Ministry of
Forests, Lands and Natural Resource Operations

Land Base Investment Strategy

Post Incremental Treatment Assessment

FINAL March 31, 2012

These standards apply, in addition to the General Standards for Ministry Funded Programs (FS 1001), to all survey activities funded under Ministry Programs.

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ARTICLE 1: GENERAL STANDARDS

NOTE: 1 (optional) ***- are specific underlined clauses available for optional selection (underlined blue are hyperlinks and are not optional clauses)***

2 (insertion ~) –are where specific underlined values are required to be entered (suggested values maybe listed)

3 Direction required by Ministry Designated Representative highlighted in yellow

Definitions

1.1 In this document the following words shall have the following meanings:

(a) **"Approved Surveys Quality Inspection System"** or **"Approved SQI System"** means the inspection system contained in this Document **or** another similar system approved in writing by the, **Ministry Designated Representative** prior to the commencement of Work.

(b) **"Control Area"** means an area no less than 1 ha. in size located within or adjacent to the prescribed area to be treated (clearly representing the target stand conditions to be treated), that will be left untreated as a control zone for future monitoring of prescribed treatment effectiveness.

(c) **"Crew"** means one person, or a group of persons working together in the same Opening.

(d) **"Ghost Tree"** means a tree of a specific species that, for a prescribed rationale (i.e. biodiversity reasons), will not be counted towards the well spaced crop leave trees in the Opening and will not be considered a competitor relative to well spaced crop trees.

(e) **"Inspector"** means any person (identified by the Ministry Designated Representative) who under the defined roles of the Approved Surveys Quality Inspection System, performs an inspection review of a survey or treatment prescription - this includes a Recipient (reviewing Contractor work); an Independent Contractor; or MoFLNRO staff (Regional or District)

(f) **"Incremental Treatment"** (for the purposes of this PITA standard) means those treatments performed on post free growing stands that include:

i) Juvenile Spacing

ii) Conifer Release; and

iii) Pruning.

(g) **"Ministry Designated Representative (MDR)"** means the MoFLNRO staff person(s) or Ministry Designated Administrator/Authority, identified at the project pre-work and documented in Article 9 of this document, who is responsible for the outcomes of the surveys performed under this standard, and will be empowered to give approval and/or direction to specific article content in this standard that references this title.

(h) **"Opening"** means an area identified on a Vegetation Resources Inventory Map by an opening number.

(i) **"Post Incremental Treatment Assessment (PITA)"** means a periodically scheduled and performed stand level assessment designed to collect stand attributes, growth and performance data that are required:

i) to evaluate the achievement of past incremental treatment objectives;

ii) to record the treatment results within corporate data bases (including the identification of treated stands from untimely early harvest, within the LRDW);

iii) to communicate the findings, learnings and improved practices annually per District; and

iv) to prescribe further intensive stand treatments where deemed necessary to achieve the prescribed stand management regime objectives.

(j) **"Stocking Standards"** means the stocking requirements per BEC site series (i.e. Minimum and Target WS /ha values of ecologically suitable species, of minimum heights) applicable to an Opening that are found either in an approved prescription or within the default Provincial Stocking Standard website.

(k) **"Stratification Criteria"** means the criteria a contractor will use to stratify an opening for survey sampling and reporting purposes, as set out in these standards.

(l) **"Stratum"** or **"Strata"** means, respectively, a Survey area or areas for which the boundaries are determined by the Stratification Criteria for the type of Survey referenced.

(m) **"Survey"** means a full plot PITA survey and includes the collection and analysis of field data, and all forms, maps, reports, photographs, Survey Summary and Treatment Prescriptions required by this standard.

(n) **"Survey Map"** means a map produced according to the specifications in Article 6.12.

(o) **"Survey Summary"** means a short (no more than one page) summary report from a Survey (signed by the Accredited Silviculture Surveyor), composed of the outcomes of the data compilation (minimum inventory and silviculture label (when applicable), and any brush competition data/issues) and an abbreviated Treatment Prescription (if a treatment is prescribed).

(p) **"Treatment Map"** means a map produced according to the specifications in Article 7.8.

(q) **"Treatment Prescription"** means a logical, biologically-sound, cost-effective recommendation, based on survey results and anticipated stand development, which specifies any future Surveys and/or silviculture treatments that are required for a Stratum, and which also specifies the year and season during which any such Survey or treatment should take place.

