Table 30	• Drums and bags must be thoroughly cleaned (rinsed) prior to disposal or return to the supplier.
11. Is rinse water recycled and drums returned to supplier/reused for waste/appropriately landfilled?	ACZA Table 30	• All rinse water must be collected and reused for make up of ACZA solution.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS**		
1. Are quantities of stored chemicals regularly checked and recorded?	General Table 12	• All chemicals must be checked and recorded as defined in Section 7.6.19 and Section 7.6.21, above.
2. Is the solution strength regularly tested?	General Table 12	• The strength of working solution must be determined after every mix as per AWPA-A Standards. Analytical instrumentation must be calibrated as per manufacturer's instructions.
3. Is the solution free from contamination?	General Table 12	• Recycled solutions and effluents must be processed through a bag filter unit before being used to prepare working solutions. Ideally the contents of working tanks should also be filtered. • The surfaces of treated products must be checked to ensure that they are free from residues.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
4. Is the system regularly checked for leaks and are those leaks promptly stopped?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
5. Are sludge levels in tanks and retort regularly checked and removed?	General Table 12	• All tanks must be checked, at least annually and any sludge must be removed. • Sludge must be removed from retorts regularly to prevent operational problems and/or surface deposits on the finished product. • All precautions for safe vessel entry must be followed.
6. Are tank vents tested for blockage at least once a month?	General Table 12	• Tank vents must be tested at least monthly, if there is any risk of restriction or blockage of the vent pipe due to deposits.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
7. Are wood loads stacked to allow good drainage of preservative?	General Table 12	• Lumber components, timbers, plywood, shingles and shakes must be stickered and stacked on an angle to maximize the rate of preservative drainage in the cylinder.
8. Are cylinder door seals in good order?	General Table 12	• Cylinder door seals must be washed and checked for damage and wear before every charge. • Spare seals must be available to allow immediate replacement when required. • Cylinder doors must be checked during the pressure cycle to ensure that they are properly sealed.
9. Are filters checked regularly, cleaned or replaced when necessary?	General Table 12	• Bag filter units must be fitted with a pressure gauge to indicate when the bag filter should be cleaned or replaced. • It is strongly recommended that bag filters are replaced rather than cleaned, to avoid the health hazards involved in handling and disposing of sludge.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
10. Are tanks free of debris, soil or other contamination?	General Table 12	• Trams and charges must be free from debris, soil and other contamination before loading into the cylinder. • Return lines from the cylinder to the working tanks must be fitted with strainers.
11. Are trams, pipes/pumps and cylinder thoroughly cleaned on preservative switch-overs?	General Table 12	• Prior to switching the ACZA system to or from another preservative system (e.g. CCA), all involved equipment must be thoroughly cleaned and all lines to the alternative system must be blocked off.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT**		
12. Is process system monitored for leaks during operation?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
13. Are recording and indicator instruments in proper order?	General Table 12	• All recording and indicator instruments must be installed and calibrated in accordance with CSA 080-M3, Clause 3.0 and CSA 080.1, Clause 2.2. • Calibration records must be kept on file.
14. Is the treatment closely monitored to ensure that maximum limits are not exceeded?	General Table 12	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits, in accordance with CSA 080.1. • Manual control without instrumentation does not allow close monitoring.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT CONT'D**		
15. Are detailed records kept of all process steps and conditions?	General Table 12	• There must be a record of each charge showing wood species, products, sizes, volumes, treating cycle stages and duration, tank gauge readings and chemical consumption. • The treatment record and process charts and print outs must be kept on file, together with the results of solution and product testing, in accordance with CSA 080-M3, Clause 1.5.
16. Are records kept of abnormal operating situations (e.g. equipment breakdown)?	General Table 12	• Abnormal operating situations must be recorded in the daily log and also entered on the treatment record. • Abnormal operating situations must be reviewed with a Supervisor, to ensure that corrective action is taken as soon as possible.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT CONT'D**		
17. Is an effective final vacuum applied after completion of the pressure cycle (level/duration)?	General Table 12 ACZA Table 29	• To be effective, the level and duration of the final vacuum must ensure that dripping is minimized when the charge is pulled from the cylinder. • Note that CSA 080 specifies that the final vacuum cannot be less than 22" Hg. • An effective final vacuum is extremely important in attaining preservative stabilization.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS**		
18. Are safeguards in place to disallow retort opening when liquid or pressure remains?	General Table 12	• Retorts must be equipped with an effective protection device to prevent doors being inadvertently opened, when retort is pressurized, filled or partially filled with preservative. The device must be effective against vandalism or sabotage. • Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to impact wrench compressors.
19. Are goggles and other appropriate safety equipment worn by operators opening retort doors?	General Table 12	• Operators must wear full PPE when opening cylinder doors and removing and unloading charges. Full PPE includes, rain suit, rubber boots, impermeable gauntlets, face shield or goggles and respirator, if emissions are unknown or above the TLV. • Hydraulic door controls must be located or shielded so that the operator is not directly exposed to liquid and/or vapour releases from the cylinder.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
20. Are impermeable gauntlets worn on handling freshly treated wood?	General Table 12	• Impermeable gauntlets must be worn for handling freshly treated wood and for all activities in the treating plant where protection is required. Leather gloves and impermeable gloves with permeable cuffs must not be worn. • The TRD also recommends the use of an impermeable apron and boots.
21. Are instructions followed to avoid exposure to ammonia vapours/mists?	ACZA Table 27 ACZA Table 20	• Avoid breathing preservative mists. Operators must stay upwind of freshly treated charges and an approved respirator must be worn if airborne concentrations are unknown, or at, or above the TLV.
22. Are charges allowed to essentially drip dry before they are pulled from the retort?	General Table 12	• Lumber components, timbers, plywood, shingles and shakes must be stickered and stacked on an angle to maximize the rate of preservative drainage. • The level and duration of the final vacuum must ensure that dripping is minimized when the charge is pulled from the cylinder. • Note that CSA 080 specifies that the final vacuum cannot be less than 22" Hg.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
23. Are personnel trained in safety procedures for vessel entry?	General Table 12	• Treating plant personnel must be trained in confined space entry procedures as defined in WCB and provincial labour regulations. • If personnel are not trained, an approved contractor must be hired for this activity. • Note that this guideline also applies to tram jams in the cylinder. • There are several safety procedures for vessel entry, including self contained breathing apparatus (SCBA) or oxygen sensors.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 STABILIZATION**		
24. Is freshly treated material held in protected storage for at least 3 weeks or kiln dried or conditioned in cylinder (heated vacuum, air exchange) and held for one week?	ACZA Table 29	• A method described in Table 29 must be applied after treatment to ensure ammonia release from the wood and preservative stabilization.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 EQUIPMENT MAINTENANCE**		
25. Is all equipment in good operating condition?	General Table 13	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all equipment and ensures immediate attention to any problems. • Records of daily inspections must be maintained and monitored to identify the need for special attention to persistent problems
26. Are NFCC maintenance recommendations adhered to?	General Table 13	• All maintenance practices must be in accordance with Sections 2.5, 3.3, 4.4.11 and 6.0 of the National Fire Code of Canada
27. Do written maintenance instructions exist?	General Table 13	• The Preventive Maintenance Program must contain written, plant specific instructions for all equipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 EQUIPMENT MAINTENANCE CONT'D**		
28. Are all necessary precautions taken when contaminated equipment is welded?	General Table 13 ACZA Table 20	• The precautions that must be taken include: o Obtaining a Hot Work permit from the Supervisor responsible. o Blocking or disconnecting lines from tanks. o Draining and rinsing tanks and lines. o Ensuring that surfaces are free from cleaning solvent residues. o Wearing an approved respirator. o Providing good ventilation in the work area. o Containing all sparks and removing flammable materials. o Complying with all additional provincial workplace safety rules.
29. Is all equipment drained/cleaned of ACZA chemicals prior to maintenance?	ACZA Table 28	• All equipment must be drained and thoroughly flushed with water prior to maintenance. Ammonia vapours must be purged prior to commencing maintenance work. • All rinse water must be reused for solution make up.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.6 CLEAN-OUT**		
30. Are written safety procedures in place?	General Table 13 General Table 1	• Safety procedures for clean-out must be included in the Plant Operations Manual and must address the details contained in Tables I and 13 of the General section of the TRD.
31. Are drip pads clean (what is the frequency of cleaning)?	General Table 13	• Drip pads must be kept clean and free from liquids and residues. • Drip pads must be inspected daily and cleaned at least weekly. • The volume and dispersion of wash water must be kept to a minimum.
32. Is wash water recycled?	General Table 13 General Table 4	• All wash water must be collected, contained and filtered before being recycled to the treating process.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION**		
1. Is wood properly seasoned prior to treatment?	General Table 17	• Every effort must be made to season wood properly. • A moisture content above the fibre saturation point (~25% dry wt.) will promote sludge formation.
2. Are trams and wood load free of debris, soil on charging?	General Table 17	• Trams and charges must be inspected before loading the cylinder and cleaned where necessary.
3. Is the treatment solution clean and are the components balanced?	General Table 17	• An unfiltered sample of working solution must be perfectly clear and treated product surfaces must be free from residues. • The solution component balance of a filtered sample of working solution must conform to the minimum levels specified in CSA-080.023 (copper 45%, zinc 22.5%, arsenic 22.5%). • The component balance must be checked at least weekly.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION CONT'D**		
4. Are close controls exercised on treatment parameters (are limits not exceeded)?	General Table 17	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits in accordance with CSA 080-M3, Clause 3.0. • Manual control without instrumentation does not allow close monitoring.
5. Are drips, leaks and washdowns reused in process?	General Table 13	• All drips, leaks and wash water must be collected, contained and filtered before being recycled to the treating process. • Collection sumps must be kept clean and free from debris.
6. Are storm run-offs collected and reused in process?	General Table 9	• Storm water run-off from paved yards shown to contain levels of ACZA in excess of regulatory limits must be collected, contained, filtered and re-used in the process. • In the case of unpaved yards, soil and groundwater samples must be taken to determine the environmental impact of storm water. • If contamination is present above regulatory levels, site remediation followed by paving may be necessary.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE**		
7. Are personnel trained in hazards and handling methods?	General Table 17	• Training in all aspects of waste handling and disposal must be provided and updated, at least annually. • Training programs must be plant specific and must address all aspects of provincial regulation related to waste handling. • Individual employee training must be documented.
8. Are wastes and sludges stored in sealed drums?	General Table 17	• Dewatering and/or drying of wastes and sludges must take place in an enclosed area, which is ventilated, roofed and contained. • Appropriate signs must be posted and operators must wear the correct PPE, when processing wastes and sludges. • When wastes and sludges are ready for shipment, they must be in sealed containers, which must conform to Transportation of Dangerous Goods (TDG) regulations. • The storage and handling of wastes and sludges must conform to provincial regulations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
9. Is waste storage area roofed, enclosed and on a paved surface?	General Table 17	• The waste dewatering, drying and storage areas must be roofed, enclosed, contained, well ventilated and separate from the normal work areas.
10. Are all drums labeled by contents?	General Table 17	• Drum and container labels must conform to TDG regulations.
11. Are records kept of inventory for solid wastes and sludges stored on site?	General Table 17	• An up to date inventory of containers, including their volumes and contents must be maintained. • Regulations in some Provinces require accurate inventories of wastes.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
12. Are disposal activities reported as per regulations?	General Table 17	• Disposal activities must be reported by the plant or by the disposal contractor, in accordance with TDG regulations. • The plant must maintain disposal records as per TDG regulations.
13. Has the waste been classified under TDGA?	General Table 17	• The waste has already been classified under the TDG Act. • Labels must show the correct classification, which is Section 6.1 and 9.2 of the TDG regulations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING**		
1. Does a specific site monitoring plan exist?	General Table 14	• A site specific monitoring plan must be prepared by a qualified environmental consultant. • The plan must be designed to address provincial standards for soil, groundwater and storm water run-off, if applicable. If there are no provincial standards, the plant must develop site specific standards in consultation with provincial environmental authorities. The plan must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices.
2. Are reporting requirements clearly defined?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective management of the chemicals used.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
3. Do monitoring areas include all areas: • Where preservative chemicals are stored, processed and handled? • All treated wood storage areas? • Drainage ditches and areas exposed to run-off?	General Table 14	• A risk evaluation study must be completed to determine the monitoring methodology required for soil, groundwater and storm water in the specified areas.
4. Are sampling frequency and constituents defined?	General Table 14	• The site monitoring plan must define sampling frequency, as per the risk evaluation study and/or the reporting requirements. • All preservative constituents must be monitored and checked against the applicable regulatory limits. • If there are no regulatory limits, the plant shall develop site specific limits in conjunction with provincial environmental authorities.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
5. Is a program in place to monitor adjacent waterbodies?	General Table 14	• The risk evaluation study in Section 11.1.3 must also address the need to monitor adjacent water bodies, based on an evaluation of site characteristics and plant operations.
6. Is a program in place to monitor groundwater or on-site wells?	General Table 14	• The TRD states: "consider implementing a groundwater monitoring program using permanent monitoring points…". • Exceptions to this consideration would be plants located on sites for which such a program would not be effective. • Any exceptions must be determined by the risk evaluation study in Section 11.1.3, based on a detailed evaluation of site characteristics and plant operations.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
7. Are all air emission sources defined?	General Table 14	• The peak and average levels of all preservative constituents (ammonia, Cu, Zn, As) in air, for significant points of emission, must be determined. • Significant points of emission include, cylinder door openings, stabilization areas, vent stacks, receiving areas for vents, enclosed plant areas and freshly treated wood storage areas. • The assessment must be updated if there are any changes in plant design and/or operating practices.
8. Are air emissions monitored as per permits?	General Table 14	• The regulations and reporting requirements, which apply to the plant must be determined and defined in the site monitoring plan. • If permits apply, air emissions must be monitored accordingly. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective control of all air emissions • Monitoring must determine all preservative constituents in air emissions.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
9. Are all liquid waste discharges identified (volumes, contamination levels)?	General Table 14	• Liquid waste discharges include storm water run-off. • The concentrations and total mass emission rates for all preservative constituents in discharges and run-off must be determined by a qualified consultant, as part of the overall site monitoring program defined in Section 11.
10. Are all liquid waste discharges monitored as per permits?	General Table 14	• If permits apply, discharges and run-off must be monitored accordingly. • Monitoring must determine the concentrations of all preservative constituents in discharges and run-off. • If permits do not apply, the plant shall develop site specific monitoring protocol and waste discharge limits in consultation with provincial environmental authorities.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING**		
11. Does a facility specific monitoring plan exist?	General Table 15	• A site specific workplace monitoring plan and program shall be prepared by a qualified industrial hygienist. • The plan and program must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices. • The plan shall address the requirements defined in Sections 11.1.7 and 11.1.8.
12. Are reporting requirements clearly defined?	General Table 15	• The regulations and reporting requirements which apply to the plant must be determined and defined in the workplace monitoring plan.
13. Are sources of skin exposure identified periodically?	General Table 15	• Existing and potential sources of skin exposure shall be identified by monthly inspections of all operating areas of the plant, from chemical receiving to shipment of treated products. • Skin exposure hazards shall be a topic for discussion at all safety committee meetings. • Safe working practices, training programs and PPE requirements must be modified when new sources of skin exposure are identified.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
14. Is a monitoring program defined: • Sampling techniques? • Frequency? • Items sampled for?	General Table 15	• The workplace monitoring plan and program defined in Sections 11.2.11 and 11.2.12 above must define the sampling techniques and sampling frequency required for all preservative constituents and other toxic chemicals used by the plant. • The requirements defined in Sections 11.1.7 and 11.1.8 also apply.
15. Are peak levels of preservative exposure from air known for all significant points of worker exposure (cylinder doors, kiln interiors, exhaust vents, enclosed preservative process areas, freshly treated charges)?	General Table 15	• Peak levels of exposure shall be determined as per the requirements defined in Sections 11.1.7 and 11.1.8 above.

ACZA FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
16. Are pre-employment medical exams carried out?	General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed by an occupational physician to verify that they are able to carry out their assigned duties. • Provided new employees are not exposed to chemicals, their pre-employment medicals may follow completion of their probationary period.
17. Does a plan exist for follow-up medicals?	General Table 15	• The plant must prepare a plan, in consultation with an occupational physician, which defines: o Jobs for which pre-employment and annual or more frequent medical examinations are mandatory, based on the degree of exposure to specific chemicals. o The person responsible for scheduling medical appointments o Responsibility for record keeping. o Responsibility for follow-up with physician and employee.

SECTION/CRITERIA	TRD REF.	GUIDELINE
18. Are follow-up medicals and biological monitoring (e.g. urine) carried out?	General Table 15	• As specified in the plan outlined in Section 11.2.17, designated employees must be periodically examined by an occupational physician to assess the effects of exposure to the chemicals in use at the plant. • As a result, medical examinations may include x-rays, nasal and skin evaluation, and urine and blood testing. • Medical examinations must address all preservative constituents and other toxic chemicals.

