Alberta
Agriculture
and Forestry

Spatial Data Directives

Guidelines for Data Formats

Version 6.0
May 2016

Forest Management Branch

Updates

Spatial Data Directives– Guidelines for Data Formats was created in July 2015 as supplemental information for a series of Forestry Division Directives, known collectively as the Spatial Data Directives. Subsequent revisions to the document are summarized below:

Date	Type of Revision	Version No.	Sections Revised
September 2015	Minor	3	Removed FMU and Regional Office from required metadata fields. Added timing (3 years) to RD_CLASS description Added SKID_DATE to As-built Harvest Boundaries Attributes Table
November 2015	Major	4	Removed field RD_CLASS and RD_STATUS attribute FUTURE from Tables 4, 8 and 11. Changed HARV_CODE format from Character (1) to Character (2) to accommodate new attributes MR = Merchantable Residual Retention and NR = Non-merchantable Residual Retention.
February 2016	Major	5	Changed SEEDLOT_NM field name to SEEDLOT_1 in Table 14. Added fields SEEDLOT_2 and SEEDLOT_3 to Table 14. Modified examples in Appendix A - Field Mapping Data Submission Example. Clarification of quality control measures for specific data submission types.

May 2016	Major	6	Changed character length for all tables listing field BLOCK_NUM to (30) from (12). Updated character length for tables listing field RD_ID to (30). Updated character length for all tables listing field WC_ID to (30). Updated Inter-Block Road definition to indicate timber year used as capture date. Added metadata file naming convention. Non-FMA FMU cutblock capture responsibility outlined in Final Cutblocks. Topology rules now apply to all relevant feature classes adding 'Must Be Disjoint' for point feature class topology. Delivery expectations for empty feature classes outlined in data format section. Changed STAND_TEND format in from Character (4) to Character (6) to accommodate new attribute REPLNT = Replant NSR Areas in Table 15. Replaced ESRD text to AF and repaired broken web links to data directives on new AF site.

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1. Data

The Spatial Data Directives specification lays out the requirements for delivery of spatial and tabular data to support various forest management needs. The specification provides the details on the datasets required and the format of these data. A data provider has the option of submitting the data either in a standardized Forest Management Branch (FMB) format as defined in this document or in its native format as used by the provider. A set of ArcGIS templates is available from FMB that can be used to provide data in a standardized format. If data is provided in its native format then additional metadata must be submitted indicating rules for translating submitted data into the standard FMB template.

1.1 Delivery Media

There are a number of options for delivering data:

1. A secure FTP site is available to upload data
2. CD, DVD
3. USB device (hard drive or zip drive/memory stick). Devices should be scanned for viruses prior to submission. Upon request, the USB device will be returned to the owner following data download.

1.2 Projection and Datum

NAD83 Canadian National Transformation version 2 (NTv2) is the only acceptable datum. Preferred projections are:

- UTM Zone 11N (WKID 26911) and
- UTM Zone 12N (WKID 26912).

Other projections are acceptable if it can be projected to either one of these UTM projections using existing ESRI geoprocessing tools.

1.3 Data Format

Spatial Data must be submitted as an Esri® polygon, line or point feature class in accordance with the data theme being submitted (blocks - polygons, roads - line, crossings - point). These feature classes can be delivered using either a shapefile or **file geodatabase (FGDB)** (preferred format). Tabular data is to be submitted as a dBase file, MS Access database, Excel spreadsheet, or **FGDB** (preferred format). A feature class without data must be submitted as a blank feature class matching standard schema formats. Accompanying metadata must declare the intentional absence of information in the comments section within the metadata table. Data should be delivered as a zip file archive containing all data related to the type of data being delivered (FHP, AOP, etc.). The name of the zip file is to follow a format as detailed in the following section.

1.4 File Naming Conventions

File names should include:

1. Stakeholder code
2. Data submission type code
3. Submission date.

The standard codes for Stakeholder Names are those used in the *Alberta Regeneration Information System Industry Operations Manual* Appendix D – Stakeholder Codes.

Standard submission types and codes are listed in Table 1 below.

