



Natural Resources Canada  
Canadian Forest Service

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## **TECHNICAL SPECIFICATION**

### **FORESTRY PROJECT**

**Completion of various forestry operations and related work  
Valcartier Base (Base Va)  
2018-2019**

Canadian Forest Service  
Natural Resources Canada

September 2018

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The purpose of these technical specifications is to provide information on the implementation of the service exchange agreement as well as certain clarifications regarding Natural Resources Canada (NRCan)'s and the Contractor's respective contractual obligations. This document is intended to supplement the information contained in the Request for Proposal.

## **1. EXECUTION OF WORK OF CATEGORY A AND B**

**1.1** The Contractor shall have the work done and completed in accordance with this contract and the directives of the Natural resources Canada (NRCan) representative responsible for approving or accepting the work. A meeting with NRCan representatives and officials from Base Va shall be held before the work begins in order to approve the work plan and coordinate the work. If necessary, meetings could be held throughout the duration of the contract. The Contractor must take into account that the territory is used for military purposes first and foremost. The equipment needed to carry out the work shall be chosen taking into account the characteristics of the site and the silvicultural prescription (sensitivity, bearing capacity, soil type, period of operation, number of stems per hectare, spacing of stems) rather than equipment availability. NRCan reserves the right to delay or cease any work, such as mechanized or manual logging, if lumber stocks in the cutting area exceed forwarding capacities. NRCan reserves the right to refuse to use equipment if it deems that the quality of the operation may fall short of the forest management objectives.

**1.2** Before the work begins, the Contractor must inform all its employees of all the requirements set out in the contract, the plans, the specifications and the appendixes, including compliance with mitigation measures for environmental impacts and safety and security measures. The operations manager must...

**1.3** The Contractor shall keep existing roads open at all times and shall be responsible for creating access roads to the work sites and keeping them open while the work is under way. When the work in an area is completed, or upon request, the manager shall be responsible for restoring the road system (road surface finish, shoulders), ditches and infrastructures to their original state, to the satisfaction of NRCan.

**1.4** The Contractor shall indicate as soon as possible any changes to the initial work plan (schedule, machinery to be used, number of workers, etc.) or any other changes that may affect the project.

**1.5** In view of the primary vocation of the area and training schedules, a sector in which forestry operations would normally be carried out during the harvesting season may be subject to temporary closure. In such a case, the Contractor must move the machinery outside the security perimeter for the duration of the closure period. It must defray the transportation costs on its own and it must not ask NRCan for compensation for any inconvenience caused by the situation. The Contractor must also be prepared for the eventuality that more than one intervention sector may be slated for harvesting during a given season. It will assume the full costs associated with the transfer of equipment between any two intervention sectors.

**1.6** Summary of the primary responsibilities of the Contractor: Carry out requested category A and category B work in a manner that respects the environment and in accordance with professional practices and standards. Establish woodpile sites to meet his needs and subsequently clean them up (both winter and summer roads). Help the CFS's team install a culvert when it is necessary to dry up a waterway. Clear the right-of-way (timber harvesting) for winter and summer roads and pay

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the same stumpage fees for timber volumes from those sectors. Market all merchantable volumes of wood more than 9 centimetres in diameter at the small end (including slasher-generated hardwood ends). Measure the area treated by all category A and category B work when supervised by the Contractor using a GPS with a minimum precision of 2–5 metres. Tape waterway protection strips and the centre of waterways. Provide the GPS-derived areal measurements for all category A and B work when supervised by the Contractor. Produce revenue and expenditure reports using a template approved by NRCan. Apply mitigation measures provided in the projects' environmental evaluation.

**1.7** Summary of the main responsibilities of NRCan: Using tape, delimit the perimeter of the areas to be treated. Mark trees to be felled during commercial cutting operations. Authorize the intervention methods to be used, access to intervention sectors and locations where timber is to be stacked. Provide guidance to the Contractor's operations manager in the performance of assigned tasks. Ensure compliance with the terms and conditions of the contract. Inform the Contractor about any constraints that could interfere with operations. Make sectors accessible based on reasonable skidding distances. With regard to the construction of summer and winter roads, NRCan agrees to take care of (payment for work from accumulated credits) the road shaping work (power shovel, bulldozer, sand and gravel if needed). At the end of the road, there will be a turn-around area for trucks that haul timber (NRCan will determine the dimensions). Approve the final survey of treated areas based on the shapefiles provided by the Contractor. Produce the final survey of the sectors (surface area measurements) using the shapefile furnished by the Contractor. Conduct inspections during and after the work is done, to check that the work complies with the technical specification. Conduct the environmental evaluations of projects.

**1.8** Silviculture prescriptions will be provided to the Contractor before the beginning of any category A and category B work. The Contractor shall take all necessary measures to achieve the success criteria for each treatment.

For category A work, refer to the *Guide sylvicole du Québec* for a description of treatments and success criteria.

For category A work, the Technical Instruction Manual (*Cahier d'instruction technique*) of the Agence des forêts privées de Québec 03 (AFPQ03), will serve as a reference document regarding the inventory methods used before and after treatment, the minimum success criteria and applicable penalties in case of unsatisfactory performance.

For tree-marked selection cutting involving the removal of at least 35% of the basal area prior to treatment, NRCan will pay the Contractor \$125/ha. This rate is fixed for the entire duration of the contract.