ALKALINE COPPER QUATERNARY (ACQ) FACILITY TECHNICAL GUIDELINES

2004

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.1 ACCESS/SECURITY**		
1. Is off-loading area located away from high yard traffic routes?	General Table 3	• Ideally, off-loading area should be located away from any traffic. If relocation is impractical, traffic must be controlled by DANGER signs, barriers and constant supervision during chemical unloading operations.
2. Is vehicle access restricted during delivery?	General Table 3	• All vehicles, including contractors' trucks and visitors' vehicles must be restricted from the off-loading area by DANGER signs, barriers and constant supervision during chemical unloading operations.
3. Are there locking valves on liquid delivery lines?	General Table 3	• Ammonia delivery lines must be securely locked when not in use.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT**		
4. Is an unloading pad and catchment sump used (ammonia)?	General Table 3	• The ammonia truck must be unloaded on an impervious pad large enough in area to hold the full length of the truck. • The pad must drain to a leak-proof sump and/or containment, large enough to hold the entire volume of the ammonia concentrate contained in the truck.
5. Are impervious construction materials used?	General Table 3	• The surfaces of the pad and sump must have a hydraulic conductivity or permeable rating to water of $1x10^{-7}$ cms/sec, or less, under a hydraulic head of 3m and be resistant to ammonia solutions. • Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer.
6. Are liquid-tight joints sealed with chemical resistant material?	General Table 3	• All joints in the pad must be sealed with caulking that complies with the requirements defined in Section 1.2.10. • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, all sump joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT CONT'D**		
7. For drum or tote delivery, is off-loading area near the storage area?	General Table 3	• Unloading should be close to the storage area and any transportation of drums/totes must be over a paved and contained area. Arrange for unloading to require minimum handling.
8. Are pads designed to contain large (tanker) spills?	General Table 3	• The pad must be constructed so that it will allow containment of the entire volume of ammonia in the truck.
9. Are pads and sumps free of settling and cracks?	General Table 3	• Pads and sumps must be designed to prevent settling and/or cracking. Any visible cracks must be repaired with ACQ resistant caulking, using procedures that will ensure a liquid-tight seal. • Evident or suspected settling must be evaluated by a certified engineer to determine the structural integrity of the pad and/or sump.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT CONT'D**		
10. Are pads and sumps lined?	General Table 3	• Secondary containment for this area is good practice and is required by some Provinces. • Secondary containment may be achieved by installing a subsurface membrane liner or by applying an impervious coating to the pad and sump surfaces. • Surface sealers, surface coatings, joint and crack sealants must have a hydraulic conductivity or permeability rating to water of $1x10^{-7}$ cms/sec, or less, under a hydraulic head of 3m. In addition they must be resistant to the chemicals in use at the plant and must have the physical properties (compressive, tensile and flexural strength), the abrasion and wear resistance and the lifetime requirements, suitable for the intended application. The performance requirements for sealers and coatings will vary in different areas of the plant. For example, the drip pad represents the most severe application, due to constant exposure to chemical solutions, vehicle traffic and cleaning processes, while cylinder and tank farm containment areas, with occasional chemical exposure and foot traffic, represent a less stringent application. Sealers, coatings and sealants and their application technology must be determined in consultation with a manufacturer with experience in the field. A list of experienced manufacturers of sealers, coatings and sealants may be obtained from the chemical supplier.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT**		
11. Is all transfer equipment in a contained area?	General Table 3	• Transfer equipment includes the entire length of the ammonia concentrate truck, the delivery hose and the valves and piping between the hose connection and the ammonia storage tank. • All this equipment must be contained as defined in Sections 1.2 and 2.4.
12. Are pipes and valves clearly identified?	General Table 3	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves and caplocks must be clearly labeled.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
13. Are delivery lines rigid, accessible and visible?	General Table 3	• There must be easy access to allow inspection, leak detection and maintenance of delivery lines. • Flexible hoses connecting delivery vehicles to tank piping must be shielded. All other piping must be of the appropriate material and schedule with the required compatibility. • Any buried piping must have secondary containment together with provision for leak detection designed by a qualified engineer.
14. Is piping protected from mechanical damage?	General Table 3	• All piping must be protected to prevent damage by any means, such as the ammonia and concentrate delivery trucks, plant mobile equipment, contractor's vehicles, wood piles, stored equipment, etc.
15. Are hose and pipe connections designed to be secure?	General Table 3	• All hose and pipe connections must be leak tight. Couplings must have safety measures to prevent improper connections and to ensure integrity of the connection throughout the unloading process. Couplings must not result in backflow when the hose is disconnected.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
16. Are pipes connected for top delivery to tanks?	General Table 3	• The ammonia delivery line must be connected to the top of the ammonia concentrate tank, above the high-level alarm sensor.
17. Are back-flow preventers installed on delivery lines?	General Table 3	• An effective check valve must be installed in the delivery line.
18. Is the delivery system totally visible from the point of off-loading to tankage?	General Table 3	• "Totally visible" means from the truck controls to the ammonia storage tank.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
19. If visibility is limited, are audible alarms installed on tanks to detect overflow?	General Table 3	• Alarms must be audible both in the tank farm and also at the off-loading station. • Alarm function must be tested weekly and prior to delivery of concentrate. Alarm tests must be recorded.
20. Is local drip catchment available?	General Table 3	• Drip catchment must be used under the hose connection at the truck and also under the hose connection to the line to the ACQ concentrate storage tank, during the off-loading process.
21. Is spill response equipment, absorbents and personnel protection equipment available and readily accessible?	General Table 3 ACQ Table 18	• Personal protection equipment must comply with TRD reference ACQ; Table 18. • Spill response equipment must be site specific and must be selected in accordance with the preservative supplier's recommendations. • Equipment inventory must be checked weekly and recorded and must be complete at all times. Location of equipment storage must allow prompt response to emergency situations.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
22. Is the off-loading area equipped with a phone or a manual alarm switch?	General Table 3	• There must be a manual alarm in the off-loading area that is audible throughout the plant. • The alarm function must be tested weekly and prior to the delivery of concentrate. Alarm tests must be recorded. • A phone and/or 2-way radio is also required to arrange any assistance that may be required.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY**		
1. Is there 24-hour security?	General Table 4	• Systems and procedures must be in place to prevent unauthorized access to the chemical storage area on a 24-hour basis. • Examples include, a restricted area policy, locked buildings with security monitoring alarms, locked buildings with security patrols, etc.
2. Are bulk liquid and solid chemicals stored in locked area?	General Table 4	• If the tank farm cannot be located in a secure, locked building, precautions must be taken to ensure that there can be no unauthorized access to the chemical storage area.
3. Are tank drain valves locked?	General Table 4	• Any valve that could cause the release of chemical, as a result of unauthorized use, must be locked. • Examples include, sampling valves on tanks and manually operated valves between tanks and between the tanks and the cylinder.
4. Are tanks protected from mechanical impact?	General Table 4	• All tanks must be protected to prevent damage by any means, such as the ammonia delivery truck, plant mobile equipment, wood piles, stored equipment, etc. • Tanks installed close to external walls that could be breached by mobile equipment and/or truck accidents require special attention.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE**		
5. Are tanks in sound physical condition, with no rust or damage?	General Table 4 General Table 11	• All chemical storage tanks, including effluent tanks must be tested annually and certified as suitable for the intended use, by an accredited testing company or agency.
6. Are underground tanks leak tested at least annually?	General Table 4 General Table 11	• It should be noted that leak testing will not prevent chemical release as leaks of 0.5 gals/hour and less cannot be detected. • Underground tanks should be removed and replaced with above ground tanks and must not be used in new construction. • If removal and replacement is impractical for an existing tank, it must have a leak detection system designed by a certified engineer. • All underground tanks must be tested annually and certified as suitable for the intended use, by an accredited testing company or agency.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
7. Are aboveground tanks mounted on containment pad surfaces?	General Table 4	• Tank bases must not be embedded in, or be encased by concrete. • Preferably, vertical tanks should be mounted on raised supports on containment pad surfaces. • If tanks must be in contact with pad surfaces, an annual assessment of external corrosion must be carried out. • The tank containment floor must be kept clean and dry, to allow immediate detection of leaks.
8. Are tanks mounted in stable positions and anchored securely?	General Table 4	• Tanks must be mounted in stable positions and must be anchored if flooding of the containment by storm water or a spill would exert uplift forces.
9. Are tanks sheltered from weather by a fixed roof?	General Table 4	• The preferred location for tanks is inside a secure, locked building. • If relocation is impractical, exterior tanks must be roofed if the storm water that enters the tank containment is not recycled to the process.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
10. Are tanks located in dyked area?	General Table 4	• All chemical storage tanks must be installed in a dyked containment. • In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
11. Are tanks protected from freezing?	General Table 4 ACQ Table 20	• The contents of all chemical storage tanks and drums/totes must be kept above 0°C.
12. Are all tank surfaces accessible for detecting leaks and insulated tanks provided with inspection points?	General Table 4	• Preferably, tanks should be raised on supports to allow leaks to be readily detected. • Whether tanks are raised or not, the tank farm floor must be kept clean and dry to allow immediate leak detection. • The lower 6" of insulated tanks must not be insulated to allow leaks to be readily detected or the tank must be provided with inspection points.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
13. Are tank vents controlled?	General Table 4 ACQ Table 20	• Interior tanks must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior tanks may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Tanks must not vent directly into the workplace.
14. Are storage areas fire protected?	General Table 6	• Fire protection must conform to applicable codes, such as the National Fire Code of Canada, the National Building Code, provincial and municipal codes, etc. • Conformance must be certified by an accredited inspector, such as the local Fire Department, building inspector, insurance company, etc.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT**		
15. Is piping rigid and permanent throughout the operation?	General Table 4	• With the exception of the connection between the delivery vehicle and the storage tank, all other piping must be of the required material and schedule with the required compatibility.
16. Is piping visible and accessible with a simple layout?	General Table 4	• Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.
17. Is piping above ground?	General Table 4	• In general all piping must be visible and readily accessible for leak detection and maintenance. • Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or piping must be brought above grade. • Underground piping is not allowed in new construction. • If there is no alternative to underground piping in existing construction, it must be installed in appropriate containment with provision for leak detection designed by a qualified engineer.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
18. Is containment provided for sub-grade piping?	General Table 4	• Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or piping must be brought above grade. • Underground piping must be installed in appropriate containment with provision for leak detection as per 2.3.17.
19. Are piping and fixtures chemically compatible?	General Table 4 ACQ Tables 2/3/4/5	• Note that ammonia is highly corrosive to many materials. • Piping and fixtures must be compatible with ammonia and ACQ solutions. Tables 2,,3, 4 and 5 of the ACQ TRD provide some information. Any questions and/or uncertainties must be resolved with the chemical supplier.
20. Are valves identified by labeling or colour-coding?	General Table 4	• Valves must be labeled or colour coded. • The label or colour-code must identify the valve function in accordance with the piping schematic in 2.3.16.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
21. Are valves and pipes protected from impact?	General Table 4	• All valves and piping must be protected to prevent damage by any means, such as the ammonia delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
22. Are lines protected from freezing (where applicable)?	General Table 4 ACQ Table 20	• All piping used for ammonia and ACQ solutions must be kept above 0ºC.
23. Do valves have local drip/spill catch trays?	General Table 4	• Valves must be installed properly and maintained regularly to prevent leakage. • The tank farm floor must be kept clean and dry to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. • Containers are also required under any unprotected valves located outside the containment area • Containers must be inspected daily and any free liquid must be cleaned out.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
24. Do pumps have local drip/spill catch trays?	General Table 4	• All pumps handling ACQ solutions must have self-contained spill trays large enough to prevent contamination of the containment area. There must be no free ACQ on the containment floor. • Spill trays must be inspected daily and any free liquid must be cleaned out.
25. Are back flow preventers on all water supply lines?	General Table 4 ACQ Table 20	• Reduced pressure type backflow preventers must be installed on all water supply lines as a secondary protection system. • Backflow preventers must be inspected and tested annually or as recommended by the manufacturer.
26. Are waterlines connected via top entry to tanks?	ACQ Table 20	• Water supply lines must be connected to the top of tanks above the high-level alarm sensor.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
27. Is piping system designed to protect against inadvertent transfers?	General Table 4	• Pipes and valves must be clearly identified and operating instructions explicitly defined. • Manual systems must not be operated by untrained personnel. • Where there is common piping in multi-preservative plants, blocking systems must be in place to prevent inadvertent transfer of solutions.
28. Are reliable, accurate level indicators installed?	General Table 4	• All level indicators must be checked regularly and calibrated and recorded every 6 months. • Calibration records must be kept on file.
29. Is mechanical impact protection functional on sight glasses?	General Table 4	• Protection system must prevent sight glasses from being damaged or accidentally disconnected.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
30. Are shut-off valves functional on all rupturable lines and gauges?	General Table 4	• Any line or gauge that can be easily damaged or accidentally disconnected must be fitted with an automatic shut-off valve. • Examples include sight glasses, instrument tubing, etc. • Vulnerable sampling valves on tanks must be physically protected.
31. Is overflow piping provided from tanks to containment?	General Table 4	• Preferred design is to connect all tanks to a dedicated overflow tank, otherwise, overflow piping must extend to a contained sump. • Overflow tanks and pipes must be vented to the exterior with provision to prevent the release of entrained liquids or overflow. • Open manholes on tanks are not permitted.
32. Are independent high-level alarms installed on tanks?	General Table 4	• All tanks must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly and the test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
33. Are high-level alarms interlocked to the pump auto-shut off?	General Table 4	• Alarms must immediately prevent any increase in the solution level in the tank, either by shutting off the pump or by closing the appropriate valve.
34. Is there a 24-hour monitoring alarm?	General Table 4	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly and the test details must be recorded.
35. Are there manual alarm buttons at potential major spill points?	General Table 4	• The chemical receiving, storage and treating cylinder areas must be adequately protected by manual alarms. • The function of all alarms must be tested weekly and the test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT**		
36. Are containment floors, dykes and joints structurally sound?	General Table 4	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer.
37. Are containment surfaces and joints sealed?	General Table 4	• Tank farm containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10.
38. Is a secondary containment barrier built into the containment area? (e.g. impermeable top coat or liner under the containment area).	General Table 4	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath tanks, together with a leak detection system. • The coating must comply with the requirements defined in Section 1.2.10.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
39. Is subsurface leak detection provided?	General Table 4	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.
40. Is the spill containment volume in compliance with NFCC?	General Table 4	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
41. Are there provisions to direct, collect and transfer spills, washdown liquids, infiltrate to tankage?	General Table 4	• Provisions must ensure the immediate transfer of all liquids to the appropriate tank. • There must be no free-standing ACQ solution or effluent, anywhere in the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
42. Is local collection/containment of incidental drips in place (pumps, valves etc.)?	General Table 4	• The tank farm floor must be kept clean and dry to prevent tracking and air contamination and to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid cleaned out. All pumps handling ACQ solutions must have self-contained spill trays large enough to prevent contamination of the containment area. • Spill trays must be inspected daily and any free liquid must be cleaned out.
43. Is containment area designed to minimize tracking of liquids and contaminated dust?	General Table 4	• The containment area must be kept free from ammonia/amine fumes and preservative liquids and residues to prevent tracking and air contamination. • The containment area must be accessed only by authorized personnel, as designated by the Plant Manager. • Walkways, footwear exchanges etc., must be provided to prevent dirt and dust being tracked to and from the plant.
44. Are there provisions for water spray and/or ventilation to control ammonia/amine vapours (in enclosed facilities)?	ACQ Table 20	• Storage and operating areas must be equipped with provisions for water spray and/or ventilation to maintain ammonia/amine and preservative constituent levels in the air below regulated limits.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
45. Are drums/totes stored in a secure, enclosed, paved area?	ACQ Table 20	• The storage areas for ACQ concentrates must be secure, roofed and paved. Totes and drums must be elevated from the floor of the storage facility.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS**		
1. Is mixing equipment in a contained, enclosed, heated area?	General Table 5 ACQ Table 21	• The containment for mixing vessels must be as defined in Section 2.4, Criteria 36-43 inclusive. • Mixing systems must be kept above 0°C.
2. Is permanent, closed mixing system used?	General Table 5	• A permanent, closed mixing system must be used. • The mixing system must be rigidly piped from tank to tank.
3. Is a high level alarm installed to prevent mix tank overflow?	General Table 5	• The mix tank must have a high-level alarm. • The alarm must be audible throughout the plant. • The alarm must trigger visible identification of a specific high-level emergency in the mixing vessel. • The alarm must be tested prior to every mix and test details must be recorded.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS CONT'D**		
4. Are high-level alarms linked to feed pump shut off?	General Table 5	• Alarms must immediately prevent any increase in the solution level in the mixing tank, either by shutting off the mix pump or by closing the appropriate valve.
5. In case of any open transfer operations, is reliable splash protection in place?	general Table 5	• Open transfer of solution is not allowed. • Working solutions must be mixed in a closed system.
6. Is transfer equipment mechanized (minimum of worker contact/spill potential)?	ACQ Table 21	• The transfer of drum and tote contents must be mechanized to minimize the potential for worker contact and spills.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT**		
7. Are containment floors, dykes and joints structurally sound?	General Table 5	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer.
8. Are containment surfaces and joints sealed?	General Table 5	• Surfaces of containments with membrane liners must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, all joints must be sealed with caulking that complies with the requirements defined in Section 1.2.10.
9. Is a secondary containment barrier built into the tank containment area?	General Table 5	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the tanks, together with a leak detection system as per 3.2.10. • The coating must comply with the requirements defined in Section 1.2.10.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
10. Is subsurface leak detection provided?	General Table 5	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. • Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.
11. Is there a subsurface leak containment and collection system?	General Table 5	• For an existing plant, if the monitoring well system detects a leak, a recovery well system must be designed and installed by a qualified hydrogeologist, to ensure containment and collection. • The double liner system described in Section 3.2.10 above is the preferred approach for new plants or additions to existing plants.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
12. Is the spill containment volume in accordance with NFCC?	General Table 5	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
13. Is tank farm covered to prevent infiltration precipitation?	General Table 5	• The preferred location for tanks is inside a secure, locked building. • If relocation is impractical, exterior tanks must be roofed if the stormwater that enters the tank containment is not recycled to the process.
14. Does containment have alarms to identify spills?	General Table 5	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly and the test details must be recorded.
15. Is the containment area visible?	General Table 5	• The containment must be well-lit, as per provincial requirements of the Workers' Compensation Board, Ministry of Labour, etc., and must not be used as an equipment storage area.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
16. Is the mix room equipped with adequate ventilation?	ACQ Table 21	• Positive ventilation must be in place to keep ammonia/amine and preservative constituent levels below regulatory limits. • The mix tank must be equipped with an efficient scrubber to control air emissions.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION**		
