ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

TASK 2 - SURVEYS AND SITE FACILITIES

SUBTASK 2.13
MARKETABILITY AND DISPOSAL STUDY FOR RESERVOIR AREA

FINAL

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1 - INTRODUCTION

The basic purpose of this subtask is to lay the groundwork for the cost consideration and evaluation of the various parameters involved in the removal of the timber from the reservoirs. This subtask will identify the alternate logging systems that could be utilized in the clearing process, the various methods of disposing of the timber, and the various environmental considerations associated with the fiber removal. All of these factors are intended to provide a focus for the cost estimates for the reservoir clearing subtask (2.14) to follow. This subtask, 2.13, serves as the link between the forest inventory data and the costing tasks. Hopefully, it will provide means to evaluate the costs and benefits of various disposal approaches, harvesting systems, and their associated environmental affects. Due to the very limited budget for this task, effort has concentrated on the identification and description of the various parameters, and identifying a literature base to assist in the actual costing analysis.

2 - SUMMARY

2.1 - Scope of Work

This subtask involved considerable professional judgment based upon past experience, the data gathered in Subtask 2.12, aerial overflights of the reservoirs, and a cursory review of the literature identified in the Bibliography. Various individuals were also contacted for their impressions regarding the marketability of the wood. Due to the limited budget available for this effort, some emphasis was placed on assembling a beginning bibliography to provide the clearing cost estimators with more firm evaluation parameters.

2.2 - Previous Studies

Due to the limited commerciality of the timber present, most of the fiber can be considered wood waste. The subject of logging residue management has become of major concern within only the last ten years. As a result, relatively little research work has been completed on the subject. A literature base is just beginning to be developed. Very little wood waste research has been conducted under Alaskan conditions except for limited areas in Southeast Alaska. There is no waste management work in Interior Alaska that can be applied to the Susitna River case before us. Consequently, the compiled bibliography for this report constitutes the basis for this subtask.

2.3 - Methods of Wood Disposal

Potential methods of wood disposal include burning, burial, marketing, chipping, rafting down the Susitna River. It is quite possible that various combinations of some of these techniques will be utilized, with various approaches in use at the same time at various locations.

2.4 - Applicability of Logging Systems

The combination of steep terrain, moderate-light tree stocking levels, small trees, erosive potential of the reservoir slopes, remoteness, and very restricted access to the reservoirs are major factors affecting the choice of harvesting systems to be utilized for this project. Such systems include high lead, skyline, tractor, whole tree logging with or without chippers, balloon and helicopter. Each system has its own advantages and disadvantages and set of conditions under which its use is optimized.

2.5 - Conclusions and Recommendations

Present market demand for the timber at Susitna is low; however, world wood demand fluctuates considerably. It is expected that the best approach to follow in disposal of the wood is one which minimizes cost. Transportation and logging costs will be astronomical. Environmental controls will greatly affect clearing costs. This portion of the study requires much more detailed analysis. It is extremely important to define what the acceptable wood residue level will be for the clearing process.

3 - METHODS OF WOOD DISPOSAL

Table 1 is essentially a listing of various ways of disposing of the wood from the Devil Canyon and Watana Reservoirs combined with relevant comments. An attempt has been made to be practical, and rely upon the literature base as well as reason and common sense. It is quite possible that various combinations of techniques will be utilized, with several different approaches in use at one time at various locations. This list will need considerable refinement in the costing subtask to follow.

TABLE 1

METHODS OF WOOD DISPOSAL, AND

ASSOCIATED ADVANTAGES AND DISADVANTAGES

Method of Disposal	Advantages	Disadvantages
Burning	°Energy Potential	°Wildfire Hazard
	°Eliminates Transport, Equipment, Processing Costs	°Smoke/Air Quality Degradation
	°Eliminates Insect Build-ups in Slash	°Loss of Commercial Timber
		°Potential for "Hard Burning" Soil
		°Potential Changes in Water Chemistry
Burial	°Eliminates Insect Build-ups in Slash	°Increased Soil Disturbance/ Erosion
		°Equipment Intensive
		°Soil Leachates
		°Loss of Commercial Uses of Timber
		°Requires Restoration
Marketing	°Monetary Return	°Additional Administrative Costs
	°Improved Resource Use Options	°Intensive Management
		°High Logging, Equipment, Transport, Processing Costs

