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MINISTRY OF ENVIRONMENT NON-POINT SOURCE  
WATER QUALITY MONITORING PROGRAM

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*Watershed Prioritization Project:  
Year End 2002/03 Final Report*



SUBMITTED TO  
THE MINISTRY OF ENVIRONMENT  
OMINECA-PEACE REGION  
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## 1.0 Introduction

In June 2002, the Ministry of Environment (MOE) commissioned Rex Environmental Services (RES) to develop a non-point source<sup>1</sup> (NPS) water quality planning and monitoring program for watersheds within the Omineca-Peace Region (OP). Watersheds were prioritized according to their risk of NPS contamination and high risk areas were selected to be monitored. If pollutant levels are found to be persistent or severe in these watersheds, follow-up source assessments will be completed to locate centers of contamination. Following this, appropriate management plans will be established to preserve acceptable and/or improve poor water quality conditions.

This report outlines the selection processes used to rank regional watersheds. Prior to discussing these processes, a brief review of NPS activities and their potential effects on water quality is provided.

### 1.1 Nonpoint Source Activities and Pollution

Non-point source pollution differs substantially from point source pollution in its origin, and delivery (Table 1). NPS activities have received more attention within the last decade as point source pollution concerns became more clearly understood and controlled. MOE recognizes seven major NPS contributors in British Columbia, namely:

1. land development,
2. agriculture,
3. storm water runoff,
4. onsite sewage systems,
5. forestry,
6. atmospheric deposition, and
7. boating and marine activities.

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<sup>1</sup> Non-point source refers to diffuse pollution sources such as stormwater, snowmelt runoff, and air emissions (USEPA, 1997)

**Table 1 -Comparison of point and non-point source pollution of water (After Rast, 1999).**

Point Sources	Non-point Sources
Steady volume and quality	Highly dynamic – interval controlled by hydrologic cycle
Low variability	High variability
Highest water quality effect during low-flow conditions	Highest effect during or after storm events
Easily identified sources of pollutant to receiving waters	Not easily defined because often occurs over extensive land base
Can be quantified with traditional hydraulic techniques	Cannot be quantified with traditional hydraulic techniques
Primary parameters of interest are BOD, dissolved oxygen, nutrients, suspended solids, heavy metals and synthetic organics	Primary parameters of interest are sediment, nutrients, heavy metals, synthetic organics, pH, micro-organisms, and dissolved oxygen
Control programs typically involve government agencies	Control programs include stewardship groups and land owners

Agriculture and forestry are the dominant NPS activities within the Omineca-Peace region. Oil & gas activities were also included in the regional program because exploration and development activities may contribute to NPS pollution and they are present and continue to expand within the Peace sub-region. Further, urban development was added because it is a prominent NPS activity that is known to degrade water quality (Novotny and Chesters, 1981).

NPS activities can negatively affect water quality and quantity in nearby streams. Forest harvesting can increase storm flows, alter temperature, nutrient, metals, and pesticide concentrations, however it is most commonly known to influence sediment transport and storage regimes (MacDonald *et al.*, 1991). Similarly, agricultural activities can increase temperature, nutrient levels, sediment transport, and fecal and gastrointestinal bacteria concentrations (Platts, 1991). Urban development can increase storm runoff, which will transport urban contaminants including pesticides, metals, nutrients, sediments, and hydrocarbons (USEPA, 1991). Finally, oil and gas exploration activities, particularly road construction, have the potential to increase delivery of NPS contaminants.

Although each NPS activity can influence a variety of water quality characteristics, they all follow similar methods of contamination. Generally, their development requires a simplification of the landscape by clearing of natural vegetation and subsequent ground leveling. This increases runoff power and the delivery of sediment and other NPS contaminants to nearby streams. Clearing activities in the riparian zone will also negatively affect stream morphology. Riparian clearing may destabilize stream banks, which can accelerate their erosion resulting in downstream channel aggradation. This brief description emphasizes the importance of targeted monitoring programs such as presented in this document.

NPS development is prominent in the OP region. The objective of this project is to initiate a monitoring program that will assess water quality degradation caused by NPS activities. To ensure effective resource allocation a two stage watershed selection process was implemented. The first stage required the selection of watersheds for monitoring in 2002/03. These were termed Tier I watersheds. The second stage required the ranking of all regional watersheds according to their NPS activities and potential for water quality degradation. These were termed Tier II watersheds.

## **2.0 Tier I Watershed Selection**

Tier I watershed selection was a terse process that focussed on determining the highest regional priority watersheds for monitoring in 2002/03. A list of candidate watersheds was generated by interviewing government staff about watersheds they thought were a high priority for monitoring because of their high density of NPS activities (Appendix A). These interviews provided a candidate list of more than 50 watersheds, which were then collated into planning watersheds based upon their proximity and the type of NPS activities occurring in their basins (Table 2).

**Table 2 - Tier 1 candidate list including forest district and planning watersheds.**

<b>Forest District</b>	<b>Tier I Candidate</b>	<b>Planning Watershed</b>
Dawson Creek	Kiskatinaw River, Brassey Creek	Kiskatinaw River
	Pouce Coupe River	Pouce Coupe River
Chetwynd	Hasler Creek	Hasler Creek
	Moberly River	Peace River
	Pine River, Coldstream Creek	Pine River
Prince George	Chilako River	Chilako River
	Torpy River	Torpy River
	Government Creek	Naver Creek
	Twin River	Twin River
	Gregg Creek/Punchaw	Gregg Creek
	Salmon River, Wright Creek	Beaver/Salmon
	Herrick Creek	Herrick Creek
	Upper Bowron	Bowron
Vanderhoof	Stony Creek	Stony Creek
	Swanson Creek, Cut-thumb Creek	Greer Creek
	Endako River	Endako River
	Knight Creek, Hogsback Creek, Sinkut River, Clear Creek	Nechako River
	Aitken Creek, Snyder River, Buick Creek, Umbach River, Prespatou River, St. John Creek, Indian Creek, Rossland Creek, Montney Creek, Milligan River, Cache Creek, Doig River, Zarembo River, Big Arrow Creek	Beaton River
Fort St. John	Stoddart Creek, Fish Creek	Charlie Lake
	Alces River, Red Creek	Peace River
Fort St. James	Pitka Creek	Sowchea River
	Ankwill	Tezzeron River
	Middle River	Middle River
	Salmon	Beaver/Salmon
	North Sustut River	Sustut River
	Necoslie River, Hudson's Bay Creek	Necoslie River
Robson Valley	Morkill River	Lower Morkill
	Holmes River	Holmes River
Mackenzie	Misinchinka River	Misinchinka River

This list was condensed so that the larger planning watersheds were ranked during the Tier I selection process. Ranking the larger planning watersheds reduces spatial bias that would occur from comparing the Tier I candidates. For example, Wright Creek is less than 50km<sup>2</sup> while the Morkill is greater than 500km<sup>2</sup>. Comparing these two candidate watersheds may positively bias Wright Creek because its NPS density will increase quicker than the Morkill for a given rate of development. The planning watersheds were ranked according to their known NPS activities and resource users (Table 3). Sub-basins with the highest density activities were highlighted as possible sampling locations.

Activity scores were based on the following designations:

- Agriculture  
Percentage Alienated Crown Land (ACL)  
0% = 0, < 10% = 2, 10-20% = 3, 20-50% = 4, > 50% = 8
- Forestry  
Older than 5 years- 0.2 (weighting factor) 8 = 1.6, 5 years and more recent – 1 (weighting factor) 8 = 8
- Oil & Gas  
< 100 wells = 2, close to 100 wells = 4, Far greater than 100 wells = 8
- Village Development  
None = 0, Yes = 8
- Water Resource Users  
Domestic/Potable Supply = 5,  
Fish - Salmonids = 1.5, Blue listed = 3.5, Red listed = 5 (to a maximum of 5)

Following the Tier I ranking process and review/consultation with MOE staff, the 13 highest ranking planning watersheds were selected for monitoring in 2002/03 (Table 4). In addition to providing a list of candidate Tier I watersheds, RES provided a sampling program design that included a list of parameters, sample intervals, and sample media that was reviewed and subsequently accepted by MOE staff (Appendix B). Sample media included water and streambed sediments. Water quality characteristics measured included general chemistry, metals, nutrients, and fecal/gastrointestinal bacteria while sediments focussed on pesticides, hydrocarbons and polycyclic aromatic hydrocarbons (PAH).

**Table 3 - Tier I watersheds selected for monitoring in 2002/03.**

<b>Tier I Watershed</b>	<b>Planning Watershed <sup>1</sup></b>	<b>NPS Activities</b>
Chilako River	Chilako River	Forestry & Agriculture
Corkscrew Creek	Lower Nechako	Forestry & Agriculture
Naver Creek	Naver Creek	Forestry & Agriculture
Hasler Creek	Pine River	Forestry/Agriculture/Oil & Gas
Moberly River	Upper Peace River	Forestry/Agriculture/Oil & Gas
Brassey Creek	Kiskatinaw River	Forestry/Agriculture/Oil & Gas
Pouce Coupe	Pouce Coupe River	Forestry/Agriculture
Alces River	Lower Peace River	Agriculture/Oil & Gas
Milligan Creek (and West)	Lower Beatton River	Oil & Gas
Doig River	Lower Beatton River	Agriculture/Oil & Gas
Blueberry River	Lower Beatton River	Agriculture/Oil & Gas
Stoddart Creek	Lower Beatton River	Agriculture/Oil&Gas
Halfway River	Upper Peace River	Forestry/Agriculture/Oil&Gas

<sup>1</sup> From Table 2 "Planning Watershed" column

**Table 4 - Tier I watershed ranking based on NPS activities and resources users.**

District	Planning Watershed	Agriculture	Forestry	Oil & Gas	Village Development	Potable Supply / Fisheries Values	Rough Score	Sub-basins with Highest Density Activities
Fort St.John	Upper Beaton (Above Big Arrow)	< 10% (ACL) <sup>1</sup> (2/8)	Forestry both newer and older than 5 years (8/8)	Little presently (<100) but high potential (2/8)	No (0)	Blue-Listed Species and Salmonids (5/10)	17	Nig Creek
	Lower Beaton (Below Big Arrow)	>50% (ACL) <sup>1</sup> Crop and Livestock (8/8)	Forestry both newer and older than 5 years (8/8)	High Density (~ 500 wells) (8/8)	Yes (8)	Doig River Band Intake, Blue listed and salmonids (10/10)	42	Aitken Creek, Milligan Creek, Doig River, Blueberry River
	Upper Peace (Above Pine River)	20-30% of North Side – South Side is protected Area (ACL) <sup>1</sup> (4/8)	Both Newer and older than 5 years (8/8)	Little presently (< 100 wells) (2/8)	Yes (8)	Fort St.John Waterworks, Blue-listed and salmonids (10/10)	32	Halfway River, Cache Creek Johnson Creek (F, Range), Moberly River (F, O&G, Range)
	Lower Peace (Below Pine)	>50% ACL (South side reserve ends above Pine River) <sup>1</sup> (8/8)	Minimal and older than 5 years (0/8)	Moderate (> 100 wells, mostly Alces R.) (4/8)	Yes (8)	Blue-Listed and Salmonids (5/10)	25	Alces River
	Charlie	>80% ACL <sup>1</sup> (8/8)	All ACL – (0/8)	Light (< 100) mostly on Stoddart Creek (2/8)	Yes (8)	Blue-Listed and Salmonids (5/10)	23	Stoddart Creek
Fort Nelson	Fort Nelson	< 2% (near Fort Nelson village only) (0/8)	Assume both newer and older than 5 years (8/8)	Light (< 20 wells) (2/8)	Yes (8)	Red-listed (5/10)	23	None
	Muskwa	None (0/8)	Assume both newer and older than 5 years (8/8)	None (0/8)	Yes (8)	Fort Nelson Water works, blue-listed and salmonids (10/10)	26	None
Chetwynd	Pine River	10-20% ACL (most below Murray confluence and near Chetwynd) <sup>1</sup> (3/8)	Forestry throughout basin Both older and newer than 5 years (8/8)	Little presently (<20) (2/8)	No (0)	Chetwynd waterworks, Blue-listed and salmonids (10/10)	23	Pine mainstem below Chetwynd, Hasler Creek (F, O&G, Range), Stewart Creek (F, O&G, Range), Cowie/Durney Creek (F, O&G, Range)
Dawson Creek	Pouce Coupe	>90% ACL <sup>1</sup> (8/8)	Older than 5 years (1.6/8)	None (0/8)	Yes (8)	None (0/10)	17.6	Mainstem and Bisette Creek (F, O&G, Range)
	Kiskatinaw	50-60% ACL <sup>1</sup> (8/8)	Forestry throughout basin Both older and newer than 5 years (8/8)	Moderate (>100 wells) (4/8)	No (8)	Dawson Creek water works, blue-listed and salmonids. (10/10)	38	Sundown (F, O&G, Range), West Kiskatinaw (F, O&G), Oetata (F, O&G, Range), Brassey (F, O&G, Range)