(r) **"Vegetation Resources Inventory Map"** means a Vegetation Resources Inventory Map maintained by the MoFLNRO or by a holder of a Tree Farm Licence or Community Forest Agreement.

Information and Materials Furnished by the MoFLNRO

1.2 At the request of the Contractor, Ministry Designated Representative will provide or facilitate access to :

- any Treatment Prescription or Work Plans applicable to the Openings, when they exist;
- copies of the Vegetation Resources Inventory Maps applicable to the Openings to be surveyed;
- applicable aerial photographs or access to ortho photos, subject to any conditions of use that may be attached; and
- all other available information considered by the Ministry Designated Representative to be pertinent to the Work.

ARTICLE 2: PITA PROCEDURAL OVERVIEW

STEP 1

Identification of the Treatment Opening Population

1. Targeted District Specific Subset of Openings
2. Random selection of Openings within Subset

STEP 2

Review of Past Prescriptions per Opening

1. Generation of a Listing of Prescription Goals; Standards; and Post Treatment Quality Attributes

2. Development of a set of specific Treatment Objective Questions required to be answered from PITA

STEP 3

Set Assessment Design Parameters

1. Pre-stratification
2. Systematic grid plot location within max and min plots range

STEP 4

Collection of Data

Sample Plot is variable (prism) and fixed radius – with one sample tree data point every second plot – repeated within control area if established.

1. Core Common Data

- From Checklist generated from STEP 2.1

2. Treatment Objective Question Data Points

- From prescription review from STEP 2.2

STEP 5

Produce and Manage Assessment Results

1. Data Analysis Report

a. Stand Attribute Summaries regarding the current conditions and parameters.

b. Post assessment stratification of SU's that require further treatments

2. Treatment Objective Achievement Report

- Synthesis of answers to Treatment Objectives and implications to best management practices.

Treatment Prescription Development

- Complete Treatment Prescription produced for areas requiring follow up incremental treatments or rehabilitation treatments

3. Communication of Learnings

- Summary Publication of findings by District by year.
- Entry/updating of findings into Incremental Treatment Decision Making Guidance Documents

4. Reporting Updates and Designating Openings as Treated

a. All Data Summary information will reported into RESULTS

b. All Spatial Files for treated Openings will be identified as treated (if not previously identified) in the LRDW and FTA data bases. The intent is to flag these openings during the CP review phase and to ensure permits for harvest will not be issued outside of the prescribed rotation timeframe.

ARTICLE 3: IDENTIFICATION OF THE TREATMENT OPENING POPULATION

3.1 General

- To be performed by the Ministry Designated Representative or their delegate.

3.2 Criteria for Population Query – District/TSA target

- Query all incremental treatments performed 10 years ago or greater
- Query RESULTS and GIS location of openings – (Spatial and Attribute Data Reports)
- Areas identified as logged in the history records will be screened from the sample population.

3.3 Resultant Non-Logged Area Query Openings Population

- Targeted Subset: Identify the targeted criteria from the initial query, specific to the District future incremental treatment needs (i.e. target sample of all Fd stands > SI 20)
- Random Selection: Of the Openings identified from the targeted selection, a specific number (as per District specific annual number of ha. and/or Openings) will be randomly selected for assessment for the project year.

ARTICLE 4: REVIEW OF PAST PRESCRIPTIONS PER OPENING

4.1 General

- To be performed by the Ministry Designated Representative or their delegate.

4.2 Past Prescription Goal Metric Checklist

- Each selected Opening will have its past prescription reviewed and the targeted stand attributes will be tabled as an assessment checklist/template for the collection of assessment data.
- The following is an initial starting point for the generation of a complete checklist per opening (this is potentially an incomplete list, but will serve as a basis):
  Target Metrics:
  - Stand structural goals (i.e. species per layer and/or by diameter class);
  - Non-timber value objectives and standards for that value requirement (e.g. spotted owl requirement of …. stems @ ….. diameter/ha.);
  - Species distribution - % Spp
  - Diameter target/ log grade targets and timeframe to achieve;
  - Forest health considerations and actions;
  - Targeted volume/ha and/or BA/ha production – with accompanied TIPSY runs;
  - Clear wood /quality requirement (i.e. 10 cm of knot free core for the first sawlog of 6 m.)
  - Future treatments required with the prescribed regime (i.e. fertilization, pruning and/or commercial thinning);
  - Ghost tree specifications (e.g. Cw and/or Pw) if applicable.

