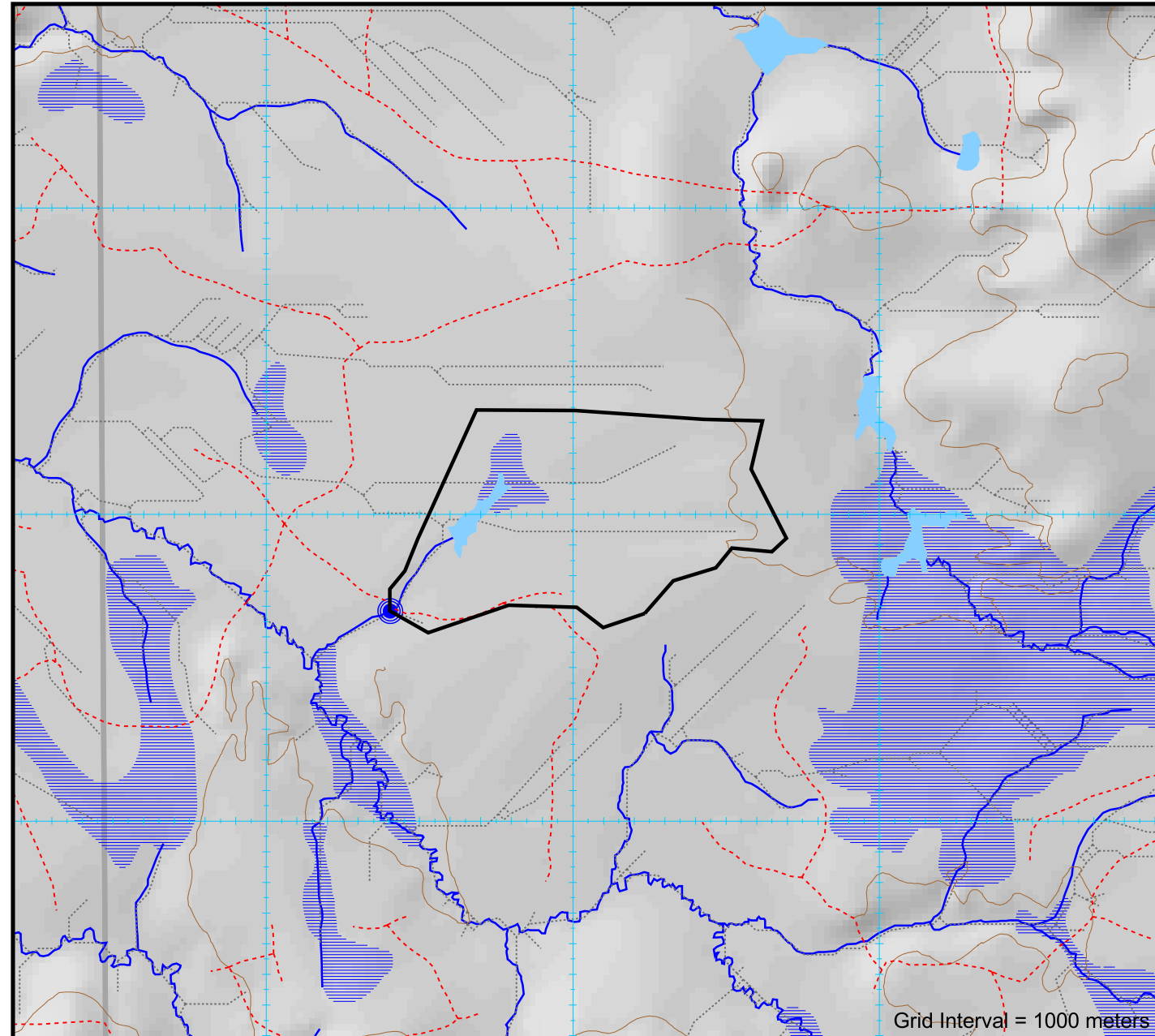


TFAI Appendix 1: Form for Submission of Information on a Proposed Crossing



| | | | |
|---------------------------------|--------------------------------|-----------------------------|--|
| Shaded Area for Office Use Only | TFAI Road Network No. 5 | Distance Along Road Segment | Crossing Evaluation Reference Number 5469 |
|---------------------------------|--------------------------------|-----------------------------|--|

Publication Date: **February 20, 2020** Road ID: **Munro 140**, Network Name: **Hedman Mine Road**