Fort St. James	Stuart	Croplands are present in the Stuart drainage particularly in the south but assume it is less than 50% because of forestry dominance (2/8)	Forestry throughout basin Both older and newer than 5 years (8/8)	None	None (0)	None (0)	10	
	Chuchi	Given remoteness of area it is assumed to be little to non-existent (0/8)	Forestry throughout basin Both older and newer than 5 years (8/8)	None (0)	No (0)	Salmonids (1.5/10)	9.5	
	Middle	Based on local staff knowledge there is no agricultural operations in the area (0/8)	Both newer and older than 5 years (8/8)	None (0)	No (0)	Salmonids (1.5/10)	9.5	
	Sustut	Given remoteness of area it is assumed to be little to non-existent (0/8)	Mostly newer than 5 years (8/8)	None (0)	No (0)	Blue-listed and salmonids (5/10)	13	
	Upper Salmon	Limited to no agricultural activities (0/8)	Both newer and older than 5 years (8/8)	None (0)	No (0)	Blue-listed and salmonids (5/10)	13	
Mackenzie	Misinchinka	Limited to no agricultural activities (0/8)	Both newer and older than 5 years (8/8)	None (0)	No (0)	Blue-listed and salmonids (5/10)	13	
Vanderhoof	Upper Nechako (Above Fraser lake)	Limited to no agricultural activities (0/8)	Both newer and older than 5 years (8/8)	None (0)	No (0)	Blue-listed and salmonids (5/10)	13	
	Lower Nechako (Below Fraser lake)	Cropland and livestock areas present (8/8)	Both newer and older than 5 years (8/8)	None (0)	Yes (8)	Domestic and salmonids (6.5/10)	22.5	Smith Creek (F, Ag), Nithi River (F, Range)
	Chilako	Livestock and crop areas present (8/8)	Both newer and older than 5 years (8/8)	None (0)	No (0)	Salmonids (1.5/10)	17.5	Gregg Creek (F, Ag), Punchaw (F, Ag)
	Endako	Limited to no agricultural activities (0/8)	<5% all older than 5 years (1.6/8)	None (0)	Yes (8)	Domestic and salmonids (6.5/10)	8.1	
Prince George	Naver	No agricultural activities (0/8)	Both newer and older than 5 years (8/8)	None (0)	No (0)	Blue-listed and salmonid (5/10)	13	
	Herrick	No agricultural activities (0/8)	Most newer than five years (8/8)	None (0)	No (0)	Blue-listed and Salmonid (5/10)	13	
	Bowron	No agricultural activities (0/8)	Both older and newer than 5 years (8/8)	None (0)	No (0)	Blue-listed and salmonid (5/10)	13	
Prince George/ Robson Valley	Torpy/Morkill/Holmes	No agricultural activities (0/8)	Both older and newer than 5 years (8/8)	None (0)	No (0)	Blue-listed and salmonids (5/10)	13	

<sup>1</sup> ACL based on McElhanney 2002 N.E. British Columbia wall map, which also identifies oil & gas development

Tier I water samples were collected on a monthly basis starting in September, 2002 while sediment samples were collected only once, in October, 2002. These data have been compiled, reviewed, and presented in summary briefs for each watershed. Each brief presents an overview of the project, a description of basin specific NPS activities, and a summary of the results. Significant water quality issues have been identified in some Tier I watersheds. However, more monitoring is required before conclusive statements on water quality status and sources of contamination can be formulated.

### 3.0 Tier II Watersheds

The Omineca-Peace (O.-P.) region is the largest in British Columbia, covering 31.6 million hectares or roughly 1/3 of the province's land mass (Figure 1). Consequently, this region also has an extensive array of waterways and waterbodies within its boundaries. During the development of their regional plans, the watershed restoration program identified 355 4<sup>th</sup> order streams in the region (MELP, 2001) and the Water Management Branch identified 87 3-8<sup>th</sup> order watersheds (Figure 2) (Wei, 1997).

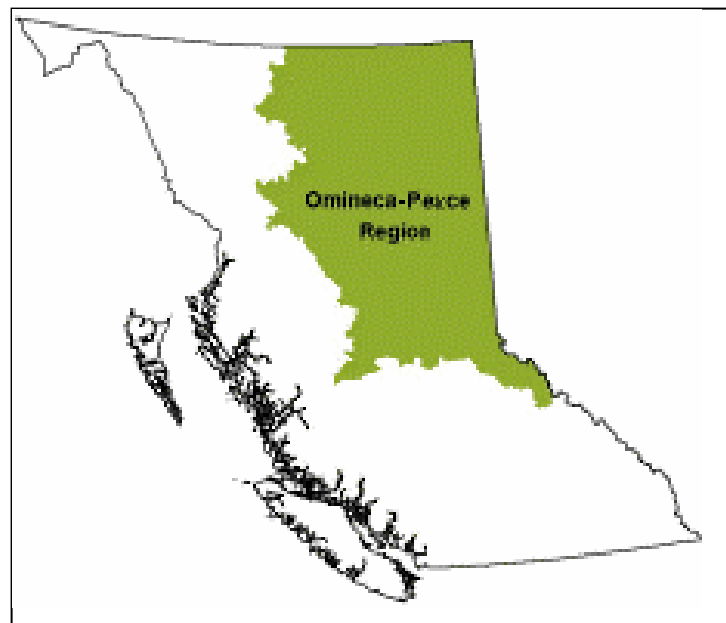


Figure 1 - The province of British Columbia showing the Omineca-Peace region.



The prioritization of regional watersheds required the following step-wise process:

- determination of a ranking procedure (risk matrix) for ranking the watersheds,
- definition and delineation of watershed boundaries,
- collection and collation of necessary information for defined watersheds,
- translation of this information to suit the risk matrix,
- calculation of each Tier II watershed's risk score.

To clarify the development of the regional watershed prioritization process these steps are discussed individually.

### **3.1 Risk Matrix**

Three risk matrices were developed. They provide a repeatable and defensible ranking system for Omineca-Peace watersheds. Developing matrices that determined NPS pollution risk with available information was a difficult task. There are a multitude of geomorphic, hydrologic, and resource based measures that can be used to determine differences in the potential for NPS contamination between watersheds. Unfortunately, this type of resolute data is not available for all areas in the Omineca-Peace Region. For example, slope stability, which is critical for assessing erosion potential was not used because this information is not available for all watersheds. Instead, watershed slope was used because it can be determined from a topographic map and it provides an indication of runoff potential and slope stability.

The matrices were designed to be relatively simple to complete because the regional watersheds had to be ranked within the 2002/03 fiscal year. The prominent simplification is that they weigh all NPS sectors equally. Although agriculture is widely recognized as the most significant contributor of NPS pollution (Clapham *et al.*, 1999), it was not rated higher than any other land use sector because land use density is also considered. Agriculture and forestry are spatially expansive activities so those watersheds having one or both sectors will have higher land use density values than a watershed having only oil & gas or village development which are most often less expansive. So, the agricultural or

forest harvesting dominated basin will rank higher than a watershed having only oil & gas or urban development activities. In addition, forest practices were not sub-categorized. For example, forest harvesting was not subdivided into clearcut, selective harvest, heli-logging, or cable yarding. Further, the matrices are land use focussed so separating NPS activities on practice type would add a layer of complexity that does not address the project objective.

RES provided MOE with three matrices (Appendix C) along with their watershed risk scores and ranks. These matrices use similar information but different weightings for NPS and land use factors and different methods for generating the overall score, addition or multiplication. All three are presented in this report as options for MOE consideration. A comparison of the ranking lists shows that the top regional priority watersheds are consistent among the three matrices (*Section 3.4*).

### 3.1.1 Risk Matrix Parameters

The matrices presented here are similar to the geographic targeting program applied by the U.S. Environmental Protection Agency (EPA) and several state resource agencies. Factors that guide geographical targeting include (EPA, 1993):

- a) data availability
- b) severity of risk
- c) impairment to the waterbody (documented or potential)
- d) resource value (to the public)

The OP risk matrices consider the severity of risk and the resource value. Water quality data availability is not considered because many areas within the OP region have no data. The objective of this project is to generate data on NPS activities and water quality interactions within this region.

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The matrices use six general categories of information. In accordance with contract requirements, these emphasize pollution sources and water users. The categories are:

1. Non-point sources – presence/absence of agriculture, forestry, oil & gas, and urban development,
2. Point sources – presence/absence of industrial or municipal point source discharges,
3. Resource users – fish population status and use as a potable supply,
4. Watershed Characteristics – the first matrix uses slope while the other two use slope and drainage density,
5. Land Use Density – the first matrix uses road and land use density while the other schemes use these as well as stream crossing density,
6. General considerations – access

#### *3.1.1.1 Non-Point and Point Sources*

Both non-point and point sources were given consideration in the matrix because of their synergistic effect on water quality. No OP regional watershed had point source activities without also having NPS activities. If a watershed had point sources without NPS activities, it would have been excluded because point source activities are not the focus of this program. This project is improved by considering both point and non-point source pollution because it provides the opportunity to address all pollution sources and most potential contaminants.

#### *3.1.1.2 Resource Users*

Resource management activities attempt to ensure resource quality will meet or exceed the needs of defined user groups. Provincial water quality guidelines are delineated based upon the sensitivity of user groups (aquatic life, potable supply, irrigation, wildlife, industrial, etc.) to concentrations of specific water quality parameters. To ensure this planning exercise agrees with provincial guidelines, resource users were considered in the risk matrices. Specifically, potable users and aquatic life were considered because they are usually the most sensitive user groups.

### *3.1.1.3 Watershed Characteristics*

Non-point source pollution effects on water quality are greatest during storm events (Novotny and Chesters, 1981). As such, several characteristics will influence in-stream NPS effects due to hydrologic response. These include:

1. drainage basin physiography,
2. soil type and chemistry,
3. vegetative cover,
4. drainage density,
5. land use treatment,
6. duration and intensity of rainfall (Novotny and Chesters 1981, Rast 1999).

The matrices use land use treatment (i.e. NPS activity type), watershed slope (physiography), and drainage density because this information was available for the entire OP region. Slope and drainage density were selected because they provide information on the potential for delivery of non-point pollution to proximal streams.