  Post Treatment Quality Plot Data
  - BEC subzone, variant and site series;
  - Inventory and Silviculture Label;
  - Actual treatment costs;
  - Site Index

4.3 Treatment Objective Question List

- Each selected Opening will have its past prescription reviewed and a list of Treatment Outcome Objective Questions produced, that need to be answered after the PITA.
- These questions will be a function of the targeted metric data relative to the treatment objectives. The following is an example of the an objective question:
  - Statement: The achievement of a Fd (80 %) and Hw (20%) stand with a minimum of 600m3/ha by age 50.
  - Question: Is this stand on the trajectory for the volume project, based on the PITA data at age 35 years?

ARTICLE 5: ASSESSMENT DESIGN PARAMETERS

5.1 General

- To be performed by the Contractor or their equivalent.

5.2 Pre-stratification

- Each selected Opening will be pre-stratified as set out in *Silviculture Survey Procedures Manual* - Section 3.2: Preliminary Stratification and Section 3.8.1: Field Stratification.

5.3 Sampling Plot Intensity

- A minimum of 5 plots/Stratum is required. Plot intensity will range from 1 plot/ 2 ha to a maximum of 10 plots per Stratum. Regardless of the plot intensity, the surveyor must ensure that their plot locations provide uniform coverage of the Stratum. This process will help ensure the plot data is representative of the whole Stratum.

5.4 Control Plot Sampling

- If a control area was left untreated and identified with the original treatment (or adjacent), it will be sampled using the same data checklists and core data collection criteria as the treated area. Plot intensity will be a minimum of one complete sample plot per control area and up to ideally 3 plots per control area.

5.5 Survey Lines and Plots Locations

- Survey lines and plots will be established using either Global Positioning System (GPS) units (preferred), or by manual chaining methods. Survey lines and plots must be identified as follows:

  (a) For both GPS and manual chaining methods:

    i) point of commencement (P.O.C.) must be marked with flagging tape showing the Opening number in waterproof ink;

    ii) flagging tape must be affixed at a height of approximately 1.3 meters above each plot centre, showing in waterproof ink the plot number, (optional) date of survey, surveyors initials (if not included with the plot number);

    iii) flagging tape must be affixed to the ground at all plot centers;

  (b) If a GPS is being used, plot centre UTM Coordinates must be provided;

  (c) If a manual chaining method is being used:

    i) survey baseline (if established) and all strip lines must marked with flagging tape showing the baseline and strip line number in waterproof ink;

    ii) all plot centre flagging tape affixed at 1.3 meters must have the bearing and distance to the next plot written in waterproof ink.

ARTICLE 6: FIELD DATA COLLECTION

6.1 General

- To be performed by the Contractor or their equivalent.

6.2 Sample Plot Design

- Each plot will collect core data within:
  - A fixed radius plot of 3.99 m radius preferred for stems < 12.5 dbh (but a 5.64 m. radius maybe more suitable for lower density stands < 400 /ha. – as long as the same plot size is used throughout the Stratum);
  - A variable plot radius using a prism to tally all stems ≥ 12.5 cm dbh - prism size will be determined by the BAF that will capture a target of between 4 to 7 stems per plot as long as the same BAF is used throughout the Stratum; and,
  - One sample tree is measured in detail every second plot. The sample tree could be the Site Index Tree as well, but will always be a leading species sample, free from forest health factors and in a dominant or co-dominant crown position (usually a Layer 1 stem).

6.3 Format of Documentation

- Where PITA data or results are summarized or represented using computerized or other electronic means, the display, content and format of the information must substantially duplicate the corresponding MoFLNRO forms – a modified FS 748 with additional columns for stand specific sample tree data is recommended.

