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Project XL Progress Report
Weyerhaeuser Flint River Operations

In 1995, the U.S. Environmental Protection Agency (EPA) embarked on a series of innovative initiatives in an effort to test new ways to achieve greater public health and environmental protection at a more reasonable cost. Through Project XL, which stands for eXcellence and Leadership, EPA enters into specific project agreements with public or private sector sponsors to test regulatory, policy, and procedural alternatives that will produce data and experiences to help the Agency make improvements in the current system of environmental protection. The goal of Project XL is to implement 50 projects that will test ways of producing superior environmental performance with improved economic efficiencies, while increasing public participation through active stakeholder processes. As of January 2001, EPA has reached its goal of 50 projects in the implementation phase. EPA Project XL Progress Reports provide overviews of the status of XL projects that are implementing Final Project Agreements (FPAs). The progress reports are available on the Internet via EPA's Project XL Web site at http://www.epa.gov/Project XL. Hard copies may be obtained by contacting the Office of Policy Economics and Innovation's (formerly the Office of Reinvention) Project XL general information number at 202–260–5754. Additional information on Project XL is available on the Web site or by contacting the general information number. The information and data presented in the January 2001 Progress Report is current as of December 2000.

Background

Weyerhaeuser Company is one of the largest private owners of forest, with 5.4 million acres in the United States. Among its products are timber, paper, and pulp. Weyerhaeuser's Flint River pulp manufacturing facility in Oglethorpe, Georgia, manufactures 320,000 tons per year of absorbent fluff pulp, a material used in diapers. The facility was opened in 1981 and is located 100 miles southwest of Atlanta, Georgia. Weyerhaeuser is striving to minimize the environmental impact of its manufacturing processes on the Flint River and the surrounding environment by pursuing a long-term vision of a Minimum Impact Mill (MIM). Through a combination of enforceable

Weyerhaeuser XL Project
Oglethorpe, Georgia

Major Milestones

September 8, 1995
Weyerhaeuser XL Proposal Submitted

January 17, 1997
Final Project Agreement Signed

January 28, 1998
First Annual Stakeholders Meeting
Montezuma, Georgia

February 4, 1999
Second Annual Stakeholders Meeting
Flint River Facility

February 3, 2000
Third Annual Stakeholders Meeting
Flint River Facility

2006
Final FPA Commitments to be Met

requirements and voluntary goals, the Weyerhaeuser XL project will improve the environmental health of the nearby Flint River and surrounding watersheds by:

- reducing the allowable air emissions by 60 percent under the dual emission caps;
- cutting bleach plant effluent by 50 percent over a ten year period;
- reducing water use by 1,000,000 gallons a day;
- cutting solid waste generation by 50 percent over a ten year period;
- preparing and implementing a facility-wide plan to reduce energy use;
- reducing the generation of hazardous waste to a level where the Flint River facility can qualify as a conditionally exempt small-quantity generator;
- maintaining criteria air pollutant emissions at levels below facility-wide emission caps;
- preparing and implementing a site-specific alternative compliance plan for hazardous air pollutant (HAP) emissions;
- improving forest management practices in over 300,000 acres of land; and
- adopting the International Organization for Standardization (ISO) 14001, an international standard that defines the elements of a continually improving environmental management system.

The Experiment

The Weyerhaeuser project tests a facility-wide permitting approach for water effluent discharges, air emissions, and solid waste generation that is designed to promote the MIM concept. Minimum impact manufacturing contains the elements of a comprehensive pollution prevention program designed to minimize the use of raw materials and to stop waste generation rather than to rely on end-of-pipe remedies.

The Flexibility

The Weyerhaeuser XL project establishes a long-term plan to continuously reduce the Flint River facility's impact on air, water, land, and the surrounding watersheds. As an incentive to achieve superior environmental performance at Weyerhaeuser's Flint River facility, EPA and the Georgia Environmental Protection Division (EPD) are providing more flexible and cost-effective processes for regulatory compliance. EPA and Georgia EPD are offering Weyerhaeuser regulatory flexibility in the areas of environmental performance reporting, effluent permitting, air quality permitting, hazardous air pollutant compliance, and solid waste permitting.

The statutory programs, and EPA offices administering those programs, that affect the Weyerhaeuser XL project are

- Clean Water Act (CWA) programs administered by EPA's Office of Wastewater Management and EPA's Office of Wetlands, Oceans, and Watersheds;
- Resource Conservation and Recovery Act (RCRA) programs administered by EPA's Office of Solid Waste;
- Clean Air Act (CAA) programs administered by EPA's Office of Air Quality Planning and Standards; and
- Pollution Prevention Act (PPA) programs administered by EPA's Office of Prevention, Pesticides, and Toxic Substances.

All permitting programs required to implement the Final Project Agreement (FPA) have been delegated by EPA to the State of Georgia. Permits are issued by Georgia EPD.

Reporting. EPA Region 4 and the Georgia EPD are allowing Weyerhaeuser the flexibility to consolidate some of the facility's routine permitting reports into two reports per year. These reports are available on EPA's Project XL web site at http://www.epa.gov/ProjectXL.

Effluent Permitting. EPA Region 4 and Georgia EPD have revised Weyerhaeuser's National Pollution Discharge Elimination System (NPDES) permit to:

- include more stringent effluent limits on biological oxygen demand (BOD), total suspended solids (TSS), and adsorbable organic halogens (AOX);
- streamline the permit renewal process;
- eliminate fish tissue sampling requirements due to improvements in process technologies that have eliminated detectable dioxin levels in effluents;
- remove a requirement for additional assimilative capacity studies of the Flint River; and
- allow annual compliance certification in lieu of periodic discharge monitoring reporting (DMR) due to the company's ten year history of meeting all required discharge levels.

Air Quality Permitting. EPA Region 4 and Georgia EPD have modified the facility's existing air quality permit to include dual emission caps for air pollutants. The caps reduce allowable air emissions from the facility by 60 percent below limits that would be required under a standard permit. The dual emission caps are (1) a cap that allows the recovery furnace, smelt dissolving tank, calciner, and combination boiler (the facility's four major sources of emissions) to be operated to their design capacity without triggering permit review; and (2) a cap covering all facility sources except those four major sources. The dual emission caps apply to particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic carbons (VOCs), and total reduced sulfur (odor-causing pollutant). This modified air quality permit streamlines the permit renewal process, includes alternate excess emission reporting protocols, and includes a protocol for conducting manufacturing process experiments without triggering a permit review.

Hazardous Air Pollutant Compliance. EPA Region 4 and Georgia EPD have agreed to provide Weyerhaeuser the flexibility to demonstrate HAP emission reductions using innovative pollution prevention approaches rather than end-of-pipe HAP controls. Weyerhaeuser committed to preparing an alternative compliance plan that will present the HAP emission reductions to be achieved by the facility following promulgation of the Maximum Available Control Technology (MACT) Cluster Rule for the pulp and paper industry.

Solid Waste Permitting. EPA Region 4 and Georgia EPD will modify Weyerhaeuser's solid waste permit to allow nonhazardous industrial wastes containing free liquids to be disposed of in a permitted, onsite landfill.

Promoting Innovation and System Change

Project XL provides EPA opportunities to test and implement approaches that protect the environment and advance collaboration with stakeholders. EPA is continually identifying specific ways in which XL projects are helping to promote innovation and system change. The innovations and system changes emerging from the Weyerhaeuser XL project are described below.