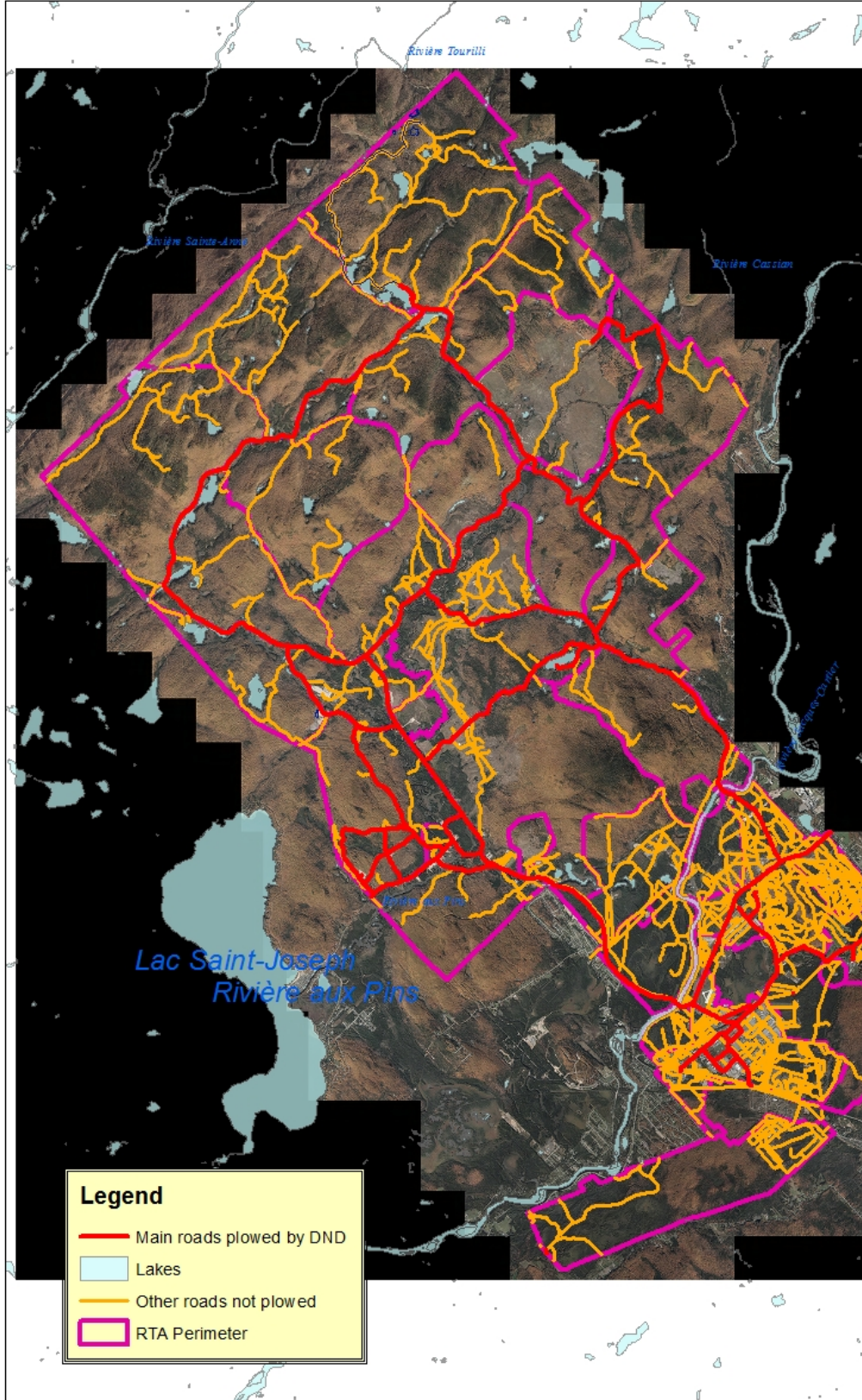
**1.9** The DND's snow removal team ensures complete winter maintenance on the main roads on the Va Base's territory. Roads maintained by DND are shown in red on the attached map. For secondary roads providing specific access to harvesting sites, the Contractor will be fully responsible for snow removal, road sanding and any other operations necessary to ensure that transportation operations are efficient and safe. The Contractor is responsible for providing all the equipment required to enable access to the work site by work crews and timber transportation trucks. Road conditions must remain safe for all users at all times. Snow removal costs will be negotiated annually by mutual agreement by considering the length of the road to be cleared, the duration of the work site, the volume of snow to be collected, the cost of fuel and the difficulty coefficient of the road network to be maintained. Regarding sanding operations, free sand from a borrow pit will be made available to the Contractor on Base Va. The loading site will be designated by NRCan. Sand loading and transportation will be at the Contractor's expense. NRCan may

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request financial compensation for snow removal operations carried out by DND that exceed the conditions stated above or when the expected timeframe is not respected by the Contractor.



### Main roads plowed by DND



## **2. AVAILABILITY OF WORKERS AND MACHINERY**

The Contractor agrees to make available, at an opportune time, the human and material resources required to carry out the forestry operations (category A work) as well as category B work. Unless otherwise specified by NRCan, the Contractor cannot delegate its contractual responsibilities to subcontractors. If necessary, for work that is not described under category A or B operations, NRCan can provide a technical specification describing the tasks to be performed.

In the event that the Contractor fails to make available equipment listed in Part B bid table, after giving 15 working days' advance notice to that effect, NRCan reserves the right to retain a subcontractor of its choice having similar equipment. If the subcontractor's hourly rate is higher, the Contractor must cover the difference between the hourly rate specified in the Part B price table and the hourly rate of the subcontractor whose services are retained.

In the event that the Contractor has to hire a subcontractor to carry out the work, the Contractor must conduct the necessary research to find a competent subcontractor for the best price and must enter into a formal contract with the subcontractor without shirking its contractual responsibilities. In all cases, NRCan reserves the right of final approval of the subcontractors retained to perform category A and B work.

At the request of a NRCan representative, the Contractor shall take steps to obtain the services of specialized suppliers (e.g., shredder, TRH brush cutter, ATV, trailer for hauling).

## **3. WORK SCHEDULE**

Unless stated otherwise, typical business hours are from Monday to Friday, between 6:00 a.m. to 6:00 p.m. Night and weekend work will only be authorized upon request in accordance with NRCan's requirements. No work will be permitted on national holidays.