TABLE 1 - CONTINUED

Method of Disposal	Advantages	Disadvantages
Chipping	°Reduces Logging, Transport Costs	°Residue Clogs Streams, Increases BOD, Warm Temperatures
	°Unifies Product, Easier Handling	
	°Eliminates Insect Build-ups in Slash	
Rafting	°Low Transport Cost	°Bundles Break, Lose Wood, Clog Stream
		°Reduce Stream Aesthetics
		°Increase Stream BOD, Warm Temperatures

4 - APPLICABILITY OF LOGGING SYSTEMS

There are a variety of methods that can be utilized to harvest timber. Each has its own set of conditions under which its use is optimized - in terms of cost and time efficiency, terrain suitability, minimization of waste, least environmental damage, etc. The steep terrain, moderate-light stocking levels, small trees, erosive potential of the reservoir slopes, remoteness and very limited access of the reservoir areas present some very difficult and costly parameters in the selection and utilization of appropriate harvesting approaches.

Table 2 identifies systems of potential use at Devil Canyon and Watana Reservoirs, and their associated advantages and disadvantages. It is quite possible that any number and combination of systems may be operating on this project at one time.

TABLE 2

ADVANTAGES AND DISADVANTAGES OF VARIOUS LOGGING SYSTEMS

Logging System	Advantages	Disadvantages
High Lead	°Use on Steep Terrain	°Some Soil Erosion °Expensive Equipment °Use More Efficient on Larger, High Value Species °Requires Set-up Time °Requires Special Expertise
Skyline	°Use on Steep Terrain °Minimal Soil Erosion	°Requires Set-up Time °Expensive Equipment °Use More Efficient on Larger, High Value Species °Requires Special Expertise
Whole Tree and/or Chipping	°Minimize Handling °Very Efficient	°Requires Flat Terrain °Road System or Good Stand Access Required °Expensive Equipment
Balloon	°Unrestricted Access	°Very Expensive °Requires Essentially Calm Air to Operate
Helicopter	°Unrestricted Access	°Very Expensive °Use More Efficient on Larger, High Value Species °Use Limited in Moderate Winds

5 - CONCLUSIONS AND RECOMMENDATIONS

In drawing some conclusions and making some recommendations regarding this subtask, there are a few basic realities about utilizing large quantities of wood fiber that should be kept in mind. The principal goals are to maximize the dollar return from the wood source and/or minimize the cost of disposing of it, guarding at all times environmental quality in the process. Present world wood fiber demand is down considerably. Many Asian markets for Southeast Alaskan wood chips, cants, and roundlog exports are at such a low level at present that most lumbering and processing operations in the state are either shut down or on a reduced work schedule. The forest industry in the Pacific Northwest is presently suffering many shutdowns as high bank lending rates choke the homebuilding industry. These interest rates have also affected building demand in the Far East, which is down considerably. However, the demand for wood fiber fluctuates considerably, and in the future, demand will rise and activity will increase. These economic realities affect the use of Susitna Project wood fiber in that demand for this material is extremely low now, with more readily available and improved quality wood obtainable (from Southeast Alaska and the Pacific Northwest, for example) when the market improves; yet these conditions can change in a few years. Demand for large quantities of wood fiber is very cyclic and the prices fluctuate dramatically over short periods of time (months, and years). With these general comments in mind, the following conclusions regarding use of the timber in the Devil Canyon and Watana Reservoirs are offered.

- General quality of the material present is low, and marketability is expected to be minimal. It is anticipated that the best approach to follow in disposal should focus on minimizing the costs of clearing.

- It is expected that various disposal techniques and logging systems can be utilized, perhaps different approaches at various locations.

- Breakage of timber and loss into the river may cause problems in the logging process.

- Transportation and logging costs will be astronomical.

- Restricted access will be a major problem.

- Defect in the wood appears to be minimal, which improves marketability.

- Although wood quality is generally low, the large volume available (20-40 million cubic feet) can be attractive to potential users.

- Environmental controls will probably have a great effect on clearing costs.

- Erosive potential of clearing is considerable.

Recommendations regarding the clearing process are as follows:

- This portion of the project requires considerably more detailed study.

- It is extremely important to define what the acceptable wood residue level will be for the clearing process, rather than require all materials to be removed.

- Careful attention should be given to the aesthetics of the clearing operations in the vicinity of the final reservoir operating levels (eventual shoreline).

- Areas adjacent to the reservoirs should be managed so as to minimize disturbance of wildlife habitat.

- Careful attention should be given to utilizing much of the wood "on-site" and minimize disposal costs by providing energy for construction camp operations.

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