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RECYCLING OLD POLES ~ *A VALUE ADDED VENTURE!*

Leon A. Joseph

British Columbia Hydro
Engineering Quality Management
Burnaby, B.C.

ABSTRACT

During the 1980s, the disposal of spent treated wood was identified as one of the issues that needed to be addressed in order to reduce pollution. The increased awareness concerning the need to protect the environment helped most user groups appreciate that sending large quantities of out-of-service treated material to land fills was an unacceptable practice. It soon became strikingly clear that recycling was the way of the future. This paper will present a brief overview of BC Hydro's wood pole recycling program. It will explain a few of the challenges that required special attention and will outline the primary steps of the recycling process. Examples of the many uses in which recycled wood is currently being used will be featured as a testimony to BC Hydro's proposition that *"recycling is a value added venture"*.

INTRODUCTION

In 1865, the *Collins Overland Telegraph Company* erected British Columbia's first wood pole line. This line, which extended from the US border crossing at Blaine, Washington to the city of New Westminster, was constructed with untreated cedar poles. The first message that was received from the US was a news flash that announced the assassination of Abraham Lincoln.

Most likely, the appearance of a wood pole line on the horizon must have looked very strange to the early settlers. In contrast, today, wood poles are a very common sight that most people do not take note of until such time that they need a place to hang a sign. For ones who are involved in either the manufacture or the use of wood poles, one thing that they all know for sure is that there are a lot of them out there. In British Columbia alone, there are approximately 1.3 million poles in service. They also know that, like all products poles have a limited service life. They will all have to be replaced at some point in time.

In the past, the disposal of old wood poles was often a job performed by the elusive pole fairy. When a utility would remove an old pole from service, they would leave it on the side of the road until such time that a truck was available to haul it away. Often, the pole would mysteriously disappear within a few days. In many cases, the pole fairy would leave little piles of sawdust several feet apart to mark the place where the old soldier had lain.

Local farmers and landscaping contractors were always anxious to get their hands on old poles for their own business uses. Regretfully, every year there were reports of incidents where spent treated material was being used in a very inappropriate manner. BC Hydro was also very concerned that old poles were being used for fire wood. Subsequently, and much to the dismay of many BC residents, BC Hydro deemed it necessary to impose restrictions that attempted to limit the private sector's access to old material. Though the policy looked good on paper, it was very hard to enforce it in a province as large as British Columbia.

By far, the most common means of disposal was to land fill treated poles that were removed from service. For obvious reasons, this practice is now considered unacceptable in many parts of the world. Subsequently, user groups, such as BC Hydro have been prompted to investigate and implement more innovated means of dealing with culled material. Today, most utilities have devised some form of a recycling program. The following information will provide a brief overview of BC Hydro's program that has enjoyed more than tens years of successful operation.

DISCUSSION

Extending the life of a pole

Prior to opening a recycling facility, BC Hydro would occasionally donate used poles to community groups, whom could be trusted to use the wood in a responsible way. This early form of recycling resulted in a few unusual, yet creative applications of old material. For example, on the north shore of Vancouver's Burrard Inlet, there is a historical site called Lighthouse Park. One of the attractions of the park is an old 19th century log cabin that overlooks the inlet. Every year, tourists enjoy having their picture taken in front of this old rustic structure. No doubt, their imaginations carry them back to the early days of life on the West Coast.

A close examination of the structure reveals a few unusual features of the logs that make up the walls of the cabin. The presence of numerous sharply cut punctures on the surface of the logs would seem to indicate that the cabin had served as a place of refuge from flying arrows. Actually, any experienced lineman would quickly identify the punctures to be marks made by climbing spurs. They would also note the presence of a drilled pole bolt hole. Unbeknownst to the park visitors is the fact that the old 19th century cabin is actually a structure made from several not so old, mid 20th century cedar poles.

In 1994, BC Hydro formed BC Wood Recycling Limited.

This is a joint venture operation that works with Telus and BC Hydro's Materials Management Business Unit. The initial focus of the operation was to reduce the amount of wood fiber being sent to local landfills. Project organizers also believed that there was a profit to be made by salvaging the sound fiber contained in old poles. In order to minimize operational costs, it was decided to locate the facility in BC Hydro's wood pole storage and distribution yard in Surrey, BC. The choice of this site has proven to be very convenient for

facilitating the transporting, receiving, handling and storage of returned material. Consequently, it also served to reduce the operational costs of the facility.