Table 1: Standard data types and codes

Data Type	Data Type Code (*DDD*)	FGDB Feature Class/Table Name	Identifier Code (*FFF*)	Type
Forest Harvest Plan	FHP	HARV_AREA_BDY	HAB	Polygon
		INTER_BLK_ROADS	IBR	Polyline
		WC_CROSSINGS	WCX	Point
		VARIANCES	VAR	Polygon
Annual Operating Plan	AOP	HARV_AREA_BDY	HAB	Table
		INTER_BLK_ROADS	IBR	Table
		WC_CROSSINGS	WCX	Table
As-Builts	ASB	HARV_AREA_BDY	HAB	Polygon
		INTER_BLOCK_ROADS	IBR	Polyline
		WC_CROSSINGS	WCX	Point
		VARIANCES	VAR	Polygon
Final Cutblocks	CCP	FINAL_BLOCKS	n/a	Polygon
Silvicultural Activities	SAP	SILV_ACTIVITIES	n/a	Polygon

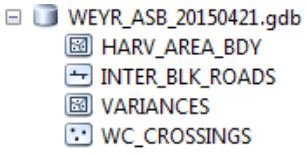
1.4.1 File Geodatabase Naming Conventions

Data delivered in FGDB format can contain multiple feature classes/tables that should only relate to the data type being delivered. For example, if delivering Forest Harvest Plan data then the FGDB should only contain feature classes for HARV_AREA_BDY, INTER_BLK_ROADS, WC_CROSSINGS, and VARIANCES. The preferred delivery format for an FGDB is a zipped archive that can be extracted to an FGDB.

FGDB name(s) are formatted *SSSS_DDD_yyyymmdd*

1. *SSSS* is stakeholder code,
2. *DDD* is data type code
3. *yyyymmdd* is the submission date in the format year, month and day.

Example for As Builts:



1.4.2 Shape File Naming Conventions

Complete submissions contain a minimum of 5 files, including:

1. <filename>.shp
2. <filename>.shx
3. <filename>.dbf
4. <filename>.prj
5. <filename>.xml

Delivered shapefiles should be provided as a zip file archive containing all shapefiles for a particular data type. For example, if delivering Forest Harvest Plan data then the zip file should contain shapefiles for HARV_AREA_BDY (HAB), INTER_BLK_ROADS (IBR), WC_CROSSINGS (WCX), and VARIANCES (VAR).

Naming convention for the zip file archive is *SSSS_DDD_yyyymmdd*

1. *SSSS* is stakeholder code,
2. *DDD* is data type code
3. *yyyymmdd* is the submission date in the format year, month and day.

Shapefiles: File name(s) are formatted *SSSS_DDD_FFF_yyyymmdd*

1. *SSSS* is stakeholder code,
2. *DDD* is data type code
3. FFF is layer identifier
4. *yyyymmdd* is the submission date in the format year, month and day.

Example for As Built Water Crossings:

WEYR_ASB_WCX_20150421.shp
WEYR_ASB_WCX_20150421.shx
WEYR_ASB_WCX_20150421.dbf
WEYR_ASB_WCX_20150421.prj
WEYR_ASB_WCX_20150421.xml

Shapefiles for SAP and CCP may be submitted as SSSS_DDD_yyyymmdd to avoid naming redundancies since in this case only one shapefile feature class is to be submitted.

Example: WEYR_CCP_20150421.shp rather than WEYR_CCP_CCP_20150421.shp

1.4.3 Table Naming Conventions

An AOP table file should be submitted in one of the following formats: **FGDB table** (preferred format), MS Excel (*.xls), MS Access (*.mdb) or dBase (*.dbf).

Files submitted as FDGB, Excel (*.xls) or MS Access (*.mdb) are formatted *SSSS_DDD_yyyymmdd*

1. *SSSS* is stakeholder code,
2. *DDD* is data type code
3. *yyyymmdd* is the submission date in the format year, month and day.

Individual tables/worksheets within each file will be labeled with the appropriate table names (see **FGDB Feature Class/Table Name** in Table 1).

Excel Example: WEYR_AOP_20150421.xls containing 3 worksheets named HARV_AREA_BDY, INTER_BLK_ROADS, and WC_CROSSINGS.

