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FEASIBILITY STUDY

SISKA INDIAN BAND

WOOD WASTE BUSINESSES

Phase 1

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Feasibility Study

Opportunity Explored

Siska Indian Band (Siska) currently has an opportunity to take advantage of the wood waste generated by a sawmill owned by J.S. Jones Timber Ltd. (Boston Bar division). This mill currently cuts approximately 465,000 M3 of fibre annually. The species milled at this facility include: Douglas Fir, Balsam, Hemlock, White Spruce and Western Red Cedar.

Annually the J.S. Jones sawmill generates approximately 49,000 tons of wood waste. This waste is comprised of wood chips, shavings, bark and sawdust. Currently the waste is burned in an environmentally unfriendly beehive burner. According to the British Columbia Waste Management Act, J.S. Jones paid \$110 per tonne of discharged total particulate from their beehive burner in 2001. This penalty has now increased for the 2002 calendar year to \$120/tonne.

In an effort to divert wood waste from the beehive burners, J.S. Jones has agreed to provide all wood waste generated by the sawmill, at no cost to the Siska Indian Band. This study will explore various business opportunities that could potentially use the raw materials provided in a profitable manner.

Market Feasibility

The wood waste available to Siska Indian Band includes Tree Bark, Sawdust, Wood Chips and Wood shavings. Of special interest is the fact that J.S. Jones only has a permit to burn wood waste in a bee-hive burner until December 31, 2002. This date may be extended to December 31, 2004 only if a burner phase out plan is implemented (see Appendix: BC Waste Management Act regulations).

Given the raw materials available, several opportunities were explored as potential business ventures:

- Production and distribution of Bark Mulch & related Landscape materials (wood chips, bark mulch, compost materials).
- Production and distribution of farm animal bedding (planer shavings and sawdust)
- Distribution of hog fuel for co-generation fuel (wood chips and sawdust)

Products and Markets Examined:

Bark mulch (major market)

Bark mulch may be sold in bags or in bulk form. Bagged mulch is primarily targeted toward homeowners and "do-it-yourself" landscapers. Bagged mulch is expensive since the customer pays additional packaging costs and larger distribution costs (retailers). Generally bagged mulch is well processed (sorted) and high quality. This product is typically sold to customers in cubic foot units.

Bulk mulch product is targeted toward professional landscapers and garden centres. There also exists a limited market for bulk sales to homeowners. Different levels of processing (screening) are available depending on the size and level of consistency required by the customer. Pricing for this product tends to vary with the amount of processing involved. Bulk mulch is typically sold in cubic yard units.

Quality bark mulch is highly processed to screen out less desirable materials such as dirt, rocks, and sawdust. Higher quality bark mulch also consists of a large percentage of tree bark chunks (vs. wood chips) and is more uniform in size. Note that Bark can be sold separately as "Bark Nuggets". These nuggets are relatively valuable when sold separately (\$25/cubic yard vs. \$3 to \$5 for wholesale screened mulch).

Without a physical presence (retail outlet) in a major market however, the only sales or distribution role the Siska Indian Band could play would be as a wholesale supplier. Potential customers would include landscape/garden supply centres and professional landscape service companies. In the lower mainland area of British Columbia there are roughly 4 dozen potential clients of this nature. Other possible service centres in the Thompson/Okanagan Region include Kamloops and Kelowna.

Trail surfacing (woodchips):

Trail surfacing materials are typically comprised of sawdust and wood chips. This material is not highly processed; therefore associated labor costs are minimal.

The process to deliver this product would include preliminary screening at the sort yard and subsequent transportation of the product to the customer.

Potential customers for this product/service were thought to be:

- Municipalities and regional districts
- Provincial government departments (recreational sites/trails).

At this point however, the potential market for this product cannot be determined. Information received from a wholesale landscape supply company in Kelowna indicates that most regional districts have their own capacity to generate wood chips. In fact that company regularly uses regional districts as a source for used machinery.