Pulp and Paper Cluster Rules. The Weyerhaeuser XL project provides a pilot for testing alternative compliance approaches to a new MACT standard. Weyerhaeuser will prepare an alternative compliance plan that will present the HAP emission reductions to be achieved by the facility following the April 15, 1998, promulgation of the MACT Cluster Rule for the pulp and paper industry. EPA will use a site-specific rulemaking or similar mechanism to authorize alternative MACT compliance.

Consolidated Reporting. The Weyerhaeuser XL project allows the facility to consolidate reporting for some of the applicable Federal, state, and local permitting and regulatory programs into two comprehensive reports each year. The XL project tests an approach to streamlining both permitting and the collection of higher quality information from regulated industries. The XL project will influence development of the comprehensive information management plan to be prepared by the EPA's new consolidated Office of Environmental Information.

Dual Emissions Caps. The Weyerhaeuser XL project provides for dual emissions caps that limit facility-wide emissions to levels 60 percent below those that would be required under a standard permit. In return, Weyerhaeuser can change certain equipment operating conditions, as long as they do not result in emissions exceeding the caps, to respond to customer needs without triggering permit reviews.

NPDES Permitting. Weyerhaeuser's NPDES permit has been revised to include more stringent effluent limits on BOD, TSS, and AOX. In return, Weyerhaeuser (1) is not required to conduct fish tissue sampling because improvements in process technologies have eliminated detectable dioxin levels in effluents; (2) is not required to conduct additional assimilative capacity studies of the Flint River; and (3) can provide an annual certification of compliance instead of periodic discharge monitoring reports (DMR) because of the company's ten year history of meeting all required discharge levels.

Comprehensive Environmental Management System (EMS). Weyerhaeuser will voluntarily revise an EMS at the Flint River facility to conform with the ISO 14001 standard. The facility is developing a comprehensive manual of standard work procedures for plant employees. As announced in the Federal Register on March 12, 1998, EPA is evaluating options that will lead to development of an Agency policy on EMSs. The Weyerhaeuser XL project will provide data on the compliance and environmental benefits of an EMS approach.

Timberland Resource Strategies. Weyerhaeuser also will reduce solid and hazardous waste generation and improve forest management practices in more than 300,000 acres of timberland. EPA will participate in review and evaluation of feasibility studies with potential applicability of results across the pulp and paper industry.

Project Commitment Summary

This table and the environmental performance section that follows summarize progress in meeting commitments described in the FPA for Weyerhaeuser's Flint River facility. The facility has completed Phases I, II, and III of its environmental management plans (which are therefore not provided in the following table), is nearing completion of all Phase IV environmental management plans, and is in the process of implementing Phase V feasibility studies.

Commitment	Status
Minimum Impact Mill Phase IV Implementation Schedule	
Construct brownside optimization equipment.	Construction and process optimization were completed in 1997.
Upgrade odor control system.	Construction and process optimization were completed in 1996.
Reduce energy steam use.	Construction and process optimization were completed in 1997.

Commitment	Status
Minimum Impact Mill Phase IV Implementation Schedule (Continued)	
Revise existing EMS to conform to ISO 14001 EMS (nonenforceable), including operational procedures, record keeping, auditing, quality assurance, and permit requirements.	The process of ISO 14001 documentation, originally scheduled for completion in mid-1997, has proceeded slower than expected. Weyerhaeuser has completed a corporate-wide guidance document for implementing an ISO 14001 EMS. The Flint River facility is identifying environmental aspects of the facility's operations. Completion of ISO 14001 EMS documentation for the Flint River facility is expected in 2000.
Minimum Impact Mill Phase V Feasibility Studies	
Conduct feasibility studies for reducing solid waste generation through source elimination, by-product reuse, and energy recovery.	A compost using facility by-products that is suitable for land application has been produced; an economic analysis of composting has been completed. Long-term land application feasibility trials are underway.
Conduct studies of mill water use to reduce the quantity of treated wastewater discharged into the river.	A feasibility study has been completed on reusing excess white water in the bleach tower. Feasibility studies are under way on reusing bleaching plant filtrate in the wood yard log flume and on using waterless packing for rotary equipment.
Conduct an energy conservation study to identify potential conservation practices and prepare a long-term energy conservation plan to reduce plant energy demand and power boiler steaming rates.	Four small-scale energy conservation projects have been completed: returning product unit condensate to the boiler feedwater system, returning evaporator condensate to the recaust area, reducing secondary temperatures in the recovery boiler, and using weak filtrate to clean the cylinder mould. A facility-wide energy conservation study was completed in early 1999; the results of the study will be used to prepare a long-term energy conservation plan.
Conduct feasibility studies, including water use, process elements, finished product quality, and multimedia impacts, to determine how to reduce the volume of bleach plant effluent flow.	An initial feasibility study on creating a closed circulation bleach plant has been completed. The initial assessment determined that this is not a cost-effective option given market conditions. Additional feasibility studies are planned for reducing bleach plant effluent.
Conduct HAP emission reduction feasibility studies to identify pollution prevention approaches for achieving HAP emission reductions.	Emissions testing on facility sources and condensate streams has been completed. A draft MACT alternative compliance plan has been sent to EPA.

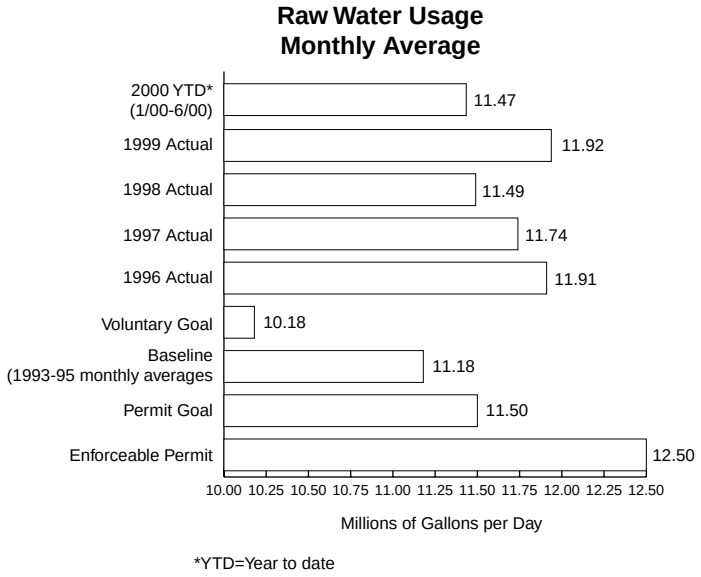
Commitment	Status
Minimum Impact Mill Phase V Feasability Studies (Continued)	
Implement timberland resource strategies for over 300,000 acres of forest to designate forest buffers, minimize erosion caused by roads, improve stream-side management, develop water bars to stabilize soils, safeguard unique habitats, implement landscape planning, establish wildlife corridors, and protect threatened and endangered species.	Documentation and implementation of timberland resource strategies was completed in the fall of 1997.
Water	
Revise the NPDES permit to provide more stringent effluent limits for BOD, TSS, and AOX; to streamline the permit renewal process; to remove the fish tissue sampling requirement; to remove the requirement for additional assimilative capacity studies of the Flint River; and to allow annual compliance certification in lieu of DMR reporting.	The NPDES permit was revised in July, 1997.
Modify the surface water withdrawal permit to reduce the daily maximum withdrawal limits by one million gallons per day (MGD).	Weyerhaeuser submitted the water withdrawal permit modification in June 2000.
Solid Waste	
Modify the solid-waste permit to allow disposal of nonhazardous industrial wastes containing free liquids into a permitted onsite landfill. Weyerhaeuser will continue stormwater and leachate treatment and quarterly groundwater monitoring.	Weyerhaeuser submitted a solid-waste permit modification request in late 1998.
Hazardous Waste	
Reduce the generation of hazardous wastes to a level where the facility can qualify as a conditionally exempt small-quantity generator.	Weyerhaeuser achieved designation as a conditionally exempt small quantity generator in 1997 by recycling and reusing a solvent (methyl ethyl ketone) used for cleaning painting equipment.
Air	
Modify the facility's air quality permit to include dual emissions caps, to streamline the permit renewal process, to include alternate excess emission reporting protocols, to include an alternate compliance testing protocol, and to include a protocol to allow experimental trials without triggering permitting.	The air quality permit was revised in December, 1997.
Revise Flint River's Title V permit to postpone permit modifications for activities undertaken pursuant to the XL project until the permit comes up for renewal.	The permit was revised in December, 1997.