## **4. APPLICABLE LAWS, REGULATIONS AND STANDARDS**

All work must be carried out in accordance with standard practices and with the laws and regulations applicable in Quebec, particularly the standards and rules of the *Commission des normes, de l'équité, de la santé et de la sécurité au travail* (CNESST), of the *Commission des normes du travail*, and of the *Sustainable Forest Development Act*.

Work must be carried out in compliance with the *Regulation respecting the sustainable development of forests*, the *Environment Quality Act*, the *Forest Protection Regulation*, or with any other applicable forestry standards. Penalties provided for in the *Sustainable Forest Development Act* will be enforced if the Contractor commits any offences under the Act. Penalties specifically provided for in this agreement shall however prevail.

## **5. OPERATION RULES AND SECURITY**

**5.1** The Contractor shall comply at all times with the rules and procedures applicable to operation of the Base Va. In addition, every employee assigned to the project shall attend a training session (maximum 1 hour) on safety and security on military property and environmental compliance measures (POL, spills, etc.).

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**5.2** Unless specified otherwise, an operations manager representing the Contractor must be present on the work site during category A work. In the case of silvicultural operations, daily work supervision must be carried out by the Contractor.

**5.3** When the operations manager is present on Va Base property, they must be equipped with a functional communication system in order to remain in constant communication with the range and training area's (RTA) control station and NRCan's representative. A portable radio (Motorola HT 1250) owned by the National Defence will be provided on loan by NRCan (the Contractor is nonetheless entirely responsible for this equipment). This radio must be functional and worn at all times by the operations manager, who should also have a spare battery in his possession at all times.

**5.4** The Contractor shall ensure that its employees and equipment comply at all times with the traffic, safety and security regulations specific to Base Va. Each employee must also sign the **Training area safety - road safety**. When travelling by vehicle, in addition to abiding by the speed limits, employees must slow down when they see troops on foot and must pay particular attention to dust.

**5.5** The Contractor and all its employees are required to comply with the control and access procedures governing the use of Base Va land, in particular the main entrance and the gates to the ranges and training areas.

**5.6** The Contractor shall comply with the regulations of the CSST in carrying out the work in question and shall ensure that workers have and use the proper safety equipment.

**5.7** The Contractor shall comply with fire safety regulations (Appendix 2).

**5.8** The Contractor shall comply with minimum forest fire prevention standards (Appendix 4).

**5.9** The Contractor must comply with the emergency plan (Appendix 3). It must have an emergency plan covering injuries and spills and it must submit the plan to the NRCan representative.

**5.10** The Contractor must comply with the environmental protection guidelines (Appendix 5).

**5.11** Signs indicating that forestry operations are under way shall be placed along the road facing both directions at the start of each crew's work area. Special attention shall be paid to strategic locations or locations that pose a high accident risk (curve, narrowing of road, crossroads, etc.) and parking shall be avoided at those locations.

**5.12** Any equipment used on Va Base property shall be in good working condition and free of oil or gas residues. The Contractor must place a tank and absorbent padding under the equipment that is prone to leak oil or gas when idle. All operators must have a sufficient supply of absorbent padding on board their equipment to soak up any minor spillage. Parking vehicles Va Base property for extended periods is prohibited.

**5.13** Clean-up of ditches and woodpile sites and restoration of road system: As needed and at the end of operations in a given area:

- a) remove branches from ditches.
  - b) restore ditches damaged by machinery (damage to grade, original drainage).
  - c) restore the road system to its original condition before work began (roadway, shoulders) to the satisfaction of NRCan.
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- d) clean up woodpile sites to the satisfaction of NRCan no more than 30 days after the timber is removed. In winter areas, clean-up shall be completed by June 1<sup>st</sup>. All merchantable timber in those areas shall be sold (firewood, etc.). Timber (branches and ends 1 inch or more in diameter or 24 inches long or longer) that cannot be sold shall be spread evenly over the cutting area (around the woodpile sites). If there is too much logging debris in the woodpile sites, NRCan will require that it be buried. If clean-up is not done to the satisfaction of NRCan, NRCan will carry out the work at the Contractor's expense.
- e) restore natural drainage in cutting areas.

**5.14** Any hourly-paid work must be approved on a daily basis by submitting a work order to be signed at the end of the day by the NRCan supervisor. NRCan will only pay for duly approved work orders. If the work order cannot be signed on the same day, it must be sent for approval by email the following day. Failure to comply with this rule will result in the non-payment of any work orders that the NRCan representative has not approved.

**5.15** Where work is performed on an hourly basis, billable hours shall commence at the location where the work is being carried out. Personal travelling time is not billable. However, daily billing for bulk material transportation truck hours will begin and end at the control station for the range and training area.

## **6. HANDLING AND STORAGE OF HAZARDOUS MATERIALS**

**6.1** Refuelling stations for machinery, saws and brush cutters must be located at least 30 metres away from the nearest watercourse. Oil tanks and fuel tanks must be kept in the box of a truck or in a trailer.

**6.2** Elimination of waste and oil: Dirty oil and other waste generated by the use of machinery shall not be disposed of in the forest. Containers of used hazardous materials shall be picked up and removed daily and placed in designated storage areas.

**6.3** In the event that corrective action is not taken, NRCan will ask the operations manager to stop the machinery in question and, if necessary, remove it from the site. NRCan reserves the right to reject any machinery that is deemed to be defective. Spills of hazardous materials shall be the responsibility of the Contractor, and the Contractor shall clean them up immediately and dispose of the soiled material in an appropriate manner. The Contractor must have at least one emergency response kit on hand at all times. The spill response procedures and the contents of the spill kit are described in Appendix 5.