Important BC provincial government clients such as the BC Ministry of Forests (camp sites and recreational trails) are no longer able to commit funds for trail surfacing. According to the latest information from the BC Government core review process (website info); "*The Forest Service can no longer afford to fund the maintenance of recreation sites and trails. All current Forest Service recreation sites and trails will be transferred to other agencies and organizations or closed by March 31, 2005.*" At this point it is not known what organization will take over responsibility for these trails.

Composted Soils:

Fine particles (sawdust) not used in the production of bark mulch can be used in the production of composted soils. Discussions with a landscape supply yard indicate that this material can be mixed with other products (sand, soils and compost) to produce a composted soil.

Equipment required for this process includes a wheel loader, a screener (as per bark mulch processing) and a hammer mill to combine the materials (cost \$4,000 to \$8,000). Given the raw materials used (sawdust only, not wood chips or bark); this product should be viewed more as a by-product of the mulch producing process rather than a stand-alone business.

Animal bedding:

There are different varieties of farm animal bedding; varying in cost and level of processing. Wood chips and sawdust right from a sawmill are suitable for most ranchers requiring some form of ground cover for their cattle. Discussions with 2 area ranchers (Savona and Merritt, BC) indicate that these by-products are readily available from area sawmills at no cost (i.e. Cache Creek Woodchips).

Owners of horses and other barn-stored animals prefer wood shavings that are cleaned, dried and sorted due to the product's absorption abilities. The dry shavings make cleaning of barn stalls easier and help with keeping the animals clean. If high moisture raw materials (sawmill woodchips) were to be processed to acceptable levels, the material would have to be sorted and cleaned to reduce dust content and then dried using a wood burning dryer or kiln. Premium wood shavings are taken only from kiln-dried wood shavings (not sawdust). This product is then cleaned and/or vacuumed prior to compression packaging.

Co-generation fuel:

Potential exists to ship the excess wood waste to a 66-megawatt power co-generation facility in Williams Lake, BC (TransCanada Power, L.P.). Contacts have been made with shippers and hog fuel producers in the Cariboo area to determine the feasibility of this opportunity.

Discussions with a sawmill company in the 100 Mile House, BC area indicate that the Williams Lake Co-generation plant is not yet paying for the hog fuel; they are only paying for trucking costs from the surrounding area mills. Payment of trucking costs does represent a change in business methods since this cost was previously the responsibility of the hog fuel producer.

Bobell Express is a transport company that hauls hog fuel to the Williams Lake co-gen plant. A discussion with their Cache Creek operations manager indicates that trucking hog fuel to a co-gen plant (such as Williams Lake) can get rid of the hog fuel, but as yet no monies are paid for the product (only trucking costs). In addition, the hog fuel supplier still has to sort out the wood chips from the hog fuel (at its own expense).

Value of Sales:

Unscreened Hog Fuel:

A discussion with Handyman Landscape Supply in Kelowna indicates that unscreened (unsorted) hog fuel can still be purchased wholesale for \$3 to \$5 per cubic yard. The historical cost has been \$3/yard from the Riverside Forest Products (Kelowna division) sawmill, however this is now changing as supply is decreasing due to the increased number of sawmills converting to a co-generation plant for electrical power generation.

Discussions with a bark mulch transport company (Montana Cartage, Coquitlam, BC) indicates that landscape companies in the lower mainland area of BC are able to purchase unscreened bark mulch from several lower mainland locations such as:

- Fraser Richmond Biocycle
- West Coast Cellufibre
- Other lower mainland sawmills (from Chilliwack to Delta)

The cost to these lower mainland wholesale customers varies from \$2 to \$5/cubic yard.

Kamloops and area wholesale customers are served by an abundance of small sawmills (custom cut operations) and larger companies such as Tolko Forest Products and Cache Creek Woodchips (Georgia Pacific). Wholesale, unscreened bark mulch cost varies from free to \$3/cubic yard, depending on the source.