Air (Continued)	
Prepare a site-specific MACT alternative compliance plan that will detail how Weyerhaeuser will reduce HAP emissions to levels equal to or exceeding those required under the MACT Cluster Rule.	The MACT Cluster Rule for the pulp and paper industry was promulgated in April 1998. Weyerhaeuser has prepared a draft MACT alternative compliance plan. Completion of the final plan is expected in the second half of 2000.
Reporting	
Prepare annual reports for distribution to EPA, the State of Georgia, and local stakeholders.	Annual reports have been completed for 1997 and 1998, and 1999. The 2000 annual report is due to be completed in January 2001.
Prepare midyear reports for distribution to EPA, the State of Georgia, and local stakeholders.	Midyear reports have been completed for 1997, 1998, 1999, and 2000.
Distribute data and reports to the public upon reports to the public upon request.	As needed.
Stakeholder Meetings	
Conduct annual public meetings in January in the vicinity of the Flint River facility.	The first annual stakeholders meeting was held in Montezuma, Georgia, on January 28, 1998. The second annual stakeholders meeting was held at the Flint River facility on February 4, 1999. The third annual stakeholders meeting was held at the Flint River facility on February 3, 2000.

Environmental Performance

This section summarizes progress in meeting the environmental performance commitments described in the FPA for Weyerhaeuser's Flint River Facility.

Raw Water Usage: Reducing the facility's use of water from the Flint River will reduce the quantity of treated wastewater discharged back into the river. Weyerhaeuser's long term goal is to reduce water withdrawal from the Flint River to a voluntary limit of 10.18 MGD monthly average. Baseline water withdrawal at the facility is 11.18 MGD monthly average. The facility's surface water withdrawal permit was scheduled to be modified to reduce enforceable withdrawal limits by 1.0 MGD, to 11.5 MGD monthly average, by January 1, 1998. Permit modification has been delayed and is now expected during the year 2000 following completion of water conservation studies.



*YTD=Year to date

Progress: The water reductions obtained from modernization projects in 1996 and 1997 were not sufficient to offset increased water use from other facility process areas, which resulted in an increase from the baseline to 11.74 MGD monthly average for 1997. In 1998, water use was reduced to 11.49 MGD monthly average through the daily water conservation efforts of production operators. In 1999**,** water use increased to 11.92 MGD monthly average. In the first six months of 2000, raw water usage decreased to 11.47 MGD.

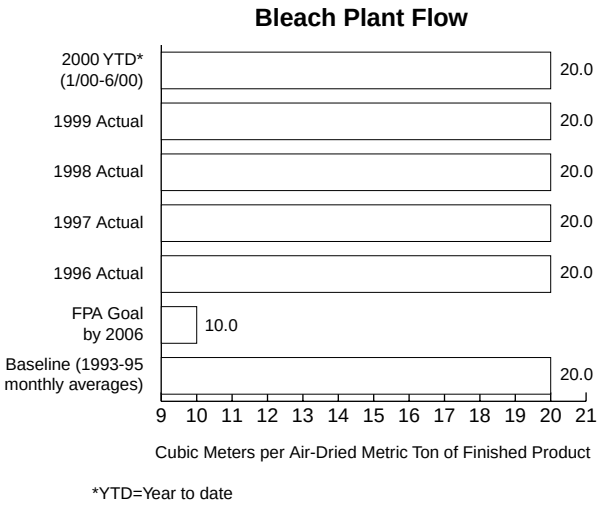
During 1999 and the first half of 2000, daily water usage was given higher visibility by the Weyerhaeuser operating teams. When water usage could not be significantly lowered through administrative controls, the teams searched for an engineering solution. Detailed engineering studies showed that by upgrading the impeller of the white water pump, Weyerhaeuser might be able to significantly reduce plant water usage. After upgrading the impeller, Weyerhaeuser found that, due to the complexities of the water system, this project was not going to yield the results they had anticipated.

Weyerhaeuser continued to search for ways to reduce total water usage. In February 2000, the Flint River facility initiated further water usage reforms that have reduced average daily water usage by 500,000 gallons per day by the end of June, bringing raw water usage to 11.47 MGD. Of this 500,000 gallons per day, Weyerhaeuser attributes saving:

- 100,000 gallons per day to raising awareness throughout the plant;
- 200,000 gallons per day from automating and adding a flow measurement device to the line that provides makeup flow to the Machine wire pit (Weyerhaeuser proved that they did not have to "turn over" the wire pit with fresh water each time before changing product grade to a higher brightness pulp);
- 100,000 gallons per day to reducing the orifice sizes in several nozzles in the wood yard operation; and
- 100,000 gallons per day to installing an automatic shutoff valve on the water that is used as a continuous washdown underneath the refuse conveyor in the wood yard.

Water conservation projects remain a priority and Weyerhaeuser will continue to study ways to decrease the raw water usage at its Flint River facility. A Weyerhaeuser project that reclaims and reuses cooling water going to several fan bearings in the boilerhouse area has just been approved for funding. This project has the potential to save another 500,000 gallons per day of water by the end of 2000.

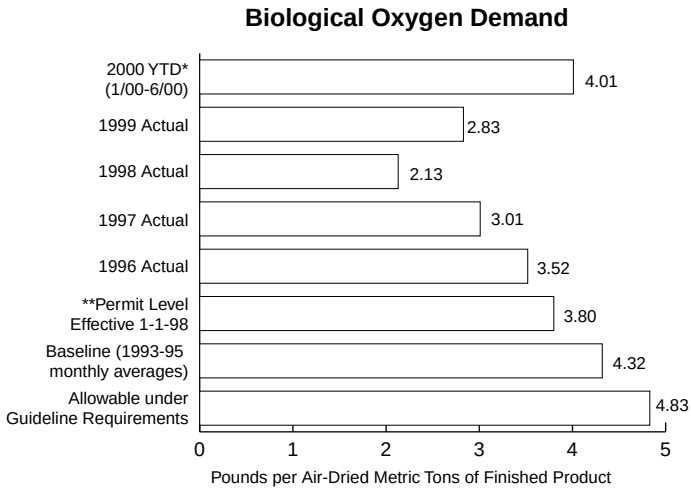
Bleach Plant Flow: Weyerhaeuser has committed to researching the feasibility of implementing future technological developments in the industry that may allow the facility to reduce its bleach plant effluent flow by 50 percent to 10 cubic meters per air dried metric ton (ADMT) for finished product (fluff pulp used to make diapers) by the year 2006. The expected environmental benefits include (1) a two MGD monthly average water-use reduction (bleach plant flow is approximately 48 to 49 percent of the total plant water usage); (2) reductions in effluent BOD, TSS, and AOX; and (3) HAP emission reductions. To reach these goals, Weyerhaeuser plans to conduct feasibility studies on water use management. The results of these studies will be used by EPA, Georgia EPD, and Weyerhaeuser to negotiate a NPDES permit to be issued in 2002. The permit will contain enforceable measures for reducing effluent flow to an agreed-upon level by 2006.