Watershed slope is defined here as the average gradient from the watershed's headwaters to its outlet (as provided by MSRM, 2002: Measured from the highest point in the watershed to the lowest). Higher gradient areas will have higher delivery of surface runoff and possibly NPS contaminants (Novotny and Chesters 1981, Brooks et al 1991). Similar to slope, higher drainage density will increase the potential for delivery of NPS pollutants. Drainage density is defined by the following equation (Knighton, 1998):

$$D_d = \Sigma L / A_d$$

Where  $D_d$  = Drainage density

$\Sigma L$  = Total channel length

$A_d$  = Watershed area

And can be approximated by the formula:

$$D_d \sim 1/l_s$$

Where  $l_s$  = mean distance of channel heads to divides

Although typically used in a geomorphic context, drainage density is highly relevant to the study of NPS pollution because of its influence on storm water delivery to streams (Knighton, 1998). Watersheds with higher drainage densities should receive more surface runoff than those with lower drainage densities.

#### *3.1.1.4 Land Use Density*

The objective of this project is to identify watersheds that are vulnerable to NPS pollution. Watersheds with extensive development will be at a greater risk of non-point source effects than those having less development. The amount of development within a watershed was measured using road density, stream crossing density, and NPS land use density.

Road density and stream crossings were selected for two reasons. Roads increase runoff during storm events. Further, all road crossings have the potential to increase sediment contribution and their bound contaminants to streams. Further, this information is typically available in watersheds where a watershed assessment has been conducted under the provincial Watershed Restoration Program.

NPS land use density was selected because of its importance in determining the potential for NPS pollution. In addition, it provides a measure of NPS pollution availability. That is, higher density land use areas may be expected to contribute more pollutants to streams than low density areas.

#### *3.1.1.5 Watershed Access*

Watershed access is included in the matrix because of its practical application. Access influences the cost of sampling. Where access is easier sampling can be done at a higher frequency, which improves the likelihood of trend and NPS pollutant detection.



### 3.1.2. Matrix Assumptions and Weighting Rationale

Several assumptions about NPS activities were made during the development of the risk matrices. The NPS sub-category definitions used in each matrix are grounded in the understanding that specific NPS activities can influence water quality more readily than others. These categories and their associated scores were presented to and approved by MOE staff.

#### *3.1.2.1 Agricultural Activities*

Agricultural activities were broadly categorized as agricultural area and range areas. Agricultural area was defined as land based activities where the land is used as the producing medium, i.e. cropland and pasture (MSRM, 2002). Rangeland areas include unimproved pasture and grassland with drought tolerant species up to 6m in length and less than 35% forest cover (MSRM, 2002).

Crop lands and feed lots are concentrated areas of development that have the potential to contribute a wider variety of contaminants than rangeland (USEPA, 1997). As such, these more intensive operations were given the maximum score while rangeland was given a lower score. However, both operation types were often present in agriculturally dominated basins (Appendix E).

#### *3.1.2.2 Forest Harvesting*

Forest harvesting areas were differentiated based on the time of harvest (Appendix F). More recently harvested areas were considered to be at greater risk of contributing pollution than older sites. *Watershed Statistics: Draft* (MSRM, 2002) delineated forest information as total logging and recent logging. Total logging density included information on all logging activities within the watershed and recent logging included information on all logging within the last 20 years. Although it would have been preferable to have logging data that focussed on the last five to ten years it was not readily available.

Lewis (1998) found that road and harvesting activities in the Caspar Creek watershed during the 1960's effected suspended sediment concentrations for a period of 6 years from the onset of harvesting. These effects subsided within 3 years after harvesting was completed. Beaudry (1999) found an increase in suspended sediment two years after harvesting and road decommissioning in the Baptiste watershed, of British Columbia's Northern Interior. This response was reduced significantly within two years.

### *3.1.2.3 Oil & Gas and Urban Development*

The oil and gas activity category was subdivided based upon the number of active wells present. A cutoff of 10 wells was suggested because most oil & gas active watersheds had a higher number of wells than 10 (Appendix E).

The urban development category was subdivided based on the density of development. Urban development was defined in *Watershed Statistics* as compact settlements including cities, towns and villages as well as isolated units such as manufacturing plants and military camps. Typically, residential use predominates these areas except where open space locations such as parks or golf courses are included as part of the urban area. A cutoff of 1% was suggested because urban development is patchy in the region and urban active watersheds typically have more than a 1% density (Appendix E).

### *3.1.3 Numeric Index Approach*

These risk matrices use a numeric index approach, which is the most common watershed ranking procedure because it allows the user to give greater weight to specific factors that are deemed to be more important (USEPA, 1993). Indexing can be completed using an additive or multiplicative approach. The additive approach treats all characteristics similarly and results in a narrow range of scores, whereas the multiplicative approach allows for the emphasis of individual characteristics and typically produces a wider range of values (USEPA, 1993).

All three matrices presented here use the multiplicative approach. Matrix categories such as 'NPS', 'Point Sources', or 'Resource Users' have a weighting factor that identifies their relative importance within each risk matrix scheme. The first matrix emphasizes the number of NPS pollution sources and delivery by giving higher weighting to NPS activities, watershed characteristics, and development density (Table 5).

**Table 5: The first risk matrix's category designations and weighting factors.**

Category	Designations	Score	Weighting Factor
NPS	Agriculture <i>Cropland – 1, Range –0.2</i>	0 to 1	$\Sigma$ presence or absence (i.e. 0 to 1) * 8
	Forestry (Harvesting) <i>&lt; 5years – 1, &gt; 5 years- 0.2</i>	0 to 1	
	Oil & Gas <i>&lt; 10 wells –0.5, &gt; 10 wells-1</i>	0 to 1	
	Urban Development <i>&lt; 1% - 0, &gt; 1%-1</i>	0 or 1	
Point Sources	Industrial	0 or 1	$\Sigma$ presence or absence (i.e. 0 or 1) * 5
	Municipal	0 or 1	
Resource Users	Potable Supply	0 or 1	$\Sigma$ user information * 5
	Fisheries: <i>Salmonid (0 or 1)* 1/3</i> <i>Blue-Listed (0 or 1)* 2/3</i> <i>Red-Listed (0 or 1)</i>	0 to 1	
Watershed Characteristics	Slope: <i>Low (0-2%) –0</i> <i>Low-Med. (3-8%) –0.2</i> <i>Medium (9-15%) – 0.4</i> <i>Med.-High (16-30%) –0.6</i> <i>High (31-50%) –0.8</i> <i>Very High (&gt;51%) -1.0</i>	0 to 1	$\Sigma$ watershed characteristics * 13
Development Density	Road Density <i>Expressed km of road to km<sup>2</sup> area of the basin</i>	0 to 1	$\Sigma$ development density * 16
	Land Use Density <i>Expressed as total of land used in the basin km<sup>2</sup>/km<sup>2</sup> (between 0 and1)</i>	0 to 1	
General Considerations	Access <i>Helicopter only – 0</i> <i>Road &amp; Helicopter –0.5</i> <i>Road &amp; Quad – 1.0</i>	0 to 1	$\Sigma$ general considerations * 3

The second matrix emphasizes pollution delivery by giving the highest weightings to watershed characteristics and development density (Table 6). Further, it includes drainage density information and excludes access because it was assumed most watersheds with high density NPS activities will have good access.

**Table 6 – The second risk matrix's category designations and weighting factors.**

Category	Designations	Score	Weighting Factor
NPS	Agriculture <i>Cropland – 1, Range –0.2</i>	0 to 1	$\Sigma$ presence or absence (i.e. 0 or 1) * 5
	Forestry (Harvesting) <i>&lt; 5years – 1, &gt; 5 years- 0.2</i>	0 to 1	
	Oil & Gas <i>&lt; 10 wells –0.5, &gt; 10 wells-1</i>	0 to 1	
	Urban Development <i>&lt; 1% - 0, &gt; 1%-1</i>	0 or 1	
Point Sources	Industrial	0 or 1	$\Sigma$ presence or absence (i.e. 0 or 1) * 5
	Municipal	0 or 1	
Resource Users	Potable Supply	0 or 1	$\Sigma$ user information * 5
	Fisheries: <i>Salmonid (0 or 1)* 1/3</i> <i>Blue-Listed (0 or 1)* 2/3</i> <i>Red-Listed (0 or 1)</i>	0 to 1	
Watershed Characteristics	Slope: <i>Low (0-2%) –0</i> <i>Low-Med. (3-8%) –0.2</i> <i>Medium (9-15%) – 0.4</i> <i>Med.-High (16-30%) –0.6</i> <i>High (31-50%) –0.8</i> <i>Very High (&gt;51%)-1.0</i>	0 to 1	$\Sigma$ watershed characteristics * 15
	Drainage Density <i>Stream length (km) to watershed area (km<sup>2</sup>), weighted so the maximum score is 1</i>	0 or 1	
Development Density	Road Density <i>Expressed km of road to km<sup>2</sup> area of the basin</i>	0 to 1	$\Sigma$ development density * 15
	Land Use Density <i>Expressed as total of land used in the basin km<sup>2</sup>/km<sup>2</sup> (between 0 and1</i>	0 to 1	

**Table 7 – The third risk matrix's category designations and weighting factors .**

Category	Designations	Score	Weighting Factor
NPS	Agriculture <i>Cropland – 1, Range –0.2</i>	0 to 1	$\Sigma$ presence or absence (i.e. 0 or 1)
	Forestry (Harvesting) <i>&lt; 5years – 1, &gt; 5 years- 0.2</i>	0 to 1	
	Oil & Gas <i>&lt; 10 wells –0.5, &gt; 10 wells-1</i>	0 to 1	
	Urban Development <i>&lt; 1% - 0, &gt; 1%-1</i>	0 or 1	
Point Sources	Industrial	0 or 1	$\Sigma$ presence or absence (i.e. 0 or 1) * 4
	Municipal	0 or 1	
Resource Users	Potable Supply	0 or 1	$\Sigma$ user information * 2
	Fisheries: <i>Salmonid (0 or 1)* 1/3</i> <i>Blue-Listed (0 or 1)* 2/3</i> <i>Red-Listed (0 or 1)</i>	0 to 1	
Watershed Characteristics	Slope: <i>Low (0-2%) –0</i> <i>Low-Med. (3-8%) –0.2</i> <i>Medium (9-15%) – 0.4</i> <i>Med.-High (16-30%) –0.6</i> <i>High (31-50%) –0.8</i> <i>Very High (&gt;51%)–1.0</i>	0 to 1	$\Sigma$ watershed characteristics * 5.5
	Drainage Density <i>Stream length (km) to watershed area (km<sup>2</sup>), weighted so the maximum score is 1</i>	0 to 1	
Development Density	Road & Crossing Density <i>Expressed km of road to km<sup>2</sup> area of the basin multiplied by crossings per kilometer</i>	0 to 1	$\Sigma$ development density * 5.5
	Land Use Density <i>Expressed as total of land used in the basin km<sup>2</sup>/km<sup>2</sup> (between 0 and1</i>	0 to 1	

The third matrix emphasizes NPS activities by using the number of pollutant sources as a multiplier for the sum of watershed characteristics and development density as follows:

Risk Score = Number of NPS Activities \*(weighting factor\*(Watershed Characteristics Score + Development Density Score)) + weighting factor \* Point Source Score + weighting factor

\*(Resource users)The third version also includes drainage density and stream crossing information (Table 7).