1. Are the treatment vessel, controls and ancillary equipment in an enclosed structure and protected from freezing?	General Table 6	• The treating cylinder, controls and ancillary equipment must be located in an enclosed winterized structure that is maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
2. Are the treatment cylinder and process tanks within a contained area?	General Table 6	• The treating cylinder and process tanks must be located in a containment area with continuous, structurally sound concrete floors and dykes. • The details of the containment must be as defined in Section 2.4, Criteria 36-43 inclusive.
3. Does the spill containment capacity comply with NFCC requirements?	General Table 6	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
4. Are the floors and dykes reinforced, structurally sound and with sealed joints?	General Table 6	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with Section 1.2.10. • Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing.
5. Are surfaces graded to facilitate drainage?	General Table 6	• Containment floors should have at least 2% grade to ensure efficient drainage to a collection system. • Free standing liquid is not permitted in the containment area.
6. Are walkway grates or other designs in place to minimize worker contact and tracking of preservative residues?	General Table 6	• The containment area must be kept free from ammonia/amine fumes and preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by those personnel authorized by the Plant Manager. • Walkways, footware exchanges etc. must be provided to prevent dirt and dust being tracked to and from the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
7. Does the entire process area have a secondary containment provision (e.g. impermeable top coat on floors and dykes or liner under the containment area)?	General Table 6	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. The liner must be resistant to ACQ solutions. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the tanks. • The coating must comply with the requirements defined in Section 1.2.10.
8. Is control and transfer equipment isolated to avoid damage from spills?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that a spill equal to the containment volume defined in Section 4.1.3 or flooding will not prevent their operation or create an electrical hazard.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.2 SUMPS**		
9. Are sumps leakproof (impermeable surfaces, sealed joints)?	General Table 7	• Sump surfaces must have a hydraulic conductivity or permeability rating to water of $1x10^{-7}$ cms/sec, or less, under a hydraulic head of 3m and must be resistant to ACQ solutions. • All joints in the sump must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with Section 1.2.10.
10. Are sumps equipped with a tertiary containment (e.g. steel lining)?	General Table 7	• Sumps must have primary containment as per Section 4.2.9, plus secondary containment, consisting of a liner or an impermeable coating, plus tertiary containment consisting of a steel lining or other suitable material.
11. Are sumps protected by independent high-level alarms?	General Table 7	• All sumps must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly and test details must be recorded.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING CYLINDER**		
12. Are all pressure vessel inspection certificates current?	General Table 7	• The plant must have a current certificate to show that the treating cylinder and all pressurized components meet all requirements of the provincial ministry responsible. • If there is no provincial requirement, the treating cylinder and all pressurized components must be inspected annually by an accredited testing company or agency.
13. Is the retort door protected from opening, when full or under pressure?	General Table 7	• Retorts must be equipped with an effective protection device to prevent doors being opened when retort is pressurized, filled or partially filled with preservative. Examples include, liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to impact wrench compressors.
14. Is the cylinder designed to facilitate drainage of excessive preservative?	General Table 7	• The alignment of the treating cylinder and/or the pump-out procedures must prevent any preservative draining from the cylinder door opening.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS**		
15. Is the operator control area segregated from retort and tank spill containment areas?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that spills or flooding will not prevent their operation or create an electrical hazard. • In the case of hydraulic doors, the hydraulic pump controls must be located or shielded so that the operator is not directly exposed to any liquid or vapour releases from the cylinder.
16. Is the control area winterized?	General Table 6	• The process control area must be winterized and maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
17. Is the control area well lit and located for maximum visibility of treatment systems?	General Table 6	• All operating and control areas must have proper lighting, as per provincial requirements, so that all equipment is totally visible at all times. • The location of the control area must allow the best possible visibility of the treatment system, for the operation concerned. • Mirrors or closed circuit TV may solve specific problems, particularly for those plants where the cylinder doors are hidden from view.
18. Are process controls simple and properly functioning to provide accurate feedback?	General Table 7	• The process controls must be installed, maintained and calibrated in accordance with CSA 080-M3, Clause 3.0.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.5 AIR EMISSION CONTROL**		
19. Are pumps, tank or other exhausts vented to outside or to recovery system?	General Table 6 ACQ Table 22	• Pumps, tanks, cylinders and other exhausts must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Interior equipment may be vented to a dedicated overflow tank, which must have an exterior vent designed to prevent the release of entrained liquids or overflow. • Equipment must not vent directly into the workplace.
20. Does general area ventilation exist to keep contaminant levels below regulatory limits?	General Table 6 ACQ Table 22	• Ventilation must be provided to maintain air emissions below the levels specified by the American Conference of Governmental Industrial Hygienists (ACGIH) for ammonia, amine, copper or as specified by provincial regulations. • Air emissions must be monitored in all work areas at least annually, or whenever there is a change in equipment and/or procedures that may affect emission levels.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM**		
21. Are traps installed on vents (to remove entrained liquids)?	ACQ Table 24	• An effective scrubbing system must be in place and operative.
22. Is the system designed to effectively contain and recycle all chemicals with minimal potential for releases?	General Table 6 General Table 7	• The system must be able to contain and recycle all chemicals used by the plant. There must be no routine release of chemicals into the containment from process equipment.
23. Is all transfer equipment in a contained area?	General Table 7	• All piping and pumps must be contained as defined in Section 2.4, Criteria 36-43 inclusive. • Transfer equipment must be kept above 0°C.
24. Are pipes and valves clearly identified?	General Table 4	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves must be clearly labeled to identify their function in accordance with the piping schematic.
25. Are delivery lines rigid, accessible and visible?	General Table 4	• All piping must be of the appropriate material and schedule with the required compatibility. • Plastic piping or flexible hoses must not be used. • Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM CONT'D**		
26. Is piping protected from mechanical damage?	General Table 4	• All piping must be protected to prevent damage by any means, such as the ammonia delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.1 GENERAL DESIGN**		
1. Is the area sheltered from precipitation and dust?	General Table 8 ACQ Table 23	• The primary wood drip area must be sheltered from precipitation and dust, unless the generation and disposal of contaminated run-off water and contaminated dust can be controlled by other means.
2. Does the area have efficient drip and run-off collection and containment?	General Table 8	• The drip pad must be fully contained with sufficient grade to minimize the retention of free liquid so that tracking and air contamination are avoided.
3. Is dispersal of liquids from tracking by personnel and vehicles minimized?	General Table 8	• Vehicles involved in loading, unloading and stacking charges on the drip pad must be dedicated to the drip pad. • All vehicles, including the ammonia delivery and contractors' trucks must be thoroughly washed before leaving the drip pad. • Tracking by personnel can be minimized by restricting foot traffic, keeping the pad clean, installing drainage channels in the storage area and providing perimeter walkways or a boot changing station.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.2 DRIP PROTECTION**		
4. Is the area sufficiently sized to hold all freshly-treated wood for at least 48 hours and until visible dripping has stopped?	General Table 8 ACQ Table 23	• The area must be large enough to hold all freshly-treated wood for 48 hours and until visible dripping has stopped. • This question also applies to those plants where the stabilization process (48 hours protected storage) is carried out in an area remote from the drip pad. • In these plants, the wood cannot be moved from the drip pad until it is absolutely drip dry. Once drip dry, the wood cannot be moved during periods of precipitation.
5. Is the area where wood is stored prior to application of accelerated fixation properly contained and roofed?	General Table 8 ACQ Table 23	• Wood stored for preservative stabilization must be stored in a roofed, open-sided structure with containment for all preservative drippage and infiltrating precipitation.
6. Is the area, where treated wood is undergoing fixation/stabilization at ambient conditions completely contained and roofed?	General Table 8 ACQ Table 23	• The storage area where preservative stabilization is undertaken must be roofed.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.3 CONTAINMENT**		
7. Are the unloading areas provided with impermeable floor and curb?	General Table 8	• The unloading track pad must be constructed to completely contain all drips from the wood and the trams. • The unloading area floor must meet a hydraulic conductivity or permeability rating to water of $1x10^{-7}$ cms/sec, or less, under a hydraulic head of 3m and be resistant to ACQ solutions. • . Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior relevant experience.
8. Are the floors sloped to facilitate collection of all contaminated liquids?	General Table 8	• The drip pad must be fully contained with sufficient grade to direct any free liquid to a collection and recycling system.
9. Are the floors and curbs covered with an impermeable top coat or is a liner installed underneath the entire area?	General Table 8	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all drip pad surfaces, together with a leak detection system, as per Section 2.4.38. • The coating must comply with the requirements defined in Section 1.2.10.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.4 CONTAINMENT: FIXATION/STABILIZATION AREA**		
10. Does the storage area used for fixation/stabilization under ambient conditions have an impermeable floor and containment with recovery provisions for drips and infiltration?	ACQ Table 23	• The storage area floor must have a hydraulic conductivity or permeability rating to water of 1x 10^{-7} cm/sec or less, under a hydraulic head of 3m and must be resistant to the chemicals in use at the plant. Floor specifications should be developed in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior applicable experience. • The storage pad must be fully contained with sufficient grade and an efficient drainage system to direct any free liquid to a collection and recycling system to prevent tracking and air contamination.
11. Is the fixation/stabilization area roofed?	ACQ Table 23	• The storage area for fixation/stabilization under ambient conditions must be roofed.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS**		
1. Has the wood been stored for a minimum of 48hours in a protected area, prior to placing it in unprotected storage (is storage period documented for every charge)?	General Table 9 ACQ Table 24	• Treated material must not be placed into unprotected storage or shipped unless it has undergone a stabilizing process (ACQ, Table 24) and is completely drip free.
2. Are treated wood packages elevated above ground (placed on stringers)?	General Table 9	• All treated wood packages/bundles must be elevated above ground to minimize contamination of soil and surface run-off water. The minimum ground separation must be 6”.
3. Are treated wood storage areas segregated from uncontaminated yard areas?	General Table 9	• Treated wood storage areas must be consolidated and segregated to minimize yard contamination and ensure efficient collection of any surface run-off water containing ACQ residues. • The evaluation of options for storage area surfaces must consider several factors, including groundwater usage, precipitation levels, etc.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS** **CONT'D**		
4. Are unsurfaced storage areas remote from water bodies?	General Table 9	• The run-off from surfaced and unsurfaced storage areas must not cause any water body, surface water or groundwater system to exceed regulatory guidelines or standards.
5. Is storage in compliance with NFCC requirements (lack of vegetation, separation of wood from buildings)?	General Table 9	• Storage areas must be separated from plant operations and other structures by an acceptable clear space permanently available for fire-fighting operations. • Storage areas must be maintained free of combustible vegetation, including grass and weeds, for at least 4.5 m from the stored material and at least 30 m from bush and forested areas. • Lumber treated with combustible liquids must be stored in piles separated from other stored material by a distance of not less than 4.5 m. • At least two fire department access routes must be provided.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.1 PROCEDURES**		
1. Is an operations manual available with written instructions for all aspects of chemical use?	General Table 10	• A current, site-specific manual must be available containing clear instructions for all aspects of chemical use, plant operation, equipment maintenance, housekeeping, accident prevention, first aid and emergency response procedures, and all applicable regulations. • The manual must be readily available to all employees. • There must also be up to date blueprints of the plant and current specifications for all equipment.
2. Are all operating personnel informed of the potential hazards and precautionary measures?	General Table 10	• Training in all aspects of chemical use and plant operation must be provided and updated, at least annually. Training programs must be plant specific and should at least include: o Chemical substances and their hazards, including personal hygiene. o Safe operation and maintenance of equipment and processes. o Spill and fire prevention procedures. o Proper use of personal protective equipment. o Proper use of all safety equipment for controlling spills and fires. o Emergency response and first aid and rescue procedures. o Handling, storage and disposal of waste materials. • Individual employee training must be documented.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.2 PERSONNEL**		
3. Are all operating personnel trained in good work practices?	General Table 10	• Operating personnel must be trained as defined in Section 7.1.2.
4. Is periodic review and update of training implemented?	General Table 10	• Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment.
5. Is a company policy and enforcement system in place to ensure that all safety measures are adhered to?	ACQ Table 26	• The operating manual must clearly describe the required safety measures and protective equipment to be worn. All operating personnel must be thoroughly trained and must sign off that they would follow all safety rules.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.3 SIGNING**		
6. Are the contents and functions of the tanks identified (e.g. ammonia storage, ACQ work solution)?	General Table 10	• The contents and functions of all tanks must be clearly identified by large, permanent signs.
7. Are personnel safety precautions and first aid procedures prominently displayed?	General Table 10	• Prominent, easy to read signs must be displayed in the chemical receiving and storage areas, the treating process area, all control stations and the plant office.
8. Are emergency response procedures and emergency telephone numbers prominently displayed?	General Table 10	• Plant specific emergency response procedures must be summarized and displayed in the form of a prominent notice. • Notices must also show phone numbers for company contacts, police, fire, ambulance, chemical supplier, etc., not just 911.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY**		
9. Are food, drink or tobacco products prohibited in working areas?	General Table 1	• Food, drink and tobacco products must be prohibited in working areas. • Designated lunch rooms and smoking areas must be separate from work areas and must be provided with washing facilities.
10. Are all personnel familiar with basic hygiene requirements?	General Table 1	• Specific training must be provided as defined in Section 7.1.2. • Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment. • Individual employee training must be documented. • New employees must be fully trained before they can assume full responsibility for any aspect of plant operation.
11. Is a system in place that ensures that soiled clothes are promptly removed?	General Table 1	• Operators and other employees who come into contact with chemicals must wear appropriate work clothing which must be changed immediately if splashed with chemicals. • Work clothes must stay at the plant and must be laundered separately from other clothing.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY CONT'D**		
12. Is a system in place that ensures that correct safety clothes (gloves, masks, boots, etc.) are worn for respective operations?	General Table 1 ACQ Table 18	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 18 of the ACQ section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
13. Are first aid personnel familiar with emergency response procedures?	General Table 1 ACQ Tables 13 - 16	• First aid training must address the specific emergency response procedures for ACQ and the other chemicals used in the plant. • First aid supplies must include all items required to treat ACQ exposure, including ingestion, as per the ACQ supplier's recommendations.
14. Are changing rooms and showers provided?	General Table 1	• Changing rooms must be provided with lockers which allow street clothes to be stored separately from work clothing and PPE. • Hot showers must be provided and operators and other employees who come into contact with preservative chemicals must shower before leaving the plant after work.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING**		
15. Does the plant have a defined housekeeping plan?	General Table 10	• Housekeeping standards aimed at maintaining a clean and orderly plant must be defined in writing and included in the plant operations manual. • The responsibility for maintaining the standards in different areas must be clearly assigned to specific individuals.
16. Are generation and accumulation of wastes minimized?	General Table 17	• To minimize the generation of wastes, the recommendations contained in Table 18 of the General section of the TRD must be followed. • Special attention must be given to all factors affecting solution cleanliness and solution component balance.
17. Is equipment regularly inspected for leaks?	General Table 12	• All process components must be inspected for leaks by every shift. • Immediate action must be taken to stop leaks.
18. Are leaks properly contained and repaired promptly?	General Table 12	• There must be no uncontained leaks. • The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
19. Are daily records maintained for chemical delivery, use and inventory?	General Table 10	• To provide a secondary level of control for chemical losses, records must be maintained as follows: o Transfers to and from the concentrate tank as they occur. o Transfers to and from the work tanks as they occur. o Inventory of concentrate and working solution volumes, monthly. • All tank levels must be checked against the last recorded level, every two days, when the plant is not operating.
20. Are daily records maintained for equipment condition and maintenance?	General Table 10	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation and ensures immediate attention to any problems. • PMP records must be maintained in a daily log and monitored to identify the need for special attention to persistent problems.
21. Are chemical volume discrepancies promptly investigated?	General Table 10 General Table 12	• To provide a secondary level of control for chemical losses, chemical use and inventory records must be reconciled monthly, to ensure that they are in balance.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.7 SPILL RESPONSE**		
22. Does a written spill contingency plan exist?	General Table 10 General Section 12.1 ACQ Section 12.1	• A written spill contingency plan must be prepared and maintained in accordance with Section 12.1 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the components of the plan. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc. • Local police and fire departments must be provided with copies of the plan together with complete details of those aspects of the operation related to the implementation of the plan.
23. Are regular spill response drills carried out, including an annual spill enactment drill?	General Table 10	• Spill response drills and annual enactments or rehearsals must be part of the spill contingency plan and must be planned in advance by the person responsible. • Annual rehearsals should be planned in collaboration with relevant agencies, such as police, fire and ambulance services and provincial authorities, with a view to gaining their involvement to make the enactment as real as possible. • Drills must be monitored and reviewed by all participants to determine the need for any improvement to emergency response procedures.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING**		
24. Does a written fire contingency plan exist?	General Table 10 General Section 12.2 ACQ Section 12.2	• A written fire contingency plan must be prepared and maintained in accordance with Section 12.2 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the various components. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc.
25. Has the local fire department been made aware of the chemicals in use?	General Table 10	• The fire contingency plan must be prepared in consultation with the local fire and police departments who must receive copies together with complete details of those aspects of the operation related to implementation of the plan. • The fire department should visit the plant at least annually, to maintain their knowledge of the operation and also identify any improvements that are needed to update the contingency plan.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
26. Is sufficient self-contained breathing equipment available (also for confined entry)?	General Table 10 General Table 12	• If it is decided to use self-contained breathing apparatus (SCBA) for fire fighting and/or vessel entry, there must be two sets available and personnel must be properly trained in their use. • Responsibility must be assigned for the inspection and maintenance of SCBA and also for the annual review and update of training. • The plant may decide that the fire department should be responsible for SCBA and also may elect to use oxygen sensors for safe vessel entry or hire contractors for this purpose.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
27. Are adequate material/procedures on hand to contain and dispose of fire residues?	General Table 10	• The fire contingency plan must define the procedures to be followed to contain and dispose of all residues created by fire fighting. • The procedures should be developed in collaboration with the local fire department and should include allowing the treating plant to burn down if there is any risk of a release of chemical or contaminated water from the containment. • The procedures should also include provision for constructing berms and ditches and blocking storm drains in yard areas to contain contaminated water and solid residues. • Plant fire crews must be designated and trained to the level necessary to implement the company's Fire Contingency Plan. Training programs must be developed in conjunction with local Fire Departments and where possible should meet National Fire Protection Association (NFPA) Standard No. 472, "Hazardous Materials Response". • This advanced level of training is provided at institutions across Canada, accredited under the International Fire Service Accreditation Congress. • Specific information re location of institutions and NFPA Std. No. 472 can be obtained from local Fire Departments.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS**		