*YTD=Year to date

Progress: Bleach plant flow remained unchanged at 20 cubic meters per ADMT in 1996, 1997, 1998, 1999, and the first six months of 2000. An initial feasibility study to determine the equipment required to reduce bleach plant flow, the effect of the equipment on product quality and effluent, and estimated capital costs has been completed. The company's initial assessment is that the cost of creating a closed loop recycling bleach plant would not justify moving ahead with major bleach plant effluent quantity reductions. Pulp purchasers in Europe and North America have indicated little interest in paying a higher price for pulp from a mill with a closed loop recycling bleach plant. Some additional testing for internal improvements in the bleach plant will be conducted to reduce bleach plant flow without requiring the major capital expenditures of creating a closed loop bleach plant. Weyerhaeuser is searching for new opportunities to reduce bleach plant effluent and is seeking alternative ways to move toward the goal of reducing bleach plant effluent by 2006.

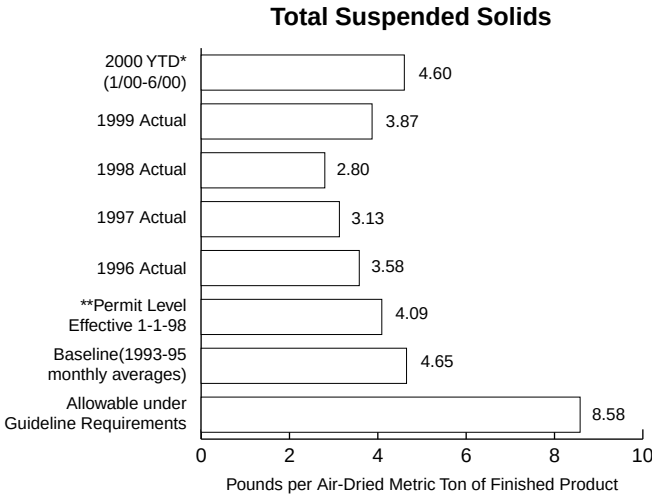
Biological Oxygen Demand (BOD) in Effluent: Weyerhaeuser has committed to reduce BOD levels in treated wastewater discharged to the Flint River. The facility's January 1998 NPDES permit allows the discharge of 3.8 pounds of BOD per ADMT of finished product.



*YTD=Year to date
**Units used in the NPDES permit are pounds per day. The permit level has not been exceeded.

Progress: Weyerhaeuser has modernized several components of the pulping process, which has reduced the amount of organic materials, and consequently the BOD levels, in bleach plant wastewater from baseline levels. Weyerhaeuser reduced the amount of BOD in its effluent from a 1997 level of 3.01 pounds per ADMT to a 1998 level of 2.13 pounds per ADMT. During 1999, BOD levels in facility effluent increased to 2.83 pounds per ADMT. Unreliable operation in a facility process during 1999 caused increased production of offgrade pulp, which is recycled through the pulp manufacturing process. This increased the amount of water used, effluent produced, and BOD levels per ton of finished product. In the first six months of 2000, BOD levels increased to 4.01 pounds per ADMT. This increase is attributed to a seasonal effect; Weyerhaeuser expects the BOD to remain within permitted levels, as noted in the footnote for the figure in this section.

Total Suspended Solids (TSS) in Effluent: Weyerhaeuser has committed to reducing TSS levels in treated wastewater discharged to the Flint River. The facility's January 1998 NPDES permit allows the discharge of 4.09 pounds of TSS per ADMT of finished product.



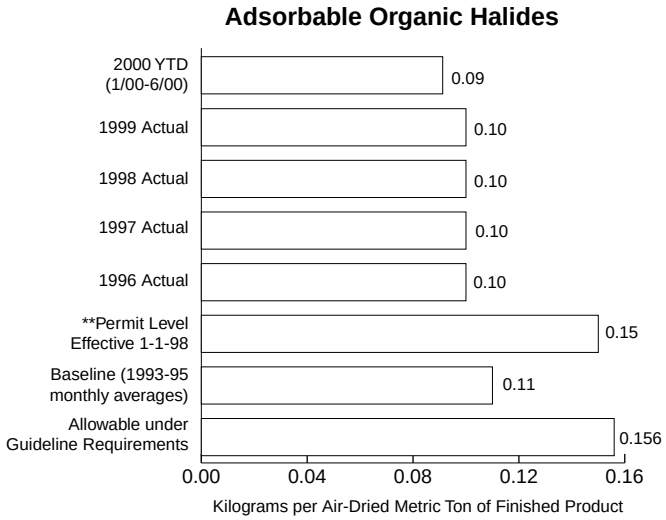
*YTD=Year to date
**Units used in the NPDES permit are pounds per day. The permit level has not been exceeded.

Progress: Weyerhaeuser has modernized several components of the pulping process, which has reduced the amount of TSS in bleach plant wastewater. Weyerhaeuser reduced the amount of TSS in its effluent from a 1997 level of 3.13 pounds per ADMT to a 1998 level of 2.8 pounds per ADMT. During 1999, TSS levels in facility effluent increased to 3.87 pounds per ADMT. Unreliable operation in a facility process

during 1999 caused increased production of offgrade pulp, which is recycled through the pulp manufacturing process. This increased the amount of water used, effluent produced, and TSS levels per ton of finished product. For the first six months of 2000, TSS levels increased to 4.60 pounds per ADMT. This apparent increase is likely due to a seasonal affect; Weyerhaeuser expects the TSS to remain within permitted levels, as noted in the footnote for the figure in this section.

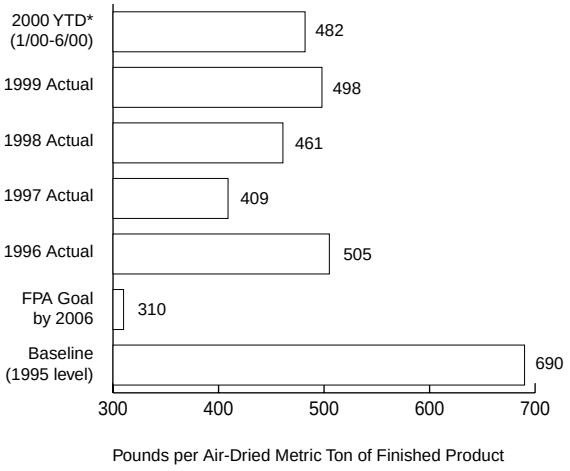
Adsorbable Organic Halogens (AOX) in Effluent: Weyerhaeuser has committed to reducing AOX levels in treated wastewater discharged to the Flint River. The facility's January 1998 NPDES permit allows the discharge of 0.15 kilograms of AOX per ADMT of finished product. The AOX limit under Project XL achieves 4 percent reductions above the best available technology standards proposed by EPA.

Progress: Weyerhaeuser has modernized several components of the pulping process, which has generally maintained the levels of AOX in bleach plant wastewater. AOX levels were 0.10 kilograms per ADMT in 1996, 1997,1998, and 1999. During 2000, AOX levels in facility effluent decreased to 0.9 kilograms per ADMT.



