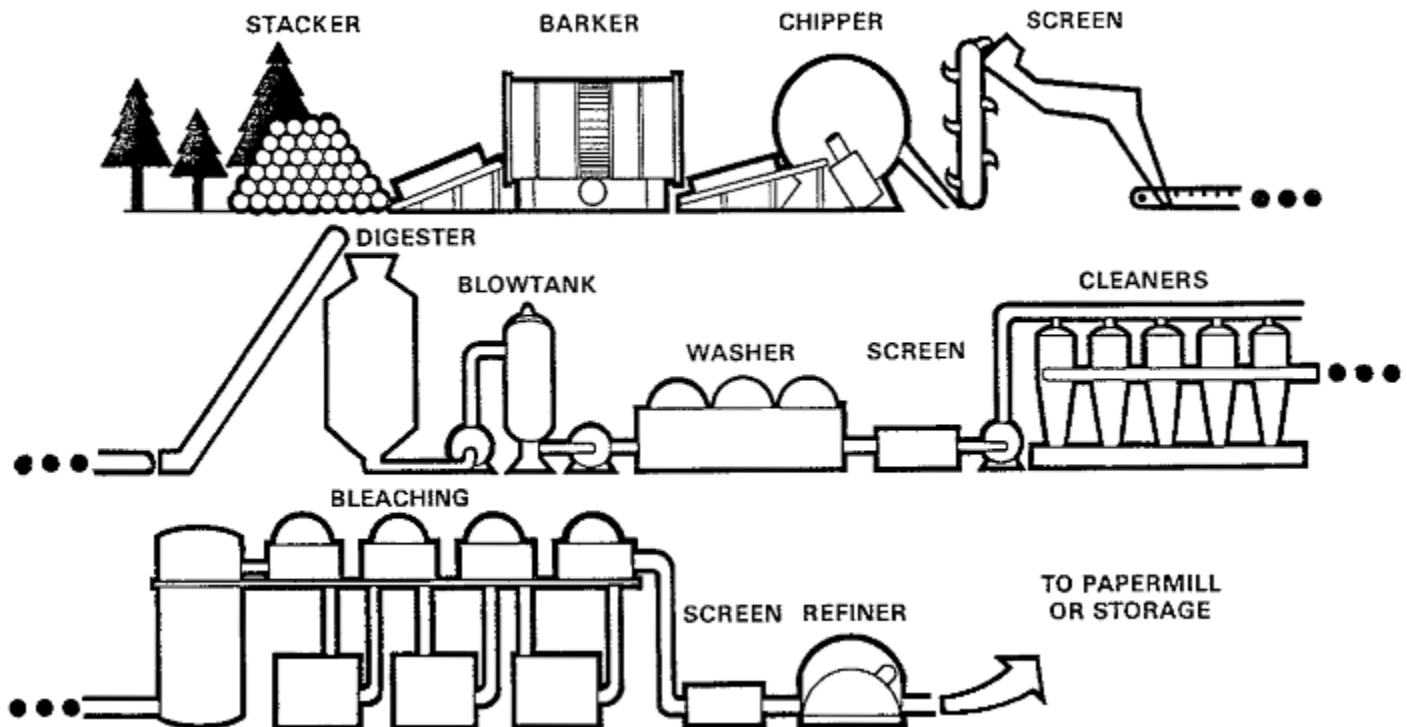
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Industry: Paper	Sub-Group: Pulp Mills
SIC: 2611	NAICS: 322110


PROCESS DESCRIPTION: Pulp wood logs are cut, trimmed, topped and transported to pulp mills where they are debarked and chipped or ground up. In the chemical process, chips are conveyed to a digester where chemicals (caustic soda and sodium sulfide or sulfite liquor) are added and cooked under pressure (approx. 125 psi) at approximately 350°F for several hours. Next the pulp is separated from the liquor, washed, screened and bleached (as required) and then stored or passed to the paper machines. In mechanical operations, the logs are ground by rotating grindstones running in water then passed through various screens and refiners. Finally, the pulp is thickened and stored or passed to the paper machines.