Spill report:

- a) The Contractor must prepare a spill report (available at the RTA) when the quantity spilled exceeds 20 litres.
  - b) The spill report must be sent to the Env O Va Base within 24 hours (submit the report to the NRCan representative, who will forward it to the Env O Va Base).
  - c) A spill report is not required for petroleum product spills of less than 20 litres on land. However, a spill report must be produced for any spill into a watercourse, even if the spill does not exceed 20 litres.
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**6.4** All sites used to store material and equipment shall be cleared of waste and restored to their original condition. The areas where work is carried out shall be cleared of all waste resulting from the use of material and equipment. No waste (e.g., water bottles, cans, motor oil containers) will be tolerated at any time. The operation manager shall be responsible for enforcing this provision.

## **7. IMPLEMENTATION OF CONTRACT OPTIONS**

### **7.1 Variations of the price of fuel**

Under this contract, the Contractor is responsible for negotiating selling prices with its timber buyers that will enable it to offset the impact of fuel costs on its operating and transportation costs.

During negotiations for the inclusion of a contract option, NRCan may consider the impact of fuel prices when determining stumpage fees for the year covered by any such option. For such a scenario to be considered, an increase or decrease of fuel pump prices of at least 10% must be registered between the deposit date of the bid and the time of negotiations. In such a case, the average consumption in litres (L) per productive machine hour (PMH) and an average production of cubic metres (m<sup>3</sup>) of timber per PMH under a partial or total cutting regime will be used to determine the impact on the admissible stumpage fee. In the event of an increase or decrease of more than 10% from the initial selling price, the amount declared by the Contractor in the “Contract Information” section shall be adjusted for felling, skidding and crosscutting rates and for timber transportation to the processing mill. You will find below the consumption and production ratings that will be used to adjust the contract option rates, if applicable:

Tracked harvester:	Average consumption: 28 L/PMH CPRS productivity: 14.33 m <sup>3</sup> /PMH Partial cutting productivity: 10.33 m <sup>3</sup> /PMH
Forest forwarder:	Average consumption: 15 L/PMH CPRS productivity: 26.07 m <sup>3</sup> /PMH Partial cutting productivity: 19.55 m <sup>3</sup> /PMH
Chainsaw:	Average consumption: 5.87 L/PMH Productivity: 14.7 m <sup>3</sup> /PMH
Feller-buncher:	Average consumption: 35 L/PMH CPRS productivity: 31.8 m <sup>3</sup> /PMH Partial cutting productivity: 18.5 m <sup>3</sup> /PMH
Grapple skidder:	Average consumption: 25 L/PMH CPRS productivity: 26.3 m <sup>3</sup> /PMH Partial cutting productivity: 22.6 m <sup>3</sup> /PMH
Delimiting machine:	Average consumption: 25 L/PMH Productivity: 16 m <sup>3</sup> /PMH
Hauling truck:	Average consumption of 65 L/100 km Productivity: Varies according to destination and truck

Calculation example for a tracked harvester working on CPRS:

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Fuel price at time of bidding: \$1.20/L  
 Fuel price for option year: \$1.50/L  
 Fuel price variation: \$0.30/L

Adjustment of harvest rate:  $\$0.30/L \times 28 \text{ L/PMH} \div 14.33 \text{ m}^3/\text{PMH} = + \$0.59/\text{m}^3$

## **7.2 Snow removal**

Snow removal costs will be negotiated annually by mutual agreement by considering the length of the road to be cleared, the duration of the work site, the harvest volume, the fuel price and the difficulty coefficient of the road network to be maintained. The Contractor is ultimately responsible for ensuring that road conditions remain safe for its operations and will not hold NRCan or DND liable in case of an accident. NRCan may request financial compensation for snow removal operations carried out by DND that exceed the conditions set out in the Request for Proposal or when the expected timeframe is not respected by the Contractor.

## **8. CUTBLOCK ACCESSIBILITY**

Harvesting as part of this project will be carried out on slopes ranging from 0% to 40%. The Contractor is responsible for carrying out the necessary work to ensure that the machinery can safely access the cutblocks in an environmentally friendly manner. The costs related to these operations are the Contractor's responsibility. The Contractor shall take all necessary precautions to ensure that skid trails and temporary bridging will not harm the environment during their construction and shall also carry out all work necessary to limit potential future damage. To do so, the Contractor shall observe the following requirements during the construction of such structures.

### **8.1 Leveling skid trails**

- Before starting any work, obtain prior approval from NRCan's representative for desired skid trail locations requiring ground levelling.
- Use wood debris in the skid trail's structure to divert runoff water toward areas of vegetation.
- Create water diversion dykes at an angle of 30–45 degrees to direct runoff water away from the skid trail. These dykes should include a depression of approximately 30 cm in depth and downstream mound of approximately 30 cm in height. Whenever possible, tree trunks (stumps) should be included in the construction of diversion dykes to ensure their long-term efficiency. Deviation dykes must exceed skid trails by 50 cm on each side.
- Place wood debris at the deviation dykes downstream extremity, or construct settling ponds when wood material is insufficient.
- Structures aiming to divert runoff water (wood debris and deviation dykes) should be separated from one another by no more than 20 metres.

Upon closing the work site, NRCan may require that the Contractor restore levelled skid trails if the precautions taken by the Contractor are deemed ineffective or insufficient