In summary, the first matrix gives equal priority to the number of NPS sources and development density (maximum for each category is 32 points for a combined total of 64 out of 100 points). The second matrix emphasizes pollutant source and delivery (maximum score for development density and watershed characteristics is 30 points each for a combined score of 60 out of 100 points). The third matrix combines these approaches by using the same weight for development density and watershed characteristics (maximum score for each category is 11 points for a combined total of 22 points). This score is then multiplied by the number of NPS activities in the watershed (maximum number of NPS activities is 4 multiplied by 22 points for a total of 88 points out of 100). The third approach ensures that multi-use NPS basins capable of delivering pollutants will rank much higher than single NPS activity basins with similar delivery capabilities. Although category weighting varied between the matrices, the NPS category was consistently given the highest scores in each matrix (Table 8).

**Table 8 - Risk matrix category weights and total score.**

Category	First Matrix		Second Matrix		Third Matrix	
	Weight	Highest Score	Weight	Highest Score	Weight	Highest Score
NPS	<b>8</b>	32	<b>5</b>	20	<b>4</b>	Multiplier
Point Sources	<b>5</b>	10	<b>5</b>	10	<b>4</b>	8
Resource Users	<b>5</b>	10	<b>5</b>	10	<b>2</b>	4
Watershed Characteristics	<b>13</b>	13	<b>15</b>	30	<b>5.5</b>	44 (score * NPS)
Development Density	<b>16</b>	32	<b>15</b>	30	<b>5.5</b>	44 (score * NPS)
Access	<b>3</b>	3	N/A		N/A	
<b>Total</b>		100		100		100

### **3.2 Watershed Boundary Determination**

A watershed can be defined as the area of land upstream of a point in a river that intercepts and delivers precipitation to that river (Leopold *et al.* 1992). However, this general definition betrays the complexity in selecting watershed boundaries for specific applications. They may be defined by stream order, general surface area, or otherwise sized to suit project objectives. For example, Figure 2 identifies watershed boundaries for the purpose of determining the density of regional hydrometric stations (Wei, 1997). Wei divided the region into 87 watersheds that range between third and eighth order streams. In contrast, the regional watershed restoration program (WRP) planning report presents the same region as composed of 355 fourth order basins (Ministry of Forests et al., 2001). Although each of these approaches is valid, the variation in their spatial scale ensures that both schemes cannot be used for the same planning purpose.

The majority of data used in the risk matrices was generated from *Watershed Statistics*. This draft report was made available by the Ministry of Sustainable Resource Management (SRM), which includes information on NPS development and general watershed characteristics for the province.

*Watershed Statistics* divides the Omineca-Peace region into nearly 6000 polygons, each of which contains information links to watershed and land use information. These polygons were coded for the SRM report and included watershed atlas codes. The watershed code is a numerical string that defines every stream in the province of British Columbia in relation to the larger stream it feeds. It is a hierarchical nomenclature system that is suitable for defining watershed units. The first three characters identify major watersheds within each region. In the Omineca-Peace Region these include the Fraser, Nechako, Sustut, Hay, Peace, Beatton, Sikkani-Chief, and several others. For example, the watershed code 180 applies to the Nechako River, its first tributary is at 1801, and the first tributary to that stream is at 18011 and so on. These numbers continue in length, to a maximum string of 45 characters, until the Nechako River watershed is completely enumerated.

Using these watershed codes and a 1:600,000 map, Tier II watershed boundaries were outlined so that they included singular large streams (4<sup>th</sup>-7<sup>th</sup> order) that directly entered major rivers such as the Nechako. When smaller streams (less than 1<sup>st</sup>- 3<sup>rd</sup> order) directly entered major rivers they were grouped with similar small streams into one unit the size of the larger watersheds. For example, the Chilako River is a 6<sup>th</sup> order stream that is a tributary to the larger Nechako River. It drains an area of approximately 3,600km<sup>2</sup> and is easily identified as a Tier II watershed. Sweden Creek directly enters the Nechako River just upstream of the Chilako River confluence. It is a third order stream that drains an area of 45 km<sup>2</sup> so it cannot be compared to the Chilako as a tier II watershed because it is too small. Instead, it was grouped with several other nearby lower order watersheds (e.g. Cluculz Creek is a fifth order watershed) that drain into the Nechako River to form a larger Tier II watershed named Sweden-Cluculz. Its watershed area is 1071 km<sup>2</sup>. Although there is still a size difference between the Chilako and Sweden-Cluculz, the spatial bias is much less than comparing Sweden Creek or Cluculz Creek to the Chilako River. Tier II watersheds were ranked based upon land use densities, so efforts were made to create Tier II watershed boundaries that isolated similar order watersheds with similar geographic areas.

Tier II watershed boundaries were determined with the goal of creating similar sized watersheds in the region. Although Tier II watersheds were not all the same size or same stream order, 75% of them were fifth or sixth order systems. The above process led to the division of the Omineca-Peace Region into 163 Tier II watersheds that ranged from third to sixth order (Table 9 and Appendix I).

**Table 9- Forest district and watershed totals categorized by stream order.**

District	Third	Fourth	Fifth	Sixth
Robson Valley		9	8	1
Prince George		13	10	6
Vanderhoof	2	4	6	1
Fort St. James		2	6	6
Mackenzie		4	15	15
Dawson Creek (& Chetwynd)		1	8	5
Fort St. John			9	5
Fort Nelson		4	9	14



Appendix D contains a CD copy of the data files that were converted from *Watershed Statistics* for use in the OP regional ranking process.

### 3.3 Data Types and Sources

Originally, the watershed ranking procedure was going to be completed by overlaying a regional map with mylar sheets, which would detail land use patterns for specific NPS sectors. Unfortunately, this was not possible because data sources did not provide complete data sets. Fortunately, a draft version of *Watershed Statistics* was provided for use in the regional watershed prioritization by SRM in December 2002.

This data product provided information on agriculture, forestry, urban development, and watershed characteristics. Data attributes for NPS information gathered from *Watershed Statistics* are provided in Table 10.

**Table 10 - Data attributes for NPS activities from Watersheds B.C.**

NPS Category	Data Type	Source	Revision Date
Forestry	Total Logging Area	Watershed Atlas	1999
	Recent Logging Area	Base Thematic Mapping	1997
Urban Development	Urban Area	Watershed Atlas	1999
		Base Thematic Mapping	1997
Agriculture	Agricultural Area	Watershed Atlas	1999
	Range Area	Base Thematic Mapping	1997

Oil and gas activities and point sources were identified using other map products. Oil and gas development activities were gathered from the McElhanny 2002 wall map, which identifies oil and gas wells in the Peace Region. Point sources were located using a map of currently permitted discharges generated from the MOE Environmental Monitoring System (EMS) database. Watershed boundaries were traced onto both maps temporarily, which allowed the enumeration of permitted discharge sites and active oil and gas wells.

The NPS land use density measures considered here were road density and land use density. Road density information was directly available from the *Watershed Statistics* document while land use density was calculated by dividing NPS activity area by total watershed area.

Watershed gradient was determined for the entire area within a watershed not just the stream. This provides a better indication of surface runoff potential. Data attributes are provided in Table 11.

**Table 11 - Land use density and watershed gradient data attributes.**

<b>Data</b>	<b>Data Type</b>	<b>Source</b>	<b>Revision Date</b>
Land Use Density	Agriculture (ha)	Watershed Atlas	1999
	Forestry (ha)	Base Thematic Mapping	1997
	Urban Development (ha)		
Road Density	Road Density (km/km <sup>2</sup> )	Watershed Atlas Base Thematic Mapping	1999 1997-1999
Watershed Gradient Drainage Density	Stream km to watershed area km <sup>2</sup>	Watershed Atlas Base Thematic Mapping	1999 1997

Resource user information was gathered from provincial government databases. The matrix incorporates two sensitive user groups, namely potable supply and red or blue-listed fish species. Potable supply areas were determined by searching all Omineca-Peace domestic water permits. Permit information included stream name, allowable volume, and the name of the holder. Stream names were listed and then searched for within the defined Tier II watershed boundaries.

Sensitive fish areas (i.e. including red or blue listed species) were located by performing a search of the Fisheries Inventory Summary System (FISS) database (Appendix G). If salmonids, red and/or blue listed fish species were known to be present in some, but not all, of the Tier II watershed's sub-basins, the watershed was scored for their presence. If the Tier II watershed was the same as a WRP watershed, for which low fish value was indicated, it was given a zero fish value score (Table 12). For example, Entiako River is both a Tier II and a WRP defined watershed with low fish value so it received a zero score. In contrast, the Upper Morkill is defined by WRP as having a low fish value but in the Tier II watershed scheme the Upper Morkill is contained within the Morkill watershed, which supports chinook, bull trout, and dolly varden so it was given the maximum fish value. It was assumed that all watersheds supported salmonids unless specified by the WRP plan. A default score of 1/3 was given to all salmonid supportive watersheds. Scores increased from here if the watershed was identified as supporting red or blue-listed species.

**Table 12 - Low fish value areas in the Omineca Peace region (MoF and MOE, 2001)**

<b>Tier II Watershed</b>	<b>WRP</b>	<b>Forest District</b>
Firesteel	Sturdee	MacKenzie
Entiako	Entiako	Vanderhoof
Jerryboy	Chedakuz	Vanderhoof
Necoslie	Necoslie	Fort St. James
TFL 42	Takla	Fort St. James
Scovil-Dastaiga	Scovil	Mackenzie
Crooked River	MacLeod	Prince George
Salmon	Muskeg	Prince George
Morkill	Upper Morkill	Robson Valley
Packsdale-Blackwater	West Kinbasket	Robson Valley

Watershed access was determined by reviewing road information provided in *Watershed Statistics*. Where road densities are high it was assumed that access would be predominantly by road. Low densities inferred that access should be by helicopter and mid-range densities inferred that a combination of road and helicopter should be feasible.

### **3.4 Watershed Risk Matrix Priority Rankings**

A comparison of the three risk matrices shows that there are some differences in the order they ranked the Tier II watersheds (Appendix C). Despite these differences, each matrix contained the same 9 Tier II watersheds within their top 10 priority basins (Table 13). Further, below the top 20 priority watersheds, Tier II risk scores differ minimally between watersheds for each of the three matrices (Appendix C). This infers that the watersheds presented in Table 13 are the highest priority watersheds within the OP region.

## **4.0 Final Comments and Recommendations**

The objective of this project was to prioritize regional watersheds for monitoring NPS activity effects on water quality. This objective was met through the completion of duties associated with Tier I and Tier II watershed prioritization processes. Tier I watersheds were sampled in 2002/03 and the Tier II watershed priority list provided in this document will be used to direct sampling efforts in the future.