File submitted in dBASE (*.dbf) tables are formatted

1. *SSSS* is stakeholder code,
2. *DDD* is data type code
3. FFF is layer identifier
4. *yyyymmdd* is the submission date in the format year, month and day.

Example: WEYR_AOP_HAB_20150421.dbf

2. Metadata

Every submission requires the appropriate metadata which defines:

- Submission Date
- Contact
- Stakeholder Name
- Operational area
- Contact for data issues

Metadata file naming convention is *SSSS_DDD_yyyymmdd_Metadata.xls* where:

1. *SSSS* is stakeholder code,
2. *DDD* is data type code
3. *yyyymmdd* is the submission date in the format year, month and day.

Example: WEYR_AOP_20160429_ Metadata.xls

Metadata requirements for spatial data (SD) submissions can be found in Table 2 below.

Table 2: Required metadata fields

Submission Date	Date	
Contact	Name Email Phone	
Stakeholder Name	Name	
Contact for Data Issues	Name Email Phone	

If the standard FMB template is not used to deliver data then a data dictionary that details each field: name, field definition, and domain codes/descriptions in each feature class or shapefile is required. Additionally, for each feature class or shapefile, metadata that maps the submitted data to the FMB standard fields must be provided (see Appendix A example) for each feature class. An EXCEL spreadsheet is available from FMB to simplify the submission of metadata. If the FMB template is used to deliver the data then this field mapping metadata is not required.

3. Quality Control

Data will be audited for completeness and achievement of standards. Additional quality checks are specified as follows:

1. Metadata is complete where required for submission.
2. Attribute data contains valid entries according to accepted set of domain values defined for field.
3. Spatial data verification.
    - Verification of datum and projection.
    - Topology:
        - **No Overlaps**
          Polygon interiors in the feature class do not overlap but may share edges or vertices.
        - **Must Be Disjoint (Point)**
          Requires that points be separated spatially from other points in the same feature class (or subtype). Any points that overlap are errors.
        - **No Gaps Where Applicable**
          Voids do not exist within a single polygon or between adjacent polygons where a polygon boundary coincides with another polygon boundary.

Data that does not meet these minimum quality checks will be returned to the data provider. Once the data provider is confident that the data will meet the quality control checks, the data can be re-submitted.

4. Feature Attributes

A minimum set of attributes is required that allows FMB to populate the required fields for each feature class or shapefile submitted. If the submitted fields do not follow FMB naming conventions or definition then a mapping of the submitted field to the associated FMB Field must be provided by filling out a field mapping table provided in the FMB EXCEL metadata document. The fields defined in the following sections are in addition to the default ESRI fields automatically provides such as SHAPE_AREA, OID, and SHAPE_LENGTH.

4.1. Forest Harvest Plan (FHP)

Refer to AF, Forestry Policy, 2015, No.2 for standards, specifications, submissions, enforcement/compliance, contact information and authorities.

Complete data submissions for FHPs include:

1. Planned/proposed harvest area boundaries
2. All inter-block roads
3. Watercourse crossings
4. Variances

Table 3: Planned/Proposed Harvest Area Boundaries Attributes Format (HARV_AREA_BDY: POLYGON)

Field Name	Field Format	Field Description and Domains
DISP_NUM	Character(15)	Disposition Number to which reforestation responsibility is attached
BLK_STATUS	Character(10)	Current Block Status: PLANNED = Planned LAID OUT = Laid Out HARVESTED = Harvested AS-BUILT = As-Built
OPEN_NUM	Character(11)	ARIS Opening Number
BLOCK_NUM	Character(30)	Block/Field number from Annual Operating Plan cutover map.
MEAS_METH	Character (5)	Method of Data Capture: GPSG = GPS Ground GPSA = GPS Air MAP = MAP PHOTO = Orthophoto SAT = Satellite Imagery SKTCH = Sketch Drawing

Table 4: Planned Inter-Block Roads Attributes Format (INTER_BLK_ROADS: POLYLINE)

Field Name	Field Format	Field Description and Domains
RD_STATUS	Character (10)	Road Status: PLANNED = Planned ACTIVE = Active
RD_YEAR	Integer	Year of Road Construction
RD_ID	Character (30)	Unique Identifier that will be used to link information contained in the Annual Operating Plan or As-Builts to its associated feature in this feature class