PROCESS FLOW:




Hazards Analysis

Major Hazards			Other Hazards		
Location	Item	Hazard	Location	Item	Hazard
Forest	Trees	Crushed limbs or bodies from falling trees or limbs	Forest	Noise from chain saws	Hearing loss
				Snakes and insects	Poison from bites

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	Cutting tools Motorized vehicles	Cuts/lacerations Overturning and crushing operator		Lifting	Back sprains
Debarker	Conveyor Flyings Log handling	Unguarded power transmission equipment Eye injury Crushed limbs by rolling logs	Chipper	Noise Flyings	Hearing loss Eye injury
Chipper	Unguarded opening Conveyor	Amputation of limbs; slipping or falling into machine; debris ejected from chipper Unguarded power transmission equipment	Chip storage bin	Housekeeping Walking/working surfaces	Fire hazard from dust accumulation Slips/falls
Digester rooms	Sodium hydroxide (lye) Sodium sulfide (colorless, clear crystals) Chlorine gas Caustic soda Pressurized steam lines Sulfur dust Lead dust inside digester	Generates hydrogen when in contact with aluminum, toxic; a severe eye hazard Toxic and mildly flammable Toxic Burns Burns/rupture or leaks Fire or explosion Lead poisoning	Digester rooms	Flyings Dust Walking/working surfaces	Eye injury Nuisance Slips/falls
			Liquor recovery	Noise Heat	Hearing loss Exhaustion; thermal burns

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				Caustics Pressurized steam lines Walking/working surfaces Chlorine gas Hydrogen sulfide gas (from burning sulfur)	Burns Burns from rupture or leaks Wet floors, slips and falls Toxic Flammable and explosive; highly toxic
			Bleach plant	Caustic soda Chlorine gas Steam lines Hydrogen peroxide bleach	Burns Toxic Burns from ruptures or leaks Powerful oxidizer, extreme irritant to eyes, skin and respiratory tract
			Screen room	Steam/hot water lines Working/walking surfaces	Burns Wet floors, slips and falls
Key OSHNC Standards					
Reference		29 CFR 1910 — General Industry Standards			
Subpart D		Walking and working surfaces			
Subpart E		Exit Routes, Emergency Action Plans, and Fire Prevention Plans			
Subpart I		Personal protective equipment – where .261 does not apply			
Subpart O		Machinery and Machine Guarding – where .261 does not apply			
Subpart S		Electrical			
1910.95		Occupational noise exposure			
1910.119		Process Safety Management			
1910.146		Permit required confined space			

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1910.147	Control of hazardous energy (lockout/tagout)		
1910.176	Handling Materials - general		
1910.178	Powered industrial trucks		
1910.261	Pulp, paper and paperboard mills		
1910.266	Logging operations		
1910.1000	Air contaminants		
1910.1200	Hazard communication		
Inspection Analysis			
<p>The inspection should begin with the pulpwood logging operation, giving attention to availability of first aid supplies, medical care, personal protective equipment, guards on mobile equipment and general work practices of employees. Follow log handling procedures to barkers, and look for unguarded power transmission equipment and protection from flying chips. Check for guarded chipper spout and excessive noise levels. Proceed to digester room and note safeguards where there is exposure to toxic and caustic substances being fed into digester. Check for exposure to high pressure steam lines at digester, blow pits and blow tanks. Determine adequacy of tag and lock-out procedures when working on or in equipment. Check for safe tank entry procedures and availability of emergency breathing apparatus, electrical equipment, ventilation and gas masks in bleach mixing room. Check for adequate guards at feed point of pulp shredders, beaters and pulpers. Check chemical quantities for applicability of 1910.119.</p>			
<p>Other Pertinent Comments: SIC Code 2611 (pulp mills) includes pulpwood logging operations. 29 CFR 1910.266 also applies to pulpwood logging, but 29 CFR 1910.261 applies only after the pulp logs have been delivered to the mill.</p>			