6.4 Core Plot Data Collection

- The following defines the procedure for data collection at plots:
  - Identify and confirm the BEC subzone, variant and site series;
  - Tally the total number of trees (layer 1 only) by species and dbh classes (increments of 5 cm after 12.5 cm)within the prism sweep;
  - Tally the number of total trees (by layer 2 and/or 3 – layer 4 will not be tallied due to the advanced age of the stands) by species, in a 3.99m plot or 5.64 m plot (at the surveyor's discretion);
  - Tally all identified ghost trees (if applicable) as outlined above by layers, separately from the total tree counts identified above;
  - Identify forest health factors/damage agents (where applicable);
  - Assess all layer 1 (in prism sweep) and layers 2 and 3 (in the fixed plot) stems as crop trees or non-crop trees based on their acceptability using the Multi-layered Damage Criteria in the FS 660 Survey Field Guide.
  - Tally broadleaf competition, including alder, maple, willow, cottonwood, bitter cherry, birch and /or aspen densities by species and dbh class, number of coppices and stems per coppice, height to live limbs.
  - Tally or record other factors/observations that may affect treatment operations as per criteria defined by the Ministry Designated Representative, (i.e., numbers of ghost cedar trees and/or western white pine, whips to be cut, and/or brush issues, etc.);
  - Estimate and record site index using the method described below for a minimum of 5 plots per stratum or every second plot, to a maximum of 10 samples per stratum;
  - A estimate of the inventory label every 1st and 4th plot, as described below (NOTE: an estimate of crown closure is required);

- Record presence of danger trees and requirements for danger tree assessments if future treatments are recommended (e.g. commercial thinning).

6.5 Plot Sample Tree Data

- A sample tree represents the **average** diameter and height of the healthy leading species in a dominant or co-dominant canopy position in the plot. This could be potentially the Site Index Tree as well, but not necessarily in every plot – for the Site Index tree is the largest tree in a 5.64 m. radius plot.
- For sample crop trees, in every second plot record:

  Minimum Data

  - diameter breast height (dbh);
  - total height (height/diameter ratio - calculated from first 2 data points);
  - height to live crown;
  - crown width;
  - breast height age;
  - ring width in cm post the treatment year; and
  - note if ring width increase post treatment or not.

  Potential Additional Data – Dependent on Prescription Objectives

  - knot / branch size and number per the first 5.6 m in height;
  - distance between knots;
  - full occlusion of knots – yes or no.

6.6 Plot Treatment Objective Question Data

- At each plot, inter-plot and/or at the final plot, notes will be recorded to generally consider and initially suggest potential answers (while still in the field) to the treatment objective questions developed in Article 4 above.

6.7 Site Index (SI) Methodology

- Site index must be collected following the procedural guidelines outlined in *Land Management Handbook 12 - Selecting a Method to Estimate Site Index 2006*: Selecting a Method to Estimate Site Index, 2006.
- The following is a site index hierarchy process applicable to Ministry treatment objectives and Stratum conditions:

  1. First if possible, use of the growth intercept (GI) method is most recommended (but not applicable for fertilized stands). Tally site index for the current dominant/co-dominant species of the leading species in the Stratum of the **largest diameter**, with a minimum of 5 samples per Stratum. If a leading species growth intercept cannot be collected, a secondary species will be collected (if possible), again from dominant/co-dominants, and converted for the leading species site index. Data should be collected from non-understorey or non-suppressed trees. Site Tools can be used to accurately calculate all SI from growth intercept measurements.
  2. Second, if the growth intercept method cannot be used, the second choice is via Site Index by BEC (SIBEC) **second** approximation data for the

appropriate species (usually denoted by a sample size, standard error and decimal site index in the SIBEC table); or

3. Third, the choice would be via SIBEC **first** approximation data for the appropriate species (usually denoted by no sample size, no standard error and whole number site index in the SIBEC table). SIBEC tables for all BEC subzones/site series by species, by old Forest Service Regions, are available at SIBEC link.

6.8 Forest Cover Inventory Label

- All PITAs must produce a complete updated forest cover inventory label for each Stratum, as specified in the *Silviculture Survey Procedures Manual* and the RESULTS Information Submission Specification - Government Submission.
- NOTE: The % species in the inventory label will be based on basal area and not density, if the leading species in the label are in layer 1 (i.e. ≥ 12.5 cm. dbh).