Figure 1: Example of Inter-block Road

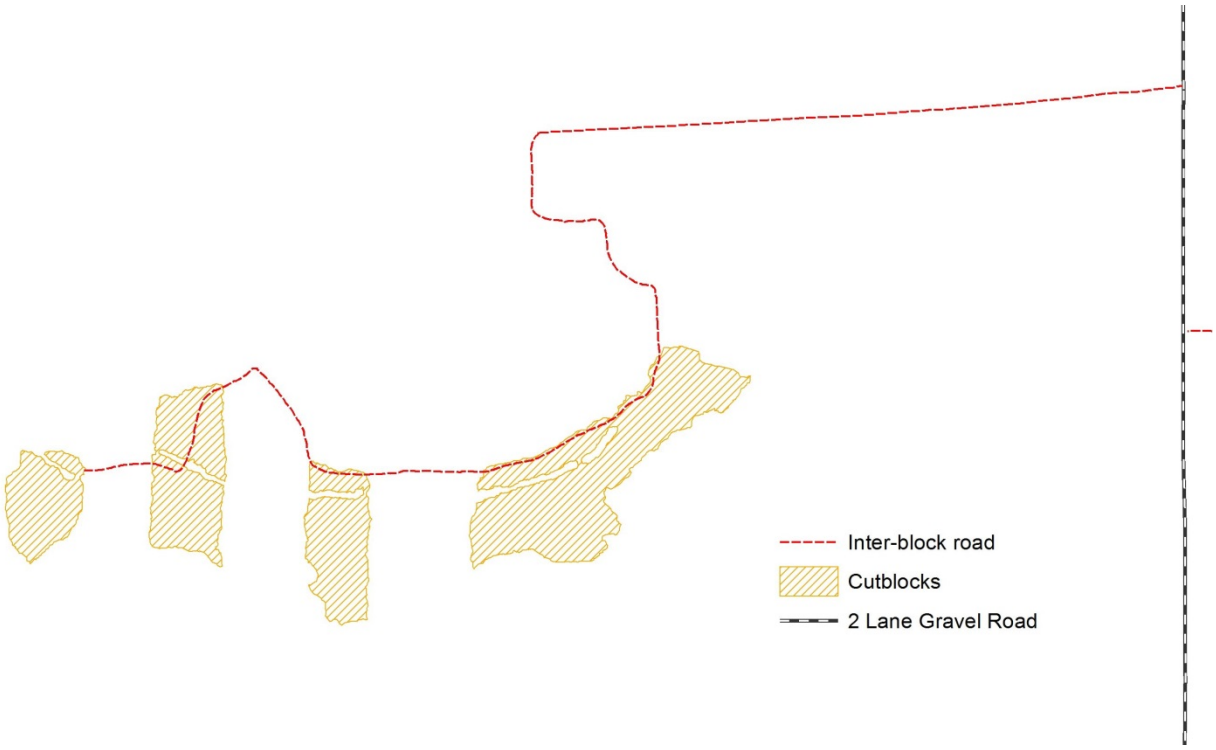


Table 5: Watercourse Crossings Attributes Format (WC_CROSSINGS: POINT)

Field Name	Field Format	Field Description and Domains
WC_TYPE	Character (2)	Watercourse Crossing Type: BR = Bridge LF = Log Fill SF = Snow Fill CU = Culvert LP = Low Profile
WC_STATUS	Character (10)	Watercourse Crossing Status: PLANNED = Planned EXISTING = Existing RECLAIMED = Reclaimed
WC_CLASS	Character (2)	Watercourse Classification (as defined by O.G.Rs): LP = Large Permanent SP = Small Permanent T = Transitional I = Intermittent E = Ephemeral
WC_ID	Character (30)	Unique Identifier that will be used to link information contained in the Annual Operating Plan or As-Builts to its associated feature in this feature class

Table 6: Variances Attributes Format (VARIANCES: POLYGON)

Field Name	Field Format	Field Description and Domains
VAR_TYPE	Character (3)	Variance Type: DEL = Deletion ADD = Addition DB = Deferral/Bypass

4.2. Annual Operating Plan (AOP)

It is assumed that spatial data for an AOP is contained in the Forest Harvest Plan (FHP) submission so a separate spatial data submission for Annual Operating Plans (AOP) is not required. However, appropriate information that links the information in the AOP tables to the associated spatial feature in the FHP is required as indicated in the table definitions below.