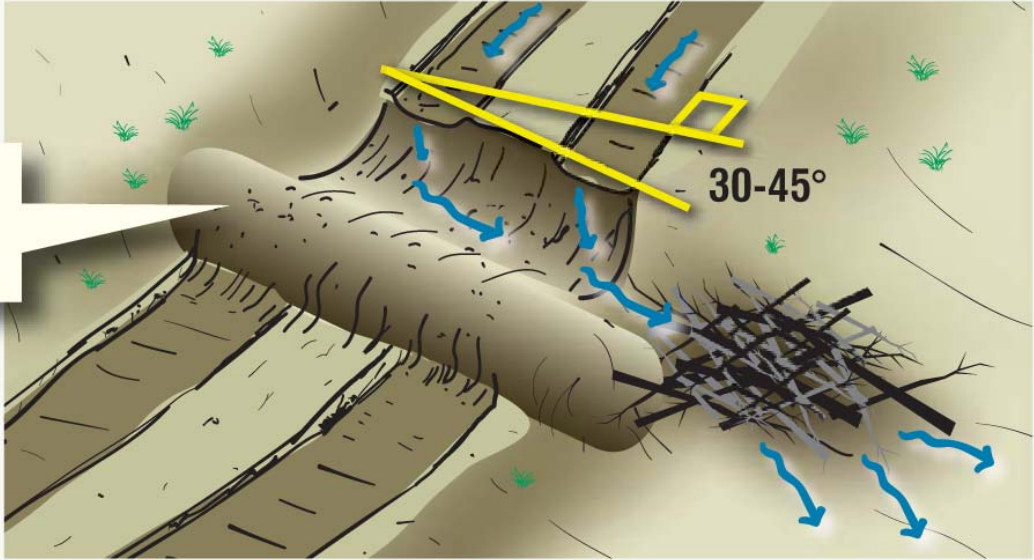
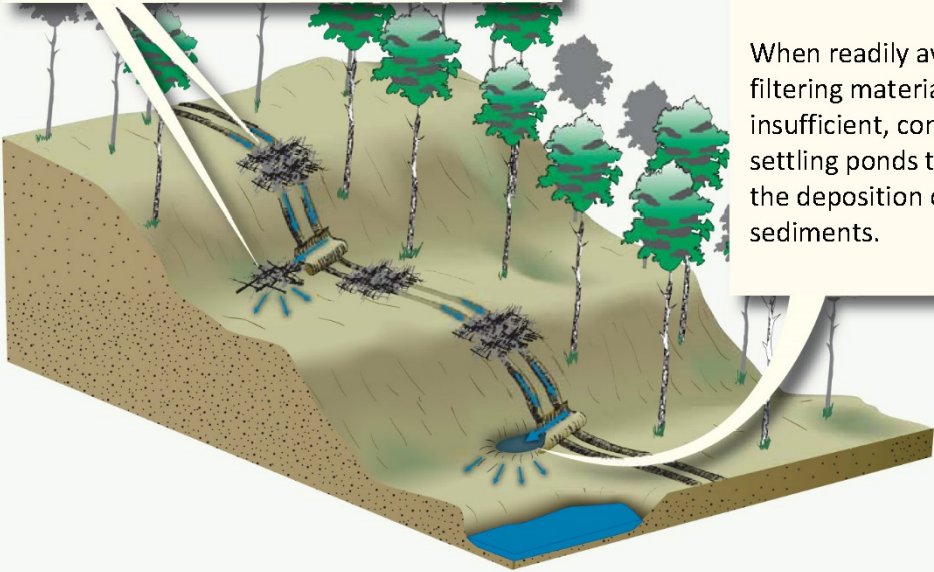
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# Short-term soil stabilization

Limit erosion and sedimentation during operations by using barriers.

Use wood debris from cutting operations to slow down or disperse the flow along a trail or at a pond's outflow.

When readily available filtering material is insufficient, construct settling ponds to allow the deposition of sediments.



Source: FPIinnovations

## 8.2 Temporary bridging for intermittent streams

- The use of 16-foot wood logs is permitted for bridges over intermittent streams. Wood log placement must enable water to flow freely.
- Bridge approaches should be paved using branches or wood debris or have a plate sill plate placed on either side of the stream in the area prone to soil rutting.
- The use of a geotextile membrane over the logs is required to limit sediment deposition in the water stream.
- Wood beams must be removed as soon as the skid trail is no longer used.
- A water barrier should be constructed at a minimum distance of 5 metres from any intermittent stream.

## 8.3 Temporary bridging for permanent streams

- Where permanent streams must be crossed by machinery, the Contractor shall use a portable yarding bridge made of wood beams.
- The size of the wood beams used must be 6' x 10" to allow the passage of a power-driven circular saw or 6" x 8" for the passage of a skidder only.
- The total width of the structure should be of at least 3.7 metres.
- The bridge should be installed at least 60 cm above water level and be set on wooden or rock diverts.
- Bridge approaches should be paved using branches or wood debris or have a plate sill plate placed on either side of the stream in the area prone to soil rutting.
- Special care must be taken to avoid damaging the banks during the installation and removal of the bridge's sections.
- Other methods may be accepted by NRCan, provided that they offer water quality protection that is equivalent or superior to the method proposed above. A request must be made to NRCan if the Contractor's preferred method differs from that of NRCan.



Source : Rutland Natural Resources Conservation District

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## **9. GENERAL CLAUSES**

**9.1 Damages, compensation, etc.:** At no time may the Contractor hold NRCan or National Defence liable for the payment of damages, compensation, favours, etc.

At the time the work is delivered and carried out, any damage to public or private property caused by employees or by equipment provided by the Contractor or subcontractors shall be the responsibility of the Contractor.

Any work carried out by DND as a result of damage caused by the Contractor or any clean-up resulting from non-compliant work by the Contractor shall be at the Contractor's expense.

Since 1994, no timber from Base Va has been found to be contaminated except for timber from two areas (areas 26 and 24) near the shooting range. This means there is a possibility of contamination by metal objects. NRCan and National Defence cannot be held liable. NRCan recommends that the Contractor advise timber purchasers of the potential contamination of the timber by metal splinters.

**9.2** NRCan and National Defence point out that military activities take precedence over all other activities. Access to the training areas is limited by military exercises that are included in the shooting range schedule. Military activities can therefore lead to conflicts or operational constraints resulting in restriction of access to or a temporary prohibition from entering certain areas, for which NRCan and National Defence cannot be held liable.

NRCan and National Defence reserve the right to suspend all or part of the work at any time before or after work begins and for any reason; in such cases, the Contractor shall be given clear notice in writing stating the scope, date and duration of such suspension if the information is known at the time. Upon receiving such notice, the Contractor shall stop work on the date, in the manner and within the limits specified in the notice. The Contractor shall resume and continue the work as soon as the suspension ends.