**Table 13 - The Omineca Peace region top 20 priority watersheds determined by the three proposed matrices. (Italicized watersheds are in top 20 for each matrix)**

<b>Rank</b>	<b>First Matrix</b>		<b>Second Matrix</b>		<b>Third Matrix</b>	
	<b>Watershed</b>	<b>Score</b>	<b>Watershed</b>	<b>Score</b>	<b>Watershed</b>	<b>Score</b>
<b>1</b>	<i>Prince George</i>	70.12	<i>Prince George</i>	62.93	<i>Tabor Creek</i>	46.09
<b>2</b>	<i>McLennan</i>	60.44	<i>McLennan</i>	55.01	<i>Prince George</i>	43.43
<b>3</b>	<i>Pouce Coupe</i>	56.68	<i>Pine River</i>	52.29	<i>Chilco-Murray</i>	40.77
<b>4</b>	<i>Stony Creek</i>	55.4	<i>Pouce Coupe</i>	49.30	<i>McLennan</i>	40.73
<b>5</b>	<i>Chilco-Murray</i>	55.31	<i>Stony Creek</i>	48.81	<i>Pouce Coupe</i>	39.4
<b>6</b>	<i>Tabor Creek</i>	54.81	<i>Tabor Creek</i>	48.72	<i>Stony Creek</i>	34.13
<b>7</b>	<i>Lower Beatton</i>	52.13	<i>Lower Beatton</i>	48.38	<i>Pine River</i>	29.39
<b>8</b>	<i>Pine River</i>	51.91	<i>Chilco-Murray</i>	48.06	<i>Lower Beatton</i>	27.65
<b>9</b>	<i>Naver Creek</i>	46.08	<i>Halfway River</i>	45.32	<i>Halfway River</i>	24.33
<b>10</b>	<i>Sweden-Cluculz</i>	44.68	<i>Naver Creek</i>	43.14	<i>Naver Creek</i>	22.27
<b>11</b>	<i>Halfway River</i>	44.54	<i>Hansard Creek</i>	42.58	<i>Sweden-Cluculz</i>	21.86
<b>12</b>	<i>Salmon River</i>	44.53	<i>Salmon River</i>	41.44	<i>Salmon River</i>	21.15
<b>13</b>	<i>Cache-Wilder</i>	43.72	<i>Sweden-Cluculz</i>	41.26	<i>Chilako River</i>	20.47
<b>14</b>	<i>Hansard Creek</i>	42.82	<i>Twin Creek</i>	41.24	<i>Sinkut-McKnight</i>	19.79
<b>15</b>	<i>Blueberry River</i>	42.65	<i>Cache-Wilder</i>	39.86	<i>McCorkall-Trapping</i>	19.54
<b>16</b>	<i>Chilako River</i>	42.56	<i>Murray River</i>	39.50	<i>Stone Creek</i>	19.53
<b>17</b>	<i>Stone Creek</i>	42.36	<i>Stone Creek</i>	39.44	<i>Moberly River</i>	19.46
<b>18</b>	<i>Kiskatinaw River</i>	41.47	<i>Chilako River</i>	39.28	<i>Murray River</i>	19.06
<b>19</b>	<i>Alces River</i>	41.26	<i>McCorkall-Trapping</i>	39.09	<i>Nevin-Small</i>	19.02
<b>20</b>	<i>Moberly River</i>	40.42	<i>Blueberry River</i>	38.86	<i>Kiskatinaw River</i>	18.89

Land use data indicate that large areas of the Omineca-Peace region are not developed. With increased development and changing environmental conditions, including the spread of the mountain pine beetle, watershed ranks can change quickly so this process should be re-visited on a 2-5 year interval as data sources are updated and its availability increased.

A comparison of the Tier I and Tier II watershed rankings shows that these processes are in general agreement. Many of the Tier I watersheds were ranked highly in the Tier II process (Table 14).

**Table 14 - Tier I watersheds and subsequent Tier II ranks (using the first matrix).**

<b>Tier I Watershed</b>	<b>Tier II Watershed</b>	<b>Rank</b>
Chilako River	Chilako River	16
Corkscrew Creek	Stony Creek	4
Naver Creek	Naver Creek	9
Hasler Creek	Pine River	8
Moberly River	Moberly River	20
Brassey Creek	Kiskatinaw River	18
Pouce Coupe	Pouce Coupe River	3
Alces River	Alces River	19
Milligan Creek (and West)	Milligan River	53
Doig River	Doig River	29
Blueberry River	Blueberry River	15
Stoddart Creek	Lower Beatton River	7
Halfway River	Halfway River	11

Results of the 2002 Tier I watershed sampling program indicate that some water quality parameters exceed federal or provincial guidelines. Many of the exceeding parameters are typical NPS pollutants. These observations support continued monitoring of the Tier I watersheds and demonstrate the value in monitoring regional watersheds prone to NPS pollution.

Although this program has been successful, improvements can be made. Future efforts should focus on the following recommendations, which will improve the Tier II watershed prioritization and its regional application. Recommendations include the:

- Creation of a digital map, showing the Tier II watershed boundaries with direct links to land use and watershed data.
- Addition of other data types to the risk matrix including riparian forest clearing, NPS activity streamside density, NPS sector land base gradients and proximity to streams. Several of these measures are provided in *Watershed Statistics*.
- Distribution of the Tier II priority list to provincial staff from MOE, MOF, and MAFF for comment and review. This step will give specialist staff the opportunity to confirm the information used in developing the Tier II priority rankings. If these data are invalid these staff can provide direction on obtaining updated information. A cover letter has been provided in Appendix H.
- Incorporation of future development activities into the risk matrix.

In summary, this Tier II watershed prioritization scheme can be used to select the highest priority watersheds for future monitoring and prioritization of MOE and partnered funding applications. It provides a quantitative ranking of regional watersheds based upon their susceptibility to NPS water quality degradation. It relies on the presence of development and does not include planned development activities.

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## Appendix A

### *Provincial Contacts and Tier I Candidates*



Table A1: Contact list showing organization and position along with suggested watersheds or other comments.

Contact	Organization/Position	District	Suggested Watershed or Comments	NPS Activity
Allan Blair	AGF/ Agrologist	Fort St. John	Kiskatinaw Charlie Lake Moberly Lake	All Agriculture Res. Development Agriculture/Forestry
Jim Tingle	AGF/Agrologist	Prince George	None	
Mark Yawney	AGF/Agrologist	Prince George	Defer to J. Tingle	
Mike McConnel	AGF/Agrologist	Dawson Creek	Kiskatinaw	
Ramona Szyska	OGC/ Habitat Officer	Fort St. John	Defer to R. Backmeyer	
Nick Baccante	MOE/Section head	Fort St. John	Defer to R. Backmeyer	
Andy Ackerman	MOE/ Regional Mgr	Fort St. John	Defer to R. Backmeyer	
Rod Backmeyer	MOE/ Snr. Biologist	Fort St. John	None Suggested	
Joanne Vinnedge	MOE/Ecosystem Biologist	Fort St. James	Agree with S. Sulyma	
Sandra Sulyma	MOE/Ecosystem Biologist	Fort St. James	North Sustut Ankwill Creek Hudson's Bay Creek Salmon River (lower)	Forestry Forestry Forestry Forestry
Dave Stevenson	MOE/Ecosystem Biologist	Prince George	Herrick Creek Government Ck. Morkill R. Chilako R. Gregg/Punchaw Twin	Forestry Forestry Forestry Forestry/Agriculture Forestry/Agriculture Forestry
Bill Arthur	MOE/Snr. Ecosystem Bio.	MacKenzie Vanderhoof  Prince George	Default to WRP Clear Creek Knight Creek HogsBack Sinkut Wright Creek	Agriculture Agriculture Agriculture Agriculture Agriculture/Forestry
Leslie Yaremko	MOE/Snr. Ecosystem Officer	Vanderhoof	Consult Traci-Leys-Schirok	

Table A1 continued

Contact	Organization/Position	District	Suggested Watershed or Comment	NPS Activity
Gabi Matscha	MOE	Prince George	Contact D Sutherland and NB Carmichael	
Dave Sutherland	MOE	Prince George	Beatton Cecil Lake Blueberry Montney Creek Doig Chilako Endako	Forestry/Agriculture/Oil&Gas Agriculture/Oil&Gas Agriculture/Oil&Gas Agriculture/Oil&Gas Agriculture/Oil&Gas Forestry/Agriculture Agriculture/Mining
Bruce Carmichael	MOE	Prince George	Chilako Morkill Torpy Endako Stone Creek Pitka Parsnip Pouce Coupe Buick Creek Blueberry Hasler Creek Pine River	Forestry/Agriculture Forestry Forestry Forestry/Mining Forestry Agriculture Forestry/Agriculture Forestry/Agriculture/Urban Oil&Gas Oil&Gas Forestry/Agriculture/Oil& Gas Forestry/Agriculture/Oil& Gas
Ray Pillipow	MOE – Fisheries Habitat	Prince George	Torpy Upper Bowron Holmes Salmon Chilako Government Greer Swanson Cut-Thumb	Forestry Forestry Forestry Forestry/Agriculture Forestry/Agriculture Forestry Forestry Forestry Forestry

Table A1 continued

Contact	Organization/Position	District	Suggested Watershed or Comments	NPS Activity
Terry Sawchuk	MOE- Toxic Management Officer	Fort St. John – Peace	Doig Milligan Zaremba Big Arrow Aiken Snyder Buick Umbach Prespatou Stoddart Fish St. John Indian Rossland Alces Cache Red Brassey Coldstream	Oil & Gas Oil & Gas Oil & Gas Oil & Gas Oil & Gas/Agriculture Oil & Gas/Agriculture Oil & Gas/Agriculture Oil & Gas/Agriculture Oil & Gas/Agriculture O&G/Agriculture/Residential O&G/Agriculture/Residential Oil & Gas/Agriculture Oil & Gas/Agriculture Oil & Gas/Agriculture Oil & Gas/Agriculture Oil & Gas/Agriculture Oil & Gas/Agriculture Agriculture
Beryl Nesbit	SRM/ Planning	Prince George	Defer to Bill Arthur	
Traci Leys-Schirok	SRM/ Planning	Vanderhoof	Agree with Bill Arthur	
Mike Slivitzky	SRM/ Planner	Fort St. James	Pitka Creek Necoslie River Chuchi Middle	Agriculture Agriculture Forestry Forestry

## **Appendix B**

### *Sample Program and Parameter List*

Table B1: Monthly Water Samples

Parameter	Technique	Cost	LOD (mg/L)	Sample Bottle & Preservative
<b>Nutrients</b>				
Total Nitrogen	Digestion/Colourimetric	10.00	0.02	Brown Glass 100ml
Nitrate+Nitrite	Cadmium reduction	5.00	0.002	
Nitrate	Ion Chromatography	5.00	0.002	
Nitrite	Calculation	-	-	
Ammonia	Bertholet	5.00	0.005	
Total Organic N	Calculation	-	-	
Total Dissolved P	Digestion Colourimetric	10.00	0.002	Brown Glass 100ml
Ortho – P	Ion Chromatography	5.00	0.001	
		<b>Subtotal- \$40.00</b>		
<b>General</b>				
pH	Automated Meter	2.50	0.01 Rel. Units	Poly 2l
Hardness (Total/Dissolved)	Calculated	-	-	Poly 2l
Colour	Hellige Aqua Tester	5.00	5 colour units	Poly 2l
Cyanide (WAD)	Auto-CN:Pyr Barb	15.00	0.001	Poly 0.25l NaOH
TSS	Gravimetric	7.00	5	Poly 2l
Alkalinity (total 4.5)	Potentiometric titration	7.00	1.0	Poly 2l
Dissolved Inorganic C	Filtered & Analyzer	8.00	1.0	Poly 0.25l
Total Carbon	Carbon Analyzer	8.00	1.0	Poly 2l
Dissolved Organic C	Calculated	-	-	Poly 2l
Sulfate/Sulfide	Ion Chromatography	15.00	1.0/ 0.005	Poly 0.5l
Bromide	Ion Chromatography	20.00	0.05	Poly 2l
Fluoride	Ion Chromatography	5.00	0.1	Poly 2l
Chloride	DPD-FAS Titrimetric	10.00	0.02	Poly 2l
		<b>Subtotal – \$102.50</b>		
<b>Bacteriological</b>				
E. Coli		5.00		
Enterococci		10.00		
Fecal Coliforms		8.00		
		<b>Sub-total-\$23.00</b>		
<b>Metals</b>				
ICPMS Total	ICPMS	35.00		Poly 0.25l HNO <sub>3</sub>
ICPMS Dissolved	ICPMS	30.00		Poly 0.25l HNO <sub>3</sub>
		<b>Subtotal -\$65.00</b>		
		<b>Monthly total - \$230.50</b>		
		<b>Site Total (7 samples + QA) - \$1844</b>		

Table B2: Water Samples – Mid-Late October, Late April/Early May, August (High Rain Periods)