Refer to AF, Forestry Policy, 2015, No.2 for standards, specifications, submissions, enforcement/compliance, contact information and authorities.

Complete tabular data for AOPs include:

1. Planned/proposed harvest area boundaries
2. All inter-block roads
3. Watercourse crossings

Table 7: Planned/Proposed Harvest Area Boundaries Attributes Table Format (HARV_AREA_BDY)

Field Name	Field Format	Field Description and Domains
DISP_NUM	Character (15)	Disposition Number to which reforestation responsibility is attached
BLK_STATUS	Character (10)	Block Status: PLANNED = Planned LAID OUT = Laid Out
OPEN_NUM	Character (11)	ARIS Opening Number that links table entry to associated feature in the HARV_AREA_BDY feature class contained in the FHP.
BLOCK_NUM	Character (30)	Block/Field number from Annual Operating Plan cutover map.
MEAS_METH	Character (5)	Method of Data Capture: GPSG = GPS Ground GPSA = GPS Air MAP = MAP PHOTO = Orthophoto SAT = Satellite Imagery SKTCH = Sketch Drawing

Table 8: Inter-Block Roads Attributes Table Format (INTER_BLK_ROADS)

Field Name	Field Format	Field Description and Domains
RD_STATUS	Character (10)	Road Status: PLANNED = Planned (Laid out) ACTIVE = Active
RD_YEAR	Integer	Year of Road Construction
RD_ID	Character (30)	Unique Identifier that will be used to link information contained in the Annual Operating Plan to its associated feature in INTER_BLK_ROADS feature class contained in the FHP.

Table 9: Watercourse Crossings Attributes Table Format (WC_CROSSINGS)

Field Name	Field Format	Field Description and Domains
WC_TYPE	Character (2)	Watercourse Crossing Type: BR = Bridge LF = Log Fill SF = Snow Fill CU = Culvert LP = Low Profile
WC_STATUS	Character (10)	Watercourse Crossing Status: PLANNED = Planned EXISTING = Existing RECLAIMED = Reclaimed
WC_CLASS	Character (2)	Watercourse Classification (as defined by O.G.Rs): LP = Large Permanent SP = Small Permanent T = Transitional I = Intermittent E = Ephemeral
WC_ID	Character (30)	Unique Identifier that will be used to link information contained in the Annual Operating Plan to its associated feature in WC_CROSSINGS feature class contained in the FHP.

4.3. As –Built Submissions

Refer to AF, Forestry Policy, 2015, No.2 for standards, specifications, submissions, enforcement/compliance, contact information and authorities.

Complete spatial data for As-Built Submissions include:

1. Proposed/proposed harvest area boundaries
2. All inter-block roads
3. Watercourse crossings
4. Variances

Table 10: As-built Harvest Area Boundaries Attributes Format (HARV_AREA_BDY: POLYGON)

Field Name	Field Format	Field Description and Domains
DISP_NUM	Character (15)	Disposition Number to which reforestation responsibility is attached
BLK_STATUS	Character (10)	Current Block Status: PLANNED = Planned LAID OUT = Laid Out HARVESTED = Harvested AS-BUILT = As-Built
OPEN_NUM	Character (11)	ARIS Opening Number
BLOCK_NUM	Character (30)	Block/Field number from Annual Operating Plan cutover map
SKID_DATE	Date (YYYY-MM-DD)	The date the timber skidding was completed in the block opening
MEAS_METH	Character (5)	Method of Data Capture: GPSG = GPS Ground GPSA = GPS Air MAP = MAP PHOTO = Orthophoto SAT = Satellite Imagery SKTCH = Sketch Drawing

Table 11: As-built Inter-Block Roads Attributes Format (INTER_BLK_ROADS: POLYLINE)

Field Name	Field Format	Field Description and Domains
RD_STATUS	Character (10)	Road Status: PLANNED = Planned ACTIVE = Active
RD_YEAR	Integer	Year of Road Construction
RD_ID	Character (30)	Unique Identifier that will be used to link information contained in the As-Built to its associated feature in INTER_BLK_ROADS feature class contained in the FHP. This is required to determine any variance.

