POST HARVEST ENVIRONMENTAL PERFORMANCE MONITORING

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INTRODUCTION

Weyerhaeuser Company has been moving towards fully adopting Total Quality processes which naturally results in an increase in focus on performance against expectations. Public concerns over environmental degradation has increased the need to document our performance against our own stewardship goals and external forest practice regulations. The company has been working on aligning functions to achieve improved environmental performance and has adopted several methods to measure post harvest environmental performance.

PRE-ACTIVITY MEETINGS AND SETTING CLOSURE PROCESS

The increasing complexity of forest practice regulations and permit conditions requires improved communications. A documented process was developed to insure our performance expectations and forest practice permit requirements are thoroughly communicated prior to work beginning. After work is completed, an inspection is made to document that expected performance has been achieved. Both functions are done on the same form.

Pre-activity meetings are held prior to beginning work. These meetings are held to discuss activity prescriptions including: environmental sensitivities, neighbor issues, aesthetics, wildlife habitat, conditions to the Forest Practices Act (FPA) permit, timing of operation, road maintenance requirements, and other issues of concern. The objective of these meetings is to fully communicate requirements for successful performance on the job, and to insure that expectations are fully understood by the people doing the work.

Setting closure is done after activities are complete, and before equipment has moved

from the site. The objective is to inspect whether the activities have been successfully completed before hand-off to the next accountable person or function.

UTILIZATION

From a purely aesthetic standpoint, there is a widely held belief that a beautiful landscape is a healthy landscape. Conversely, perceived disruption of the landscape (such as clearcutting) is not beautiful and therefore, not "healthy". Public interviews indicated that logs, slash and debris remaining after harvest were clear indications to the public there was damage to public resources. The forest products industry in the Northwest has been responding to the public perception of a healthy forest through media campaigns, participation in educational programs and the political channels of local, state and federal forest policy forums.

Economically, reduced federal and state harvest of timber from public lands coupled with a strong worldwide demand for pulp and paper has resulted in decreased supplies and increasing residual values for previously "non-merch" material. As the variable cash contribution of recovering smaller material has shifted to positive, the company has increased its recovery of wood fiber by reducing the size of material it expected to recover from its properties. For example, current standards call for the recovery of all 3"-12' of fiber material. Standards vary dependent on the type and value of timber, location to market and the cost of recovery. Standards represent the minimum

dimensions of material required to be removed from our ownership. All other material that has a cash contribution to Weyerhaeuser Company should be removed and delivered to market. Cash contribution is defined as delivered market value less variable costs of removal.

In Washington, 50 percent of Weyerhaeuser Company logging is done by company employees. In 1986, the company and its labor unions adopted a Competitive Logging Program (CLP) which incented company logging crews to maximize volume of production. Together with the reduced average age and piece size of timber harvest, this has resulted in a system disincentive to fully utilize small material.

A utilization audit is done during harvest if performance is not up to par, or following harvest to measure performance against standards established for the setting. The sample system used is similar to the Wagner Waste system used in some parts of New Zealand.

Operationally, various systems are in use or being trialed to optimize the recovery of small wood:

- drop boxes for short chunks not able to be bunked on a truck
- woods chain flail debarking and chipping systems
- tub grinders for the recovery of hog fuel and other products
- full stem harvesting and mechanical processing on the landing

FOREST SOILS MANAGEMENT-GROUND BASED OPERATIONS

Through the leadership of our Forest Councils, we adopted objectives for forest soils:

- Protect the soil asset, be a leader in the industry, and maintain or enhance competitiveness of harvest operations
- Implement and continuously improve a reliable process for soils management in ground-based harvest operations. Harvest operations includes clear-cut harvest, commercial thinning, partial cuts, and salvage logging.

For assessing soil disturbance, we established five Soil Disturbance Classes:

Class 1
Soil has been compacted but has not been churned up. Track of ground machine is obvious, forest floor and light slash may be pressed into soil, but this organic material is not stirred into the soil.

Class 2
Soil surface has been churned up. The depth of disturbance is confined to the surface horizon. The forest floor and some light slash has been stirred into the soil. The depth of churning and incorporation of debris is confined to the surface horizon. The subsurface horizon can be compacted but is not churned up.

Class 3
Surface and subsurface horizons have been churned up. Part of the surface horizon may have been displaced. Slash and forest floor materials have been deeply churned into the soil.

Class 4
Surface horizon has been displaced. Subsurface horizon puddled. Organic debris may have been incorporated into the soil.

Class 5
Any Class 1, 2 or 3 disturbance that disrupts internal water movement and causes the soil to be saturated for periods greater than 10 days particularly in the dormant period (winter).