*YTD=Year to date
**Units used in the NPDES permit are pounds per day. The permit limit has not been exceeded.

Solid Waste Generation: Weyerhaeuser has committed to reducing solid waste generation by 50 percent by the year of 2006 from the MIM Phase IV goal of 621 pounds per ADMT, which would be 310 pounds per ADMT. Source elimination, by-product recycling and reuse, and by-product energy recovery will be used to accomplish this goal.



*YTD=Year to date

Progress: Weyerhaeuser has modernized several components of the pulping process, which has generally reduced the amount of solid waste generated by the plant. Solid waste generation at the facility in 1997 was 409 pounds per ADMT (59 percent of baseline). This increased in 1998 to 461 pounds per ADMT (67 percent of baseline). The increase was caused primarily by the generation of over 9,200 tons of additional lime mud from two calciner operating and mechanical incidents. On the positive side, a total of 1,550 tons of solid waste reductions were achieved in waste clarifier sludge from enhancing performance of the finish fiber cleaners, from reducing power boiler fly ash, from reducing screening room knots from the digester, and from recovering wood yard debris.

During 1999, solid waste generation increased to 498 pounds per ADMT (72 percent of baseline). The increase was predominately due to additional lime mud generation caused by calciner operational problems. The increase in lime mud generation offset continued progress in reducing generation of power boiler fly ash by approximately 630 tons, reducing generation of screening room knots by about 126 tons, and recovering 982 tons of wood yard debris. Through June 2000, solid waste generation decreased to 482 pounds per ADMT.

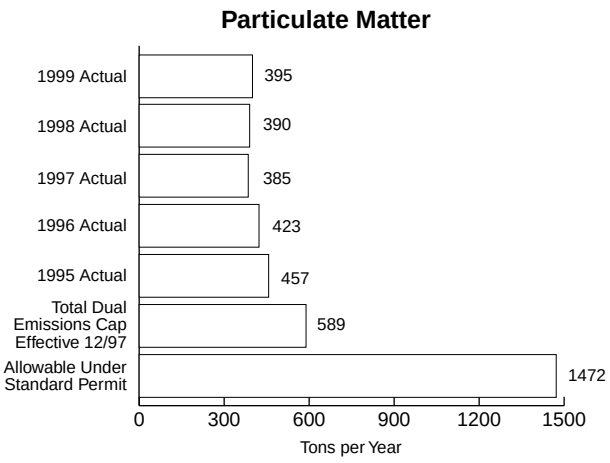
The mill will be initiating a major study in the second half of 2000 to determine the scope required to meet the 2006 solid waste goal. In addition, the plan to refine composting methods and cost was completed in the first half of 2000. If possible, approval will be sought during 2001. In addition, the power boiler advanced control study is in progress to investigate ways to reduce combustion of flyash from the boiler. The study is expected to take approximately one year to complete.

The University of Georgia has completed composting trials showing that composting is a viable alternative to landfilling of certain solid wastes. A draft of the composting feasibility report concludes that the composting process results in a stable product that can be used in horticultural, agricultural, and other soil blending applications. The compost has been used on a test plot for surface mine reclamation and has shown promising results. The China Clay Producers Association has requested the compost for an expanded field study. If the expanded study is successful and the economics are favorable, composting of process residuals would be commercially viable.

Field plots supplemented with compost and process wastes have been planted with pine seedlings. This land application feasibility trial is continuing into the second growing season. No effect on the mortality rates of pine seedlings was observed after the first growing season. Growth rate is expected to be positively impacted in subsequent years. This field study is ongoing.

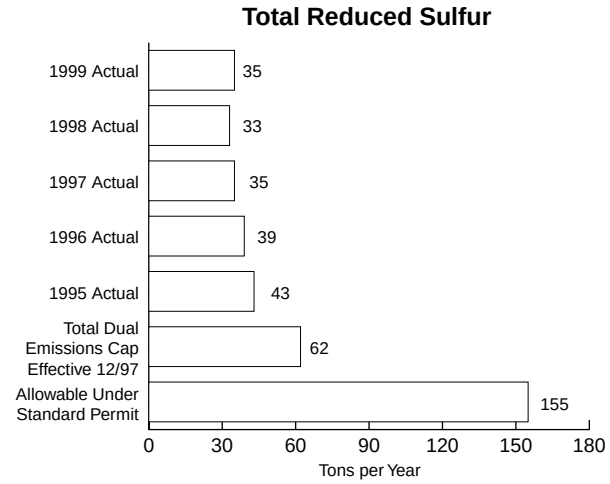
Air Emissions of Particulate Matter: The facility's December 1997 air quality permit includes dual emission caps for air pollutants. The cap on all emissions of particulate matter is 589 tons per year, which is a 60 percent reduction from the 1,472 tons per year allowed under a standard permit.

Progress: Particulate matter air emissions increased slightly from a 1998 level of 390 tons per year (66 percent of capped level) to a 1999 level of 395 tons per year (67 percent of capped level). Data on particulate matter emissions were not analyzed during the first six months of 2000. Updated information on particulate matter emissions will be provided in the annual report.



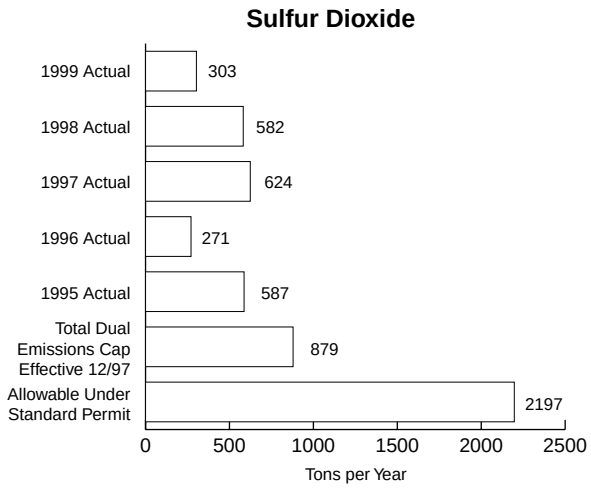
Air Emissions of Total Reduced Sulfur: The facility's December 1997 air quality permit includes dual emission caps for air pollutants. The total cap on all emissions of total reduced sulfur is 62 tons per year, which is a 60 percent reduction from the 155 tons per year allowed under a standard permit.

Progress: Total reduced sulfur air emissions increased slightly from a 1998 level of 33 tons per year (53 percent of capped level) to a 1999 level of 35 tons per year (56 percent of capped level). Data on total reduced sulfur emissions were not analyzed during the first six months of 2000. Updated information on sulfur emissions will be provided in the annual report.



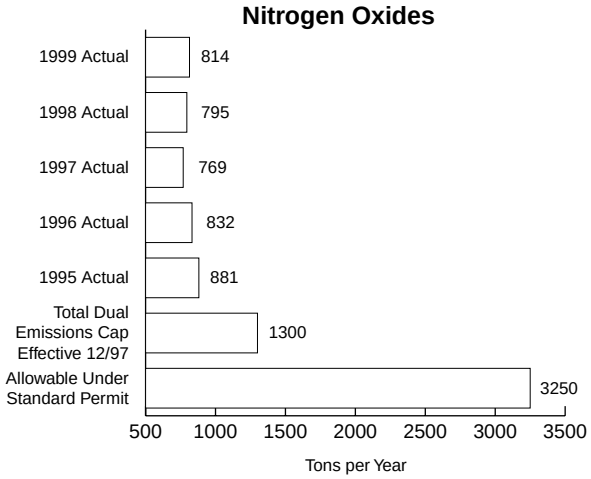
Air Emissions of Sulfur Dioxide (SO_2): The facility's December 1997 air quality permit includes dual emission caps for air pollutants. The total cap on all emissions of SO_2 is 879 tons per year, which is a 60 percent reduction from the 2,197 tons per year allowed under a standard permit.