Parameter	Method	Cost	LOD (mg/L)
<b>Herbicides –Pesticides</b>			
Acid Extractable Herbs	GC-ECD	120.00	0.001
Organo-Chlorine Pests	DCM	105.00	0.05 (ug/L)
Organo-Phosphate Pests	DCM	105.00	0.05 (ug/L)
N Containing Pests	DCM	105.00	1 (ug/L)
Glyphosate (Aug. only)	HPLC	120.00	0.005
		<b>Sub- total – \$555.00</b>	
<b>Hydrocarbons</b>			
Oil & Grease	Perchloroethylene _IR	30.00	0.2
Hydrocarbons Ext. (C10-32).	DCM-GC	35.00	0
PAH	DCM GC-MS	95.00	0.02 (ug/L)
		<b>Sub-total –\$160.00</b>	
<b>Others</b>			
Chlorophenols	Hexane Extraction GC	110.00	0.002 (ug/L)
Colourimetric Phenols	Aminoantipyrine	15.00	0.001
AOX	Carb Adsorption	65.00	0.01
		<b>Sub-total - \$190.00</b>	
		<b>Sample total – 905.00</b>	
		<b>Site Total (1-(1/6QA) - \$1056.00</b>	

Table B3: Sediment Samples – Collected Late September/October, Late July/August

Parameter	Method	Cost	LOD
<b>Herbicides –Pesticides</b>			
Acid Extractable Herbs	GC-ECD	135.00	0.05 (ug/g)
Organo-Chlorine Pests	DCM	120.00	0.05 (ug/L)
Organo-Phosphate Pests	DCM	120.00	0.05 (ug/L)
N Containing Pests	DCM	120.00	1 (ug/L)
		<b>Sub- total – \$495.00</b>	
<b>Hydrocarbons</b>			
Hydrocarbon	Screening (C5-C40)	95.00	0
PAH	DCM GC-MS	95.00	0.02 (ug/L)
		<b>Sub-total –\$190.00</b>	
<b>Others</b>			
Chlorophenols	Hexane Extraction GC	110.00	0.002 (ug/L)
		<b>Sub-total - \$110.00</b>	
		<b>Sample Total - \$795.00</b>	
		<b>Site Total (1 (1/6QA))- \$927.50</b>	

Assuming a total of 12 sub-basins/sites are selected Program costs will be:

- |                                                                                                    |                                   |
|----------------------------------------------------------------------------------------------------|-----------------------------------|
| 1) Monthly water samples for 7 months * 14 samples (12 sites + 2 QA samples (blank and replicate)) | <b>\$22,589.00</b>                |
| 2) High rain period water samples will not be collected until Spring                               | <b>\$0</b>                        |
| 3) Sediment sample at 12 sites + 2 replicates -                                                    | <b>\$11,130.00</b>                |
|                                                                                                    | <b>2002/03 Fiscal \$33,719.00</b> |

## **Appendix C**

### *Risk Matrices*

Table C1: First risk matrix watershed rankings for the Omineca-Peace Region NPS watershed characterization program.

Watershed	Forest District	Water-shed Order	Total Forest Area	Total Logging Density	Total Logging Area	Total Land (Ha)	Recent Logging Density	Forestry Score	Com-munity Watershed (Ha)	Urban Area (Ha)	Urban %	Urban Score	Agricultural Area (Ha)	Range Area (Ha)	Mine Area (Ha)	Agri-cultural %	Range %	Agri-cultural Score	Crown %	Private %	Com-munity Watershed %	Oil & Gas	Oil&Gas Score	NPS Score	Road Density	Weighted Roads	Road Score	Land Use Area (ha)	Land Use Density	Land Use Score	Point Source **	Gradient Category *	Category Score	Gradient Score	Fisheries Score	Potable Supply *	Access *	Total Score	Rank	Watershed
Prince George	Prince George	4	29254	14.44	4224.28	39889	6.57	1	0	14795	37.09	1.00	4718	0	45	11.83	0.00	1.00	19.22	80.89	0.00		0.00	24.00	2.13	1.00	16.00	23737.28	0.595	9.52	10.00	2	0.2	2.6	5	0	3	70.12	1	Prince George
McLennan	Robson Valley	5	31824	11.76	3742.50	5640	2.95	1	0	428	7.59	1.00	1025	0	43	18.17	0.00	1.00	100.0	0.00	0.00		0.00	24.00	0.24	1.11	1.80	5195.50	0.921	14.74	10.0	5	0.8	10.4	1.5	5	3	60.44	2	McLennan
Pouce Coupe	Dawson Creek	5	65725	10.49	6894.55	163849	0.00	0.2	0	1661	1.01	1.00	94308	0	0	57.56	0.00	1.00	79.41	20.59	0.00	15	0.00	25.60	1.19	0.56	8.94	102863.55	0.628	10.04	5.00	2	0.2	2.6	1.5	0	3	56.68	3	Pouce Coupe
Stoney Creek	Vanderhoof	5	39809	31.08	12372.64	58623	9.28	1	0	630	1.07	1.00	11665	478	58	19.90	0.82	1.00	82.2	17.80	0.00		0.00	24.00	1.19	0.56	9.94	25146.64	0.429	6.86	0.00	2	0.2	2.6	5	5	3	55.40	4	Stoney Creek
Chilco-Murray	Vanderhoof	3	15557	27.25	4239.28	29493	3.79	1	0	511	1.73	1.00	12907	10	27	43.76	0.00	1.00	36.2	63.70	0.00		0.00	24.00	1.38	0.65	10.40	17657.25	0.599	9.58	0.00	1	0		3.33	5	3	55.31	5	Chilco-Murray
Tabor Creek	Prince George	5	28413	15.17	4310.25	35186	4.98	1	0	824	2.34	1.00	4461	0	72	12.68	0.00	1.00	99.99	0.01	0.00		0.00	24.00	1.32	0.62	9.92	9595.25	0.273	4.36	0.00	3	0.4	5.2	3.33	5	3	54.81	6	Tabor Creek
Lower Beaton	Fort St. John	6	601951	2.49	14988.58	738686	0.13	0.2	0	660	0.09	0.00	133747	2983	33	18.11	0.40	1.00	74.20	25.80	0.00	> 100	1.00	17.60	0.75	0.35	5.63	152378.58	0.206	3.30	10.00	2	0.2	2.6	5	5	3	52.13	7	Lower Beaton
Pine River	Dawson Creek	6-7	334554	6.71	22448.57	386855	0.54	0.2	0	476	0.12	0.00	16569	0	20	4.28	0.00	1.00	97.40	2.60	0.00		0.00	17.60	0.25	0.12	1.88	39493.57	0.102	1.63	10.00	4	0.6	7.8	5	5	3	51.91	8	Pine River
Naver	Prince George	5	85057	33.59	28570.65	90119	9.82	1	0	281	0.31	0.00	2523	0	17	2.80	0.00	1.00	99.84	0.16	0.00		0.00	16.00	0.84	0.39	6.31	31374.65	0.348	5.57	0.00	3	0.4	5.2	5	5	3	46.08	9	Naver
Sweden-Cluculz	Prince George	5	92912	21.80	20254.62	107172	4.26	1	0	297	0.28	0.00	6194	0	18	5.78	0.00	1.00	100.0	0.00	0.00		0.00	16.00	1.21	0.57	9.05	26745.82	0.250	3.99	0.00	2	0.2	2.6	5	5	3	44.68	10	Sweden-Cluculz
Halfway River	Fort St. John	6-7	726259	5.27	38273.85	940173	0.07	0.2	0	370	0.04	0.00	20156	25516	39	2.14	2.71	1.00	95.65	4.35	0.00	90	1.00	17.60	0.26	0.13	2.10	84315.85	0.090	1.43	0.00	4	0.8	10.4	5	5	3	44.54	11	Halfway River
Salmon	Prince George	6	384598	20.61	79265.65	445787	2.12	1	0	731	0.16	0.00	11216	0	32	2.52	0.00	1.00	100.00	0.00	0.00		0.00	16.00	0.82	0.29	4.66	91212.85	0.205	3.27	5.00	2	0.2	2.6	5	5	3	44.53	12	Salmon
Cache-Wilder	Fort St. John	5	84602	3.06	2588.82	64082	0.00	0.2	0	0	0.00	0.00	19663	0	0	30.68	0.00	1.00	60.29	39.71	0.00	>100	1.00	17.60	0.65	0.31	4.96	22251.82	0.347	5.56	0.00	2	0.2	2.6	5	5	3	43.72	13	Cache-Wilder
Hansard Creek	Prince George	4	13211	39.62	5234.20	13891	9.44	1	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	83.3	16.70	0.00		0.00	8.00	1.41	0.66	10.59	5234.20	0.377	6.03	0.00	3	0.4	5.2	5	5	3	42.82	14	Hansard Creek
Blueberry River	Fort St. John	5	226456	8.80	19928.13	232434	0.00	0.2	0	10	0.00	0.00	49900	0	0	21.47	0.00	1.00	78.59	21.41	0.00	>100	1.00	17.60	0.62	0.29	4.64	69838.13	0.300	4.81	0.00	2	0.2	2.6	5	5	3	42.65	15	Blueberry River
Chilako River	Prince George	6	330324	19.91	65886.97	328520	1.12	1	0	1229	0.37	0.00	9823	336	50	2.99	0.10	1.00	89.7	10.26	0.00		0.00	16.00	0.96	0.45	7.20	72774.97	0.235	3.76	0.00	2	0.2	2.6	5	5	3	42.56	16	Chilako River
Stone Creek	Prince George	4	31017	25.06	7772.86	33584	3.97	1	0	158	0.47	0.00	1258	0	0	3.75	0.00	1.00	100.0	0.00	0.00		0.00	16.00	0.97	0.46	7.29	9188.86	0.274	4.38	0.00	3	0.4	5.2	1.5	5	3	42.36	17	Stone Creek
Kiskatinaw River	Dawson Creek	5	510349	5.86	18186.45	409794	0.00	0.2	0	24	0.01	0.00	88496	1133	0	21.60	0.28	1.00	68.70	31.30	0.00	>100	1.00	17.60	0.54	0.25	4.06	107839.45	0.263	4.21	0.00	2	0.2	2.6	5	5	3	41.47	18	Kiskatinaw River
Alces River	Fort St. John	5	45830	1.54	705.78	84436	0.00	0.2	0	0	0.00	0.00	37162	0	0	44.01	0.00	1.00	30.36	69.64	0.00	>100	1.00	17.60	1.13	0.53	8.48	37867.78	0.448	7.18	0.00	1	0		5	0	3	41.26	19	Alces River
Moberly River	Dawson Creek	5	162021	6.76	10952.62	184735	0.00	0.2	0	0	0.00	0.00	5908	0	0	3.20	0.00	1.00	100.0	0.00	0.00		0.00	17.60	0.42	0.20	3.15	16860.62	0.091	1.46	0.00	3	0.4	5.2	5	5	3	40.42	20	Moberly River
Eight Mile-Septimus	Dawson Creek	4	7828	0.83	64.97	27694	0.00	0.2	0	453	1.64	1.00	19383	0	0	69.99	0.00	1.00	34.1	96.59	0.00		0.00	17.60	1.07	0.50	8.04	19900.97	0.719	11.50	0.00	1	0		0	0	3	40.14	21	Eight Mile-Septimus
McCorkall-Trapping	Prince George	4	32067	17.11	5486.66	37153	3.68	1	0	95	0.15	0.00	1160	0	0	3.12	0.00	1	99.9	0.14	0.00		0.00	16.00	1.12	0.53	8.41	6701.66	0.180	2.89	0.00	2	0.2	2.6	1.5	5	3	39.40	22	McCorkall-Trapping
Willow	Prince George	6	260071	37.09	96460.33	276206	8.29	1	0	394	0.14	0.00	2751	0	68	0.99	0.00	0.00	100.0	0.00	0.00		0.00	8.00	0.89	0.42	6.63	99585.33	0.361	5.77	5.00	3	0.4	5.2	5	5	3	38.65	23	Willow
Fraser-Francois	Vanderhoof	6	93134	11.82	11008.44	108329	1.00	1	0	549	0.51	0.00	2607	255	83	2.41	0.24	1.00	89.34	10.68	0.00		0.00	16.00	0.86	0.40	6.46	14419.44	0.133	2.13	0.00	3	0.4	5.2	5	0	3	37.79	24	Fraser-Francois
Murray River	Dawson Creek	6	537057	4.35	23361.98	648916	0.07	0.2	0	1094	0.17	0.00	16999	0	4697	2.62	0.00	1.00	99.9	0.10	0.00	13	0.50	13.60	0.29	0.14	2.18	41444.98	0.064	1.02	5.00	4	0.6	7.8	5	0	3	37.60	25	Murray River
Twinn Creek	Robson Valley	4	23035	13.36	2712.75	38379	1.44	1	0	0	0.00	0.00	4	0	0	0.01	0.00	0.00	100.0	0.00	0.00		0.00	8.00	1.54	0.72	11.57	2716.75	0.071	1.19	0.00	5	0.8	10.4	3.33	0	3	37.43	26	Twinn Creek
Sinkut-McKnight	Vanderhoof	5	45770	21.70	9932.09	56314	6.23	1	0	40	0.07	0.00	6548	356	22	11.63	0.63	1.00	100.00	0.00	0.00		0.00	16.00	0.74	0.35	5.56	16876.09	0.300	4.73	0.00	2	0.2	2.6	0	5	3	36.95	27	Sinkut-McKnight
Nevin -Small	Robson Valley	4	21508	7.50	1613.10	65024	3.88	1	0	0	0.00	0.00	490	32	15	0.75	0.05	1.00	89.75	10.25	0.00		0.00	16.00	0.09	0.04	0.68	2135.10	0.033	0.53	0.00	5	0.8	10.4	1.5	5	1.5	35.60	28	Nevin -Small
Frog River	Mackenzie	6	4628808	7.90	365676.91	256137	0.70	0.2	0	0	0.00	0.00	0	1176	0	0.00	0.46	0.00	100.0	0.00	0.00		0.00	1.80	0.00	0.00	0.00	366851.91	1.432	22.82	0.00	5	0.8	10.4	5	0	3	39.92	29	Frog River
Dog River	Fort St. John	6	115115	4.14	4765.76	204176	0.00	0.2	0	0	0.00	0.00	20634	0	0	16.11	0.00	1.00	84.00	16.00	0.00	>100	1.00	17.60	0.39	0.18	2.93	25399.76	0.124	1.99	0.00	1	0		0	5	3	35.52	30	Dog River
Crooked River	Prince George	6	188744	31.98	60360.33	219881	8.05	1	0	255	0.12	0.00	97	0	123	0.04	0.00	0.00	96.30	3.70	0.00		0.00	8.00	0.48	0.23	3.61	60712.33	0.277	4.44	0.00	3	0.4	5.2	5	5	3	34.24	31	Crooked River
Tay-Averill	Prince George	4	29460	40.16	11831.14	30558	10.98	1	0	0	0.00	0.00	224	0	0	0.73	0.00	1.00	99.9	0.10	0.00		0.00	8.00	1.34	0.63	10.07	12055.14	0.395	6.31	0.00	3	0.4	5.2	1.5	0	3	34.08	31	Tay-Averill
MacGregor	Prince George	6-7	90668	11.33	10272.68	180460	1.33	1	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.00	0.00	0.00		0.00	8.00	0.21	0.10	1.58	10272.68	0.057	0.91	0.00	5	0.8	10.4	5	5	3	33.89	32	MacGregor
Hungary-Slim	Prince George	5	67340	23.23	15643.09	74851	1.98	1	0	60	0.08	0.00	0	0	0	0.00	0.00	0.00	99.6	0.40	0.00		0.00	8.00	0.46	0.22	3.46	15703.08	0.210	3.36										