Timiskaming Forest - S.F.L. # 542247
 Proponent: Timiskaming Forest Alliance Inc.
 22 Paget Street
 New Liskeard, Ontario
 POJ 1P0
 (705) 680-0033 ext. 0222
 Plan Term: 2011-2021
 AWS Year: 2020-21

Fisheries Operational Management Zone (OMZ): **TF_KLK_LZ_03**
 Standard for Self-assessed Water Crossing Construction, Removal and/or Decommissioning: **Conditions of standard not met. See red text.**
 Previous Assessment Year (incl. SA): **2017**
 SAR species likely to be impacted: **NO**
 Preconstruction photos available: **NO**
 Within 500m of Brook Trout stream: **YES**

| Culvert Design Options | Q ₂₅ | Q ₁₀ | Q ₅ | Q _{2.33} |
|------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Design Flow | 0.000 m ³ /sec | 0.000 m ³ /sec | 0.000 m ³ /sec | 0.000 m ³ /sec |
| 1 Round | 450mm | 450mm | 450mm | 450mm |
| 2 Round | N/A | N/A | N/A | N/A |
| 3 Round | N/A | N/A | N/A | N/A |
| 1 Arch (BxD) | 450x340mm | 450x340mm | 450x340mm | 450x340mm |
| 2 Arch (BxD) | N/A | N/A | N/A | - |
| 3 Arch (BxD) | N/A | N/A | N/A | - |

• Required Opening for bridges is calculated as per the Crown Land Bridge Management Guidelines.

Conditions on Culvert Design Options

- Initial Fisheries Review based on one pipe. Two or more pipes requires a re-assessment.
- Round culvert calculations assume 10% fill. For 20% fill, increase diameter to next highest standard diameter.
- For 40% fill, use a round culvert diameter of the Base distance of the corresponding Arch style culvert.

General Standards

- No watercourse realignment, nor use of explosives is permitted.
- Minimize loss or disturbance to riparian vegetation. Restrict removal of riparian vegetation to the disturbance footprint required for construction, maintenance and decommissioning of the water crossing.
- Install erosion and sediment control measures prior to commencement of construction or decommissioning to prevent release of sediment or other deleterious substances into watercourse.
- Fill material placed below the normal high water mark must be erosion-resistant and/or protected from erosion.
- Direct storm water runoff from bridge decks, side slopes, road approaches and ditches away from the watercourse and into a retention pond or vegetated area.
- Ensure erosion and siltation in ditch lines adjacent to the watercourse crossing approaches are controlled using sediment traps such as rock/soil dams or log jams as site conditions warrant.
- Do not block or impede the free passage of water and fish at any time of year up and down stream, with the exception of potential and temporary blockage due to water crossing construction/decommissioning activities.
- Abide by fisheries in-water timing windows in the approved FMP and/or forest management guides. Where fishery communities are not well documented, the most restrictive in-water timing window must be used.
- Complete all in-water construction and decommissioning activities in an uninterrupted fashion and in an appropriate timeframe to minimize potential for site disturbance.
- If installation requires inwater work, do not locate within 100m of spawning or sensitive fish habitat eg. rapids, riffles, known overwintering areas.
- Maintain machinery free of fluid and fuel leaks. Wash, refuel and service machinery at least 30m from watercourse. Store fuel and other materials for machinery a minimum of 30m from the watercourse.
- Operate machinery on land with tracks/wheels above the normal high water mark, or on ice in a manner that avoids disturbance to the banks of the watercourse and adjacent riparian vegetation areas.
- Remove all debris from construction and decommissioning work from the site following completion of the undertaking.
- If machinery fording is required, limit to a one-time event (over and back) per piece of equipment essential to implementing the project, and only if using an existing crossing at another location is not available or practical.
 - If minor rutting is likely, watercourse bank and bed protection methods (e.g., swamp mats, pads) are to be used provided they do not constrict flows or block fish passage;
 - Grading of the watercourse banks for the approaches is not permitted;
 - If the watercourse bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion or degradation is likely, use a temporary crossing structure or other practice to protect them;
 - The one-time fording must adhere to the appropriate in-water timing windows; Forging must occur under low-flow conditions and not when flows are elevated due to local rain events or seasonal flooding.