**9.3** If the Contractor fails to comply with the provisions of the contract or directions given by the NRCan representative and, in particular, if it:

- a) delays the start of work;
- b) does not use personnel, machinery and methods that are likely to ensure that the quality requirements are met or the work is completed within the time frame specified in the contract;
- c) makes felling errors that reduce log quality and lead to volume reductions and/or a decrease in cutting rights;
- d) does not attain adequate productivity in the work carried out;
- e) compromises the security of personnel or the operations;
- f) interrupts or slows the pace of work;
- g) fails to produce the revenue and expenditure reports specified in the contract;

NRCan shall give a written notice and prescribe appropriate corrective measures to be taken within a set time frame.

The Contractor understands that if it does not comply with the written notice in the prescribed time frame, NRCan will ask it to pay to the Receiver General for Canada damages in the amount of \$300 for every full calendar day in which the Contractor is in default (maximum \$27,000) between the

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date the default identified in the notice begins and the date on which the Contractor rectifies the situation to the satisfaction of NRCan.

Where the Contractor does not comply with the written notice within the prescribed time frame or transfers its property, declares bankruptcy, files a holding proposal or becomes insolvent, the Contractor is in default and NRCan may also terminate the contract without prior notice.

Damages or termination of contract directly related to non-compliance with the schedule (start of work, completion of work) does not apply where NRCan or National Defence reduces by more than 20% the number of potential harvesting days.

Where the Contractor is in default under the contract, NRCan may terminate the contract in whole or in part. The Contractor is not entitled to damages. The Contractor continues to be liable to NRCan for any loss or damage caused by its default.

Where NRCan terminates the contract in whole or in part, it shall give the Contractor written notice. Upon receiving such notice, the Contractor shall immediately:

- a) stop work on the date, in the manner and within the limits specified in the notice;
- b) take any measures deemed necessary by NRCan representative to preserve the state of the completed work or finalize specific tasks.

On the date indicated in the notice of termination, NRCan and the duly notified Contractor jointly take an inventory of all completed work and the volume of timber (cut and not transported). A detailed report of revenue and expenditures shall then be produced after the last timber sale slips are received. The balance of credits shall be retained by the Contractor until NRCan determines the procedure for transfer.

**9.4** In the event the Contractor does not, for example, respect the environment and the forest, penalties or sanctions commensurate with those set out in the *Sustainable Forest Development Act* (Quebec) or the *Environment Quality Act* may be imposed.

**9.5** If the Contractor is unable to haul the timber on a winter road as a result of a failure on its part, the Contractor shall pay the value of the credits associated with the volume of timber thus lost. If, however, the Contractor decides to recover the timber after the snow has melted, it shall pay the entire cost of road works necessary to make the timber accessible. This includes repairing the winter road's structure in the event that a carrier is used to haul the wood.

## **10. DESCRIPTION, SPECIFIC STANDARDS AND EVALUATION OF FORESTRY WORK**

**General note:** The various forestry operations to be carried out shall abide by the silvicultural prescriptions provided to the Contractor before the work begins. Silvicultural prescriptions are based on the established forestry sector standards in the province of Quebec.-

### **SPECIFIC STANDARDS for partial cuttings**

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When the objective of the treatment is to promote the regeneration of yellow birch, Eastern white pine or spruce, stems must be preferably skidded at a time when this will result in light scarification

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of the soil by the machinery. If cutting is done at a time that does not promote soil disturbance, partial scarification must be carried out during or after a good seed year.

- 1) In carrying out the required work, the Contractor must respect the boundaries of the treatment blocks established by NRCan.
- 2) The boundaries of the areas to be treated are marked with **orange tape**.
- 3) Stems to be harvested may be marked at NRCan's discretion.
- 4) The Contractor must also skid felled marked stems in protected areas without using heavy equipment in these areas.
- 5) In the case of stems with a diameter equal to or greater than 24 cm, the total basal area harvested must be between 90 and 110% of the basal area of marked stems and unmarked stems that are cut or uprooted.
- 6) In the case of stems with a diameter less than 24 cm (10–22 cm), the number of unmarked, cut, uprooted or damaged trees must not exceed 25% of the total number of stems in the 10– 22 cm diameter class.
- 7) The Contractor must begin the prescribed treatment by first harvesting the back part of the sectors to be treated and proceeding in the direction of the stacking area. Avoid crisscrossing of forwarding trails. A 33 m space between logging trails is recommended in leafy areas. Damaged stems at the edge of the trails must be recovered.
- 8) Intermittent streams marked with **blue tape** cannot be crossed by machinery.
- 9) Delimiting must be done at the stump and piles of branches should be avoided.
- 10) Special attention must be paid to residual stems. The percentage of the basal area of broken stems of species with a diameter equal to or greater than 10 cm must not exceed 10% of all residual stems.

### **EVALUATION OF SILVICULTURAL TREATMENTS for partial cuttings**

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The evaluation will be based, as a minimum, on the criteria below. If required, the evaluation may be conducted based on the *Méthodes d'échantillonnage pour les inventaires d'intervention (inventaire avant traitement) et pour les suivis des interventions forestières (après martelage, après coupe et années antérieures)* published by the Quebec Department of Forests, Wildlife and Parks (DFWP).

#### **EVALUATION OF HARVEST PERCENTAGE**

- **Stems with a diameter equal to or greater than 24 cm**

NRCan evaluates treatment quality by using circular plots with a 11.28 m radius (a minimum of one plot per 5 ha of cutting area), distributed uniformly throughout the treatment area. NRCan then records:

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- (a) the species and diameter of harvested marked stems;
- (b) the species and diameter of unharvested marked stems;
- (c) the species and diameter of unmarked stems that have been accidentally cut or uprooted.