Retail prices for this unscreened bark mulch average \$15/cubic yard delivered to the customer's residence or place of business (price with minimum 4 yard order).

Sorted (screened) Bark Mulch:

Based on discussion with Kelowna and Lower Mainland landscape suppliers, most wholesale and retail operations have the ability to sort their own materials with a trommel or shaker type screen. Supplying this screened product wholesale will save the retailers or landscape service companies the wage costs and equipment depreciation associated with the screening process.

As no supplier provided the cost information for this value-added product, it was estimated at raw material costs + screening costs (wages and equipment use) + trucking costs to the sort yard.

\$300	Material cost for 100 cubic yards of unscreened materials (typical)
\$100	Screening costs for 100 cubic yards of material (wage + depreciation)
<u>\$150</u>	Estimated trucking costs from closest supplier
\$550	Estimated screened bark mulch wholesale price (100 cubic yards)

Screened bark mulch then retails for \$20 (picked up at site) to \$32 per cubic yard (blown in to delivered site).

Bark Nuggets:

A premium is currently being paid for fir bark nuggets. This product is comprised only of tree bark that is chipped into nuggets (1 ½" to 2 ½" size). There is potential to realize wholesale revenues of \$8 to \$12 per cubic yard.

Bagged Bark Nuggets:

Initial investigations into this product indicate that bags of 20kg size can retail from \$8 to \$12/bag based on nugget size. The only concern with this process at this point is that there is a significant cost for bagging equipment due to the size of the product.

Trail Surfacing:

Although the market was not determined, wood chips and sawdust have a negligible value that would be overshadowed by their transportation cost.

Animal Bedding:

Pricing varies depending on the product specifications. Unprocessed wood waste (chips and sawdust) can be obtained by ranchers for free. Cleaned and dried kiln dried wood shavings that are compression packaged sell for \$5 to \$6 per package (2.2 cubic feet compressed = 7.0 cubic feet unwrapped)

Co-generation fuel:

No positive earnings are associated with supplying the Williams Lake co-generation plant.

Operating Feasibility

Procedures to determine the operational requirements for a processing site are based on discussions with the previously mentioned Kelowna wholesale landscape supplier, various trucking firms and a search of internet equipment sources.

Bark Mulch Operational Requirements:

Distribution of bark mulch on a wholesale level would entail the following procedures:

- Establishing clientele in major markets
- Establishing credit terms for these clients (typically 30 day net)
- Transporting the raw materials to a sort yard
- Screening out undesirable materials (dirt, sawdust fines, rocks) with a trommel screen
- Loading the screened materials onto the transport trailer
- Transporting and unloading the mulch to the clients as needed.

Material sorting (value added process) of the hog fuel (into Sorted bark mulch, Bark nuggets, wood chips and wood fines) for a wholesale business requires the following EQUIPMENT:

- Wheel loader (with a large bucket ...4 or 5 cubic yard capacity)
- Trommel screen
- Wood chipper (if necessary depending on size of wood waste)

Equipment Cost:

\$40,000	Used Wheel Loader (CAT 950 or JD 644 or equivalent size)
\$25,000	Used trommel screen (new cost \$40,000 to \$50,000)
\$65,000	Estimated costs for bark mulch manufacturing only*

* Equipment cost estimates are based on a review of the BC Equipment Trader publication and internet pricing (Machinery Exchange).

Bark Nuggets Operational Requirements:

Requires the same equipment as bark mulch (wheel loader and a screen) plus a wood chipper. These chippers come in various sizes and prices depending on production levels contemplated. A search of Internet pricing indicates a range of \$10,000 to \$250,000+.

Above and beyond equipment requirements, Siska would have to address a raw materials dilemma: can Siska find a source for Bark only, if not, what would Siska do with the remaining wood chips and fines (sawdust)?

Bark Nuggets (Bagged) Operational Requirements:

Bark nugget production requires the same equipment as Bark nuggets (loader, screen and chipper) plus packaging equipment.