Performance standards are based upon Forest Practice Act regulations, science, economics, aesthetics, public expectations and Weyerhaeuser stewardship goals. Standards address the protection of public resources (water quality, fish and wildlife habitat), sustainable site productivity and visual impacts, and provide operating targets against which we can measure our

performance and identify opportunities to improve.

SOIL DISTURBANCE STANDARDS
Percentage of ground based logged area

Class 1
No restriction

Class 2
Ground logging only (1 machine entry). Target is </= to 10% with a 5% variance. Mechanized cutting followed by ground logging (2 machine entries). Target is 0 with a 15% variance.

Class 3, 4
Target is 0 with a 2% variance

Class 5
Target is 0 with a 5% variance. Settings will be required to be examined one year after planting to verify the results of assessment.

A compliance audit of all ground logged settings, or portions of settings, greater than 10 acres (4 hectares) in size are audited for soil disturbance. This audit process began in 1995 and will be evaluated at year end for summarization of results and identification of process improvements. A new forest soils training package has been completed and all managers and operators will be required to attend the training.

ENVIRONMENTAL AUDIT
Weyerhaeuser Company has a long tradition of commitment to environmental performance. Environmental policy is established at the corporate level and regularly communicated to employees. Environmental and stewardship goals are an integral part of each employee's performance evaluation. Each year, a timberlands environmental audit is conducted and the results communicated to the affected managers. The audit thoroughly covers forest planning, harvest and silvicultural activities.

Forestry and Silviculture
Sustainable Harvest
Chemicals and Fertilizers
Specialty Forest Products
Forest Utilization
Fire Protection
Site Preparation
Regeneration

Water Quality
Streamside Management
Road Construction
Road Maintenance

Soil Productivity
Erosion
Control/Waterbarring
Soil Protection

Stewardship
Agency Relations
Communications

Wildlife Habitat
Wildlife/Fish/Biodiversity
Threatened and Endangered Species

Aesthetics
Clearcut/Greenup
Sensitive Areas
Housekeeping

Each year, a team made up of local and other area foresters/supervisors and led by a corporate timberlands manager spends a week at each operation and audits performance against criteria established for each subject area. A 1-5 scoring system is used to assess performance. A pre-audit and post audit conference is held with local management. A report is prepared and circulated to local and corporate management.

The process has been in place since the mid 1970's, and has undergone numerous changes. Efforts are underway currently to de-emphasize the numerical rating system and change the audit to assess a unit's performance by measuring whether the management processes are in place to

achieve results. The proposed changes are more consistent with a total quality approach to aligning our organization to achieve results.

ROAD MAINTENANCE

Watershed Analysis identified road maintenance practices as the single largest contributor from forest practices to reduced water quality and the potential for significant resource damage. Comprehensive road inventories and development of road maintenance plans have identified a significant amount of work mostly in:

- puncheon (wooden culvert) replacement
- replacing undersized or non-functional culverts
- identification of high risk roads for abandonment
- road maintenance and use practices

Cascade Area recently made the decision to go to a low tire pressure tree farm. What that means is:

- All heavy trucks will run at low tire pressure while operating on tree farm roads.
- Heavy trucks carrying loads on the highway will reinflate to highway pressure.
- All light and medium duty trucks will operate at a reduced tire pressures suitable for mixed on and off highway duty.

Years of research by USFS, US Army, FERIC, Weyerhaeuser and others has shown significant benefits to low tire pressure. The single biggest reason to move quickly now is the recognized potential to significantly reduce sedimentation from logging roads.

The benefits from low tire pressure are:

- Lower road maintenance costs due to :
  - ◊ Reduced rutting
  - ◊ Reduced surface degradation
- Reduced road construction costs by:
  - ◊ Shorter, steeper grades
  - ◊ Less rock on temporary roads
- Improved driver comfort by:
  - ◊ Less vibration to truck and driver
  - ◊ Better traction
- Improved environmental performance by:
  - ◊ Reduced sedimentation
- Increased operating days

SUMMARY

As we have progressed in our implementation of Total Quality principles, we have adopted several methods to measure post harvest environmental performance:

- Operationally, various systems are in use or being trialed to optimize the recovery of small wood. A utilization audit is conducted following harvest to inspect our performance against standards established for the setting. The sample system used is similar to the Wagner Waste system used in some parts of New Zealand.
- A process to measure forest soils disturbance from ground based equipment was developed and results are measured against established standards.
- Environmental and stewardship goals are an integral part of each employee's annual goals. Each year, a timberlands environmental audit is conducted and the results communicated to the affected managers.
- In response to sedimentation caused by road maintenance and use practices, we made the decision to go to a low tire pressure tree farm.

The challenge we now have is to link these processes into a clear, efficient and effective mechanism to consistently achieve environmental performance against our goals.