1. Is personnel trained in emergency response procedures?	General Table 11	• All personnel must be formally trained in emergency response procedures for spills and fires. • Individual employee training must be documented and updated annually. • Training must be reinforced during the year by spill response drills.
2. Is access to unloading area restricted during unloading operations?	General Table 11	• All vehicles, including contractors' trucks and visitors' vehicles must be prohibited from the off-loading area by DANGER signs, barriers and constant supervision. • The unloading operation must be attended by a trained operator, wearing full PPE. The truck driver must also wear full PPE. First aid personnel must be available. • Ammonia concentrate must not be delivered outside normal working hours.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS**		
3. Is there ready access to emergency aid?	General Table 11	• As defined in Section 8.1.2 above, the unloading operation must be attended by a trained operator. This operator must be trained in chemical handling, chemical hazards, emergency response procedures and first aid. • Additional first aid personnel, trained to deal with emergencies involving ammonia concentrate must be on site and must be given advance notice of chemical unloading. • Prior to chemical delivery, first aid supplies must be checked and eye wash fountains and emergency showers must be operational. • An emergency response team, trained in chemical spill procedures must be available and all alarms and spill control equipment must be in good order.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS**		
4. Are equipment used and procedures followed to avoid worker contact with preservative chemicals?	General Table 11 General Table 1 ACQ Table 18	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Table 18 of the ACQ section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
5. Is responsibility of storage area assigned to trained personnel?	General Table 11	• All activities in the chemical storage area must be carried out by personnel trained in all aspects of chemical handling, system operation, hazard identification and emergency response. • The chemical storage area must be off-limits to all other personnel.
6. Is a visual inspection routine of equipment storing and transferring chemicals instituted?	General Table 11 General Table 12 General Table 13	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation, including chemical storage and transfer and ensures immediate attention to any problems. • PMP records must be maintained and monitored to identify the need for special attention to persistent problems.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
7. Are drips and spills cleaned up promptly?	General Table 11	• There must be no uncontained drips or spills. • The operating objective must be to be drip and spill-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
8. Are safeguards in place to prevent contact of ACQ concentrate with incompatible materials, e.g. strong oxidizing agents, strong acids and combustibles?	ACQ Tables 2 - 6	• Incompatible materials, such as strong oxidizing agents, strong acids and combustibles must not be stored near ACQ concentrates. When not sure, consult with MSDSs and suppliers.
9. Are concentrate containers thoroughly cleaned?	ACQ Table 29	• Totes and drums need to be triple rinsed and all rinsate must be collected and reused for make up of ACQ solution.
10. Is rinse water recycled and drums/totes returned to supplier or appropriately land-filled?	ACQ Table 29	• Use rinsate for make-up of work solution. • Return totes to supplier or dispose of in an approved disposal facility.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS**		
1. Are quantities of stored chemicals regularly checked and recorded?	General Table 12	• All chemicals must be checked and recorded as defined in Section 7.6.19 and Section 7.6.21, above.
2. Is the solution strength regularly tested?	General Table 12	• The strength of working solution must be determined after every mix as per AWPA-A Standards. Analytical instrumentation must be calibrated as per manufacturer's instructions.
3. Is the solution free from contamination?	General Table 12	• Recycled solutions and effluents must be processed through a bag filter unit before being used to prepare working solutions. Ideally the contents of working tanks should also be filtered. • The surfaces of treated products must be checked to ensure that they are free from residues.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
4. Is the system regularly checked for leaks and are those leaks promptly stopped?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
5. Are sludge levels in tanks and retorts regularly checked and removed?	General Table 12	• All tanks must be checked, at least annually and any sludge must be removed. • Retorts must be checked at least weekly and any sludge must be removed. • All precautions for safe vessel entry must be followed.
6. Are tank vents tested for blockage at least once a month?	General Table 12	• Tank vents must be tested at least monthly, if there is any risk of restriction or blockage of the vent pipe due to deposits.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
7. Are wood loads stacked to allow good drainage of preservative?	General Table 12	• Lumber components, timbers, plywood, shingles and shakes must be stickered and stacked on an angle to maximize the rate of preservative drainage.
8. Are cylinder door seals in good order?	General Table 12	• Cylinder door seals must be washed and checked for damage and wear before every charge. • Spare seals must be available to allow immediate replacement when required. • Cylinder doors must be checked during the pressure cycle to ensure that they are properly sealed.
9. Are filters checked regularly, cleaned or replaced when necessary?	General Table 12	• Bag filter units must be fitted with a pressure gauge to indicate when the bag filter should be cleaned or replaced. • It is strongly recommended that bag filters are replaced rather than cleaned, to avoid the health hazards involved in handling and disposing of sludge.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
10. Are tanks free of debris, soil or other contamination?	General Table 12	• Trams and charges must be free from debris, soil and other contamination before loading into the cylinder. • Return lines from the cylinder to the working tanks must be fitted with strainers.
11. Are trams, pipes/pumps and cylinder thoroughly cleaned on preservative switch-overs?	General Table 12	• Prior to switching the ACQ system to or from another preservative system (e.g. CCA), all involved equipment must be thoroughly cleaned and all lines to the alternative system must be blocked off.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT**		
12. Is process system monitored for leaks during operation?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
13. Are recording and indicator instruments in proper order?	General Table 12	• All recording and indicator instruments must be installed and calibrated in accordance with CSA 080-M3, Clause 3.0 and CSA 080.1, Clause 2.2. • Calibration records must be kept on file.
14. Is the treatment closely monitored to ensure that maximum limits are not exceeded?	General Table 12	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits, in accordance with CSA 080.1. • Manual control without instrumentation does not allow close monitoring.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT CONT'D**		
15. Are detailed records kept of all process steps and conditions?	General Table 12	• There must be a record of each charge showing wood species, products, sizes, volumes, treating cycle stages and duration, tank gauge readings and chemical consumption. • The treatment record and process charts and print outs must be kept on file, together with the results of solution and product testing, in accordance with CSA 080-M3, Clause 1.5.
16. Are records kept of abnormal operating situations (e.g. equipment breakdown)?	General Table 12	• Abnormal operating situations must be recorded in the daily log and also entered on the treatment record. • Abnormal operating situations must be reviewed with a Supervisor, to ensure that corrective action is taken as soon as possible.
17. Is an effective final vacuum applied after completion of the pressure cycle (level/duration)?	General Table 12	• To be effective, the level and duration of the final vacuum must ensure that dripping is minimized when the charge is pulled from the cylinder. • Note that CSA 080 specifies that the final vacuum cannot be less than 22" Hg. • An effective final vacuum is extremely important in attaining preservative stabilization.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS**		
18. Are safeguards in place to disallow retort opening when liquid or pressure remains?	General Table 12	• Retorts must be equipped with an effective protection device to prevent doors being inadvertently opened, when retort is pressurized, filled or partially filled with preservative. The device must be effective against vandalism or sabotage. • Examples include liquid sensors, pressure switches and laser “eye” controls. • Bolted doors could be protected by interlocking the protection device to impact wrench compressors.
19. Are goggles and other appropriate safety equipment worn by operators opening retort doors?	General Table 12	• Operators must wear full PPE when opening cylinder doors and removing and unloading charges. Full PPE includes, rain suit, rubber boots, impermeable gauntlets, face shield or goggles and respirator, if emissions are unknown or above the TLV. • Hydraulic door controls must be located or shielded so that the operator is not directly exposed to liquid and/or vapour releases from the cylinder.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
20. Are impermeable gauntlets worn on handling freshly treated wood?	General Table 12	• Impermeable gauntlets must be worn for handling freshly treated wood and for all activities in the treating plant where protection is required. Leather gloves and impermeable gloves with permeable cuffs must not be worn. • The TRD also recommends the use of an impermeable apron and boots.
21. Are instructions in place and followed to avoid exposure to ammonia and amine vapours/mists?	ACQ Table 18 ACQ Table 27	• Avoid breathing preservative mists. Operators must stay upwind of freshly treated charges and an approved respirator must be worn if airborne concentrations are unknown, or at/above the TLV.
22. Are charges allowed to essentially drip dry before they are pulled from the retort?	General Table 12	• Lumber components, timbers, plywood, shingles and shakes must be stickered and stacked on an angle to maximize the rate of preservative drainage.. • The level and duration of the final vacuum must ensure that dripping is minimized when the charge is pulled from the cylinder. • Note that CSA 080 specifies that the final vacuum cannot be less than 22" Hg.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
23. Are personnel trained in safety procedures for vessel entry?	General Table 12	• Treating plant personnel must be trained in confined space entry procedures as defined in WCB and provincial labour regulations. • If personnel are not trained, an approved contractor must be hired for this activity. • Note that this guideline also applies to tram jams in the cylinder. • There are several safety procedures for vessel entry, including self contained breathing apparatus (SCBA) or oxygen sensors.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 FIXATION/STABILIZATION**		
24. Is best available practice applied to ensure optimum fixation/stabilization (heated vacuum, air exchange) and held for 48hrs?	ACQ Table 23	• The preservative fixation/stabilization is a function of time and temperature. Accelerated processes utilize extended vacuums or vacuums at elevated temperature. Chemical suppliers are still experimenting with various procedures. As for now, a minimum storage period of 48 hours for treated wood removed from the cylinder is to be applied. This storage must be in a roofed and contained area.
25. Is wood released to an unprotected area only after optimum fixation/stabilization has been achieved?	ACQ Table 23	• Wood must be held in a contained and roofed area for a minimum of 48 hours after removal from the cylinder before it may be placed into unprotected yard storage or shipped.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 EQUIPMENT MAINTENANCE**		
26. Is all equipment in good operating condition?	General Table 13	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all equipment and ensures immediate attention to any problems. • Records of daily inspections must be maintained and monitored to identify the need for special attention to persistent problems.
27. Are NFCC maintenance recommendations adhered to?	General Table 13	• All maintenance practices must be in accordance with Sections 2.5, 3.3, 4.4.11 and 6.0 of the National Fire Code of Canada
28. Do written maintenance instructions exist?	General Table 13	• The Preventive Maintenance Program must contain written, plant specific instructions for all equipment.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 EQUIPMENT MAINTENANCE**		
29. Are all necessary precautions taken when contaminated equipment is welded?	General Table 13 ACQ Table 28	• The precautions that must be taken include: o Obtaining a Hot Work permit from the Supervisor responsible. o Blocking or disconnecting lines from tanks. o Draining and rinsing tanks and lines. o Ensuring that surfaces are free from cleaning solvent residues. o Wearing an approved respirator. o Providing good ventilation in the work area. o Containing all sparks and removing flammable materials. o Complying with all additional provincial workplace safety rules.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.6 CLEAN-OUT**		
30. Are written safety procedures in place?	General Table 13 General Table 1	• Safety procedures for clean-out must be included in the Plant Operations Manual and must address the details contained in Tables I and 13 of the General section of the TRD.
31. Are drip pads clean (what is the frequency of cleaning)?	General Table 13	• Drip pads must be kept clean and free from liquids and residues. • Drip pads must be cleaned daily. • The volume and dispersion of wash water must be kept to a minimum.
32. Is wash water recycled?	General Table 13 General Table 4	• All wash water must be collected, contained and filtered before being recycled to the treating process.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION**		
1. Is wood properly seasoned prior to treatment?	General Table 17	• Every effort must be made to season wood properly. • A moisture content above the fibre saturation point (~25% dry wt.) will promote sludge formation.
2. Are trams and wood load free of debris, soil on charging?	General Table 17	• Trams and charges must be inspected before loading the cylinder and cleaned where necessary.
3. Is the treatment solution clean and are the components balanced?	General Table 17	• An unfiltered sample of working solution must be perfectly clear and treated product surfaces must be free from residues. • The solution component balance of a filtered sample of working solution must conform to the minimum levels specified in CSA-080. • The component balance must be checked at least weekly.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION CONT'D**		
4. Are close controls exercised on treatment parameters (are limits not exceeded)?	General Table 17	• Treatment systems must have the control instrumentation necessary to maintain pressure, temperature and vacuum within specified limits in accordance with CSA 080-M3, Clause 3.0. • Manual control without instrumentation does not allow close monitoring.
5. Are drips, leaks and washdowns reused in process?	General Table 13	• All drips, leaks and wash water must be collected, contained and filtered before being recycled to the treating process. • Collection sumps must be kept clean and free from debris.
6. Are storm run-offs collected and reused in process?	General Table 9	• Storm water run-off from paved yards shown to contain levels of ACQ in excess of regulatory limits must be collected, contained, filtered and re-used in the process. • In the case of unpaved yards, soil and groundwater samples must be taken to determine the environmental impact of storm water. • If contamination is present above regulatory levels, site remediation followed by paving may be necessary.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE**		
7. Are personnel trained in hazards and handling methods?	General Table 17	• Training in all aspects of waste handling and disposal must be provided and updated, at least annually. • Training programs must be plant specific and must address all aspects of provincial regulation related to waste handling. • Individual employee training must be documented.
8. Are wastes and sludges stored in sealed drums?	General Table 17	• Dewatering and/or drying of wastes and sludges must take place in an enclosed area, which is ventilated, roofed and contained. • Appropriate signs must be posted and operators must wear the correct PPE, when processing wastes and sludges. • When wastes and sludges are ready for shipment, they must be in sealed containers, which must conform to Transportation of Dangerous Goods (TDG) regulations. • The storage and handling of wastes and sludges must conform to provincial regulations.
9. Is waste storage area roofed, enclosed and on a paved surface?	General Table 17	• The waste dewatering, drying and storage areas must be roofed, enclosed, contained, well ventilated and separate from the normal work areas.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
10. Are all drums labeled by contents?	General Table 17	• Drum and container labels must conform to TDG regulations.
11. Are records kept of inventory for solid wastes and sludges stored on site?	General Table 17	• An up to date inventory of containers, including their volumes and contents must be maintained. • Regulations in some Provinces require accurate inventories of wastes.
12. Are disposal activities reported as per regulations?	General Table 17	• Disposal activities must be reported by the plant or by the disposal contractor, in accordance with TDG regulations. • The plant must maintain disposal records as per TDG regulations.
13. Has the waste been classified under TDGA?	General Table 17	• The waste has already been classified under the TDG Act. • Labels must show the correct classification, which is Section 6.1 and 9.2 of the TDG regulations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING**		
1. Does a specific site monitoring plan exist?	General Table 14	• A site specific monitoring plan must be prepared by a qualified environmental consultant. The plan must be designed to address provincial standards for soil, groundwater and stormwater run-off, if applicable. If there are no provincial standards, the plant must develop site specific standards in consultation with provincial environmental authorities. The plan must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices.
2. Are reporting requirements clearly defined?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective management of the chemicals used.
3. Do monitoring areas include all areas: • Where preservative chemicals are stored, processed and handled? • All treated wood storage areas? • Drainage ditches and areas exposed to run-off?	General Table 14	• A risk evaluation study must be completed to determine the monitoring methodology required for soil, groundwater and stormwater in the specified areas.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
4. Are sampling frequency and constituents defined?	General Table 14	• The site monitoring plan must define sampling frequency, as per the risk evaluation study and/or the reporting requirements. • All preservative constituents must be monitored and checked against the applicable regulatory limits. • If there are no regulatory limits, the plant shall develop site specific limits in conjunction with provincial environmental authorities.
5. Is a program in place to monitor adjacent waterbodies?	General Table 14	• The risk evaluation study in Section 11.1.3 must also address the need to monitor adjacent water bodies, based on an evaluation of site characteristics and plant operations.
6. Is a program in place to monitor groundwater or on-site wells?	General Table 14	• The TRD states: "consider implementing a groundwater monitoring program using permanent monitoring points…". • Exceptions to this consideration would be plants located on sites for which such a program would not be effective. • Any exceptions must be determined by the risk evaluation study in Section 11.1.3, based on a detailed evaluation of site characteristics and plant operations.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
7. Are all air emission sources defined?	General Table 14	• The peak and average levels of all preservative constituents (ammonia, ethanolamine, Cu, DDAC/ABD) in air, for significant points of emission, must be determined. • Significant points of emission include, cylinder door openings, stabilization areas, vent stacks, receiving areas for vents, enclosed plant areas and freshly treated wood storage areas. • The assessment must be updated if there are any changes in plant design and/or operating practices.
8. Are air emissions monitored as per permits?	General Table 14	• The regulations and reporting requirements, which apply to the plant must be determined and defined in the site monitoring plan. • If permits apply, air emissions must be monitored accordingly. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective control of all air emissions • Monitoring must determine all preservative constituents in air emissions.
9. Are all liquid waste discharges identified (volumes, contamination levels)?	General Table 14	• Liquid waste discharges include storm water run-off. • The concentrations and total mass emission rates for all preservative constituents in discharges and run-off must be determined by a qualified consultant, as part of the overall site monitoring program defined in Section 11.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
10. Are all liquid waste discharges monitored as per permits?	General Table 14	• If permits apply, discharges and run-off must be monitored accordingly. • Monitoring must determine the concentrations of all preservative constituents in discharges and run-off. • If permits do not apply, the plant shall develop site specific monitoring protocol and waste discharge limits in consultation with provincial environmental authorities.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING**		
11. Does a facility specific monitoring plan exist?	General Table 15	• A site specific workplace monitoring plan and program shall be prepared by a qualified industrial hygienist. • The plan and program must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices. • The plan shall address the requirements defined in Sections 11.1.7 and 11.1.8.
12. Are reporting requirements clearly defined?	General Table 15	• The regulations and reporting requirements which apply to the plant must be determined and defined in the workplace monitoring plan.
13. Are sources of skin exposure identified periodically?	General Table 15	• Existing and potential sources of skin exposure shall be identified by monthly inspections of all operating areas of the plant, from chemical receiving to shipment of treated products. • Skin exposure hazards shall be a topic for discussion at all safety committee meetings. • Safe working practices, training programs and PPE requirements must be modified when new sources of skin exposure are identified.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
14. Is a monitoring program defined: • Sampling techniques? • Frequency? • Items sampled for?	General Table 15	• The workplace monitoring plan and program defined in Sections 11.2.11 and 11.2.12 above must define the sampling techniques and sampling frequency required for all preservative constituents and other toxic chemicals used by the plant. • The requirements defined in Sections 11.1.7 and 11.1.8 also apply.
15. Are peak levels of preservative exposure from air known for all significant points of worker exposure (cylinder doors, kiln interiors, exhaust vents, enclosed preservative process areas, freshly treated charges)?	General Table 15	• Peak levels of exposure shall be determined as per the requirements defined in Sections 11.1.7 and 11.1.8 above.
16. Are pre-employment medical exams carried out?	General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed by an occupational physician to verify that they are not medically sensitive to any of the chemicals used at the plant. Provided new employees are not exposed to chemicals, their pre-employment medicals may follow completion of their probationary period.