Two dilemmas arise with this production scenario:

- 1) Can the business find a raw material source for Bark only? If not, what would Siska do with the remaining wood chips and fines (sawdust)?
- 2) Packaging equipment suitable for bark mulch and bark nuggets is expensive. A search of the internet located only new bark mulch bagging equipment from the USA. The cost for this equipment (without a palletizer and wrapper) was in excess of \$100,000 USD (see Appendix: Creative Packaging Inc.). No used packaging equipment was located. Once wrapped, the nuggets would still have to be palletized, wrapped and then trucked to large market locations or lower mainland shipping points.

Animal Bedding Operational Requirements:

If Siska is contemplating this market, the only value added and potential profitable venture is for the premium kiln dried wood shavings. At this point it is not known what volume of kiln-dried wood shavings are available from the J.S. Jones sawmill, but they would have to be cleaned and packaged for delivery.

Equipment required for this venture would include:

\$40,000	Used Wheel Loader (CAT 950 or JD 644 or equivalent size)
\$25,000	Used trommel screen (new cost \$40,000 to \$50,000)
\$ Unknown	Compression packaging/baling equipment and supplies

At this point it is not known whether Siska would have access to the dry planer shavings alone. If not, then the question remains of what would be done with the remaining raw materials (chips, bark, and fines).

Trucking:

Trucking costs prove to be the Siska operation's largest potential expense. The problem with transporting bark mulch (and wood chips) is the large trailer volume required. These products do not weigh excessively and are relatively easy on equipment, but they are bulky.

As per discussions with Arrow Transport (Kamloops) and Bobell Express (Cache Creek) you need to ship wood chips and/or bark mulch with a walking floor trailer if no tipping station is available. A walking floor (a.k.a. shuffle floor) trailer has a series of sliding steel or aluminum slats that move lengthwise powered by hydraulic cylinders. The slat movement will move the load backward or forward (see appendix: Equipment). These trailers have an open top for loading purposes and have a tie-down tarp over the trailer.

There are three options when considering hauling with a walking floor trailer;

- Use the trailer of an owner/operator,
- rent a trailer
- purchase a trailer

Montana Cartage (Coquitlam) is a bark mulch/wood waste hauler with a 53' tridem walking floor trailer. Based on initial discussions with this company, a trip from Lytton to Vancouver area would cost approximately \$500/trip (\$83/hour). Fully loaded the trailer would haul approximately 9 or 10 BDU (Bone Dry Units); this is equal to approximately 74.5 cubic yards. Based on this information, the trucking costs for Siska would equal $(\$500 / 74.5 \text{ yards}) = \$6.72 \text{ cubic yard trucking cost}$.

International Transport (Abbotsford, BC) will sell or rent 53' open top walking floor trailers. Rents are currently \$3000/month for a used trailer or \$3,500 for a new trailer. Although capacity is stated at 144 yards, Montana Cartage states that 75 cubic yards is a typical load for these trailers.

Ralph Holland, owner of CRH Trucking (Kamloops) states that the trucking costs are higher in the interior of BC. He states that the costs to truck into the interior of BC are \$86/hour if the trailer were supplied by Siska. This significant difference in trucking costs poses an additional barrier to entry into the Interior markets (Thompson/Okanagan) when competing against local suppliers. Mr. Holland also notes that this business would be more competitive in the interior as there is already a person hauling mulch from Kamloops (name unknown), they would therefore have a trucking cost advantage.

Labor Requirements

Loader Operator:

- Experience is required.
- Operator wages start at
- Required to load truck and maintain yard operations (keep screened piles separate).

Sec. 21 bus. info

Trucking Owner Operator:

- Lower Mainland operators (\$83/hour)
- Interior Operators (\$86/hour) plus trailer rental @ \$3,000/month.