Table C1 continued

Watershed	Forest District	Water-shed Order	Total Forest Area	Total Logging Density	Total Logging Area	Total Land (Ha)	Recent Logging Density	Forestry Score	Com-munity Watershed (Ha)	Urban Area (Ha)	Urban %	Urban Score	Agricultural Area (Ha)	Range Area (Ha)	Mine Area (Ha)	Agri-cultural %	Range %	Agri-cultural Score	Crown %	Private %	Com-munity Watershed %	Oil & Gas	Oil&Gas Score	NPS Score	Road Density	Weighted Roads	Road Score	Land Use Area (ha)	Land Use Density	Land Use Score	Point Source **	Gradient Category *	Category Score	Gradient Score	Fisheries Score	Potable Supply *	Access *	Total Score	Rank	Watershed	
Lower Sikanni	Fort St. John	6-7	547816	0.50	2739.08	677865	0.00	0.2	0	263	0.04	0.00	0	2025	109	0.00	0.30	0.00	99.97	0.03	0.00	>100	1.00	9.60	0.35	0.16	2.63	5027.08	0.007	0.12	0.00	2	0.2	2.6	5	0	3	22.95	75	Lower Sikanni	
Scott-Cut Thumb	Mackenzie	4	69285	3.71	2570.47	69424	0.00	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	84.49	15.51	0.00		0.00	1.60	0.26	0.12	1.95	2570.47	0.037	0.59	0.00	5	0.8	10.4	5	0	3	22.58	76	Scott-Cut Thumb	
Davis River	Mackenzie	5	19249	21.88	4211.68	19249	0.00	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.05	0.02	0.38	4211.68	0.219	3.50	0.00	5	0.8	10.4	5	0	1.5	22.58	77	Davis River	
Toad River	Fort Nelson	6	155705	0.00	0.00	155705	0.00	0	0	67	0.04	0.00	23	0	0	0.01	0.00	0.00	98.7	11.30	0.00		0.00	1.00	0.05	0.02	0.38	90.00	0.001	0.01	0.00	5	0.8	10.4	5	0	1.5	22.28	78	Toad River	
Moose	Robson Valley	5	41145	0.00	0.00	114141	0.00	0	0	0	0.00	0.00	0	0	41	0.00	0.00	0.00	94.30	5.70	0.00		0.00	0.00	0.02	0.01	0.15	0.00	0.00	0.00	5	0.8	10.4	5	0	1.5	22.05	79	Moose		
Upper Finlay	Mackenzie	5	103432	0.00	0.00	246779	0.00	0	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	99.7	0.30	0.00		0.00	0.00	0.01	0.00	0.08	0.00	0.00	0.00	5.00	5	0.8	10.4	5	0	1.5	21.98	80	Upper Finlay	
Manson River	Mackenzie	5	138133	11.44	15802.42	152778	0.00	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.33	0.15	2.48	15802.42	0.103	1.68	0.00	4	0.6	7.8	5	0	3	21.53	81	Manson River	
Omineca River	Mackenzie	6	427438	1.00	4022.00	584503	0.00	0.2	0	64	0.01	0.00	0	95	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.06	0.03	0.45	4086.00	0.007	0.11	0.00	4	0.6	7.8	5	0	1.5	21.46	82	Omineca River	
Raush River	Robson Valley	5	30817	0.41	125.53	101127	0.00	0.2	0	16	0.02	0.00	402	0	0	0.40	0.00	0.00	99.90	0.10	0.00		0.00	1.60	0.00	0.00	0.00	543.53	0.005	0.09	0.00	6	1	13	1.5	5	0	21.19	83	Raush River	
Lower Prophet	Fort Nelson	6	314866	3.28	10264.63	415837	0.00	0.2	0	173	0.04	0.00	594	2346	84	0.14	0.58	0.20	99.78	0.22	0.00		10	0.50	7.20	0.34	0.16	2.55	13377.63	0.032	0.51	0.00	2	0.2	2.6	5	0	3	20.87	84	Lower Prophet
Kuzawa	Fort St. James	6	158914	15.08	24099.95	193981	2.40	1	0	12	0.01	0.00	0	0	0	0.00	0.00	0.00	99.78	0.22	0.00			0.00	8.00	0.50	0.23	3.76	24111.95	0.124	1.99	0.00	2	0.2	2.6	1.5	0	3	20.85	85	Kuzawa
Targe-Swanson	Vanderhoof	5	60792	9.94	6042.72	60943	0.00	0.2	0	0	0.00	0.00	165	6043	0	0.27	9.93	0.20	98.3	16.80	0.00			0.00	3.20	0.27	0.13	2.03	12250.72	0.201	3.22	0.00	2	0.2	2.6	1.5	5	3	20.55	86	Targe-Swanson
Torpy River	Prince George	5	94244	11.02	10385.69	120449	0.77	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.22	0.10	1.65	10385.69	0.086	1.38	0.00	4	0.6	7.8	5	0	3	20.43	87	Torpy River	
Messlinka River	Mackenzie	6	205296	7.01	14391.25	205440	0.00	0.2	13166	0	0.00	0.00	0	0	0	0.00	0.00	0.00	85.2	14.80	24.50		0.00	1.60	0.08	0.04	0.60	14391.25	0.070	1.12	0.00	5	0.8	10.4	5	0	1.5	20.22	88	Messlinka River	
Whitefish Creek	Fort St. James	5	49420	8.70	4299.54	57173	0.16	0.2	0	35	0.06	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.21	0.10	1.58	4334.54	0.076	1.21	0.00	4	0.6	7.8	5	0	3	20.19	89	Whitefish Creek	
Carbon Creek	Dawson Creek	6	73296	6.39	4683.61	89259	0.00	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	97	-3	0.00		0.00	1.60	0.11	0.05	0.80	4683.61	0.052	0.84	0.00	5	0.8	10.4	5	0	1.5	20.14	90	Carbon Creek	
Nabeshe River	Mackenzie	5	109720	5.00	5486.00	153671	0.00	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	96.63	3.37	0.00		0.00	1.60	0.13	0.06	0.98	5486.00	0.036	0.57	0.00	5	0.8	10.4	5	0	1.5	20.06	91	Nabeshe River	
Racing River	Fort Nelson	6	66071	0.00	0.00	255854	0.00	0	0	40	0.02	0.00	162	0	0	0.06	0.00	0.00	98.4	1.60	0.00		0.00	0.00	0.05	0.02	0.38	202.00	0.001	0.01	0.00	6	1	13	5	0	1.5	19.89	92	Racing River	
Chowika River	Mackenzie	5	82963	6.03	5002.67	82963	0.00	0.2	0	5	0.01	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.05	0.02	0.38	5007.67	0.060	0.97	0.00	5	0.8	10.4	5	0	1.5	19.84	93	Chowika River	
Goat River	Robson Valley	5	45080	8.01	3610.91	72348	0.11	0.2	0	0	0.00	0.00	0	22	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.04	0.02	0.30	3610.91	0.050	0.80	0.00	5	0.8	10.4	5	0	1.5	19.60	94	Goat River	
Elleh River	Fort St. John	5	71832	0.21	150.85	139443	0.00	0.2	0	61	0.04	0.00	0	0	0	0.00	0.00	0.00	100.00	0.00	0.00		0.00	1.60	0.19	0.09	1.43	211.85	0.002	0.02	10.00	1	0	0	5	0	1.5	19.55	95	Elleh River	
Morkill	Robson Valley	5	84712	6.25	5294.50	141386	0.00	0.2	21	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.06	0.03	0.45	5294.50	0.037	0.60	0.00	5	0.8	10.4	5	0	1.5	19.55	96	Morkill	
Swanell Creek	Mackenzie	5	72984	3.00	2189.52	72984	0.00	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	99.9	0.10	0.00		0.00	1.60	0.06	0.03	0.45	2189.52	0.030	0.48	0.00	5	0.8	10.4	5	0	1.5	19.43	97	Swanell Creek	
Cleanwater	Mackenzie	5	74520	2.84	2116.37	112196	0.00	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.07	0.03	0.53	2116.37	0.019	0.30	0.00	5	0.8	10.4	5	0	1.5	19.33	98	Cleanwater	
Columbia River	Robson Valley	5	40682	15.27	6212.14	65915	0.27	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	99.9	0.10	0.00		0.00	1.60	0.36	0.17	2.70	6212.14	0.094	1.51	0.00	5	0.8	10.4	0	0	3	19.21	99	Columbia River	
Upper Prophet	Fort Nelson	5-6	274155	0.27	740.22	430249	0.00	0.2	0	97	0.02	0.00	6	5354	0	0.00	1.24	0.20	100.00	0.00	0.00		0.00	3.20	0.18	0.08	1.35	6197.22	0.014	0.23	0.00	4	0.6	7.8	5	0	1.5	19.08	100	Upper Prophet	
Lower Finlay	Mackenzie	6	347364	2.15	7468.33	488995	0.00	0.2	0	174	0.04	0.00	0	0	0	0.00	0.00	0.00	99.96	0.04	0.00		0.00	1.60	0.03	0.01	0.23	7642.33	0.016	0.25	0.00	5	0.8	10.4	5	0	1.5	18.98	101	Lower Finlay	
Ospika River	Mackenzie	6	179045	1.26	2255.97	179045	0.00	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.00	0.00	0.00		0.00	1.60	0.02	0.01	0.15	2255.97	0.013	0.20	0.00	5	0.8	10.4	5	0	1.5	18.85	102	Ospika River	
Nation River	Mackenzie	6	614374	6.65	40855.87	699864	0.07	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.32	0.15	2.40	40855.87	0.059	0.95	0.00	3	0.4	5.2	5	0	3	18.15	103	Nation River	
Rubytrock	Fort St. James	5	33087	3.87	1280.47	37419	0.32	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	99.5	0.50	0.00		0.00	1.60	0.01	0.08	0.98	1280.47	0.034	0.55	5.00	4	0.6	7.8	1.5	0	1.5	18.02	104	Rubytrock	
Scovill-Dastaga	Mackenzie	4	60048	7.10	4263.41	66173	0.78	0.2	0	2	0.00	0.00	0	0	0	0.00	0.00	0.00	99.8	0.20	0.00		0.00	1.60	0.27	0.13	2.03	4265.41	0.064	1.03	0.00	3	0.4	5.2	5	0	3	17.86	105	Scovill-Dastaga	
Packsdale-Blackwater	Robson Valley	4	48416	5.53	2677.40	115129	0.04	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	99.68	0.32	0.00		0.00	1.60	0.05	0.02	0.38	2677.40	0.023	0.37	0.00	5	0.8	10.4	3.33	0	1.5	17.58	106	Packsdale-Blackwater	
Wapiti River	Dawson Creek	6	207750	0.79	1641.23	207750	0.00	0.2	0	22	0.01	0.00	5	0	0	0.00	0.00	0.00	100.00	0.00	0.00		0.00	1.60	0.19	0.09	1.43	1668.23	0.008	0.13	0.00	4	0.6	7.8	5	0	1.5	17.46	107	Wapiti River	
Moule	Fort Nelson	5	150757	0.00	0.00	150757	0.00	0	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	99.8	0.20	0.00		0.00	0.00	0.06	0.03	0.45	0.00	0.00	0.00	0.00	5	0.8	10.4	5	0	1.5	17.35	108	Moule	
Seebach	Prince George	5	41812	19.50	8153.34	44386	0.00	0.2	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00																				