Table 12: Watercourse Crossings Attributes Format (WC_CROSSINGS: POINT)

Field Name	Field Format	Field Description and Domains
WC_TYPE	Character (2)	Watercourse Crossing Type: BR = Bridge LF = Log Fill SF = Snow Fill CU = Culvert LP = Low Profile
WC_STATUS	Character (10)	Watercourse Crossing Status: PLANNED = Planned EXISTING = Existing RECLAIMED = Reclaimed
WC_CLASS	Character (2)	Watercourse Classification (as defined by O.G.Rs): LP = Large Permanent SP = Small Permanent T = Transitional I = Intermittent E = Ephemeral
WC_ID	Character (30)	Unique Identifier that will be used to link information contained in the As-Built to its associated feature in WC_CROSSINGS feature class contained in the FHP. This is required to determine any variance.

Table 13: Variances Attributes Format (VARIANCES: POLYGON)

Field Name	Field Format	Field Description and Domains
VAR_TYPE	Character (3)	Variance Type: DEL = Deletion ADD = Addition DB = Deferral/Bypass

4.4. Final Cutblocks

Refer to AF, Forestry Policy, 2015, No.3 for standards, specifications, submissions, enforcement/compliance, contact information and authorities.

Currently, vegetation inventory depletions are captured chiefly by contractors for the Forest Management Agreement (FMA) holders and other non-government agencies. Departmental staff are responsible for capturing cutblocks on non-FMA Forest Management Units (FMU).

Operators who harvest greater than 10,000 m^3 of timber annually from public land must complete this submission.

Complete spatial data for Final Cutblocks include:

1. Final cutblocks

Table 14: Final Cutblocks Attribute Format (FINAL_BLOCKS: POLYGON)

Field Name	Field Format	Field Description and Domains
DISP_HOLDR	Character (4)	ARIS stakeholder code – see Appendix D – ARIS Industry Operations Manual
DISP_NUM	Character (15)	Disposition Number to which reforestation responsibility is attached
OPEN_NUM	Character (11)	ARIS Opening Number
HARV_CODE	Character (2)	Harvest Type Code: H = Harvested MR = Merchantable Residual Retention NR = Non-merchantable Residual Retention A = Anthropogenic Disturbance (inside disposition) N = Naturally Non-Vegetated
HARV_YR	Integer	Harvest Year as defined by operational period May 1st to April 30th.

4.5. Silvicultural Activities

Refer to AF, Forestry Policy, 2015, No.4 for standards, specifications, submissions, enforcement/compliance, contact information and authorities.

Complete spatial data for Silvicultural Activities include:

1. Silvicultural activities

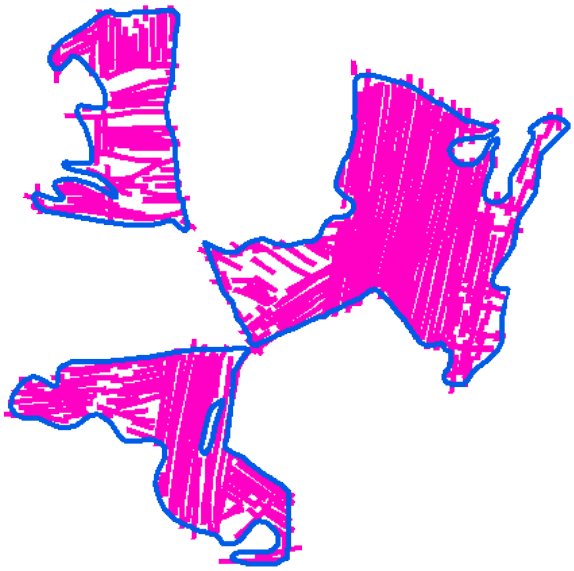
Table 15: Silvicultural Activities Attribute Format (SILV_ACTIVITIES: POLYGON)