6.9 Silviculture Label Requirement Criteria

- An **estimate** (not based on measured plot data, but based on the surveyors visual assessment) of the updated Silviculture Label is **only required** for each Stratum that recommends a **stand treatment** as specified in the *Silviculture Survey Procedures Manual* and the RESULTS Information Submission Specification - Government Submission. The Stocking Standards applicable in order to determine the Well Spaced (WS) and Free Growing (FG) stems will follow the hierarchy of locating the appropriate standards:
    1. From an existing and most current approved Site Plan, Silviculture prescription, PHSP or previous Survey or Prescription containing complete Stocking Standards.
    2. If none of the above documents are available, the Stocking Standards for the Opening's site series will be used as listed in the Default Stocking Standards for all BEC subzones in the province at the Stocking Standards Website.

6.10 (optional) Supportive Photography

- Colour photographs maybe taken showing representative views of any Stratum requiring detailed explanations of complex or unique conditions observed by the surveyor.

6.11 Access

- Current access and required access improvement notes shall be collected during and documented/summarized with the Treatment Prescription if applicable.

6.12 Survey Maps

- Survey Maps must:
    - be submitted in accordance with the British Columbia Mapping Standards BC Mapping Standards for use in RESULTS submissions; and
    - in addition to the requirements above, Survey Maps must also show:
        - the type of Survey;
        - biogeoclimatic (BEC) classification from the subzone to the site series level;
        - Opening and Strata area;
        - inventory;
        - points of commencement of the survey;
        - plot centers numbered at least every fifth plot; and
        - (optional) survey lines and direction travelled.

ARTICLE 7: MANAGEMENT OF ASSESSMENT RESULTS

7.1 General

- To be performed by the Contractor or their equivalent.

7.2 General

- PITA results will be tabled in 3 reports: **Data Analysis Report**; **Treatment Objective Achievement Report**; and potentially a **Treatment Prescription**.
- All Treatment Prescriptions must be signed and sealed by an RPF or RFT.

7.3 Data Analysis Report

- The Contractor will prepare a summary report outlining the stand attributes regarding the current conditions and factors.
- A sample report template is attached in Appendix A.
- For Strata within the Openings that require further incremental treatments (by meeting the treatment criteria list below and have further treatment prescribed in the original prescription treatment regime), the Contractor will provide a complete Treatment Prescription as outlined below.

7.4 Treatment Objective Achievement Report

- The Contractor will prepare a summary report outlining the stated pre treatment objectives/metrics and present the current measured attributes relative to those objectives questions identified in Article 4 for the Opening. They will be presented in a comparison manner on one page, to clearly illustrate common metric achievements and comparisons.
- A sample report template is attached in Appendix A.

7.5 Communications of Learnings Summary

- The Contractor will provide a brief summary of the treatment learnings resulting from the Treatment Objective Answer Report to the Ministry Designated Representative of a format determined for the local district.

7.6 Treatment Decision Criteria

- **Juvenile Spacing** – will be recommended by the Contractor only for Strata that meet the Interim Field Guidelines for the Selection of Stands for Spacing, either for the Coast FS 448A or for the Interior FS448B, whichever is appropriate regionally.
- **Pruning** – will be recommended by the Contractor only for Strata that meet the Guidelines for the Selection of Stands for Pruning, in the Pruning Guidebook FPC
- **Forest Health Treatment Impacts** must be considered as outlined in the guideline documents referenced above. Actions for specific pests are:
  a) Black Headed Budworm (IDH) defoliation observed: no Juvenile Spacing treatment.
  b) Western Spruce Budworm (IDE) defoliation observed: Should be reported to the regional MoFLNRO specialist before planned treatment (spacing is an acceptable treatment).

7.7 Treatment Prescriptions

- For all Strata with proposed treatments (treatment areas), a complete Treatment Prescription will be produced by the Contractor, comprised of 4 components:

    1. Completed LBIS Pre-Stand Tending Survey Report Template (to be posted April 2012) – manually completed and/or digitally uploaded, including the following elements in the Recommendations Section of the Template:
        a. a schedule of treatments and treatment window including options/alternatives, preference rationale, and follow-up surveys;
        b. danger tree assessment recommendation where applicable;
        c. total hectares of the prescribed treatment unit, (optional) as determined by a GPS traverse;
        d. access notes including information on accessibility and any required access improvements (e.g. 4WD, quad access only, required road or culvert repairs, brush removal and other);
        e. for spacing treatments include;
            i. minimum stump height, criteria related to the cut stump angle, treatment of slash and maximum slash depth and any areas of unspaced buffers (e.g. 10m unspaced buffers established along all drivable roads);
            ii. (optional) For IDF subzone Strata with multi-storey stand structure, a Prognosis model report is required.
        f. any forest health issues to address;
        g. where a Stratum may also require brushing treatments, include competing species densities, average dbh and range, average height and range, height to live limbs, potential coppice issues and prescriptions, optional treatment methods, rationale for treatment in tandem with spacing operations, and comments on other issues with potential to affect operations; **and,**
        h. any necessary measures to address potential Integrated Resource Management values.
    2. Additional digital attachments relative to the LBIS Pre-Stand Tending Survey Template such as:
        a. Colour photograph for each Stratum.
    3. Treatment Map with location of Control Area;
    4. Survey Summary

7.8 Treatment Maps - Additional Requirements

- Treatment Maps must show:
    a) biogeoclimatic (BEC) classification from the subzone to the site series level;
    b) Opening and Strata area;
    c) inventory and silviculture label (including either well spaced [WS] or free growing [FG] per Stratum);
    d) treatment unit boundaries (treatable areas) and identifiers;
    e) abbreviated Treatment Prescription Recommendations;
    f) the direction and distance to nearest town; and
    g) gross and net treatment area.

7.9 (optional) Layout of Treatment Units (treatable areas)

- The Contractor will only layout and/or traverse those areas approved by the Ministry Designated Representative.
- If traversing is required of treatment units, roads and spur roads, it is preferred to be completed using GPS technology and to FFT GPS Standards .
- All non-GPS layouts and traverses must be aerial-photo tied and ground-tied to a mappable unit.
- All treatment unit boundaries will be flagged using winter weight ribbon of the colour and format as defined by the Ministry Designated Representative and TSA standard. All flagging shall be inter-visible at a glance (i.e. two consecutive ribbons are visible in one direction). and attached as high as possible, to residual stems.

7.10 Deliverables

- For each Opening that a PITA is preformed, the Contractor will ensure the provision of the following products to the Ministry Designated Representative and deliverables 2 to 4 in the following table will be included as attachments in the RESULTS submission.

PITA List of Deliverables	# of Originals	Digital Deliverable Format (insertion ~ content)
1. All original field data and summary forms.	1	Not applicable
2. Survey Map, Data Analysis Report, Treatment Objective Answer Report and Communication Learning Summary	1	.pdf
3. Treatment Map and Treatment Prescription (signed by an RPF), where future treatments are recommended.	1	.pdf
4. (optional) Colour photograph for each Stratum	1	.jpg (incorporated into report)

ARTICLE 8: SUBMISSION INTO RESULTS AND LRDW

8.1 General

- The Contractor must submit completed survey data, prescribed planning activities (where applicable), forest cover polygon data, inventory label data, silviculture label data (where applicable), attachments such as photos (where applicable) and digital maps into RESULTS using Electronic Submission Framework or online submission (whichever is applicable).

8.2 Data Entry Standards

- All data must be entered into RESULTS in accordance with the FFT Standards for RESULTS Submissions. (unique coding for PITA to be developed by RPB)This standard describes the process of creating new Openings and provides a link to the Provincial Standard for RESULTS submissions - “RESULTS Information Submission Specifications for Government Funded Silviculture Activities” and “Silviculture Information Submission Guidebook”.

8.3 Designating Openings as Treated

- All Spatial Files for treated Openings will be identified as treated (if not previously identified) in the LRDW and FTA data bases. The intent is to flag these openings during the CP review phase and to ensure permits for harvest will not be issued outside of the prescribed rotation timeframe.

- This data review check and entry will be performed by the Ministry Designated Representative**,** (unless specified otherwise in this standard), in accordance with the IBIS Standards for FTA Flagging (to be developed by RPB).

8.4 RESULTS Quality Management

- For the purposes of quality management, the Contractor must submit tabular and spatial data for 5 (five) Openings into RESULTS by a deadline specified by the Ministry Designated Representative. Following this initial submission, the Contractor will periodically provide to the FFT Regional Staff, a list of Openings that have been successfully submitted into RESULTS.