ACQ FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
17. Does a plan exist for follow-up medicals?	General Table 15	• The plant must prepare a plan, in consultation with an occupational physician, which defines: o Jobs for which pre-employment and annual or more frequent medical examinations are mandatory, based on the degree of exposure to specific chemicals. o The person responsible for scheduling medical appointments o Responsibility for record keeping. o Responsibility for follow-up with physician and employee.
18. Are follow-up medicals and biological monitoring (e.g. urine) carried out?	General Table 15	• As specified in the plan outlined in Section 11.2.17, designated employees must be periodically examined by an occupational physician to assess the effects of exposure to the chemicals in use at the plant. • As a result, medical examinations may include x-rays, nasal and skin evaluation, and urine and blood testing. • Medical examinations must address all preservative constituents and other toxic chemicals.

PENTACHLOROPHENOL THERMAL (PCPT) FACILITY TECHNICAL GUIDELINES

2004

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.1 ACCESS/SECURITY**		
1. Is off-loading area located away from high yard traffic routes?	General Table 3 PCPT Table 4	• Ideally, off-loading areas for oil and solid PCP should be located away from any traffic. If relocation is impractical, traffic must be controlled by DANGER signs, barriers and constant supervision during unloading operations.
2. Is vehicle access restricted during delivery?	General Table 3 PCPT Table 4	• All vehicles, including contractors' trucks and visitors' vehicles must be restricted from the off-loading area by DANGER signs, barriers and constant supervision during unloading operations.
3. Are there locking valves on liquid delivery lines?	General Table 3 PCPT Table 4	• Oil delivery lines must be securely locked when not in use.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT FOR OIL DELIVERY**		
4. Is an unloading pad and catchment sump used?	General Table 3 PCPT Table 4	• An impervious pad must be provided, large enough in area to hold the full length of the truck or tank car. • The pad must be constructed so that any spill will be diverted to a leak-proof sump and/or containment, large enough to handle the entire volume of oil contained in the truck or tank car.
5. Are impervious construction materials used?	General Table 3 PCPT Table 4	• The unloading pad and sump surfaces must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cms/sec, or, less, under a hydraulic head of 3m and be resistant to oil. • Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior relevant experience.
6. Are liquid-tight joints sealed with chemical resistant material?	General Table 3 PCPT Table 4	• All joints in the pad must be sealed with oil resistant caulking that complies with Section 1.2.9 • If it is not known whether liquid-tight sump construction methods have been used, such as water-stop inserts, all sump joints must be sealed with chemically resistant caulking that complies with the requirements defined in Section 1.2.9.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.2 CONTAINMENT FOR OIL DELIVERY CONT'D**		
7. Are pads designed to contain large (tanker) spills or does diversion to contained area exist?	General Table 3 PCPY Table 4	• The unloading pad must be constructed so that it will allow containment of the entire volume of oil in the truck or tank car.
8. Are pads and sumps free of settling and cracks?	General Table 3	• Pads and sumps must be designed to prevent settling and/or cracking. • Any visibly open cracks must be repaired with oil resistant caulking, using procedures that will ensure a liquid-tight seal. Evident or suspected settling must be evaluated by a certified engineer to determine the structural integrity of the pad and/or sump.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
9. Are pads and sumps lined?	General Table 3	• Secondary containment for this area is good practice and is required by some Provinces. • Secondary containment may be achieved by installing a subsurface membrane liner or by applying an impervious coating to the pad and sump surfaces. • Surface sealers, surface coatings, joint and crack sealants must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cms/sec, or less, under a hydraulic head of 3m. In addition they must be resistant to the chemicals in use at the plant and must have the physical properties (compressive, tensile and flexural strength), the abrasion and wear resistance and the lifetime requirements, suitable for the intended application. The performance requirements for sealers and coatings will vary in different areas of the plant. For example, the drip pad represents the most severe application, due to constant exposure to chemical solutions, vehicle traffic and cleaning processes, while cylinder and tank farm containment areas, with occasional chemical exposure and foot traffic, represent a less stringent application. Sealers, coatings and sealants and their application technology must be determined in consultation with a manufacturer with experience in the field. A list of experienced manufacturers of sealers, coatings and sealants may be obtained from the chemical supplier. • See Introduction for further information.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.3 CONTAINMENT FOR SOLID PCP DELIVERY**		
10. Is unloading pad paved and with curbs?	PCPT Table 4	• Unless PCP is delivered in lined, sealed, steel drums or double wrapped block packages, (e.g., with a fabric outer wrapping that totally encloses the package), a paved, curbed and roofed pad must be provided.
11. Is the pad drained to a containment?	Table 4	• If a pad is required, it must be contained or be drained to a containment.
12. Is the pad roofed?	PCPT Table 4	• See 1.3.10 above.
13. Is a vacuum cleaner available?	PCPT Table 4	• A vacuum cleaner with a filtered exhaust must be readily available for unloading, storage and mixing operations.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.4 DELIVERY/TRANSFER EQUIPMENT**		
14. Is all equipment/piping in accordance with NFCC?	PCPT Table 4	• Equipment and piping must be installed in accordance with the National Fire Code of Canada (NFCC) Section 4.4 and 4.6. • Facilities must be available to allow unloading procedures as per Section 4.11 of the NFCC.
15. Is all transfer equipment in a contained area?	General Table 3 PCPT Table 4	• PCP block packages and steel drums containing PCP must be securely sealed during transport to the mixing operation. Bags and drums manufactured from easily damaged materials such as paper, plastic and cardboard must not be transported over unpaved ground unless they are placed in a contained carrier. For oil transfer, the vehicle, piping, valves and transfer pumps must be contained.
16. Are pipes and valves clearly identified?	General Table 3 PCPT Table 4	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves and caplocks must be clearly labeled. Identification must be in accordance with NFCC Section 4.4.4.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.4 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
17. Are delivery lines rigid, accessible and visible?	General Table 3	• There must be easy access to allow inspection, leak detection and maintenance of delivery lines. • Flexible hoses connecting rail cars and trucks to tank piping must be shielded. All other piping must be rigid, permanent and of appropriate material and schedule with the required compatibility. • New and replacement piping must not be buried. Any existing buried piping must have secondary containment with provision for leak detection designed by a qualified engineer.
18. Is piping protected from mechanical damage?	General Table 3 PCPT Table 4	• All piping must be protected to prevent damage by any means, such as the oil delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
19. Are hose and pipe connections designed to be secure?	General Table 3	• All hose and pipe connections must be leak tight. • Connections shall be located and constructed as per NFCC 4.3.6.4.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.4 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
20. Are pipes connected for top delivery to tanks?	General Table 3	• Different approaches may be used, including bottom delivery, top delivery, or top delivery into a drop tube that extends to the bottom of the tank. Systems with bottom delivery must have a double system of back flow preventors, approved by a qualified engineer. • The piping at the connection point between the storage tank system and the delivery vehicle shall be configured to prevent spillage when lines are disconnected.
21. Are back-flow preventors installed on delivery lines?	General Table 3	• Ensure back-flow of oil cannot occur under any circumstances or install a reliable back-flow preventor. • NFCC 4.6.4.3 requires that systems through which tank cars or tank vehicles discharge into above ground storage tanks, by means of pumps, shall be provided with check valves at appropriate locations in the system.
22. Is the delivery system totally visible from the point of off-loading to tankage?	General Table3	• "Totally visible" means from the truck controls to the oil storage tank.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.4 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
23. If visibility is limited, are audible alarms installed on tanks to detect overflow?	General Table 3	• Alarms must be audible at the locations where personnel are constantly on duty during the transfer operation and must promptly stop or divert the flow. (CCME-EPC-LST-71E) • Alarm function must be tested weekly and prior to delivery of oil. • Alarm tests must be recorded and kept on file.
24. Is spill response equipment, absorbents and personnel protection equipment available and readily accessible?	General Table 3 PCPT Table 3	• Personal protection equipment must comply with TRD Reference PCPT, Table 3. • Spill response equipment must be site specific and must be in accordance with the preservative supplier's recommendations. • Equipment inventory must be checked weekly and logged and must be complete at all times • Location of equipment storage must allow prompt response to emergency situations.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **1.CHEMICAL RECEIVING AND UNLOADING AREA** **1.4 DELIVERY/TRANSFER EQUIPMENT CONT'D**		
25. Is the off-loading area equipped with a phone or a manual alarm switch?	General Table 3	• There must be a manual alarm in the off-loading area that is audible throughout the plant. • The alarm function must be tested weekly and prior to the delivery of chemicals. Alarm tests must be recorded and filed. • A phone and/or 2-way radio is also required to arrange any assistance that may be required.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY**		
1. Is there 24-hour security?	General Table 4 PCPT Table 5	• Systems and procedures must be in place to prevent unauthorized access to the chemical storage area on a 24 hour basis. • Examples include, a restricted area policy, locked buildings with security monitoring alarms, locked buildings with security patrols, fencing of the storage areas as per NFCC 3.3.2.6 or fencing of a larger area that includes the storage area.
2. Are tank drain valves locked?	General Table 4 PCPT Table 5	• Any valve that could cause the release of chemical, as a result of unauthorized use, must be locked. • Examples include, sampling valves, drain valves and unloading and loading line valves.
3. Are tanks protected from mechanical impact?	General Table 4 PCPT Table 5	• All tanks must be protected to prevent damage by any means, such as the oil or PCP delivery truck, plant mobile equipment, wood piles, stored equipment, etc. • Tanks installed close to external walls that could be breached by mobile equipment and/or truck accidents require special attention.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.1 ACCESS/SECURITY CONT'D**		
4. Are PCP blocks/bags stored in a locked area?	PCPT Table 5	• PCP must be stored in sealed bags, drums or wrapped block packages inside a ventilated building which is locked at all times.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE**		
5. Are tanks in sound physical condition, with no rust or damage?	General Table 4 PCPT Table 5	• All tanks must comply with NFCC Section 4.3 and "Technical Guidelines for Above Ground Storage Tank Systems Containing Petroleum Products," Canada Gazette, Part 1, August 17, 1996 • CCME-EPC-LST-61E requires daily inspections plus a thorough annual inspection. • API 653 requires ultrasonic thickness testing at 5 year intervals and internal inspections at intervals not exceeding 20 years. • Inspections and tests must be recorded and kept on file.
6. Are underground tanks leak tested at least annually?	General Table 4 General Table 11	• It should be noted that leak testing will not prevent chemical release as leaks of .0.5 gals/hour and less cannot be detected. • Underground tanks should be removed and replaced with above ground tanks and must not be used in new construction. • If removal and replacement is impractical for an existing tank, it must have a leak detection system designed by a certified engineer. • All underground tanks must be tested annually and certified as suitable for the intended use, by an accredited testing company or agency. Tanks must conform to CCME, EPC-LST-61E, March 1993. • Inspections and tests must be recorded and kept on file.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
7. Are aboveground tanks mounted on containment pad surfaces?	General Table 4	• Tanks should be installed as per Section 4.3 of the NFCC and Section 3.5 of CCME-EPC-LST-71E. Existing tanks should be arranged as per Section 4.3 of the NFCC and Part 4 of CCME-EPC-LST-71E. • Tank bases must not be embedded in, or be encased by concrete. • Preferably, vertical tanks should be mounted on raised supports on containment pad surfaces. • If tanks must be in contact with pad surfaces, a monthly assessment of external corrosion must be carried out, with ultrasonic testing every 5 years. • The tank containment floor must be kept clean and dry, to allow immediate detection of leaks. • Inspections and tests must be recorded and kept on file.
8. Are tanks mounted in stable positions and anchored securely?	General Table 4	• Tanks must be mounted in stable positions and must be anchored if flooding of the containment by storm water or a spill would exert uplift forces. (NFCC Section 4.3.3)

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
9. Are tanks located in dyked area?	General Table 4	• All chemical storage tanks must be installed in a dyked containment. • In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
10. Are all interior tanks vented outside (or into recovery system)?	PCPT Table 5 General Table 4	• Tanks must be provided with vent piping for vapour control, as per NFCC Section 4.3. • Interior tanks must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Tanks must not vent directly into the workplace.
11. Are all insulated tanks provided with inspection points?	General Table 4	• Preferably, tanks should be raised on supports to allow leaks to be readily detected. • Whether tanks are raised or not, the tank farm floor must be kept clean and dry to allow immediate leak detection. • The lower 6" of insulated tanks must not be insulated to allow leaks to be readily detected or tanks must have inspection points.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.2 TANKAGE CONT'D**		
12. Are tanks vent controlled?	General Table 4 PCPT Table 5	• Tanks must be provided with vent piping for vapour control, as per NFCC Section 4.3. • Vents must be protected against release of entrained liquids or overflow. • Tanks must not vent directly into the workplace.
13. Are tanks equipped with electric bonding?	PCPT Table 5	• Electric bonding/grounding must be provided on all tanks in accordance with NFCC, Sections 4.3.12.10,4.6.4.5 and 4.11.3.2. • Bonding systems must be checked for electrical continuity on a monthly basis.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT**		
14. Is piping rigid and permanent throughout the operation?	General Table 4 PCPT Table 5	• With the exception of the connection between the delivery vehicle and the storage tank, all piping must be rigid, permanent and of the appropriate material and schedule and must conform to NFCC Section 4.4.
15. Is piping visible and accessible with a simple layout?	General Table 4 PCPT Table 5	• Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
16. Is piping above ground?	General Table 4 PCPT Table 5	• All piping must be visible and readily accessible for leak detection and maintenance. • Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or piping must be brought above ground. • Underground piping is not allowed in new construction. • If there is no alternative to underground piping in existing construction, it must be installed in appropriate containment with provision for leak detection designed by a qualified engineer. • Sub-grade piping must meet the requirements in Section 3.9 of CCME-EPC-LST-71E.
17. Is containment provided for sub-grade piping?	General Table 4 PCPT Table 5	• Visible sub-grade piping must be contained in a leak-proof channel, which must be kept clean and dry to allow leaks to be readily detected or piping must be brought above ground. • Underground piping must be installed in appropriate containment with provision for leak detection as per Section 3.9 of CCME-EPC-LST-71E.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
18. Are piping and fixtures chemically compatible?	General Table 4 PCPT Table 5	• Piping and fixtures must be compatible with PCP/oil solutions. • Any questions and/or uncertainties must be resolved with the chemical supplier.
19. Are valves identified by labeling or colour-coding?	General Table 4 PCPT Table 5	• Valves must be labeled or colour-coded. • The label or colour-code must identify the valve function in accordance with the piping schematic in 2.3.15. • Colour-coding must meet the requirements of NFCC Section 4.4.2.
20. Are valves and pipes protected from impact?	General Table 4	• All valves and piping must be protected to prevent damage by any means, such as the oil or PCP delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.
21. Are lines protected from freezing (where applicable)?	General Table 4	• Heating may be used to enhance the transfer of solutions and if used, must be in accordance with Section 4.4.9 of the NFCC.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
22. Do valves have local drip/spill catch trays?	General Table 4	• Valves must be installed properly and maintained regularly to prevent leakage. • The tank farm floor must be kept clean and dry to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid must be cleaned out.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
23. Do pumps have local drip/spill catch trays?	General Table 4	• All pumps handling oil or PCP/oil solutions must have self-contained spill trays large enough to prevent contamination of the containment area. • There must be no free oil or solution on the containment floor. • Spill trays must be inspected daily and any free liquid must be cleaned out.
24. Is piping system designed to protect against inadvertent transfers?	General Table 4	• Pipes and valves must be clearly identified and operating instructions explicitly defined. • Manual systems must not be operated by untrained personnel. • Where there is common piping in multi-preservative plants, blocking systems must be in place to prevent inadvertent transfer of solutions.
25. Are reliable, accurate level indicators installed?	General Table 4	• All level indicators must be checked regularly and calibrated every 6 months, where appropriate. • Calibration records must be kept on file.
26. Is mechanical impact protection functional on sight glasses?	General Table 4	• Protection system must prevent sight glasses from being damaged or accidentally disconnected.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
27. Are shut-off valves functional on all rupturable lines and gauges?	General Table 4	• Any line or gauge that can be easily damaged or accidentally disconnected must be fitted with an automatic shut-off valve. • Examples include sight glasses, instrument tubing, etc. • Vulnerable sampling valves on tanks must be physically protected.
28. Is overflow piping provided from tanks to containment?	General Table 4	• Preferred design is to connect all tanks to a dedicated PCP/oil overflow tank; otherwise, overflow piping must extend to a contained sump with provision for recycling to a storage tank. • Overflow tanks and pipes must be vented to the exterior with provision to prevent the release of entrained liquids or overflow. • Open manholes on tanks are not permitted.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
29. Are independent high-level alarms installed on tanks?	General Table 4 PCPT Table 5	• All tanks must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly. Alarm tests must be recorded and kept on file.
30. Are high-level alarms interlocked to the pump auto-shut off?	General Table 4	• Alarms must immediately prevent any increase in the solution level in the tank, either by shutting off the pump or by closing the appropriate valve.
31. Is there a 24-hr. monitoring alarm?	General Table 4	• The containment must be protected by a system, which is able to detect a chemical release in the tank farm and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly. Alarm tests must be recorded and kept on file.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.3 TRANSFER EQUIPMENT CONT'D**		
32. Are there manual alarm buttons at potential major spill points?	General Table 4	• The chemical receiving, storage and treating cylinder areas must be adequately protected by manual alarms. • The function of all alarms must be tested weekly. Tests must be recorded and kept on file.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT**		
33. Are containment floors, dykes and joints structurally sound?	General Table 4 PCPT Table 5	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer.
34. Are containment surfaces and joints sealed?	General Table 4 PCPT Table 5	• Tank farm containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
35. Is a secondary containment barrier built into the containment area? (e.g. impermeable top coat or liner under the containment area).	General Table 4	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. The membrane liner must be resistant to PCP/oil solutions. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath tanks, together with a leak detection system, as per 2.4.36. • The coating must comply with the requirements defined in Section 1.2.9.
36. Is subsurface leak detection provided?	General Table 4	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. • Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
37. Is the spill containment volume in compliance with NFCC?	General Table 4 PCPT Table 5	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
38. Are there provisions to direct, collect and transfer spills, washdown liquids, and infiltrating water to tankage?	General Table 4	• Provisions must ensure the immediate transfer of all liquids to the appropriate tank. There must be no free-standing PCP/oil solution or effluent, anywhere in the plant. • Centrifugal pumps must not be used to transfer oil-contaminated water to minimize emulsion formation as per Section 3.12 of CCME-EPC-LST-71E.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
39. Is local collection/containment of incidental drips in place (pumps, valves etc.)?	General Table 4	• The tank farm floor must be kept clean and dry to prevent tracking and air contamination and to allow immediate detection of valve leaks during daily inspections. • If persistent valve leakage cannot be prevented, drip collection containers must be in place under valves. Containers are also required under any unprotected valves outside the containment area. • Containers must be inspected daily and any free liquid must be cleaned out. • All pumps handling oil or PCP/oil solutions must have self-contained spill trays large enough to prevent contamination of the containment area. • Spill trays must be inspected daily and any free liquid must be cleaned out.
40. Is containment area designed to minimize tracking of liquids and contaminated dust?	General Table 4	• The containment area must be kept free from preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by authorized personnel, as designated by the Plant Manager. • Walkways, boot-changing facilities etc. must be provided to prevent dirt and dust being tracked to and from the plant.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.4 CONTAINMENT CONT'D**		
41. Are PCP blocks/bags stored in a secure, enclosed, roofed and paved area?	PCPT Table 5	• PCP must be stored in sealed bags, drums or block packages inside a secure, enclosed, roofed, ventilated, non-combustible building or other structure, which is locked at all times. The building or structure must have an impervious floor.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.5 PENTACHLOROPHENOL STORAGE**		
42. Is storage area close to the delivery and mixing area?	PCPT Table 5	• The PCP storage area must be as close as possible to the delivery and mixing areas. • PCP block packages and steel drums containing PCP must be securely sealed during transport to the mixing operation. Bags and drums manufactured from easily damaged materials such as paper, plastic and cardboard must not be transported over unpaved ground, unless they are placed in a contained carrier. For oil transfer, the vehicle, piping, valves and transfer pumps must be contained.
43. Is storage segregated from other chemicals?	PCPT Table 5	• PCP storage must be segregated from other chemicals. PCP must be stored as per Section 2.4.41. PCP storage building or structure must be constructed from non-combustible materials.
44. Does ventilation exist for routine and emergency situations?	PCPT Table 5	• The PCP storage building or structure must have a ventilation system which maintains the PCP in the air below the TLV-TWA values published by the American Conference of Governmental Industrial Hygienists (ACGIH).