- All calculations are for projecting ends. Total pipe length normally not to exceed 20m.
- All calculations assume a Headwater Depth of 1.0.
- MP = Multi-Plate (i.e. SPCSP)

Standards for Single, Small Closed-Bottom Round Culverts

- This standard applies to single, round, corrugated, closed-bottom steel, aluminum, or plastic culverts less than or equal to 1200mm in diameter that do not require site-specific engineering approval per MNR's Crown Land Bridge Manual.
- This standard only applies if the project does not:
 - Replace an existing open-bottom crossing (e.g., clear span bridge, arch culvert);
 - Replace an existing closed-bottom culvert larger in diameter than that being installed; or
 - Involve the installation of more than one closed-bottom culvert at the crossing location.
- Locate, design and construct to minimize likelihood of ongoing outlet scour, culvert undermining or erosion of fill in order to provide stable, non-perched culverts that provide for fish passage.
- Do not locate on meander bends, braided streams, or any other area inherently unstable that may result in alteration of natural stream functions or erosion and scouring of the structure.
- Size to a minimum Q₂₅ design flow. If an unmapped stream is encountered and proper analysis cannot be completed to determine Q₂₅, size to ensure it spans from bank to bank.
- Do not install where channel slope at crossing location is of a gradient greater than 2.0%.
- Do not install where slope of road approaches or either bank approach is greater than 30% (17°).
- Locate where culvert can be embedded below grade of stream bed.
- Use site-specific mitigation measures to ensure no ongoing erosion of fill. As a minimum:
 - Stabilize both inlet and outlet ends with appropriately sized non-erodible material;
 - Rock used is clean, free of fine materials and of sufficient size to resist peak flood events;
 - Place rock at original bank grade to ensure no infilling or narrowing of watercourse;
 - Fill material placed below normal high water mark must be erosion resistant and/or protected from erosion.
- The Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales refers to the normal high-water mark as the edge of vegetation communities capable of providing an effective barrier to the movement of sediment.
- Do not locate within 100 metres of fisheries spawning or sensitive habitat.
- Do not locate within 500 metres of any brook trout spawning or upwelling areas.
- Do not locate on watercourses that flow into, and are within 500m of, known naturally reproducing brook trout lakes.
- Mix of size, length, slope & drainage area must not increase flows to consistently & predictably impede fish passage.
- Install under low-flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
- Both interior and exterior of culverts must be corrugated to ensure structural stability and facilitate fish passage.
- The grade of the culvert must reflect the grade of the natural watercourse bed.
- Compact backfill adequately around the culvert. Use only clean sand or gravel and compact around the culvert in layers.
- Length of culverts must permit banks to be sloped at an angle of 2:1 or a stable angle of repose for the materials used.

Crossing's Watershed Characteristics

Watershed Area : **0.66 km²**
 Lake Area : **0.01 km²**
 Swamp Area : **0.03 km²**
 Retention Area : **0.04 km²**
 Retention Factor : **6.30 %**
 Base Class : **0.00**
 Watercourse Type : **Permanent**
 Watershed Number : **366**
 Watershed Name : **Centre Creek**

Crossing Characteristics for Fisheries Evaluation

NOTE: See current AWS Tables 1 and 2 and AWS maps for approved AWS details for year of installation.

Evaluation ID No. : **5469**
 MNR Crossing No. : **5469**
 Geographic Township : **Munro**
 UTM Coordinates (NAD83) : **554403E, 5383684N**
 Structure Type : **Culvert - Round Steel**
 Road Type : **Operational**
 Fill Material Type : **Sand and Gravel**
 Installer Experience : **As Per AWS Compliance Plan**

| | | | |
|---|--|--|-------------|
| Stream Gradient at crossing (from GIS) | Is the Slope > 30% (17°) | Thermal Code | Design Flow |
| 0% | NO | CD | Q25 |
| Isolate Work Area From Flowing Water? | If "Yes", will stream be diverted or straightened? | If "Yes", will coffer dam or silt fence be used? | |
| NO | NO | NO | |
| Starting Date for In Water Work (if required) | Completion Date for In Water Work (if required) | Structure Removal Timeframe | |
| June 16 | August 31 | > 2 Years | |

Reviewed by MNR. Follow standard as well as any Appendix 2 conditions.

MNR Appendix 2: Biologist Risk Evaluation Watershed Thermal Code : **CD** MNR Assigned Thermal Code at Crossing **CD**

Concerns and Conditions on Construction

The crossing is at a previously approved and existing crossing site. Installation is suggested at this site rather than creating new approaches, abutments, landings, etc. Ranking does not authorize any undertaking resulting in serious harm to fish, but suggests low risk of causing serious harm to fish in compliance with the Fisheries Act following best practices, such as those described in the DFO measures to avoid harm to fish and fish habitat and the standard mitigation techniques outlined in the FMP.