Field Name	Field Format	Field Description and Domains
DISP_HOLDR	Character (4)	ARIS stakeholder code – see Appendix D – ARIS Industry Operations Manual
DISP_NUM	Character (15)	Disposition Number to which reforestation responsibility is attached
OPEN_NUM	Character (11)	ARIS Opening Number
SITE_PREP	Character (4)	Site Preparation Type CHEM = Chemical
STAND_TEND	Character (6)	Treatment Method Codes: CHAD = Chemical Aerial Broadcast CHAP = Chemical Aerial Accuflow CHHD = Chemical Aerial Highlight CHHP = Chemical Aerial Highlight (Accuflow/TVB) REPLNT = Replant NSR Areas
GEN_STOCK	Character (6)	Genetic Class Codes from Stream 2 Materials (seed from seed orchards): AIC9 = Improved Orchard AIC12 = Hybrid Orchard BIc9 = Clones from Approved Government Facility BIc10 = Clones from Approved Government Facility BIc11 = Clones from Approved Government Facility BIc12 = Clones from Approved Government Facility BIc13 = Clones from Approved Government Facility BIc14 = Clones from Approved Government Facility
SEEDLOT_1	Character (30)	Seed Lot Number
SEEDLOT_2	Character (30)	Additional Seed Lot Number (for multiple seed lots)
SEEDLOT_3	Character (30)	Additional Seed Lot Number (for multiple seed lots)
RETREAT_YR	Integer	Year of Retreatment

Herbicide excursions (applications outside approved plans) shall be associated with the opening number of the nearest opening (harvest area).

See Figure 2 for an example of a spatial data submission for herbicide application.

Figure 2: Example of Herbicide Application Submission



5. Definitions

Inter-Block Road – Any temporary road that extends through a block to reach another block. It ends at the edge of the last block connected to the road. ROAD_YR is defined within the timber year of road construction.

Temporary Road - Roads that are part of a harvest area or that connect harvest areas and are built, used and reclaimed before the expiry of the Annual Operating Plan (AOP) or reclaimed within three years of construction.

Harvest Year/Timber Year – Operational period May 1st to April 30th. Example: if HARV_YR is 2008 then it was cut between May 1, 2008 and April 30, 2009.

Watercourse Crossings – Any anticipated watercourse crossings, as defined in the operating ground rules, which would be developed in association with the proposed inter-block roads.

Variance Types – Spatial Harvest Sequence (SHS) variance types and reporting thresholds as defined in the operating ground rules.

APPENDIX A – Field Mapping Data Submission Example

It is important that the proper field from the submitted data is mapped to the appropriate field required to evaluate the data. A field mapping table is required for each feature class or shapefile if the name of the field for the submitted data does not match the FMB standard. The following is an example of a filled in table.

Appendix A: FHP Planned/Proposed Harvest Area Boundaries Attributes Format

Stakeholder Field Name	Stakeholder Field Format	Stakeholder Field Domain and equivalent FMB Domains	FMB Field Name	FMB Field Format	FMB Field Description and Domains
SDE_PRIMAR	Character(254)	SDE Disposition Number	DISP_NUM	Character (15)	Disposition Number to which reforestation responsibility is attached
BLOCSTAT	Character(254)	Block Status **SHS level = PLANNED** **Unapproved/Seeking Approval = LAID OUT** **Constructed = HARVESTED** **Modified = AS-BUILT**	BLK_STATUS	Character (10)	Current Block Status **PLANNED = Planned** **LAID OUT = Laid Out** **HARVESTED = Harvested** **AS-BUILT = As-Built**
SDE_OPENIN	Character(254)	SDE ARIS Opening Number	OPEN_NUM	Character (11)	ARIS Opening Number
BLOCK_ID	Double (18,9)	Block number	BLK_NUM	Character (30)	Block number from Annual Operating Plan cutover map
MEASMETH_2	Character(254)	Method of Data Capture **Ground = GPSG** **Air = GPSA** **Drawn = SKTCH**	MEAS_METH	Character (5)	Method of Data Capture **GPSG = GPS Ground** **GPSA = GPS Air** **MAP = MAP** **PHOTO = Orthophoto** **SAT = Satellite Imagery** **SKTCH = Sketch**