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.5 PENTACHLOROPHENOL STORAGE CONT'D**		
45. Is storage pad paved, dyked and without a drain?	PCPT Table 5	• The PCP storage building or structure must have an impervious paved floor, which is curbed or dyked and has no floor drains. • To ensure that it is impervious, a paved floor must have a coating or sealer which meets the performance requirements defined in Section 1.2.9.
46. Is a vacuum cleaner system (with filtered exhaust) in place?	PCPT Table 5	• A vacuum cleaner with a filtered exhaust must be readily available for unloading, storage and mixing operations.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.6 BULK SLUDGES**		
47. Is storage in exterior or well ventilated area?	PCPT Table 5	• Bulk sludges must be stored in an exterior or well-ventilated location. • Interior storage must be ventilated as per Section 2.5.44. • Note that provincial regulations may mandate requirements for waste storage areas, including ventilation, containment, security, signing, etc.
48. Are sludges stored in closed and sound tanks/drums?	PCPT Table 5	• Bulk sludges must be stored in closed tanks or sealed drums in sound condition.
49. Are storage tanks/drums in a contained area with impermeable floors?	PCPT Table 5	• Interior and exterior bulk sludge storage must be in a contained area with an impermeable floor, which can be readily cleaned.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **2. CHEMICAL STORAGE AREA** **2.6 BULK SLUDGES CONT'D**		
50. Is containment adequately sized?	PCPT Table 5	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
51. Are all drains blocked and containment sized to accommodate infiltrate?	PCPT Table 5	• Preferably, the containment should have no drains, otherwise all drains must be blocked. • If storm water cannot be collected and treated to the applicable limits, prior to discharge, the sludge containment area must be roofed.
52. Is storage area secure?	PCPT Table 5	• Interior and exterior sludge storage areas must be secure against unauthorized access.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS**		
1. Is transfer equipment (pumps) in a contained, enclosed, heated area?	General Table 5 PCPT Table 6	• The containment for transfer equipment must be as defined in Section 2.4, Criteria 33 – 40 inclusive. The area must be maintained at a suitable temperature to allow correct equipment operation.
2. Is permanent, closed transfer system used?	General Table 5 PCPT Table 6	• If mixing vessel cannot be closed, precautions must be taken to protect workers from exposure to splashes and PCP emissions.
3. Is a high level alarm installed to prevent mix tank overflow?	General Table 5	• The mix tank must have a high-level alarm. • The alarm must be audible throughout the plant. • The alarm must trigger visible identification of a specific high-level emergency in the mixing vessel. • The alarm must be tested weekly. Tests must be recorded and kept on file.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.1 TANKAGE/MIXING VESSELS CONT'D**		
4. Are high-level alarms linked to feed pump shut off?	General Table 5	• Alarms must immediately prevent any increase in the solution level in the mixing tank, either by shutting off the mix pump or by closing the appropriate valve.
5. In case of any open transfer operations, is reliable splash protection in place?	General Table 5 PCPT Table 6	• If mixing vessel cannot be closed, precautions must be taken to protect workers from exposure to splashes and PCP emissions.
6. Is transfer equipment mechanized (minimum of worker contact/spill potential)?	General Table 5 PCPT Table 6	• Equipment and practices for handling bulk PCP must prevent worker contact with the chemical and minimize spill potential.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT**		
7. Are containment floors, dykes and joints structurally sound?	General Table 5 PCPT Table 6	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer with prior relevant experience.
8. Are containment surfaces and joints sealed?	General Table 5 PCPT Table 6	• Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing. • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.
9. Is a secondary containment barrier built into a tank containment area?	General Table 5	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the mix tanks, together with a leak detection system as per 2.4.36. • The coating must comply with the requirements defined in Section 1.2.9.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
10. Is subsurface leak detection provided?	General Table 5	• A subsurface leak detection designed by a qualified hydrogeologist must be provided. • For a new plant or for an addition to an existing plant, preference should be given to a double liner system provided with leak detection, containment and collection. • For an existing plant, monitoring wells and sampling protocol must be designed and installed by a qualified hydrogeologist. • Existing monitoring wells and sampling protocol must be evaluated by a qualified hydrogeologist to determine their effectiveness as a leak detection system.
11. Is there a subsurface leak containment and collection system?	General Table 5	• For an existing plant, if the monitoring well system detects a leak, a recovery well system must be designed and installed by a qualified hydrogeologist, to ensure containment and collection. • The double liner system described in Section 3.2.9 above is the preferred approach for new plants or additions to existing plants.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
12. Is the spill containment volume in accordance with NFCC?	General Table 5 PCPT Table 6	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.
13. Is mix tank covered to prevent infiltrating precipitation?	General Table 5 PCPT Table 6	• The preferred location for mix tanks is inside a secure, locked building. • Exterior mix tanks must be roofed if the storm water that enters the tank or the tank containment is not collected, contained and treated prior to controlled discharge, as per applicable regulations. • Mixing in exterior open tanks which cannot be easily roofed, must not take place during precipitation. Any storm water that has accumulated in the tank must be removed prior to mixing PCP.
14. Does containment have alarms to identify spills?	General Table 5 PCPT Table 5	• The containment must be protected by a system, which is able to detect a chemical release and trigger an alarm which is monitored on a 24 hour basis, preferably by an auto-dial security system. • The alarm function must be tested weekly. Tests must be recorded and kept on file.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.2 CONTAINMENT CONT'D**		
15. Is the containment area visible?	General Table 5	• The containment must be well-lit, as per provincial requirements of the Workers' Compensation Board, Ministry of Labour, etc., and must not be used as an equipment storage area.
16. Is accessible storage for spill response equipment, absorbents and personnel protection nearby?	General Table 3 PCPT Table 3	• Personal protection equipment must comply with TRD Reference PCPT, Table 3. • Spill response equipment must be site specific and must be selected in accordance with the preservative supplier's recommendations. • Equipment inventory must be checked weekly and recorded and must be complete at all times. • Location of equipment storage must allow prompt response to emergency situations.
17. Is the mix area adequately ventilated?	PCPT Table 6	• The mix area must be ventilated to maintain the PCP in the air below the TLV-TWA values published by the American Conference of Governmental Industrial Hygienists (ACGIH). • Ventilation must conform to NFCC 4.1.7.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **3. CHEMICAL MIXING SYSTEMS** **3.3 SOLIDS HANDLING**		
18. Is mechanized handling equipment used to minimize worker exposure?	PCPT Table 6	• Equipment and practices for handling bulk PCP must prevent worker contact with the chemical and minimize spill potential.
19. Is the area for removal of wraps/bags paved and sheltered?	PCPT Table 6	• The area where PCP wraps, bags and drums are opened must be paved and roofed and the surface must be easy to clean.
20 Is a vacuum system installed to clean up dust/PCP particles?	PCPT Table 5	• A vacuum cleaner with a filtered exhaust must be readily available for unloading, storage and mixing operations.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION**		
1. Is the treatment tank in the open air and above ground?	PCPT Table 7	• Treatment tanks must be in the open air. The tank containment structure must be above the groundwater level at all times.
2. Are the controls and ancillary equipment in an enclosed structure and protected from freezing?	General Table 6 PCPT Table 7	• The controls and ancillary equipment must be located in an enclosed winterized structure that is maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
3. Are these areas vented outside or to recovery system?	PCPT Table 7	• Any air emissions from the control and ancillary equipment structure must be vented externally in accordance with NFCC requirements for vapour control.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
4. Are the treatment tank and process tanks within a contained area?	PCPT Table 8	• The treatment tank and process tanks must be located in containment areas with continuous, structurally sound concrete floors and dykes. • The details of the containment must be as defined in Section 2.4, Criteria 33-40 inclusive.
5. Does the spill containment capacity comply with NFCC requirements?	General Table 6	• In a single tank installation, the volume of the containment must be 110% of the volume of the tank. • In multiple tank installations, the volume must be 100% of the largest tank plus 10% of the aggregate volume of the remaining tanks or 110% of the volume of the largest tank, whichever is the greater.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
6. Are the floors and dykes reinforced, structurally sound and with sealed joints?	General Table 6 PCPT Table 8	• If containment is cracked or damaged in any way, or if construction details, such as concrete specifications, reinforcement etc., are unknown, then the structural integrity of the containment must be verified by a certified engineer • All joints in the containment must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, joints must be sealed with caulking that complies with Section 1.2.9. • Containment surfaces must be sealed if they cannot be kept clean by normal methods, e.g. vacuuming and/or washing.
7. Are surfaces graded to facilitate drainage?	General Table 6	• Containment floors should be graded to ensure efficient drainage to a collection system. • Free standing liquid is not permitted in the containment area.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
8. Are walkway grates or other designs in place to minimize worker contact and tracking of preservative residues?	General Table 6	• The containment area must be kept free from preservative liquids and residues to prevent tracking and air contamination. • The containment area can be accessed only by those personnel authorized by the Plant Manager. • Walkways, etc. must be provided to prevent dirt and dust being tracked to and from the plant.
9. Does the entire process area have a secondary containment provision (e.g. impermeable top coat on floors and dykes or liner under the containment area)?	General Table 6	• New plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection, if applicable. The liner must be resistant to PCP/oil solutions. • Existing plants without liners must have an impermeable top coat on all containment surfaces, including underneath the tanks. • The coating must comply with the requirements defined in Section 1.2.9.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.1 CONTAINMENT/LOCATION CONT'D**		
10. Is control and transfer equipment isolated to avoid damage from spills?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that a spill equal to the containment volume defined in Section 4.1.5 or flooding will not prevent their operation or create an electrical hazard.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.2 SUMPS**		
11. Are sumps leakproof (impermeable surfaces, sealed joints)?	General Table 7	• Sump surfaces must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cm/sec, or less, and be resistant to PCP/oil solutions. • All joints in the sump must be liquid-tight. • If it is not known whether liquid-tight construction methods have been used, such as water-stop inserts, all sump joints must be sealed with caulking that complies with the requirements defined in Section 1.2.9.
12. Are sumps equipped with a secondary containment (e.g. steel lining)?	General Table 7	• The surfaces of concrete sumps must have an impermeable coating and also be lined with steel or other suitable material. • Impermeable coatings and lining materials must meet a permeability rating of $1x10^{-7}$ cm/sec, or less, under a hydraulic head of 3m and be resistant to PCP/oil solutions.
13. Are sumps protected by independent high-level alarms?	General Table 7	• All sumps must have independent high-level alarms. • Alarms must be audible throughout the plant. • Alarms must also trigger visible identification of the specific high-level emergency. • Alarms must be tested weekly. Tests must be recorded and kept on file.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING TANK**		
14. Is the tank sound (not leaking)?	PCPT Table 12	• The integrity of in-ground thermal tanks must be tested at least every 2 years by an accredited testing agency. • Test results must be documented and kept on file.
15. Is the tank secured to prevent uplifting?	PCPT Table 8	• In-ground thermal tanks must be installed above ground water level and must be secured in the containment to prevent uplifting.
16. Are there independent overflow alarms with automatic feed pump shut-off?	PCPT Table 8	• The tanks must have independent high-level alarms which automatically shut off the fill pumps. The alarms must be audible throughout the plant and must be tested weekly. Tests must be recorded and kept on file.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING TANK CONT'D**		
17. Is there adequate containment for overflows/collection and return provisions?	PCPT Table 8	• There must be adequate containment for the collection and direct return of any overflow from the treatment tanks to the work tanks.
18. Are tank lids used?	PCPT Table 8	• Full-length thermal tanks must have tight-fitting lids to reduce vapour emissions and exclude precipitation. • Where possible, butt tanks should have lids to exclude precipitation when they are not operating.
19. Is the tank under roof?	PCPT Table 8	• Where possible, tanks should be roofed to exclude precipitation. • If roofing is impractical, any storm water that has accumulated in the tank must be removed before commencing the treating process. • Butt tanks must not be operated during precipitation.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.3 TREATING TANK CONT'D**		
20. Are there any means to contain frothing?	PCPT Table 8	• Tanks and treating solutions must be kept free of water to control frothing. Tanks must be operated at a solution level which allows any frothing to be contained in the tank.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS**		
21. Is the operator control area segregated from tanks and spill containment areas?	General Table 6	• To recover any releases that may occur, the control and transfer equipment must be located so that a spill equal to the containment volume defined in 4.1.5 or flooding will not prevent their operation or create an electrical hazard.
22. Is the control area winterized?	General Table 6 PCPT Table 7	• The process control area must be winterized and maintained at a suitable temperature to permit correct equipment operation and process control and proper record keeping.
23. Is the control area well lit and located for maximum visibility of treatment systems?	General Table 6 PCPT Table 7	• All operating and control areas must have proper lighting as per provincial requirements so that all equipment is totally visible at all times. • The location of the control area must allow the best possible visibility of the treatment system, for the operation concerned.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.4 PROCESS CONTROLS CONT'D**		
24. Are process controls simple and properly functioning to provide accurate feedback?	General Table 7	• The process controls must be installed, maintained and calibrated in accordance with CSA 080-M3, Clause 3.0. • Calibration records must be kept on file.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.5 AIR EMISSION CONTROL**		
25. Are pumps, tank or other exhausts vented to outside or to recovery system?	General Table 4 General Table 6	• Pumps, tanks, cylinders and other exhausts must be vented to the exterior and the vents must be designed to prevent the release of entrained liquids or overflow. • Equipment must not vent directly into the workplace. All vents must be provided with vapour control as per NFCC Section 4.3.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM**		
26. Are traps installed on vents (to remove entrained liquids)?	General Table 4 General Table 6	• All vents must have traps to remove entrained liquids as per Section 4.5.25.
27. Is the system designed to effectively contain and recycle all chemicals with minimal potential for releases?	General Table 6 General Table 7	• The system must be able to contain and recycle all chemicals used by the plant. • There must be no routine release of chemicals into the containment from process equipment.
28. Is all transfer equipment in a contained area?	General Table 7	• All piping and pumps must be contained as defined in Section 2.4, Criteria 33-40 inclusive.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **4. TREATMENT PROCESS SYSTEMS** **4.6 PIPING AND RECYCLE SYSTEM CONT'D**		
29. Are pipes and valves clearly identified?	General Table 4	• All piping must be colour-coded and/or clearly labeled. • Flow direction must be shown. • All valves must be clearly labeled to identify their function in accordance with the piping schematic. • Identification must be in accordance with NFCC Section 4.4.4.
30. Are delivery lines rigid, accessible and visible?	General Table 4	• All piping must be rigid, permanent and of the appropriate material and schedule. • Plastic piping or flexible hoses must not be used • Piping design must allow leaks to be readily detected and maintenance to be easily carried out. • A complete and up to date piping schematic must be available.
31. Is piping protected from mechanical damage?	General Table 4	• All piping must be protected to prevent damage by any means, such as the oil or PCP delivery truck, plant mobile equipment, contractors' vehicles, wood piles, stored equipment, etc.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.1 GENERAL DESIGN**		
1. Does the area have efficient drip and run-off collection and containment?	General Table 8	• If the charge is removed from the tank and transferred to a drip pad before it is completely drip-dry, the drip pad must be fully contained with sufficient grade to prevent the retention of any free liquid so that tracking and air contamination is minimized.
2. Is dispersal of liquids from tracking by personnel and vehicles minimized?	General Table 8	• If the charge is removed from the tank and transferred to a drip pad before it is completely drip-dry, the drip pad must be designed to minimize the dispersal of PCP/oil solution by vehicles or foot traffic.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.2 DRIP PROTECTION**		
3. Is the area sufficiently sized to hold all freshly-treated wood until visible dripping has stopped?	General Table 8 PCPP Table 12	• If the charge is removed from the tank and transferred to a drip pad before it is completely drip-dry, the area must be large enough to hold all freshly-treated wood until visible dripping has stopped.
4. Is the area where wood is stored an open structure with proper containment?	General Table 8	• If the charge is removed from the tank and transferred to a drip pad before it is completely drip-dry, the drip pad must have provision for collecting and containing runoff water prior to treatment and controlled discharge.
5. Is the area roofed?	General Table 8	• If the charge is removed from the tank and transferred to a drip pad before it is completely drip-dry, the area must be roofed if storm water and wash down cannot be collected, contained and treated for controlled discharge as per regulatory standards.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **5. PRIMARY WOOD DRIP AREA** **5.3 CONTAINMENT**		
6. Are the unloading areas provided with impermeable floor and curb?	General Table 8 PCPP Table 12	• If the charge is removed from the tank and transferred to a drip pad before it is completely drip-dry, the unloading area floor must meet a hydraulic conductivity or permeability rating of $1x10^{-7}$ cm/sec, or less and be resistant to PCP/oil solutions. • Materials and specifications should be selected in consultation with manufacturers, suppliers and a certified civil/materials engineer with prior relevant experience.
7. Are the floors sloped to facilitate collection of all contaminated liquids?	General Table 8	• If the charge is removed from the tank and transferred to a drip pad before it is completely drip-dry, the drip pad must be fully contained with sufficient grade to direct any free liquid to a collection and recycling system, or to a wastewater treatment system.
8. Are the floors and curbs covered with an impermeable top coat or is a liner installed underneath the entire area?	General Table 8	• If a drip pad is necessary, new plants and modifications or additions to existing plants must have a membrane liner under the containment area, with provision for leak detection, containment and collection. • Existing plants without liners must have an impermeable top coat on all drip pad surfaces, together with a leak detection system, as per Section 2.4.36. • The coating must comply with the requirements defined in Section 1.2.9.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS**		
1. Is the wood completely drip dry prior to placing it in unprotected storage?	General Table 9 PCPT Table 9	• Freshly-treated wood must be drip dry before being placed in unprotected storage. If there is a risk of further dripping or leaching that will cause soil and run-off contamination in excess of applicable standards, the wood must be stored under cover or on a paved surface. If there are no provincial standards for soil and run-off contamination, the soil limits defined in "1997 CCME Soil Quality Guidelines for PCP" and the water quality standards published in: www.elp.gov.bc.ca/epda/contam_sites/guidance/technical/9.html shall apply.
2. Are treated wood packages elevated above ground (placed on stringers)?	General Table 9 PCPT Table 9	• All treated wood packages/bundles must be elevated at least 6" above ground to minimize contamination of soil and surface run-off water.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS** **CONT'D**		
3. Are treated wood storage areas segregated from uncontaminated yard areas?	General Table 9 PCPT Table 9	• Treated wood storage areas must be consolidated and segregated to minimize yard contamination and ensure efficient collection of any surface run-off water containing PCP residues in excess of regulatory limits. • The evaluation of options for storage area surfaces must consider several factors, including groundwater usage, precipitation levels, etc.
4. Are unsurfaced storage areas remote from water bodies?	General Table 9 PCPT Table 9	• The run-off from surfaced and unsurfaced storage areas must not cause any water body, surface water or groundwater system to exceed regulatory guidelines or standards.