To attract the interest of potential consumers, a marketing scheme was formulated that emphasized the pro-environment aspect of recycling. Two effective lines of reasoning were used to capture the attention of BC residents. These were; "recycling old poles saves trees" and "recycling reduces the amount of waste being sent to landfills by at least 60%". As was anticipated, both the local media and the Fraser Valley residents were quick to express their approval and interest in the new facility. Information booths were set up at various events and trade shows that featured examples of the creative products that could be made using lumber that was salvaged from retired poles. Before long, the demand for the high quality wood products being produced exceeded the plant's output.

Recycling ~ sapwood verses heartwood

After many years of service, the sapwood of a pole is usually in rather poor condition. It may contain pockets of decay, mechanical damage and other undesirable imperfections. These defects, along with the presence of wood preservative components render the sapwood portion of a pole unsuitable for fiber recovery. In the recycling process, it represents a waste factor.

In contrast, the heartwood is usually in very good shape and suitable for remanufacturing into marketable products. Subsequently, the ratio of heartwood verses sapwood has a direct impact on the amount of fiber that is recovered during the recycling process. It also has a bearing on the amount of waste that is accumulated for disposal. Adding to the equation is the species of the poles that are selected for recycling since sapwood depth is species related.

By far, Western Red Cedar and Yellow Cedar outshine all other species in this regard. Both of these species tend to have very shallow sapwood, along with heartwood that is highly resistant to decay. Subsequently, the recovery of marketable material from cedar is substantially higher than that of other species. This is quite significant considering that cedar lumber is the product of choice for patio decking, posts, fencing and many other forms of building material intended for use in outdoor structures. Add to that the monetary value of cedar and it becomes very apparent that recycling cedar poles dramatically enhances the financial viability of a recycling facility.

The sapwood depth of other pole species, such as Lodgepole pine, Douglas fir and Western Larch can range from 19mm to more than 80mm (¾" to 3"+). Sawmilling poles that contain excessively deep sapwood is often not worth the effort. Recycling personnel have also lamented that the heartwood of old Douglas fir and Western Larch poles tends to be as hard as concrete. During sawing, this hardness can cause the ripsaw blade to wander, resulting in variances in the width and thickness of the end products. Saw blades also require frequent re-sharpening when attempting to cut these species. Fortunately, this has not proven to be major concern for BC Wood Recycling since they primarily process cedar.

A limited number of pine poles have been sawn into timbers for use as highway guardrail posts and parking lot barriers.

Recycling ~ The Process

Step 1. In order to ensure a steady flow of material to the recycling facility, an effective pole recovery program needed to be established. This proved to be more challenging than was first anticipated. Many of the poles in BC Hydro's system are shared as part of a joint use agreement with Telus. It had to be decided who would be responsible for accumulating and forwarding the used material to the recycling plant. Once this issue was resolved, the various district service yards needed to formulate a procedure for accumulating poles that were suitable for the recycling program.

During the first years of operation, it was noted that a substantial amount of material was not arriving at the facility. Apparently, a large number of poles were still ending up in the hands of local residents. The remedy for this problem was to immediately remove the poles from the field when they were pulled out of the ground. By far, this has proven to be the most difficult procedure to put into practice. Though the situation has greatly improved over the years, it continues to be an ongoing problem.

Step 2. The second step of the operation is to access the condition of the material arriving at the recycling facility. Each pole is examined in order to assess the general condition of the wood fiber. The material is separated according to species and type of treatment. During this exercise, the form of recycling that will be employed for each individual pole is determined. For example, newer poles that have failed as a result of a motor vehicle accident or from improper handling may be cut into anchor logs, wood pole stubs or landscaping rounds. Older poles that have been identified as suitable for sawmilling into timbers and/or dimensional lumber are bucked into workable lengths in preparation for the next step of the recycling process. For safe handling, shorter sections are loaded into metal carriages.

Step 3. Prior to sawing, all embedded metal objects must be removed. After many years of service, the variety of objects that can be found in a pole is quite remarkable. Examples include; every size of staple and nail imaginable, thumb tacks, bolts, screws and even railway spikes. Poles frequently contain pieces of automobiles, bullets, mounting brackets, anti-split devises and many other metal-based objects. To ensure that none go undetected, recycling personnel use a metal detector to careful scan the entire surface of each pole section. Once this exercise has been completed the poles are ready to be cut into a variety of marketable products.

