1 Identification

page ____ of ____

Assessed by _____ Date M M / D D / Y Y Y Y

District _____ Opening ID _____ Road ID _____

Watershed/Stream _____

2 Description

Is the watershed being used for drinking water? ☐ Yes ☐ No ☐ NA

Where is (are) the intake(s)? (Locate on map if known)

What is the distance and what is the connectivity between intake and cutblock _____ km

Comments: _____ ☐ Direct via stream

_____ ☐ Indirect (lake, wetland)

_____

Are there other special resource values associated with watershed? ☐ Yes ☐ No ☐ NA

If yes, explain: _____

_____

_____

Within the probable sampling areas, what are the approximate length, age and status of the access roads?

Type	Status[1]	Approximate Length (km)	Age of Road (years)
Main line			
Branch line			
Spur			
Winter use roads			

[1] active, inactive, temporarily or permanently deactivated

Areas of sensitive soils and unstable terrain associated with cutblock and access road? ☐ Yes ☐ No ☐ NA

3 Reported Disturbance

page _____ of _____

Type of Disturbance	Year of Occurrence	Type of Disturbance	Year of Occurrence
☐ Landslide		☐ Road slump	
☐ Debris torrent		☐ Heavy gullying	

4 Report Use Of

	On Road right of way	Within Block
Fertilizer	☐	☐
Herbicide	☐	☐
Pesticide	☐	☐

5 Locate on 1:20,000 Map Showing Cutblocks, Roads and Streams

a. Approximate Extent of Sample Area (randomly selected cutblock or as-built road and access)

b. Sample Sites associated with forestry activities requiring field checking including: (check applicable)

- ☐ Stream crossings (bridges, culverts)
- ☐ Roads running parallel to stream (within 20 m)
- ☐ Potential unstable slopes along, in or down slope from road or cutblock
- ☐ Potential sensitive soils
- ☐ Harvesting adjacent to stream
- ☐ Potential livestock concerns
- ☐ Other _____

Travel mode:

- ☐ Truck
- ☐ Quad
- ☐ Helicopter
- ☐ Other

Time(hrs) to complete evaluation of area:

_____ travel time (hrs)
\+ _____ field time (hrs)
x _____ crew size
_____ total time (hrs)

6 Comments

_____

_____

_____

1 Checklist of Range Indicators Potentially Affecting Water Quality

Opening ID _____ Road ID _____ Sample Site ID _____

Observations of Livestock Disturbed Component of Sample Site with Demonstrated Connectivity of Receiving Waters
(refer to Range Resource Assessment Procedures, 2006)

Yes / No	Condition of Plant Community
☐ ☐	1. Riparian vegetation absent or highly modified by grazing or trampling
☐ ☐	2. Herbaceous stubble height < 10 cm noted (from 10 samples over 100 meters)
☐ ☐	3. Browsing of > 70% of leaders noted (from 10 samples over 100 meters)
Yes / No	**Condition of Ground Surface**
☐ ☐	4. Bare soil and compaction common (10% of component by area)
☐ ☐	5. Recent pugging and unvegetated hummocks common (10% of component by area)
Yes / No	**Condition of Stream Bank and Channel**
☐ ☐	6. Bank erosion/collapse apparent resulting from heavy livestock use
☐ ☐	7. Evidence of livestock standing in stream bed
☐ ☐	8. Macro-invertebrates indicate degraded water quality
☐ ☐	9. Algal mats occur in receiving waters
☐ ☐	10. Water run-off along livestock trails
Yes / No	**Presence of Livestock Dung**
☐ ☐	11. Livestock feces noted within 3 m of water's edge, or on trails, ditch lines or other surface drainage features leading to water
Yes / No	**Specific Range Management Practices**
☐ ☐	12. Livestock drink directly from water source
☐ ☐	13. Absence of livestock control structures limiting access to water source
☐ ☐	14. Observed presence of calves (< 4 months old) in or adjacent to water source
☐ ☐	15. Salt, minerals, oilers within 100 m of water body

1 Checklist continued

If at least three of the five preceding indicator classes receive at least one yes response, the possibility exists that livestock presence may be compromising water quality. The assessment of these 15 indicators provides a record of possible range management issues that may require further evaluation by the Range Division.