ARTICLE 9: ADDITIONAL DISTRICT SPECIFIC STANDARDS

- Additional standards to all of the base standards above (including TSA specific Forest Health factors impacting prescriptions), may be requested by specific TSA Ministry Designated Representative. These additional standards must be attached to this document.
- These additional standards will be clear as to the Articles of this base standard that are being added to and/or superseded and will contain specific rationale for a variance to this base standard.

ARTICLE 10: INSPECTION

10.1 Quality Inspection - General

- Unless otherwise specified by a Ministry Designated Representative, the methodology given in this Article shall form the basis for the Approved Surveys Quality Inspection System.
- The Approved SQI System will involve potentially two parties: at least the Ministry Designated Representative and potentially a second as the Inspector – if different than the Ministry Designated Representative.

10.2 Method of Inspection

- If the Deliverables are satisfactory, the Ministry Designated Representative / Inspector shall conduct a reconnaissance of the Payment Area to carry out a preliminary assessment of the quality of the Work.
- If, after any reconnaissance, the Ministry Designated Representative/ Inspector decides, in their discretion, to conduct field inspections of the corresponding Payment Area, they shall inspect 10% or more of the Payment Area to determine compliance with the terms and conditions of this Agreement.
- The Ministry Designated Representative will provide the Contractor with a copy of the inspection of the Deliverables and the preliminary assessment, and/or field inspection within (insertion ~ 10) working days of the date of the inspection so that the Contractor is notified in a timely manner as to:
    - whether to proceed to the next activity or phase of Work; and/or
    - any deficiencies or non-compliance with the Agreement.

10.3 Field Inspection

- The Ministry Designated Representative/ Inspector shall conduct field inspections by checking, at their discretion, the results of all plots and lines established by the Contractor on a portion of the Payment Area or by establishing an independent survey of some of the Strata within the Payment Area.

- Where the Ministry Designated Representative/ Inspector checks the results of actual plots established by the Contractor in an Opening, they shall inspect the greater of five (5) plots established or 10% of plots established, and the Province shall assess and compare the data it obtains with that collected by the Contractor for the same plots.

10.4 Provision of Field Maps

- The Ministry Designated Representative may request that the Contractor provide them with copies of Survey cards and field maps for any Stratum surveyed, and the Contractor shall supply the copies within a reasonable time period as agreed to by the Ministry Designated Representative.

10.5 Satisfactory Work Quality Defined

- The Ministry Designated Representative must examine the data to the extent necessary to determine that the Survey has been undertaken and reported in accordance with this Standard, and specifically may determine a Survey to be **satisfactory** when:
    - **a.** an Opening is correctly stratified according to the Stratification Criteria;
    - b. the Survey correctly identifies for a Stratum:
        - i. the Biogeoclimatic zone, sub-zone, and site series,
        - ii. the order of the leading and secondary species in the inventory label, and
        - iii. any pest, pest damage, disease, disease damage or other physical damage;
    - c. a field check finds a difference of no more than 10% between the Survey and the Ministry Designated Representative's/ Inspector's tally in any data collected in Article 6;
    - d. field cards, reports, maps or summaries are legible, and are completed in accordance with this Standard, and;
    - e. the Deliverables are complete and contain no errors, omissions or false statements.

10.6 Approval of Payment from Inspection

- The Ministry Designated Representative shall approve payment for any Payment Area where the Contractor has, in the sole opinion of the Ministry Designated Representative, satisfactorily completed and submitted all Deliverables and Silviculture Treatment Recommendations required for the Payment Area to the Standards of this document. The Ministry Designated Representative may approve partial payment for achievement of specified milestones as set out in the Work Progress Plan.
- The Ministry Designated Representative will recommend the following action on a per Opening basis, for Work pertaining to all Surveys that are determined unsatisfactory due to non-compliance of the criteria identified in Article 10.5:
    - a. the Ministry Designated Representative shall promptly notify the Contractor, and
    - b. the notice shall:
        - i. specify the fault, give the Contractor a deadline for compliance, and specify if the Ministry Designated Representative wishes to exercise their option to require the Contractor to rework the unsatisfactory Work; or,
        - ii. specify the fault, indicate that the Ministry Designated Representative will exercise the option to correct the unsatisfactory Work, and deduct from payment all direct and indirect costs incurred for correcting the unsatisfactory Work.