Step 4. Once the poles have been prepped, they are brought into the saw mill and loaded onto a timber deck. Prior to making the first cut, the sawyer carefully examines and orients the pole section to ensure that the saw cut will yield the highest quality of material possible. Using a large circular ripsaw, the poles are cut into slabs of various thicknesses. Once this has been done, the treated portions are removed and the slabs are sawn into the dimensions that are the most in demand by the public. Defects, such as large seasoning checks, pockets

of decay and drilled holes are trimmed out of the final product. The end result is high quality dimensional lumber that rivals any material sold at building supply centers.

The most popular products that are produced include;

- Fencing
- Decking
- Posts and timbers
- Shop lumber
- Appearance-grade lumber

The trimmed waste generated by the facility is accumulated and loaded into bins for disposal. It is estimated that over the past 10 years that BC Wood Recycling has been in operation, BC Hydro has saved approximately $600,000 in disposal fees.

Creative uses of wood from recycled poles

BC Recycling Limited has enjoyed the privilege of working with a local special needs group. It has been truly satisfying to see the wood from old poles being fashioned into beautiful pieces of outdoor patio furniture and other creative wood products. Only one thing outshines the beauty of the wood. Try to imagine that you own a small manufacturing facility that employs workers who love their jobs. They are always happy, they never complain and they take great pride in the products that they build. It is truly inspiring to witnesses the zeal and dedication that these very special individuals display in their work habits. They are outstanding examples worthy of imitation.

Their product line includes;

- Adirondack chairs
- Garden terraces
- Planter boxes
- Picture frames
- Decorative award plaques
- Wind Whirlers
- Outdoor benches
- Picnic tables
- 2010 Olympic salmon boxes

Many local residents have made BC Wood Recycling their first choice for cedar products. They find it quite intriguing to use recycled wood in their various home improvement projects. The fact that their new balcony or hand railing is constructed with wood from former utility poles is a great conversation topic at their cocktail parties and barbeques. Former customers tend to be zealous promoters of recycled wood, with no sales commission required.
Another advantage of dealing with BC Wood Recycling is that the facility can very easily accommodate orders for custom-cut material that is required for special building projects. Especially when refurbishing old wooden structures, builders often require lumber or

timbers that are sized to match the existing wooden members. Very few custom-cut sawmills are willing to process small orders of nonconventional-sized material. Those that will accommodate such orders, attach setup charges that render the items too steep for the average homeowner's pocketbook.

Parks & Recreation

Throughout British Columbia, recycled wood is being used in many applications that enhance the beauty of provincial and municipal parks. Considering that BC Hydro's poles began their life as trees in the park-like forests of the province, it is quite satisfying to the see the recycled wood being used in a similar setting. Unbeknownst to park visitors is the possibility that the table they are using for their picnic may have been manufactured using wood from a utility pole that once stood in front of their home.

Other agencies, who have purchased material from BC Wood Recycling include, Oceans and Fisheries, who have used the wood to construct fish gates and fish counting platforms. Several BC municipalities have purchased recycled wood products for use around their recreational facilities. The Greater Vancouver Regional District has used recycled wood for constructing walkways, railings and pedestrian bridges. All these examples attest to the fact that there are many applications in which recycled can be used.

Latest development

Several months ago, BC Wood Recycling formed an alliance with D & B Power line Supply Limited of Abbotsford, BC. This company serves as a wood pole broker that caters to private contractors in the Fraser Valley and Vancouver Island regions. Recently, D & B constructed a machine that resembles a wood shake splitter to make rustic fences rails. These rails have become a very popular product for equestrian centers, hobby farms and park walkways. This new venture serves as another example of how, with a little ingenuity, old poles can be put to good use.

SUMMARY

The success of a recycling facility greatly depends on the attitude of the individuals who are called upon to make it work. Creativity flourishes when management, program arrangers and plant personnel all firmly believe in the fundamental principles that attest to the value of recycling. Community involvement serves to inspire innovative applications of recycled material and generates support for a recycling facility. By focusing on the pro-environment aspect of recycling, local residents are motivated to show their support by purchasing the various products that are produced. Waste reduction savings and the profit from product sales, combined with the social benefits described above all point to one conclusion. *"Recycling is a value-added venture"*.

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12500 – 88th Avenue, Surrey, BC
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Email: bcwoodrecycling@shaw.ca

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Ron Merkley

For additional information please contact;

Leon A, Joseph (604) 528 3023
BC Hydro Engineering Quality Management
6911 Southpoint Drive, Burnaby, BC – V3N 4X8
Email: leon.joseph@bchydro.com