Progress: Emissions of SO_2 have decreased from a 1997 level of 624 tons per year (71 percent of capped level) to a 1998 level of 582 tons per year (66 percent of capped level). Sulfur dioxide air emissions have since significantly decreased to a 1999 level of 303 tons per year (34 percent of capped level). Data on sulfur dioxide emissions were not analyzed during the first six months of 2000. Updated information on sulfur dioxide emissions will be provided in the annual report.



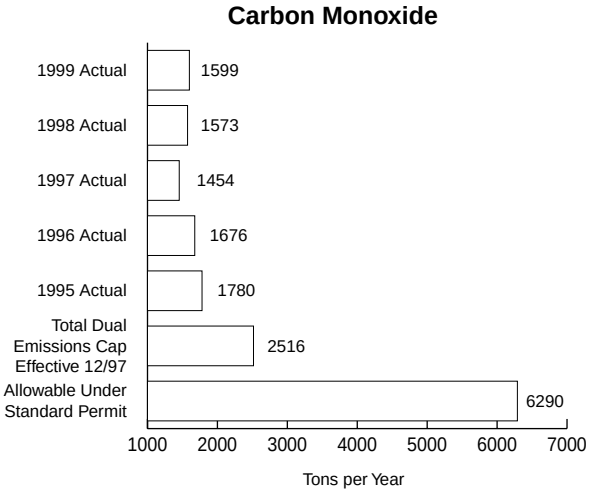
Air Emissions of Nitrogen Oxides (NO_x): The facility's December 1997 air quality permit includes dual emission caps for air pollutants. The total cap on all emissions of NO_x is 1,300 tons per year, which is a 60 percent reduction from the 3,250 tons per year allowed under a standard permit.

Progress: NO_x air emissions had increased slightly from a 1997 level of 769 tons per year (59 percent of capped level) to a 1998 level of 795 tons per year (61 percent of capped level). NO_x air emissions have since increased to a 1999 level of 814 tons per year (63 percent). Data on nitrous oxide emissions were not analyzed during the first six months of 2000. Updated information on nitrous oxide emissions will be provided in the annual report.



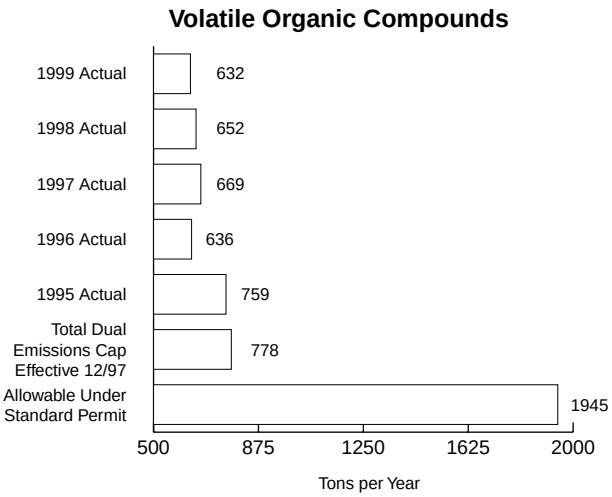
Air Emissions of Carbon Monoxide (CO): The facility's December 1997 air quality permit includes dual emission caps for air pollutants. The total cap on all emissions of carbon monoxide is 2,516 tons per year, which is a 60 percent reduction from the 6,290 tons per year allowed under a standard permit.

Progress: Carbon monoxide air emissions increased from a 1998 level of 1,573 tons per year (63 percent of capped level) to a 1999 level of 1,599 tons per year (64 percent of capped level). Data on carbon monoxide emissions were not analyzed during the first six months of 2000. Updated information on carbon monoxide emissions will be provided in the annual report.



Air Emissions of Volatile Organic Compounds (VOCs): The facility's December 1997 air quality permit includes dual emission caps for air pollutants. The total cap on all emissions of VOCs is 778 tons per year, which is a 60 percent reduction from the 1,945 tons per year allowed under a standard permit.

Progress: VOC emissions had decreased from a 1997 level of 669 tons per year (86 percent of capped level) to a 1998 level of 652 tons per year (84 percent of capped level). VOC emissions have since decreased to 303 tons per year (39 percent of capped level). Data on VOC emissions were not analyzed during the first six months of 2000. Updated information on VOC emissions will be provided in the annual report.



Hazardous Air Pollutant (HAP) Emissions: HAP emission levels that Weyerhaeuser will be required to attain under the new MACT rule will be determined based on a site-specific assessment, Weyerhaeuser's development of an alternative compliance plan, and Federal and state agency approval of that plan.

Progress: The facility has completed HAP emissions testing around the steam stripping system, the bleach plant, the screening room, and oxygen stage sources to quantify the amount of HAPs (in this case, methanol) that are produced in these process areas. HAP emissions testing conducted on sources subject to the MACT rules shows the mill to be in compliance with the MACT standards for HAPs collection. This is a result of the system modifications completed in 1996. In July 1999, the plant performed 30 days of testing for methanol content in condensate streams. The results of this testing indicated that with a change in piping, more methanol in condensate could be diverted to biological treatment. After piping changes were made, another 21 days of testing was performed in October 1999. The results show that the condensate collection system is treating 83 percent more methanol than that required by the Cluster Rule in biological treatment alone. A follow-up meeting was held with Weyerhaeuser, EPA, and Georgia EPD in December 1999. Weyerhaeuser has completed and submitted the facility's MACT alternative compliance plan to EPA and Georgia EPD. A draft site-specific MACT Rule has been written by EPA to formalize this agreement and is in circulation within EPA. The process will be completed before the MACT compliance date in April 2001.

Hazardous Waste Generation: Weyerhaeuser committed to reduce its hazardous waste generation to the point where the facility's RCRA designation would be changed from a small-quantity generator (SQG) to a conditionally exempt small-quantity generator.

Progress: Weyerhaeuser achieved this goal in 1997 by recycling and reusing a solvent (methyl ethyl ketone) used for cleaning painting equipment.

Environmental Management System (EMS): An EMS instills the principles of continuous environmental improvement through pollution prevention rather than end-of-pipe controls. The existing Flint River Operations EMS will be revised to conform to the ISO 14001 EMS. ISO 14001 is a voluntary international standard that outlines a framework for an environmental management system. When completed, the ISO 14001 EMS will document the management systems required to comply with all applicable Weyerhaeuser policies and state, local, and Federal rules and regulations.

Progress: An ISO 14001 guidance document has been completed by Weyerhaeuser staff at the corporate level, at the Flint River facility, and at another Weyerhaeuser mill. The guidance document outlines the require-

ments, steps to take, and examples for implementing an ISO 14001 EMS. Other Weyerhaeuser mills will use this guidance document as a template to create their own EMS.

In the first six months of 2000, Weyerhaeuser has made significant progress in reorganizing and redocumenting the Flint River EMS to conform to the ISO 14001 standard. Most of the high-level documentation has been completed and significant environmental aspects have been identified, 50 percent of which have been documented. The plant has prepared a training package on EMS responsibilities for plant leadership, team leaders, and all mill employees. An initial EMS audit is scheduled for November 2000. Weyerhaeuser plans to have a fully functioning EMS that conforms to ISO 14001 completed by the end of 2000.