Financial Feasibility

Cost to produce 75 yards (1 trailer load) of bark mulch:

\$100	Estimated Trucking costs to Siska yard:
\$100	Processing wage (loading the screens, screening out fines)
\$ 60	Wheel Operator wage (loading truck 4 hours @ \$15/hour)
<u>\$500</u>	trucking costs (for trucking screened bark mulch to Lower Mainland)
\$760	Total Operation expense

Operational costs per yard

\$760 / 75 cubic yards = \$10.14 cost per cubic yard.

Sales less Expenses:

Potential revenues of \$3 to \$5 / cubic yard for bark mulch are significantly less than operational production costs of \$10.14 / cubic yard.

Note that administrative costs were not examined (insurance, interest costs and book-keeping costs) due to the high operational costs (the venture is already not financially feasible).

Venture Feasibility

The following businesses have been dismissed within this feasibility study:

- 1) **Bark mulch and Bark Nuggets (major market):** Having no physical retail presence limits Siska to a role as a wholesale supplier. Trucking costs are substantial when trying to compete with suppliers that have a local supply of relatively inexpensive product. Trucking costs are also higher in the BC Interior region. These trucking costs combined with an overabundance of wood waste supply makes the Kamloops/Kelowna markets even less accessible than coastal markets.

Bagged bark nuggets were not considered due to the high cost of bagging equipment (over \$100,000 USD). Once bagged and palletted for delivery, trucking charges may

still prove to be an obstacle to overcome. In addition, the question will remain: What does the business do with any raw materials not used (wood chips, sawdust)?

- 2) **Trail surfacing (woodchips):** This is a relatively low value-added product comprised of wood chips and sawdust. The product is relatively inexpensive; the major cost for this product will be delivery.

Market for this product was deemed to be limited (municipalities, regional districts, provincial government) since municipal type governments handle their own wood chipping and composting requirements. Provincial government departments were unable to commit or forecast their requirements based on the recent BC government core review.

- 3) **Composted Soils:** This product should be viewed as a by-product to a mulching type operation. It will give the business an avenue for use of sawdust, but still has an equipment requirement.
- 4) **Animal Bedding:** There is some potential for use of kiln dried planer shavings in the production of premium animal bedding. This facet of delivery was not explored since it is unknown whether Siska would have access to only the kiln-dried planer shavings from the sawmill. If not then the challenge remains, what to do with the balance of the raw materials (wood chips and sawdust).

- 5) **Cogeneration fuel:** No positive earnings were associated with this process.

Final Decision:

Given the information provided, it would seem that none of the proposed business ventures would prove to be economically feasible. The opportunities explored all require a significant capital outlay for equipment and an on-going outlay of cash for trucking costs. All businesses explored also require a steady supply of wood waste. According to the BC Waste Management Act, this supply cannot be guaranteed past December 31, 2002; at which time J.S. Jones has to find other methods of disposing of the wood waste.

This initial study does however offer insight into other potential business ventures for Siska such as:

Bark Mulch and garden supplies (local market):

Given that transportation costs are a major barrier to cost effective product distribution, it could be assumed that Siska would have a cost advantage compared to distant competitors of these same products (bark mulch, composted soils, etc.). To determine the feasibility of this market, a study of local market requirements would have to take place. Possible markets could include Fraser Canyon communities such as Hope, Boston Bar and Lytton or other communities such as Lillooet, BC. Since this is a smaller market, the size of equipment used

could also be reduced. Cost savings could also be realized if Siska could incorporate any equipment or transport vehicles already owned.

Specific Product marketing:

The study performed assumed that wood waste generated by J.S. Jones sawmill would be shipped to the Siska sort yard mixed. This mix would then be sorted (screened) into the various products for distribution. If Siska was allowed to remove specific products such as fir bark or kiln dried planer shavings only, then the potential exists to further explore the more valuable markets of animal bedding and landscape bark nuggets. When compared to other wood waste such as wood chips and sawdust, these are relatively valuable products. Authorization to only remove certain raw materials would also reduce operational costs (don't need to deal with the less valuable waste). At this point it is not known whether or not these options are likely.