Are range conditions suggesting livestock is compromising water quality? ☐ Yes ☐ No

(risk will be proportional to distance downstream to water intake)

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Water Quality
Resource Stewardship Monitoring
Form 2 Side 1

Sample Site ID: _____ Opening ID: _____ District: _____

UTM Zone: _____ Easting: _____ Northing: _____ Road Ref: _____

Watershed/stream: _____ Known Domestic Intake Downstream (circle) Yes / No

Stream Channel Width (m) _____ Opening ID: _____ Date Completed: M M / D D / Y Y Y Y

Site Type (Stream crossings, inter-drainage culverts, road failures, riparian harvesting/ yarding, skidder/harvester trails, other forestry disturbances)

Components and their Characteristics			**a. Mass Wasting Contribution (see back of card)**	**b. Surface Erosion Contribution**									
Column 1 Identify individual components of site within shared drainage. (Table 2) (road surface, road cutbank, road ditch, road sidecast, rills or gullies, mass failures, upturned root wads, livestock disturbance noted, etc)	*Column 2* Estimate connectiity between artificial and natural drainage (Table 3 & 4) Chose from: none (0) little (.2) half (0.5) a lot (0.8) all (1)	*Column 3* Estimate **portion of fine sediment** in matrix of eroded/ erodible material (Table 5) Chose from: none (0) little (.2) half (0.5) a lot (0.8) all (1) active road surfaces always 1	*Columns 4-7*	*Column 8* (Estimate erodible surface area of identified components within mini catchment) Gross area of component x portion erodible = Net area For portion erodible, choose from: None (0), a little (.2), half (0.5), a lot (0.8), all (1) (Portion of active road surface erodible always considered to be 1)			*Column 9a* *Required for Road Surfaces only* ***Slope*** 0-2 % 2-10 % >10%	*Column 9b* ***Road Use*** Heavy, Moderate, Light, Deactivated	*Column 9c* ***Road Surface Quality*** Paved, Good, Average, Poor	*Column 9d* Estimate depth of erosion expected for surface of each component Road Surfaces (Table 6 a, b, c)\ All other surfaces (Table 7)	*Column 10* Calculate **volume** of material removed by surface erosion C8(net) x C(9d)	*Column 11* Calculate **total sediment** contribution from surface erosion C2 x C10	*Column 12* Calculate **fine sediment** contribution from surface erosion C3 X C11
				l x w (m^2)	Portion of surface erodible	Net (m^2)				(m^3)	(m^3)	(m^3)	(m^3)

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(SEE OVER)

Total Fine Sediment Generation from Surface Erosion for Site

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Mass Wasting Contributions – Form 2 Side 2

Sample Site ID: _____ Opening ID: _____

Mass Wasting Contributions (> 1/2m³)

Column 1 Identify individual components of site Fill slumps (F) Gullys (rills) (G) Landslides (L)	*Column 3* Estimate portion of fine sediment in eroded/ erodible material Choose from none (0) little (.2) half (0.5) a lot (0.8) all (1) (Active road surfaces usually 0.2)	*Column 4* Estimate volume of material removed by mass wasting and gullying processes L x W x D of failure(s) gully(s) m³	*Column 5* Estimate volume of failed material still on site L x W x D of failure(s) gully(s) m³	*Column 6* Calculate total volume of sediment reaching stream C4-C5 m³	*Column 7* Calculate volume of fine sediment from mass wasting/ gullys reaching stream C6 x C3 m³

a. Total fine sediment generation from mass wasting at site	
b. Total fine sediment generation from surface erosion at site (from Side 1)	
Grand Total Fine Sediment for Site (a.+ b.)	

Site Diagram: Sketch of site components, drainage pathways and connectivity

Required Rating for FREP Evaluations

(CIRCLE)

Grand Total Fine Sediment	Rating
<0.2	Very Low
0.2–1	Low
1–5	Moderate
5–20	High
>20	Very High

(From Table 8)

Possible means to reduce stream sedimentation from this sample site (required if site rated moderate, high or very high (see Table 11)

1. _____
2. _____
3. _____
4. _____
5. _____

Optional
Rating of Water Quality Impact for fish bearing stream immediately downstream of site From Table 9

Optional
Rating of Water Quality Impact for domestic intake immediately downstream of site From Table 10

Comments on site

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Summary of Water Quality Sample Sites within Sample Area – Form 4

District ID: _____ Opening ID: _____ Date Completed: M M / D D / Y Y Y Y

Summary of Sample Sites Evaluated Within Sampling Area

Sample Site ID	Type of Disturbance	Total volume of fine sediment generated at Site (m3)	Fine sediment generation potential class (VL, L, M, H, VH)	Management opportunities to reduce negative water quality impact of forestry	Range form 3 completed and showing compromised water quality (check if compromised)	Indicators observed that suggest water quality has been compromised

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Summary of Water Quality Sampling Sites Within District – Form 5

District ID: _____ Year: Y Y Y Y Total # of Sample Sites Evaluated: _____

Sediment Generation Potential Rating	***VERY LOW***		***LOW***		***MODERATE***		***HIGH***		***VERY HIGH***	
Number of sample sites with assigned fine sediment generation potential class.	# of sites	% of total	# of sites	% of total	# of sites	% of total	# of sites	% of total	# of sites	% of total

Leading management opportunities to reduce negative water quality impact of forestry operations (with moderate or higher impact rating)	1.
	2.
	3.
	4.
	5.

Total number of range sample sites evaluated:	
Number of sample sites showing range characteristics compromising water quality:	
% of range sites showing compromised water quantity:	

Indicators observed that suggest water quality has been compromised	1.
	2.
	3.
	4.
	5.