Energy Conservation: Weyerhaeuser committed to conducting energy conservation studies to identify opportunities for long-term reductions in facility energy demand. Based on these studies, a long-term goal for energy conservation will be determined and incorporated into the FPA. The expected environmental benefit is a reduction in air pollutant emissions due to a reduction in the amount of fuel burned.

Progress: Weyerhaeuser continued to make gains in the area of energy conservation, specifically in their efforts to reduce steam usage. Two capital projects from the energy conservation study were investigated. The results from the non-capital projects implemented in 1998 show the average annual steaming rate continues to decline. The reduction in power boiler steaming rate has a direct relationship to less criteria air pollutants being emitted. There has been a decrease in power boiler steaming rate since the baseline years (from a level of 295,000 pounds per hour in 1994 to 199,000 pounds per hour for the first six months of 2000). In addition, since 1996, energy steam usage has decreased from 22.44 million pounds (Mlbs)/ADMT to 20.62 Mlbs/ADMT through the first six months of 2000.

Stakeholder Participation

Weyerhaeuser worked to ensure that stakeholders were involved in the environmental design and impact assessment of its XL project and had an opportunity to participate fully in project development. The organizations directly involved in negotiating the FPA included Weyerhaeuser, U.S. EPA, Georgia EPD, the Georgia Pollution Prevention Assistance Division (PPAD), and the Lake Blackshear Watershed Association. Efforts to include a broad array of stakeholders as direct participants and to keep the public well informed included:

- a series of regional public meetings in Oglethorpe, Georgia;
- personal contacts through telephone calls and meetings;
- oral briefings and broad distribution of written descriptions of Project XL to employees;
- oral briefings and the distribution of written project summaries to interested national, nongovernmental organizations; and
- publication of notices in courthouses and local newspapers to convey an open invitation to scheduled public meetings.

Complete listings of all stakeholders that participated in general public meetings held to discuss the Weyerhaeuser FPA are available in FPA Appendix A.

Weyerhaeuser openly communicates with stakeholders about the status of operations under the FPA, answering all questions and inquiries. Weyerhaeuser has committed to holding annual stakeholder meetings in the vicinity of the Flint River facility. Reasonable advanced meeting notice will be provided to Federal, state, and local agencies and other stakeholders. The annual meeting is the platform for Weyerhaeuser to present the status of FPA implementation and to answer stakeholder questions and concerns.

On January 28, 1998, the first Project XL annual stakeholders meeting was held in Montezuma, Georgia. On February 4, 1999, the second annual stakeholders meeting was held at the Flint River facility. The third annual stakeholders meeting was also held at the Flint River facility, on February 3, 2000. Members of Weyerhaeuser's corporate leadership attended as well as representatives of EPA headquarters and Region 4, Georgia EPD, Weyerhaeuser employees, other stakeholders, and the general public. An audience of approximately 30 people participated in open question-and-answer period following a presentation on the progress of Project XL at the Flint River facility.

Six-Month Outlook

The key focus areas for continued successful implementation of the FPA over the next six months will be to

- identify and implement water conservation measures to drive towards the goal of 10.18 MGD total water usage;
- define possible water reuse and reduction opportunities that would reduce bleach plant effluent flow;
- continue efforts in energy conservation;
- complete the effort to convert Flint River Operation's EMS into ISO 14001 EMS in 2000;
- implement the applicable Cluster Rule requirements according to timelines within the regulation; and
- focus on continued reduction of solid waste from the calciner with the implementation of a rate and reliability study.

Project Contacts

- Mark Johnson, Weyerhaeuser, (770-777-8308).
- Lee Page, EPA Region 4, (404) 562-9131.
- Nancy Birnbaum, EPA Headquarters, (202) 260-2601.
- David Word, Georgia EPD, (404) 656-4713.
- Alan Leake, Georgia EPD, (404) 363-7138.
- Bob Donoghue, Georgia PPAD, (404) 651-5120.

Information Sources

The information sources used to develop this progress report include (1) focus group discussions with representatives of the U.S. EPA, Weyerhaeuser Flint River Operations, Georgia EPD, Georgia PPAD, and local community stakeholders; (2) the FPA for the Weyerhaeuser XL project; and (3) annual and semiannual status reports prepared by Weyerhaeuser. The information sources are current through July 2000.

Glossary

Adsorbable Organic Halogen (AOX): A measurement of the amount of chlorinated organic compounds in an effluent water sample.

Assimilative Capacity: The capacity of a body of water to receive wastewaters or toxic materials without deleterious effects and without damage to either aquatic life, or to humans or terrestrial animals that consume the water.

Baseline: A measure by which future environmental performance can be compared.

Best Management Practices: Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from non-point sources.

Biological Oxygen Demand (BOD): The measurement in an effluent water sample of the oxygen consumed by biological processes breaking down organic matter. Excessive amounts of BOD in water can result in algal blooms.

Bleach Plant: Bleaching is any process that chemically alters pulp to increase its brightness.

Brownside Optimization: The name given to Weyerhaeuser's project to upgrade its pulp digester to isothermal cooking technology, reinjection of wood knots, and change out of primary screens.

Brownstock Washing: The pulping solution used in chemical pulping is separated from the pulp using brownstock washing. Efficient washing is critical to maximize the reuse of pulping solution and minimize the concentration of pulping solution in the pulp sent to the bleach plant.

Calciner: In the calcining process, typically, a lime kiln is used to regenerate lime from lime mud.

Carbon Monoxide (CO): A colorless, odorless, poisonous gas produced by incomplete fossil fuel combustion.

Clean Air Act (CAA): The Clean Air Act is the comprehensive Federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes EPA to establish National Ambient Air Quality Standards (NAAQS) and other regulations to protect public health and the environment.

Clean Water Act (CWA): The Clean Water Act sets the basic structure for regulating discharges of pollutants to waters of the United States. The law gives EPA the authority to set technology-based effluent standards on an industry basis and establish water quality standards for all contaminants in surface waters. The CWA makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a National Pollutant Discharge Elimination System (NPDES) permit is obtained.

Conditionally Exempt Small-Quantity Generator: Persons or enterprises that produce less than 220 pounds of hazardous waste per month. Exempt from most regulations, they are required only to determine whether their waste is hazardous, notify appropriate state or local agencies, and ship the waste by an authorized transporter to a permitted facility for proper disposal.

Criteria Air Pollutants: The CAA requires EPA to set NAAQS for certain pollutants known to be hazardous to human health. EPA has identified and set standards to protect human health and welfare for six criteria air pollutants—ozone, carbon monoxide (CO), total suspended particulates, sulfur dioxide (SO2), lead, and nitrogen oxide (NOx). EPA must describe the characteristics and potential health and welfare effects of these pollutants. It is on this basis that NAAQSs are set or revised.

Digester: A reaction vessel used to convert wood chips into pulp. Wood chips are mixed with a pulping solution (white liquor) in a reaction vessel (digester) that cooks the solution under increased pressure and temperature. Output products are separated wood fibers (pulp) and a liquid that contains woody solids in a solution of reacted and unreacted pulping chemicals (black liquor).

Dioxin: Any one of a family of compounds known chemically as dibenzo-p-dioxins. Concern about dioxin arises from their potential toxicity as a contaminant in commercial products. Tests on laboratory animals indicate that dioxin is one of the most toxic of man-made compounds.