90% ≤ % of acceptable harvest ≤ 110%

- **Calculations**

$$\text{MINIMUM \%} = \frac{\text{basal area of (a) stems} - \text{basal area of (b) stems}}{\text{basal area of (a) stems}} \times 100$$

$$\text{MAXIMUM \%} = \frac{\text{basal area of (a) stems} + \text{basal area of (c) stems}}{\text{basal area of (a) stems}} \times 100$$

- **Stems with a diameter less than 24 cm (10–22 cm)**

NRCan also counts in the circular (11.28 m radius) quadrats the stems between 10 cm and 22 cm in diameter (inclusively), noting:

- a) unmarked cut and unmarked uprooted or damaged stems;
- b) residual stems.

The number of unmarked cut, uprooted or damaged stems must not exceed 25% of the total number of stems (10–22 cm) before cutting.

- **Calculations**

$$\% = \frac{\text{(a) stems}}{\text{total stems (10 to 22 cm before cutting)}} \times 100$$

- **Penalties**

- In the event of an insufficient harvest (less than 90%), NRCan representative will inform the Contractor immediately, and the latter must rectify the situation to NRCan representative's satisfaction.
- In the event of an excessive harvest (over 110%), the Contractor shall increase the credit to NRCan. The additional credit shall be calculated according to the percentage of the excess harvest. For each 1% of excess harvest, the Contractor will give an additional credit of \$25 per hectare for the treatment block to NRCan.



### **SPECIFIC STANDARDS for clear cuttings**

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- 1) In carrying out the work, the Contractor must respect the boundaries of the treatment blocks established by NRCan.
- 2) The boundaries of the areas to be treated are marked with **orange tape**.
- 3) The Contractor must also skid marked cut stems in protected areas without using heavy equipment.
- 4) Delimiting must be done at the stump and piles of branches should be avoided.
- 5) The Contractor must begin the prescribed treatment by first harvesting the back part of the sectors to be treated and proceeding in the direction of the stacking areas.
- 6) Intermittent streams marked with **blue tape** cannot be crossed by machinery.
- 7) Special attention should be paid to protecting natural regeneration and saplings, particularly in the case of cutting with protection of regeneration and soils. All recognized methods for protecting natural regeneration and saplings must be used during harvesting.

### **EVALUATION OF SILVICULTURAL TREATMENTS involving clear cuttings and site preparation**

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The evaluation will be based, as a minimum, on the criteria below. If required, the evaluation may be conducted based on...

#### **SAMPLING METHOD**

- **Cluster sampling**

Cluster sampling will be used to assess the quality of the Contractor's work.

NRCan counts seedlings (both natural and artificial regeneration), young trees, appropriate microsites and stumps within circular plots, in groups of ten. The plots are located along a 45-m line corresponding to a cruise line, with 5 metres between the centres of the circles.

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The sampling plan must entail the sampling of 50 clusters of 10 circular plots each. When the area to be evaluated is greater than 20 ha but less than 120 ha, sampling should be done in 25 clusters (one cluster out of two). If the accuracy obtained is insufficient<sup>1</sup>, data must be gathered from the other 25 clusters of 10 plots each.

The evaluation of cutting with protection of regeneration and soils and potential penalties will be done according to the methods used by the *Services d'intervention forestière* of the DFWP.

The evaluation of site preparation work will be carried out as prescribed in the *Programme de mise en valeur des forêts privées*, including potential penalties.

In areas of 20 ha or less, the following recommendations must be followed:

Area treated (ha)	Number of clusters
less than 2	4
2–4	5
4–6	6
6–8	7
8–12	8
12–16	9
16–20	10

Plot size may vary depending on the species targeted for silvicultural treatment. Refer to the following table for more information:

Species	Area (m <sup>2</sup> )	Plot size
Conifers	4	1.13 m radius or 2 x 2 m
Hardwoods	9	1.69 m radius or 3 x 3 m
Shade-tolerant hardwoods Red and white pine	12.25	1.97 m radius or 3.5 x 3.5 m

### **SPECIFIC STANDARDS for site preparation**

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- 1) In carrying out the work, the Contractor must respect the boundaries of the treatment blocks established by NRCan.
- 2) The boundaries of the areas to be treated are marked with **orange tape**.
- 3) Treatment quality must be at least 95%.
- 4) Operations must not result in microsite or soil loss of greater than 15%, or in severe scalping.

**Definition of severe scalping:** Scalping of the soil is observed over 50% or more of the area of the quadrat (1.13 m radius); in other words, the layer of organic material has been completely removed from over half of the surface of the survey plot.

- 5) As much as possible, machinery should not cross intermittent streams marked with **blue tape** except at the site judged to be the most appropriate.

### **EVALUATION OF SILVICULTURAL TREATMENTS for site preparation**

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See EVALUATION OF SILVICULTURAL TREATMENTS for clear cuttings and site preparation (previous section).

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**SPECIFIC STANDARDS  
for reforestation**

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- 1) The Contractor must carry out the requested work while respecting the boundaries of the treatment blocks established by NRCan. Unless otherwise notified, Contractors are not to plant seedlings along roadsides or ditches.
- 2) The boundaries of the areas to be treated are marked with **orange tape**.
- 3) The care of the seedlings is the responsibility of the Contractor. The seedlings must be kept sufficiently moist and the Contractor must appoint a person to be responsible for this. Bareroot stock must be delivered to the site daily based on the number of seedlings to be planted that day. Bareroot seedlings must not be left at the site for more than a day.
- 4) Transportation of seedlings between the road and the reforestation site shall be done at the Contractor's expense. The Contractor must be prepared to carry out reforestation operations in sectors served by winter roads. The Contractor must use suitable and safe equipment to transport the seedlings.
- 5) The work shall be done between spring, as soon as the ground has thawed, and early July upon seedlings availability.
- 6) Reforestation must be done with the appropriate tools and equipment.
- 7) The quality percentage must be at least 85% per block. Otherwise, a progressive penalty will be imposed on the total amount per block. Penalties are imposed as follows:

<u>Quality percentage</u>	<u>Credits granted/awarded</u>
85–100%	100%
80–84.9%	100% - [0.5 (85% - quality %)]
70–79.9%	100% - [2.5% + (80% - quality %)]
60–69.9%	100% - [12.5% + 2(70% - quality %)]
less than 59.9%	0%

- 8) NRCan may impose penalties when an infraction is discovered involving the practices used to store, handle or use seedlings.
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## EVALUATION OF SILVICULTURAL TREATMENTS for reforestation

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This method will be used to evaluate the quality of the Contractor's work.