SECTION/CRITERIA	TRD REF.	GUIDELINE
DESIGN **6. TREATED WOOD STORAGE AREAS** **CONT'D**		
5. Is storage in compliance with NFCC requirements (lack of vegetation, separation of wood from buildings)?	General Table 9 PCPT Table 9	• Storage areas must be separated from plant operations and other structures by an acceptable clear space permanently available for fire-fighting operations. • Storage areas must be maintained free of combustible vegetation, including grass and weeds, for at least 4.5 m from the stored material and at least 30 m from bush and forested areas. • Lumber treated with combustible liquids must be stored in piles separated from other stored material by a distance of not less than 4.5 m. • At least two fire department access routes must be provided.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.1 PROCEDURES**		
1. Is an operations manual available with written instructions for all aspects of chemical use?	General Table 10	• A current, site-specific manual must be available containing clear instructions for all aspects of chemical use, plant operation, equipment maintenance, housekeeping, accident prevention, first aid and emergency response procedures, and all applicable regulations. • The manual must be readily available to all employees. • There must also be up to date blueprints of the plant and current specifications for all equipment.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.1 PROCEDURES**		
2. Are all operating personnel informed of the potential hazards and precautionary measures?	General Table 10	• Training in all aspects of chemical use and plant operation must be provided and updated, at least annually. Training programs must be plant specific and should at least include: o Chemical substances and their hazards, including personal hygiene. o Safe operation and maintenance of equipment and processes. o Spill and fire prevention procedures. o Proper use of personal protective equipment. o Proper use of all safety equipment for controlling spills and fires. o Emergency response and first aid and rescue procedures. o Handling, storage and disposal of waste materials. • Individual employee training must be documented.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.2 PERSONNEL**		
3. Are all operating personnel trained in good work practices?	General Table 10	• Operating personnel must be trained as defined in Section 7.1.2. • In addition, training in emergency procedures, unloading operations, location of valves, visual inspections, operational tests and maintenance procedures must be in accordance with NFCC Section 4.11. • The operations and procedures in Part 5 of CCME-EPC-LST-71E must also be implemented.
4. Is periodic review and update of training implemented?	General Table 10	• Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment.
5. Is a pre-employment medical check-up and on-going annual medical surveillance carried out?	General Table 10 General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed to verify that they are able to carry out their assigned duties. • Provided new employees are not exposed to chemicals, their pre-employment medicals may follow completion of their probationary period. • Employees must also have an annual medical check-up, specifically designed to assess any effects of exposure to the chemicals in use at the plant.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.3 SIGNING**		
6. Are the contents and functions of the tanks identified (e.g. PCP work tank)?	General Table 10	• The contents and functions of all tanks must be clearly identified by large, permanent signs.
7. Are personnel safety precautions and first aid procedures prominently displayed?	General Table 10	• Prominent, easy to read signs must be displayed in the chemical receiving and storage areas, the treating process area, all control stations and the plant office.
8. Are emergency response procedures and emergency telephone numbers prominently displayed?	General Table 10	• Plant specific emergency response procedures must be summarized and displayed in the form of a prominent notice. • Notices must also show phone numbers for company contacts, police, fire, ambulance, chemical supplier, etc., not just 911.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY**		
9. Are food, drink or tobacco products prohibited in working areas?	General Table 1	• Food, drink and tobacco products must be prohibited in working areas. • Designated lunch rooms and smoking areas must be separate from work areas and must be provided with washing facilities.
10. Are all personnel familiar with basic hygiene requirements?	General Table 1	• Specific training must be provided as defined in Section 7.1.2. • Training must be reviewed and updated at least annually or whenever there are changes in job responsibilities, procedures or equipment. • Individual employee training must be documented. • New employees must be fully trained before they can assume full responsibility for any aspect of plant operation.
11. Are soiled clothes promptly removed?	General Table 1	• Operators and other employees who come into contact with chemicals must wear appropriate work clothes which must be changed immediately if splashed with chemicals. • Soiled Work clothes must stay at the plant and must be laundered separately from other clothing.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.4 PERSONAL HYGIENE AND SAFETY CONT'D**		
12. Are correct safety clothes (gloves, masks, boots, etc.) worn for respective operations?	General Table 1 PCPT Table 3	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Table 3 of the PCPT section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced.
13. Are first aid personnel familiar with emergency response procedures?	General Table 1	• First aid training must address the specific emergency response procedures for PCP and the other chemicals used in the plant. • First aid supplies must include all items required to treat PCP exposure, including ingestion, as per the PCP supplier's recommendations.
14. Are changing rooms and showers provided?	General Table 1	• Changing rooms must be provided with lockers which allow street clothes to be stored separately from work clothing and PPE. • Hot showers must be provided and operators and other employees who come into contact with chemicals must shower before leaving the plant after work.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING**		
15. Does the plant have a defined housekeeping plan?	General Table 10	• Housekeeping standards aimed at maintaining a clean and orderly plant must be defined in writing and included in the plant's operations manual. • The responsibility for maintaining the standards in different areas must be clearly assigned to specific individuals.
16. Are generation and accumulation of wastes minimized?	General Table 17	• To minimize the generation of wastes, the recommendations contained in Table 17 of the General section of the TRD must be followed. • Special attention must be given to all factors affecting solution cleanliness and solution concentration.
17. Is equipment regularly inspected for leaks?	General Table 12	• All process components must be inspected for leaks by every shift, as per NFCC Section 4.4.11.5 and Section 5.3 of CCME-EPC-LST-71R • Immediate action must be taken to stop leaks.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.5 HOUSEKEEPING CONT'D**		
18. Are leaks properly contained and repaired promptly?	General Table 12	• Leaks must be repaired promptly as per NFCC 4.4.11.5. • There must be no uncontained leaks. • The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
19. Are daily records maintained for chemical delivery, use and inventory?	General Table 10	• To provide a secondary level of control for chemical losses, records must be maintained as follows: o Transfers to and from the oil storage tank as they occur. o Transfers to and from the work tanks as they occur. o Inventory of oil, solid PCP and working solution volumes, monthly. All tank levels must be checked against the last recorded level, every two days, when the plant is not operating.
20. Are daily records maintained for equipment condition and maintenance?	General Table 10	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation and ensures immediate attention to any problems. • PMP records must be maintained in a daily log and monitored to identify the need for special attention to persistent problems.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.6 RECORD KEEPING**		
21. Are chemical volume discrepancies promptly investigated?	General Table 10 General Table 12	• To provide a secondary level of control for chemical losses, chemical use and inventory records must be reconciled monthly, to ensure that they are in balance. • Any unexplained loss of 1% or more of monthly throughput must be reported to the authority having jurisdiction as per CCME-EPC-LST-71E and NFCC Section 4.3.16.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.7 SPILL RESPONSE**		
22. Does a written spill contingency plan exist?	General Table 10 General Section 12.1	• A written spill contingency plan must be prepared and maintained in accordance with Section 12.1 of the General section of the TRD. • The plan must be site specific and must identify the individuals responsible for implementing the components of the plan. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc. • Local police and fire departments must be provided with copies of the plan together with complete details of those aspects of the operation related to the implementation of the plan.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.7 SPILL RESPONSE**		
23. Are regular spill response drills carried out, including an annual spill enactment drill?	General Table 10	• Spill response drills and annual enactments or rehearsals must be part of the spill contingency plan and must be planned in advance by the person responsible. • Annual rehearsals should be planned in collaboration with relevant agencies, such as police, fire and ambulance services and provincial authorities, with a view to gaining their involvement to make the enactment as real as possible. • Drills must be monitored and reviewed by all participants to determine the need for any improvement to emergency response procedures.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING**		
24. Does a written fire contingency plan exist?	General Table 10 General Section 12.2	• A written fire contingency plan must be prepared and maintained in accordance with Section 12.2 of the General section of the TRD and NFCC Sections 2.8, 4.3.2.5 and Part 6. • The plan must be site specific and must identify the individuals responsible for implementing the various components. • The plan is part of the plant operations manual and must be supported by clearly written instructions related to chemical hazards, emergency response, PPE, safety, first aid, maintenance, housekeeping, training, etc.
25. Has the local fire department been made aware of the chemicals in use?	General Table 10	• The fire contingency plan must be prepared in consultation with the local fire and police departments who must receive copies together with complete details of those aspects of the operation related to the implementation of the plan. • The fire department should visit the plant at least annually, to maintain their knowledge of the operation and also identify any improvements that are needed to update the contingency plan.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **7. GENERAL PRACTICES** **7.8 FIRE FIGHTING CONT'D**		
26. Is sufficient self-contained breathing equipment available?	General Table 10 General Table 12	• If it is decided to use self-contained breathing apparatus (SCBA) for fire fighting and/or vessel entry, there must be two sets available and personnel must be properly trained in their use. • Responsibility must be assigned for the inspection and maintenance of SCBA and also for the annual review and update of training. • The plant may decide that the fire department should be responsible for SCBA and also may elect to use oxygen sensors for safe vessel entry or hire contractors for this purpose.
27. Is appropriate fire extinguishing material (e.g. foam) readily available?	PCPT Table 10 PCPP Table 2	• Fire extinguishing materials and procedures must be reviewed with the local fire department. Normally, dry chemical or foam systems must be used to extinguish fires involving PCP/oil. Water spray must be used to cool fire exposed surfaces and protect fire-fighting personnel.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
28. Are adequate material/procedures on hand to contain and dispose of fire residues?	General Table 10	• The fire contingency plan must define the procedures to be followed to contain and dispose of all residues created by fire fighting. • The procedures should be developed in collaboration with the local fire department and should include allowing the treating plant to burn down if there is any risk of a release of chemical or contaminated water from the containment. • The procedures should also include provision for constructing berms and ditches and blocking storm drains in yard areas to contain contaminated water and solid residues. • Plant fire crews must be designated and trained to the level required to implement the company's Fire Contingency Plan. Training programs must be developed in consultation with the local fire department and where possible should be in accordance with National Fire Protection Association (NFPA) Standard No. 472, "Hazardous Materials Response". • This advanced level of training is provided at institutions across Canada, accredited under the International Fire Service Accreditation Congress. • Specific information re location of institutions and NFPA Std. No. 472 can be obtained from local Fire Departments.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS**		
1. Is personnel trained in emergency response procedures?	General Table 11 PCPT Table 10	• All personnel must be formally trained in emergency response procedures for spills and fires. • Individual employee training must be documented and updated annually. • Training must be reinforced during the year by spill response drills.
2. Is access to unloading area restricted during unloading operations?	General Table 11 PCPT Table 10	• All vehicles, including contractors' trucks and visitors' vehicles must be prohibited from the off-loading area by DANGER signs, barriers and constant supervision. • The unloading operation must be attended by a trained operator, wearing full PPE. The truck driver must also wear full PPE. First aid personnel must be available. • Solid PCP and oil must not be delivered outside normal working hours.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.1 UNLOADING CHEMICALS CONT'D**		
3. Is there ready access to emergency aid?	General Table 11 PCPT Table 10	• As defined in Section 8.1.2 above, the unloading operation must be attended by a trained operator. This operator must be trained in chemical handling, chemical hazards, emergency response procedures and first aid. • Additional first aid personnel, trained to deal with emergencies involving solid PCP and Petroleum oil must be on site and must be given advance notice of chemical unloading. • Prior to chemical delivery, first aid supplies must be checked and eye wash fountains and emergency showers must be operational. • An emergency response team, trained in chemical spill procedures must be available and all alarms and spill control equipment must be in good order.
4. Are transfer operations attended at all times?	General Table 11 PCPT Table 10	• The unloading of solid PCP and petroleum oil must be attended at all times and personnel responsible must be trained as per Section 4.4.11 of the NFCC. Transfers must occur as per Section 4.11 of the NFCC.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS**		
5. Are equipment used and procedures followed to avoid worker contact with preservative chemicals?	General Table 1 General Table 11 PCPT Table 3	• The correct personal protective equipment (PPE) must be specified for each job as per the detail contained in Table 1 of the General section, and Table 3 of the PCPT section of the TRD. • Employees must sign a statement, indicating their agreement to wear the correct PPE as a condition of employment. • The PPE policy must be strictly enforced
6. Is responsibility of storage area assigned to trained personnel?	General Table 11 PCPT Table 10	• All activities in the chemical storage area must be carried out by personnel trained in all aspects of chemical handling, system operation, hazard identification and emergency response. • The chemical storage area must be off-limits to all other personnel.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
7. Is a visual inspection routine of equipment storing and transferring chemicals instituted?	General Table 11 General Table 12 PCPT Table 10	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all aspects of the treating operation, including chemical storage and transfer and ensures immediate attention to any problems as per NFCC Section 4.4.11.5 and Section 5.3 of CCME-EPC-LST-71E. • PMP records must be maintained and monitored to identify the need for special attention to persistent problems.
8. Are valves tested regularly?	General Table 12 PCPT Table 10	• The functionality of all valves must be tested in accordance with the Preventive Maintenance Program defined in Section 8.2.7 above. • NFCC Section 4.4.11.6 requires tests of all safety shutoff valves and other fire safety devices, with particular attention to normally open fusible-link operated valves, float valves and automatic controls.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **8. CHEMICAL HANDLING AND STORAGE** **8.2 HANDLING AND STORAGE OF PRESERVATIVE SOLUTIONS CONT'D**		
9. Are drips and spills cleaned up promptly?	General Table 11	• There must be no uncontained drips or spills. • The operating objective must be to be drip and spill-free to avoid contamination of containment areas and exposure of workers to chemicals. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
10. Are bags/block wraps, pallets, hooks, etc. suitably cleaned and properly disposed of?	PCPT Table 13 PCPT Section 8.4	• Bags, wraps, drums, pallets, hooks etc. must be cleaned, stored and disposed of in accordance with provincial regulatory requirements. Materials used in the shipment of solid PCP should be returned to the supplier, wherever possible.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS**		
1. Are quantities of stored chemicals regularly checked and recorded?	General Table 12	• All chemicals must be checked and recorded as defined in Sections 7.6.19, 7.6.20 and 7.6.21, above.
2. Is the solution strength regularly tested?	General Table 12	• The strength of PCP/oil solutions must be determined after every mixing operation, in accordance with AWPA Standard A-5.
3. Is the solution free from contamination?	PCPP Table 15	• If the PCP/oil solution cannot be kept free from carbon and other contaminants and its water and sediment content kept below 0.5%, as per CSA 080.201, then the solution must be processed through a filter press to ensure cleanliness.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
4. Is the system regularly checked for leaks and are those leaks promptly stopped?	General Table 12	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately, as per NFCC 4.4.11.5. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
5. Are sludge levels in tanks and retort regularly checked and removed?	General Table 13	• Whenever there is evidence of excess surface contamination, sludges in the treatment vessel and the tanks must be checked and if necessary, removed • All process tanks must be checked, at least annually and any sludge must be removed. • Treatment tanks must be checked at least monthly and any sludge must be removed. Checks must be recorded and kept on file. • All precautions for safe vessel entry must be followed.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
6. Are tank vents tested for blockage at least once a month?	General Table 12	• Tank vents must be tested at least monthly, if there is any risk of restriction or blockage of the vent pipe due to deposits.
7. Are wood loads stacked to allow good drainage of preservative?	General Table 12 PCPT Table 11	• Wood loads must be stacked in the tank for sufficient time to maximize the rate of preservative drainage.
8. Are loads secured to prevent floating?	PCPT Table 11	• Wood loads must be secured if there is any risk of floating.
9. Are filters checked regularly, cleaned or replaced when necessary?	General Table 12	• Filter presses and strainers must be checked and cleaned in accordance with the schedule established in the written preventive maintenance program.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.1 ROUTINE CHECKS CONT'D**		
10. Are tanks free of debris, soil or other contamination?	General Table 12 PCPT Table 12	• Trams and charges must be free from debris, soil and other contamination before loading into the tank or the cylinder. • Return lines from tanks and cylinders to working tanks must be fitted with strainers.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT**		
11. Is process system monitored for leaks during operation?	General Table 12 PCPT-17 Table 11	• All process components must be inspected for leaks by every shift. The operating objective must be to be leak-free to avoid contamination of containment areas and exposure of workers to chemicals. Leaks must be stopped and repaired immediately. • An inventory of spare parts, such as pump seals, valve components, etc., must be maintained, so that leaking equipment may be repaired immediately.
12. Are recording and indicator instruments in proper order?	General Table 12	• All recording and indicator instruments must be installed and calibrated in accordance with CSA 080-M3, Clause 3.0 and CSA 080.1, Clause 2.2. • Calibration records must be kept on file.
13. Is the treatment closely monitored to ensure that maximum limits are not exceeded with a minimum of over-treatment?	General Table 12	• Treatment systems must have the control instrumentation necessary to maintain temperatures within specified limits, in accordance with CSA 080.1. • Manual control without instrumentation does not allow close monitoring.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.2 CHECKS DURING TREATMENT CONT'D**		
14. Are detailed records kept of all process steps and conditions?	General Table 12	• There must be a record of each charge showing wood species, products, sizes, volumes, treating cycle stages and duration, tank gauge readings and chemical consumption. • The treatment record and process charts and print outs must be kept on file, together with the results of solution and product testing, in accordance with CSA 080-M3, Clause 1.5.
15. Are records kept of abnormal operating situations (e.g. equipment breakdown)?	General Table 12	• Abnormal operating situations must be recorded in the daily log and also entered on the treatment record. • Abnormal operating situations must be reviewed with a Supervisor, to ensure that corrective action is taken as soon as possible
16. Are tank lids tight?	PCPT Table 11	• Full-length thermal tanks must have tight-fitting lids to reduce vapour emissions and exclude precipitation. • Where possible, butt tanks should have lids to exclude precipitation when they are not operating.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS**		
17. Is the charge sufficiently ventilated prior to unloading?	General Table 12 PCPT Table 11	• If TLV levels for PCP are unknown, or at, or above the regulatory limits specified by the ACGIH, workers must wear an approved respirator in the vicinity of the treatment tank.
18. Are goggles and other appropriate safety equipment worn by operators opening lids and removing wood charges?	General Table 12 PCPT Table 11	• Operators must wear full PPE when opening tank lids and removing and unloading charges. Full PPE includes, rain suit, rubber boots, impermeable gauntlets, face shield or goggles and respirator, if emissions are unknown, or at, or above the TLV.
19. Are impermeable gauntlets worn on handling freshly treated wood?	General Table 12 PCPT Table 11	• Impermeable gauntlets must be worn for handling freshly treated wood and for all activities in the treating plant where protection is required. • Leather gloves and impermeable gloves with permeable cuffs must not be worn. • The TRD also recommends the use of an impermeable apron and boots.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.3 POST TREATING CHECKS CONT'D**		
20. Are instructions followed to avoid exposure to preservative vapours/mists?	PCPT Table 3	When there is any risk of exposure to preservative vapours or mists in any operation, the PPE specified in Table 3 of the PCPT section of the TRD must be worn.
21. Are charges allowed to essentially drip dry before they are pulled from the tank?	General Table 12 PCPT Table 11	Charges must not be removed from the treatment vessel until the excess solution has drained and the wood, as a result is essentially drip free.
22. Are personnel trained in safety procedures for tank entry?	General Table 12 PCPT Table 12	• Treating plant personnel must be trained in confined space entry procedures as defined in WCB and provincial labour regulations. • If personnel are not trained, an approved contractor must be hired for this activity. • There are several safety procedures for vessel entry, including self contained breathing apparatus (SCBA) or oxygen sensors.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 EQUIPMENT MAINTENANCE**		
23. Is all equipment in good operating condition?	General Table 13	• There must be a written Preventive Maintenance Program (PMP), which requires daily inspections of all equipment and ensures immediate attention to any problems. • Records of daily inspections must be maintained and monitored to identify the need for special attention to persistent problems.
24. Are NFCC maintenance recommendations adhered to?	General Table 13	• All maintenance practices must be in accordance with Sections 2.5, 3.3, 4.4.11 and 6.0 of the National Fire Code of Canada.
25. Do written maintenance instructions exist?	General Table 13	• The Preventive Maintenance Program must contain written, plant specific instructions for all equipment.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 EQUIPMENT MAINTENANCE CONT'D**		
26. Are all necessary precautions taken when contaminated equipment is welded?	General Table 13 PCPT Table 3	• The precautions that must be taken include: o Obtaining a Hot Work permit from the Supervisor responsible. o Blocking or disconnecting lines from tanks. o Draining and rinsing tanks and lines. o Ensuring that surfaces are free from cleaning solvent residues. o Wearing an approved respirator. o Providing good ventilation in the work area. o Containing all sparks and removing flammable materials. o Complying with all additional provincial workplace safety rules. o Taking special precautions in view of the high explosion hazard.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.4 EQUIPMENT MAINTENANCE CONT'D**		
27. Is all equipment drained/cleaned of oil or PCP solutions prior to maintenance?	General Table 13 PCPT Table 12	• Prior to maintenance, contaminated equipment must be drained of oil or PCP/oil solution and thoroughly cleaned. • Cleaning solvent or condensate from steam cleaning must be collected and contained.
28. Are all alarms and safety devices tested regularly?	PCPT Table 12	• All alarms and safety devices must be tested weekly or as specified by the manufacturer. • Alarm tests must be recorded and kept on file.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **9. OPERATING PRACTICES FOR PROCESS SYSTEM, MAINTENANCE, CLEAN-OUT AND SHUTDOWN** **9.5 CLEAN-OUT**		
29. Are written safety procedures in place?	General Table 1 General Table 13	• Safety procedures for clean-out must be included in the Plant Operations Manual and must address the details contained in Tables 1 and 13 of the General section of the TRD.
30. Are drip pads clean (what is the frequency of cleaning)?	General Table 13	• Drip pads must be kept clean and free from liquids and residues. • Drip pads must be inspected daily and cleaned at least weekly. • The volume and dispersion of wash water must be kept to a minimum.
31. Is wash water treated prior to discharge?	General Table 4 General Table 13	• All wash water must be collected, contained and treated to applicable regulatory limits, prior to controlled discharge.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION**		
1. Is wood properly seasoned prior to treatment?	General Table 17	• Every effort must be made to season wood properly. • A moisture content above the fibre saturation point (~25% dry wt.) will promote sludge formation.
2. Is the treatment solution clean and are the components balanced?	General Table 12	• If the PCP/oil solution cannot be kept free from carbon and other contaminants and its water and sediment content kept below 0.5%, as per CSA 080.201, then the solution must be processed through a filter press to ensure cleanliness. • The strength of PCP/oil solutions must be determined after every mixing operation, in accordance with AWPA Standard A-5.
3. Are close controls exercised on treatment parameters (are limits not exceeded)?	General Table 12 PCPP Table 15	• Treatment systems must have the control instrumentation necessary to maintain within specified limits in accordance with CSA 080-M3, Clause 3.0. • Manual control without instrumentation does not allow close monitoring.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.1 MINIMIZATION CONT'D**		
4. Are storm run-offs collected and treated?	General Table 9	• Storm water run-off from paved yards shown to contain levels of PCP in excess of regulatory limits must be collected, contained and treated to comply with regulatory limits prior to controlled discharge. • In the case of unpaved yards, soil and groundwater samples must be taken to determine the environmental impact of storm water. • If contamination above the standards or guidelines listed in Section 6.1 is present, site remediation followed by paving may be necessary.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE**		
5. Are personnel trained in hazards and handling methods?	General Table 17	• Training in all aspects of waste handling and disposal must be provided and updated, at least annually. • Training programs must be plant specific and must address all aspects of provincial regulation related to waste handling. • Individual employee training must be documented.
6. Are wastes and sludges stored in sealed drums?	General Table 17	• Dewatering and/or drying of wastes and sludges must take place in an enclosed area, which is roofed, ventilated and contained. • Appropriate signs must be posted and operators must wear the correct PPE, when processing wastes and sludges. • When wastes and sludges are ready for shipment, they must be in sealed containers, which must conform to Transportation of Dangerous Goods (TDG) regulations. • The storage and handling of wastes and sludges must conform to provincial regulations.
7. Is waste storage area roofed, enclosed and with a paved surface?	General Table 17	• The waste dewatering, drying and storage areas must be roofed, paved, contained, well ventilated and separate from the normal work areas.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
8. Are all drums labeled by contents?	General Table 17	• Drum and container labels must conform to TDG regulations.
9. Are records kept of inventory for solid wastes and sludges stored on site?	General Table 17	• An up to date inventory of containers, including their volumes and contents must be maintained. • Regulations in some Provinces require accurate inventories of wastes.
10. Are disposal activities reported as per regulations?	General Table 17	• Disposal activities must be reported by the plant or by the disposal contractor, in accordance with TDG regulations. • The plant must maintain disposal records as per TDG regulations.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **10. WASTE HANDLING AND DISPOSAL** **10.2 COLLECTION AND STORAGE CONT'D**		
11. Has the waste been classified under TDGA?	General Table 17	• The waste has already been classified under the TDG Act. • Labels must show the correct classification. PCP waste is designated as a Class 6.1 and Class 9.2 substance.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING**		
1. Does a specific site monitoring plan exist?	General Table 14	• A site specific monitoring plan must be prepared by a qualified environmental consultant. • The plan must be designed to address provincial standards for soil, groundwater and storm water run-off, if applicable. If there are no provincial standards, the plant must develop site specific standards in consultation with provincial environmental authorities. • The plan must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices.
2. Are reporting requirements clearly defined?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective management of the chemicals used.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
3. Do monitoring areas include all areas: • Where preservative chemicals are stored, processed and handled? • All treated wood storage areas? • Drainage ditches and areas exposed to run-off?	General Table 14	• A risk evaluation study must be completed to determine the monitoring methodology required for soil, groundwater and storm water in the specified areas.
4. Are sampling frequency and constituents defined?	General Table 14	• The site monitoring plan must define sampling frequency, as per the risk evaluation study and/or the reporting requirements. • All preservative constituents must be monitored and checked against the applicable regulatory limits.
5. Is a program in place to monitor adjacent waterbodies?	General Table 14	• The risk evaluation study in Section 11.1.3 must also address the need to monitor adjacent water bodies, based on an evaluation of site characteristics and plant operations.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
6. Is a program in place to monitor groundwater or on-site wells?	General Table 14	• The TRD states: "consider implementing a groundwater monitoring program using permanent monitoring points…". Exceptions to this consideration would be plants located on sites for which such a program would not be effective. Any exceptions must be determined by the risk evaluation study in Section 11.1.3, based on a detailed evaluation of site characteristics and plant operations.
7. Are all air emission sources defined?	General Table 14	• The peak and average levels of PCP in air, for significant points of emission, must be determined. • Significant points of emission include, treatment tank tops, vent stacks, receiving areas for vents, enclosed plant areas and freshly treated wood storage areas. • The assessment must be updated if there are any changes in plant design and/or operating practices.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
8. Are air emissions monitored as per permits?	General Table 14	• The regulations and reporting requirements which apply to the plant must be determined and defined in the site monitoring plan. • If permits apply, air emissions must be monitored accordingly. • If there are no applicable regulations and/or reporting requirements, the plant must maintain monitoring records, which clearly demonstrate effective control of all air emissions • Monitoring must determine all preservative constituents in air emissions.
9. Are all liquid waste discharges identified (volumes, contamination levels)?	General Table 14	• Liquid waste discharges include storm water run-off. • The concentrations and total mass emission rates for all preservative constituents in discharges and run-off must be determined by a qualified consultant, as part of the overall site monitoring program defined in Section 11.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.1 ENVIRONMENTAL MONITORING CONT'D**		
10. Are all liquid waste discharges monitored as per permits?	General Table 14	• If permits apply, discharges and run-off must be monitored accordingly. • Monitoring must determine the concentrations of all preservative constituents in discharges and run-off. • If permits do not apply, the plant must develop site specific monitoring protocol and waste discharge limits in consultation with provincial environmental authorities.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING**		
11. Does a facility specific monitoring plan exist?	General Table 15	• A site specific workplace monitoring plan and program shall be prepared by a qualified industrial hygienist. • The plan and program must be reviewed annually and modified when necessary, to reflect any changes in design and/or operating practices. • The plan shall address the requirements defined in Sections 11.1.7 and 11.1.8.
12. Are reporting requirements clearly defined?	General Table 15	• The regulations and reporting requirements which apply to the plant must be determined and defined in the workplace monitoring plan.
13. Are sources of skin exposure identified periodically?	General Table 15	• Existing and potential sources of skin exposure shall be identified by monthly inspections of all operating areas of the plant, from chemical receiving to shipment of treated products. • Skin exposure hazards shall be a topic for discussion at all safety committee meetings. • Safe working practices, training programs and PPE requirements must be modified when new sources of skin exposure are identified.