Discharge Monitoring Report (DMR): Facilities that discharge wastewater directly from point sources to surface waters must submit DMRs under NPDES wastewater permitting.

Effluent: Treated or untreated wastewater that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

Emissions Cap: A provision designed to prevent projected growth in emissions from both existing and future stationary sources from exceeding mandated limits. Generally, such provisions require that any emissions increase from equipment at a facility be offset by emission reductions from other equipment under the same cap.

End-of-Pipe Controls: Technologies, such as scrubbers on smokestacks and catalytic convertors on automobile tailpipes, that reduce the emission or discharge of environmental pollutants after they have formed.

Final Project Agreement: The FPA outlines the details of the XL project and each party's commitments. The project's sponsors, EPA, state agencies, Tribal governments, other regulators, and direct participant stakeholders negotiate the FPA.

Forest Buffers: Strips of forests along each side of a stream that resist erosion and slow the runoff of sediment-laden rainwater into the stream.

Hazardous Air Pollutants (HAPs): Air pollutants that are not covered by the NAAQS but that may present a threat of adverse human health effects or adverse environmental effects. Such pollutants include methanol, asbestos, beryllium, mercury, benzene, radionuclides, and vinyl chloride.

Impeller: The blade of a rotating portion of a machine. Weyerhaeuser increased the size of the impeller of a whitewater pump, allowing the pump to process a higher volume of water when needed. This reduced the amount of water overflowing into the sewer as waste, thereby conserving water.

International Organization for Standardization (ISO) 14000: ISO 14000 is primarily concerned with environmental management. The ISO 14000 series sets out the methods that can be implemented in an organization to minimize harmful effects on the environment caused by pollution or natural resource depletion.

Landfill: Secure landfills are disposal sites for solid wastes, selected and designed to minimize the release of hazardous substances into the environment.

Leachate: Water that collects contaminants as it trickles through wastes, pesticides, or fertilizers. Leaching may occur in farming areas, feedlots, and landfills, and may result in hazardous substances entering surface water, groundwater, or soil.

Lime Mud: A by-product of the process of recovering used pulping solution. Impurities removed during the recaust process are mixed with lime, which precipitates lime mud.

Maximum Available Control Technology (MACT): The emission standard for sources of air pollution requiring the maximum reduction of hazardous emissions, taking cost and feasibility into account. Under the CAA Amendments of 1990, the MACT must not be less than the average emission level achieved by controls on the best performing 12 percent of existing sources, by category, of industrial and utility sources.

Media: Specific environments—air, water, soil—which are the subject of regulatory concern and activities.

Methyl Ethyl Ketone (MEK): A solvent typically used in cleaning painting equipment.

Minimum Impact Manufacturing (MIM): Minimum Impact Manufacturing contains the elements of a comprehensive pollution prevention program designed to obtain the greatest use of raw materials and to stop waste generation rather than rely on end-of-pipe remedies. MIM involves a holistic approach to pollution prevention employing a systems engineering approach, waste reduction, and a commitment to continuous environmental improvement.

Multi-media: Several environmental media, such as air, water, and land.

National Ambient Air Quality Standards (NAAQS): Standards established by EPA under the CAA applicable to the emission of criteria air pollutants throughout the country.

National Pollutant Discharge Elimination System (NPDES): A provision of the CWA that prohibits the discharge of pollutants into waters of the United States unless a special permit is issued by EPA, a state, or where delegated, by a Tribal government on an Indian reservation.

Nitrogen Oxides (NOx): An air pollutant that is the result of photochemical reactions of nitric oxide in ambient air. Typically, it is a product of combustion from transportation and stationary sources. It is a major contributor to the formation of tropospheric ozone, photochemical smog, and acid deposition.

Particulate Matter: Fine liquid or solid particles, such as dust, smoke, mist, fumes, or smog, found in air or emissions.

Point Source: A stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution, for example, a pipe, ditch, ship, ore pit, or factory smokestack.

Pollution Prevention: Identifying, altering, or eliminating areas, processes, and activities that create excessive waste products or pollutants. Such activities, consistent with the Pollution Prevention Act of 1990, are conducted across all EPA programs.

Pulp: Cellulose fibers separated from wood chips used in making paper, cardboard, and related products.

Pulping Solution: A chemical solution that is mixed with wood chips and digested under temperature and pressure. The pulping solution degrades wood by dissolving the bonds holding cellulose fibers together.

Recaust: The molten pulping solution reclaimed from the recovery boiler treated to further remove impurities and convert sodium carbonate into active sodium hydroxide and sodium sulfide.

Recovery Boiler: Used pulping solution is sent to the recovery boiler to burn off impurities (undigested woody solids). Woody solids are burned for energy and the pulping solution is removed from the mixture in molten form (smelt).

Resource Conservation and Recovery Act (RCRA): RCRA gives EPA the authority to control hazardous waste from ”cradle-to-grave.“ This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also establishes a framework for the management of nonhazardous wastes. RCRA enables EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. RCRA focuses only on active and future facilities and does not address abandoned sites.

Screening: A pulp processing step that helps remove impurities from digested pulp, such as bark fragments, oversized chips, and undigested chips. In open screening rooms, wastewater from the screening process goes to wastewater treatment prior to discharge. In closed screening rooms, wastewater from the screening process is reused in other pulping operations and ultimately enters the mill’s recovery system.

Small-Quantity Generator (SQG): Persons or enterprises that produce 220-2,200 pounds per month of hazardous waste. SQGs are required to keep more records than conditionally exempt generators. The largest category of hazardous waste generators, SQGs include automotive shops, dry cleaners, photographic developers, and many other small businesses.

Solid Waste: Nonliquid, nonsoluble materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes also include sewage sludge, agricultural refuse, demolition wastes, and mining residues. Technically, solid waste also refers to liquids and gases in containers.

Sulfur Dioxide (SO2): Sulfur-dioxide gases are formed when fuel containing sulfur (mainly coal and oil) is burned and can be formed during metal smelting and other industrial processes. Sulfur dioxide is associated with acidification of lakes and streams, accelerated corrosion of buildings and monuments, reduced visibility, and such adverse health effects as inhibition of breathing, respiratory illness, and aggravation of existing cardiovascular disease.

Title V of the Clean Air Act: Establishes a federal operating permit program that applies to any major stationary facility or source of air pollution. The purpose of the operating permits program is to ensure compliance with all applicable requirements of the CAA. Under the program, permits are issued by states or, when a state fails to carry out the CAA satisfactorily, by EPA. The permit includes information on which pollutants are being released, how much may be released, and what kinds of steps the source's owner or operator is taking to reduce pollution, including plans to monitor the pollution.

Total Reduced Sulfur (TRS): Sulfur is a nonmetallic element used particularly in the chemical and paper industries. TRS is a measure that includes all sulfur-based compounds with extra electrons, such as hydrogen sulfide, dimethyl sulfide, and dimethyl disulfide. TRS has an odor suggestive of rotten eggs.

Total Suspended Solids (TSS): The measurement of the amount of suspended solids in an effluent water sample.

Volatile Organic Compound (VOC): Any organic compound that easily evaporates and participates in atmospheric photochemical reactions, except those designated by EPA as having negligible photochemical reactivity.

Wastewater: The spent or used water from a home, community, farm, or industry that contains dissolved or suspended matter.

Water Bars: An obstruction that slows the downhill flow of rainwater and, therefore, reduces erosion.

White Water: Screening and cleaning operations during the pulp processing stage are sources of large volumes of wastewater. This effluent stream is called white water because of its characteristic color.