If the Contractor fails to comply by the specified deadline for compliance, or if any inspection of further Work indicates that Work is again unsatisfactory, the Ministry Designated Representative will recommend no payment per Opening basis, for Work pertaining to all Surveys.

APPENDIX A – EXAMPLE OUTLINE OF PITA DATA ANALYSIS & TREATMENT OBJECTIVE ACHIEVEMENT REPORT

1. DATA ANALYSIS

1.1 Stand History

Area: Ecology

Treatments Dates

Harvested:
Planted:
Fill Planted:
Juvenile spaced/ Brushing: **Control Established**:
Pruned:

Year	Area	Density Pruned (sph)	**Year**	Area (ha)	Density pruned (sph)
1st lift (2.8 m)					
Double lift (5.5 m)					

Table 1: Summary of pruning

Pre- Treatment Forest Cover Label

Post-Treatment Forest Cover Label:

1.2 Post Incremental Treatment Assessment (PITA) Data Summary:

Species	**Form Class**	**Diameter (cm) distribution – BA (m^2/ha)**								
		15	**20**	**25**	**30**	**35**	**40**	**45**	**50**	total
	Acceptable									
	Not acceptable									
										Total Excluding unacceptable
										Total Basal area

Table 2: Post spacing residual diameter distribution (m^2 per ha)

Species	**Form Class**	**Diameter (cm) distribution – density (sph)**								
		15	**20**	**25**	**30**	**35**	**40**	**45**	**50**	total
	Acceptable									
	Not acceptable									
									Total density excluding unacceptable	
									Total density	

Table 3: Post spacing residual diameter distribution (sph)

Current Inventory Label

(EXAMPLE: Fd92Cw03Hw03Mb01 31 years 27m ht. SI 43 80% CC 40.2 m^2)

Species	**Layer 2**		**Layer 3**		**Total**	**Total**
	Unacceptable	Acceptable	Unacceptable	Acceptable	Unacceptable	Acceptable

Table 4: Understory regeneration (sph)

Species	**Ht to live crown (m)**	**Average Height (m)**	**Average DBH (cm)**	**Average age at DBH**	**Average Ht / Diameter ratio**	**Average crown width (m)**	**Average ring width since treatment (cm per year)**	**Average knot size < 5 m (cm)**	**Average knot size > 5 m (cm)**

Table 5: Sample tree characteristics – wood quality and tree form

1.3 Control Area Assessment (PITA) Results or TASS/TIPSY Projections (insert model runs below per Table category)

Species	**Form Class**	**Diameter (cm) distribution – BA (m^2/ha)**								
		15	**20**	**25**	**30**	**35**	**40**	**45**	**50**	total
	Acceptable									
	Not acceptable									
									Total Excluding unacceptable	
									Total Basal area	

Table 6: Control diameter distribution (m^2 per ha)

Species	**Form Class**	**Diameter (cm) distribution – density (sph)**								
		15	**20**	**25**	**30**	**35**	**40**	**45**	**50**	total
	Acceptable									
	Not acceptable									
										Total density excluding unacceptable
										Total density

Table 7: Control diameter distribution (sph)

Control Inventory Label

……

Species	**Layer 2**		**Layer 3**		**Total**	**Total**
	Unacceptable	Acceptable	Unacceptable	Acceptable	Unacceptable	Acceptable

Table 8: Control Understory regeneration (sph)

Species	**Ht to live crown (m)**	**Average Height (m)**	**Average DBH (cm)**	**Average age at DBH**	**Average Ht / Diameter ratio**	**Average crown width (m)**	**Average ring width since treatment (cm per year)**	**Average knot size < 5 m (cm)**	**Average knot size > 5 m (cm)**

Table 9: Control Sample Tree characteristics – wood quality and tree form

2. TREATMENT OBJECTIVE ACHIEVEMENT REPORT

2.1 Treatment Outcome Objectives (from original Prescriptions)

1. To .....

2.2 Treatment Outcome Questions

1. SPACING IMPACT: Has the spacing treatment…….?

2.3 Treatment Objective Achievement Discussion

1. SPACING IMPACT:

Original Stand:

PITA Stand Attribute:

ANSWER:

- Spacing treatment has resulted in.....