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
14. Is a monitoring program defined: • Sampling techniques? • Frequency? • Items sampled for?	General Table 15	• The workplace monitoring plan and program defined in Sections 11.2.11 and 11.2.12 above must define the sampling techniques and sampling frequency required for all preservative constituents and other toxic chemicals used by the plant. • The requirements defined in Sections 11.1.7 and 11.1.8 also apply.
15. Are peak levels of preservative exposure from air known for all significant points of worker exposure (cylinder doors, exhaust vents, enclosed preservative process areas, freshly treated charges)?	General Table 15	• Peak levels of exposure shall be determined as per the requirements defined in Sections 11.1.7 and 11.1.8 above. • Peak levels shall be determined annually under worst case conditions, e.g. during the winter months when plant areas are enclosed.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
16. Are pre-employment medical exams carried out?	General Table 15	• To protect the health of employees and the interests of employers, new employees must have a pre-employment check-up, specifically designed by an occupational physician to verify that they are able to carry out their assigned duties. • Provided new employees are not exposed to chemicals, their pre-employment medicals may follow completion of their probationary period.
17. Does a plan exist for follow-up medicals?	General Table 15	• The plant must prepare a plan, in consultation with an occupational physician, which defines: o Jobs for which pre-employment and annual or more frequent medical examinations are mandatory, based on the degree of exposure to specific chemicals. o The person responsible for scheduling medical appointments o Responsibility for record keeping. o Responsibility for follow-up with physician and employee.

PCP THERMAL FACILITY TECHNICAL GUIDELINES

SECTION/CRITERIA	TRD REF.	GUIDELINE
PRACTICES **11. ROUTINE MONITORING** **11.2 ROUTINE WORKPLACE MONITORING CONT'D**		
18. Are follow-up medicals and biological monitoring (e.g. urine) carried out?	General Table 15	• As specified in the plan outlined in Section 11.2.17, designated employees must be periodically examined by an occupational physician to assess the effects of exposure to the chemicals in use at the plant. • As a result, medical examinations may include x-rays, nasal and skin evaluation, and urine and blood testing. • Medical examinations must address all preservative constituents and other toxic chemicals.