- **Sampling intensity: reforestation**

The following table specifies the minimum number of sample plots that must be established based on the number of trees replanted.

NUMBER OF SEEDLINGS	MINIMUM NUMBER OF SAMPLE PLOTS
less than 5,000	1 to 4
5,000 to 10,000	5
10,000 to 15,000	6
15,000 to 20,000	7
20,000 to 30,000	8
30,000 to 40,000	9
40,000 to 50,000	10
50,000 or more	10 + 1 sample plot per 15,000 seedlings planted in excess of 50,000

Circular quadrats with a radius of 5.64 m (1/100 ha) will be used.

The evaluation will be carried out roughly in the same way as specified in the *Programme de mise en valeur des forêts privées*. The main criteria evaluated are verticality, depth, compaction, location, density and spacing.

## **11 TECHNICAL GUIDELINES AND GENERAL INFORMATION**

### **11.1 Skidding and movement of machinery (skidders or other types)**

The purpose of the measures described below is to reduce the impact of skidders or any other type of equipment on regeneration, saplings, residual stems and soil during partial cuttings or cutting with protection of regeneration and soils. Some of these measures (a to h) do not apply when seed-tree cutting or strip cutting is being done and when the goal is to maximize the proportion of surface soil that is disturbed (light scarification) in order to allow natural regeneration to get established or when natural regeneration is not already present.

- a) minimize the rate of use of skidding trails;
  - b) limit the number of turning manoeuvres by skidders;
  - c) use directional felling;
  - d) limit movement of skidders on trails and in stacking areas;
  - e) the movement of machinery (skidders) should not cause disturbance in the areas between trails;
  - f) the width of the main trails should be roughly one and a half times the width of the skidders;
  - g) turnaround areas should be preferably located in nonregenerated clearings, roughly every 30 m;
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- h) the usual practice of making a 360-degree turn off the trail should be prohibited, since it is one of the main causes of the destruction of regeneration;
- i) delimiting should be done at the stump.

## 11.2 Criteria for work in a forest environment

Without being legally subject thereto, NRCan shall enforce all the terms and conditions set out in the *Sustainable Forest Development Act* for this project. At all times, the Contractor shall carry out its operations in accordance with this Act. The Contractor is responsible for providing the necessary training to its employees and subcontractors regarding the terms and conditions that apply to VA Base pursuant to this contract. The Contractor should pay particular attention to the following.

- **Stacking and bucking areas**
    - The locations of stacking areas must be approved by NRCan representative and these areas must have a minimum size. Wood must not be skidded or yarded over main roads without special authorization.
    - should be located to minimize the number of stream crossings, erosion and release of forest biomass into the water;
    - a 20-m-wide strip of vegetation must be preserved along the edge of watercourses;
    - must conform to the provisions of the *Environmental Quality Act*;
    - runoff must be channelled towards an area of vegetation at least 20 m from watercourses;
    - to limit encroachment on roads, stacking areas may be created at the roadside with the authorization of NRCan representative.
  - **Skidding and hauling trails**
    - surface water to be channelled to a zone of vegetation (diagonal trenches, felling of non-merchantable stems across trails) at least 20 m from a lake or watercourse;- stream crossings to be achieved by the construction of a temporary (corduroy) bridge or culvert with a 45 cm or greater diameter, depending on requirements, unless the soil and watercourse are frozen to a depth exceeding 35 cm.
  - **Corduroy bridges, culverts and ditches**
    - of adequate size to accommodate flood flows;
    - respect the initial width of the river or stream bed.
    - stabilization of fill used next to culvert with vegetation or riprap;
    - channelling of runoff to vegetated area more than 20 m from watercourse.
  - **Stump height**
    - the trees must be cut at a height not exceeding 15 cm above the highest ground level, except when the snow cover reaches a height equivalent to a water column at least 20 cm high; in the latter case, stump height should not exceed 60 cm;
    - within a given intervention sector, the Contractor may harvest only trees with a diameter greater than or equal to that authorized in the forest management permit.
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### **11.3 Method for evaluating treated area**

The boundaries of treated areas are to be mapped so that these areas can be included in the forest data bank and to ensure that a follow-up of the mapping of the management plan is being done. The position of perimeters is determined by GPS (nad 83 data, MTM projection zone 7). The Contractor is responsible for providing the requested data according to NRCan criteria (shapefile names, work categories, etc.).

When the Contractor deems that a sector has been completed, the Contractor shall notify NRCan representative at the latest 2 working days after the work is finished so that the evaluation of the quality of the work and verification of the treated area can be done as the work progresses. If NRCan deems that the area does not correspond to the area delimited, the Contractor must return to the site to correct the situation to the satisfaction of NRCan representative. Before moving any machinery outside the Garrison, the Contractor must receive authorization from the NRCan representative certifying that the work has been completed to the representative's satisfaction.

### **11.4 Modification of areas to be treated**

Should NRCan have to replace one or more areas specified in the contract or remove or add areas, the Contractor undertakes to respect the unit prices specified in the tender schedule attached to this contract and any other specifications stipulated in the service contract.

### **11.5 Timber sales report**

A sample timber sales report (Excel format) will be provided to the Contractor selected. The report must show, by type of product and for a given period, only one datum per line including the trip ticket numbers, the units delivered, the volume in m<sup>3</sup> (applying conversion factors), stumpage dues (\$/m<sup>3</sup>) granted and equivalent credits (\$). A summary per factory per period shall also be provided.

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