Risk Evaluation: **LOW** Site Inspection Required: **NO** Date Completed _____

TIMISKAMING FOREST ALLIANCE INC.

Company Name _____ (Print)
 Company Signature _____
 Operator Name _____ (Print)
 Operator Signature _____
 Date _____

Calculations performed by First Resource Management Group (FRMG). Neither Timiskaming Forest Alliance Inc. nor FRMG guarantee the accuracy of any information presented on this form. Coordinates and map are UTM projection, Zone 17 NAD83 datum.



TFAI Crossing Installation Report (Must be completed for each crossing location)

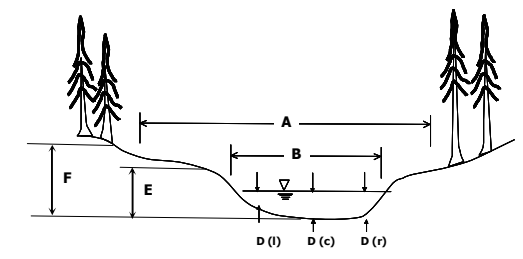
Shareholder: _____ Block ID: _____

Contractor: _____ Road Name: _____

SITE CONDITIONS ENCOUNTERED

| | |
|----------------------|--------------------------|
| Crossing Located By: | Date Measurements Taken: |
|----------------------|--------------------------|

| Stream Measurements (meters) | |
|------------------------------|--------|
| Flood Plain Width : | A |
| Bankful Width : | B |
| Channel width : | C |
| Depth - 25% of Channel : | D (l) |
| Depth - 50% of Channel : | D (c) |
| Depth - 75% of Channel : | D (r) |
| Depth - Bankful Flow : | E |
| Depth - Floodplain : | F |
| Stream Velocity : | m /sec |



Notes:

Foundation Soil Description :

- Sand
- Silt
- Clay
- Muck
- Rubble
- Gravel

Channel Type:

- Ephemeral
- Intermittent
- Permanent

TFAI Notification Provided :

- (TFAI Advised-Appendment)
- FRI Incorrect
- Unmapped

INSTALLATION CONDITIONS

| | |
|-----------------------------|-----------------------|
| Installation Supervised By: | Date of installation: |
|-----------------------------|-----------------------|

Crossing Permanency : Refer to Structure Removal Timeframe specified in AWS 4 and 5 Month / Year

Permanent Temporary Decommissioned Date: _____

Note: Measurements (*) must be included for all structures which remain in place beyond date of inspection Scheduled Removal Date: _____

Crown Land Bridge Bridge Record Form submitted (i.e. MNR / TFAI)

NAD 83 (Record Actual Crossing Location on Stream Segment): _____ E _____ N

| New Crossing Type: | Structure Description: | Type of Fill: |
|--|--|--------------------------------------|
| Box Culvert <input type="checkbox"/> | Steel <input type="checkbox"/> | Sand <input type="checkbox"/> |
| Arch Culvert <input type="checkbox"/> | Plastic <input type="checkbox"/> | Gravel <input type="checkbox"/> |
| Round Culvert <input type="checkbox"/> | Wood <input type="checkbox"/> | Rock Rubble <input type="checkbox"/> |
| Portable Bridge <input type="checkbox"/> | Concrete <input type="checkbox"/> | Other <input type="checkbox"/> |
| Steel Stringer Bridge <input type="checkbox"/> | Ford (Engineered) <input type="checkbox"/> | |
| Winter Snow Pack <input type="checkbox"/> | | |

Erosion Prevention and Control (X): (Indicate applicable measures taken)

- Stable slopes on stream banks and drainage ditch banks
- Course, clean rock to high water mark
- Re-vegetate or seed slopes (stream banks and ditch banks)
- Divert drainage ditches to green belt
- Line drainage ditches with rock
- Use rock weirs in drainage ditches to impede water flow
- Use filter cloth on upstream side of culverts
- No grubbing or stripping of ground vegetation
- Use filter cloth (On top of ice if fill is used for Winter Crossings)
- Other:

WATER CROSSING OPERATIONS CHECKLIST

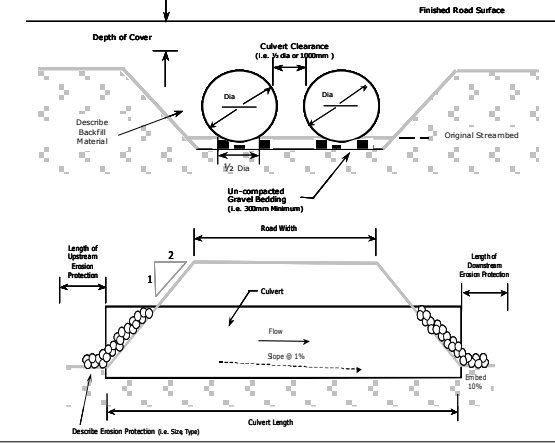
Only certified inspectors are allowed to conduct Forest Operations Inspections for submission to the FOIP database

Inspector Name: _____

FOIP Report Number : _____

*** 'As Built' Culvert Installation Measurements (meters)**

| | |
|-------------------------|--|
| Installed Diameter : | |
| Structure Length : | |
| Road Width : | |
| Depth of Cover: | |
| Water Depth in Pipe : | |
| Number of Culverts : | |
| Spacing Between Pipes : | |

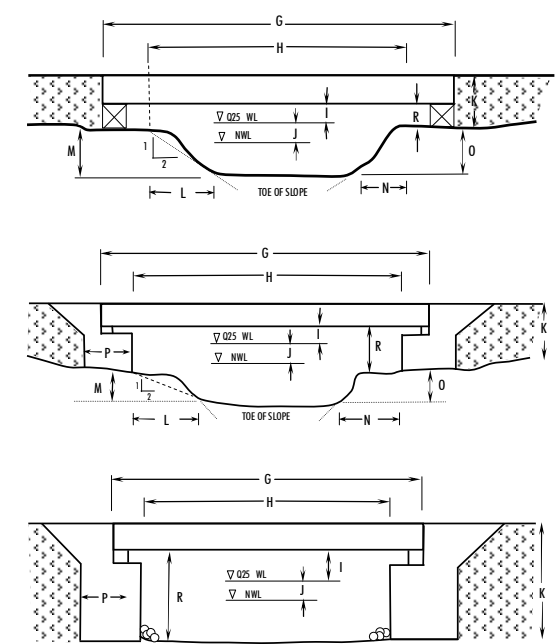


- 4 Photos must be Attached**
- () Approaches
 - () Inlet
 - () Outlet
 - () Inside Pipe

Remedial action required

*** 'As Built' Bridge Installation Measurements (meters)**

| | |
|------------------------|---|
| Bridge length : | G |
| Clear Opening Width : | H |
| Freeboard (min 0.5m) : | I |
| Flood Rise : | J |
| Fill Height : | K |
| Left Slope Length : | L |
| Left Slope Rise : | M |
| Right Slope Length : | N |
| Right Slope Rise : | O |
| Crib Width : | P |
| Crib Height : | R |



Bridge Used (Identification #):

- 5 Photos must be Attached**
- () Approaches
 - () Deck
 - () Underside
 - () Upstream (Inlet)
 - () Downstream (Outlet)

Remedial action required

Verified 'As Built' measurements consistent with proposed bridge dimensions on 'Bridge Site Data Form'

Verification :

I have confirmed that the final crossing condition satisfies the mandatory water crossing standards and will not impede future transfer of responsibility

Notes:

- Water Crossing Activity (X):**
- Water crossing location same as AWS submission
 - Installation of culvert and size same as described in AWS water shed calculations.
 - No sediments or woody debris left in water body or streams
 - Construction materials removed from site
 - Embankment sloped properly (e.g. 2:1) with no possibility of slumping
 - Timing restriction met
 - Culvert properly installed (i.e. refer to FMP Standards)
 - Sediment Control Plan in AWS followed
 - No Erosion or Sedimentation present (e.g. filter cloth used to prevent material from entering waterway)
 - No signs of equipment or machinery in stream (i.e. culvert installed before equipment progresses past crossing)
 - Coarse clean rock used on all culvert crossings
 - Natural vegetation protected
 - Additional measures used to prevent erosion (e.g. seed, filter cloth, rip rap etc.)
 - Drainage ditches properly installed
 - Crossing removed before March 31 unless left for silviculture activities
 - Road right of way width through unallocated stands , no larger than FMP requirement
 - Road right of way width through AOC's (reserves), no larger than FMP requirement

Note: All of the above activities must be checked. ✓ - Verified to be within acceptable limits ✗ - Outside of acceptable limits. Refer to comments for additional details N/A - Not applicable

I certify that the activities inspected are fully compliant based on an inspection appropriate to support this decision. Signature: _____ Date: _____