Table C1 Continued

Watershed	Forest District	Water-shed Order	Total Forest Area	Total Logging Density	Total Logging Area	Total Land (Ha)	Recent Logging Density	Forestry Score	Com-munity Watershed (Ha)	Urban Area (Ha)	Urban %	Urban Score	Agricultural Area (Ha)	Range Area (Ha)	Mine Area (Ha)	Agri-cultural %	Range %	Agri-cultural Score	Crown %	Private %	Com-munity Watershed %	Oil & Gas	Oil&Gas Score	NPS Score	Road Density	Weighted Roads	Road Score	Land Use Area (ha)	Land Use Density	Land Use Score	Point Source ***	Gradient Category *	Category Score	Gradient Score	Fisheries Score	Potable Supply* **	Access *	Total Score	Rank	Watershed
Grayingling	Fort Nelson	6	152077	0.00	0.00	152077	0.00	0	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	0.00	0.07	0.03	0.53	0.00	0.000	0.00	0.00	3	0.4	5.2	5	0	1.5	12.23	149	Grayingling
Hay River	Fort Nelson	6	271189	2.00	6718.00	433380	0.00	0	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.00	0.00	0.00	80	1.00	8.00	0.12	0.06	0.90	6718.00	0.016	0.25	0.00	1	0	0	1.5	0	1.5	12.15	150	Hay River
Kotcho River	Fort Nelson	6	223777	0.00	924.00	376394	0.00	0	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	23	1.00	8.00	0.14	0.07	1.05	924.00	0.002	0.04	0.00	1	0	0	1.5	0	1.5	12.09	151	Kotcho River
Geddes Creek	Fort Nelson	4	22703	0.00	0.00	22703	0.00	0	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	0.00	0.03	0.01	0.23	0.00	0.000	0.00	0.00	3	0.4	5.2	5	0	1.5	11.93	152	Geddes Creek
Kwadacha River	Mackenzie	6	125362	0.00	0.00	243665	0.00	0	0	5	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	0.00	0.00	0.00	0.00	5.00	0.000	0.00	0.00	5	0.8	10.4	1.5	0	0	11.90	153	Kwadacha River
Capot-Blanc	Fort Nelson	4	86462	1.70	1469.85	86462	0.00	0.2	0	25	0.03	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.02	0.01	0.16	1494.85	0.017	0.28	0.00	2	0.2	2.6	5	0	1.5	11.14	154	Capot-Blanc
Fishing Creek	Fort Nelson	6	88524	0.00	0.00	88524	0.00	0	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	0.00	0.01	0.00	0.08	0.00	0.000	0.00	0.00	4	0.6	7.8	1.5	0	1.5	10.88	155	Fishing Creek
Sowchea	Fort St. James	6	35383	8.65	3060.63	37557	0.00	0.2	0	0	0.00	0.00	38	0	0	0.10	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.29	0.14	2.18	3098.63	0.083	1.32	0.00	2	0.2	2.6	0	0	3	10.70	156	Sowchea
Kakwa River	Prince George	4	18626	0.00	0.00	35378	0.00	0	0	0	0.00	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	0.00	0.09	0.04	0.68	0.00	0.000	0.00	0.00	4	0.6	7.8	1.5	0	0	9.98	157	Kakwa River
Entiako Creek	Vanderhoof	5	154076	4.25	6548.23	171510	0.00	0.2	0	66	0.04	0.00	0	0	126	0.00	0.00	0.00	99.81	0.19	0.00		0.00	1.60	0.19	0.09	1.43	6614.23	0.039	0.62	0.00	2	0.2	2.6	1.5	0	1.5	9.24	158	Entiako Creek
Chedakuz	Vanderhoof	5	113087	7.23	8176.19	113087	0.00	0.2	0	0	0.00	0.00	433	0	106	0.38	0.00	0.00	99.9	0.14	0.00		0.00	1.60	0.09	0.04	0.64	8609.19	0.076	1.22	0.00	2	0.2	2.6	1.5	0	1.5	9.06	159	Chedakuz
Catkin Creek	Fort Nelson	4	133575	0.02	26.72	158434	0.00	0	0	39	0.02	0.00	0	0	0	0.00	0.00	0.00	100.00	0.00	0.00		0.00	0.00	0.11	0.05	0.80	65.72	0.000	0.01	0.00	3	0.4	5.2	1.5	0	1.5	9.01	160	Catkin Creek
Kiwigana-Klenteh	Fort Nelson	6	126184	2.18	2750.81	126184	0.00	0.2	0	17	0.01	0.00	0	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	1.60	0.07	0.03	0.53	2767.81	0.022	0.35	0.00	1	0	0	5	0	1.5	8.98	161	Kiwigana-Klenteh
Lower Liard	Fort Nelson	6-7	113204	8.00	9056.32	155381	0.00	0.2	0	84	0.05	0.00	0	0	0	0.00	0.00	0.00	99.98	0.02	0.00		0.00	1.60	0.11	0.05	0.83	9140.32	0.059	0.94	0.00	1	0	0	1.5	0	1.5	6.37	162	Lower Liard
Klua River	Fort Nelson	6	142978	1.58	2259.05	232253	0.00	0.2	0	47	0.02	0.00	47	355	0	0.02	0.15	0.00	99.83	0.17	0.00		0.00	1.60	0.14	0.07	1.05	2708.05	0.012	0.19	0.00	1	0	0	1.5	0	1.5	5.84	163	Klua River

\* Based on Road Density Information  
\*\* Based on Community Watersheds and Domestic Water Permits  
\*\*\* Point Source using February 28, 2003 MOE produced point Source map and a follow-up excel file.

Table C2: Second risk matrix priority ranking for the Omineca-Peace watershed characterization program.

Watershed	Forest District	Water-shed Order	Total Forest Area	Total Logging Density	Total Logging Area	Total Land (Ha)	Recent Logging Density	Forestry Score	Community Watershed (Ha)	Urban Area (Ha)	Urban %	Urban Score	Agri-cultural Area (Ha)	Range Area (Ha)	Agri-cultural %	Range %	Agri-cultural Score	Crown %	Private %	Community Watershed %	Oil & Gas	Oil&Gas Score	NPS Score	Road Density	Weighted Roads	Road Score	Land Use Area (ha)	Land Use Density	Land Use Score	Point Source	Gradient Category	Gradient Category Score	Drainage Density	Drainage Score	Water-shed Score	Fisheries Score	Potable Supply	Total Score	First Rank	Watershed	
Prince George	Prince George	4	29254	14.44	4224.28	39889	6.57	1	0	14795	37.09	1.00	4718	0	11.83	0.00	1.00	19.22	80.89	0.00	0.00	0.00	15.00	2.13	1.00	15.00	23737.28	0.595	8.93	10.00	2	0.2	1.66	0.4	9	5	62.93	1	Prince George		
McLennan	Robson Valley	5	31824	11.76	3742.50	5640	2.95	1	0	428	7.59	1.00	1025	0	18.17	0.00	1.00	100.0	0.00	0.00	0.00	15.00	0.24	0.11	1.69	5195.5	0.921	13.82	0.00	5	0.8	1.46	0.4	18	1.5	55.01	2	McLennan			
Pine River	Dawson Creek	6-7	334554	6.71	22448.57	366855	0.54	0.2	0	476	0.12	0.00	16569	0	4.28	0.00	1.00	97.40	2.60	0.00	25	1.00	11.00	0.25	0.12	1.76	39493.57	0.102	1.53	10.00	4	0.6	2.3	0.6	18	5	52.29	8	Pine River		
Pouce Coupe	Dawson Creek	5	65725	10.49	6894.55	163849	0.00	0.2	0	1661	1.01	1.00	94308	0	57.56	0.00	1.00	79.41	20.59	0.00	15	1.00	16.00	1.19	0.56	8.38	102983.6	0.628	9.42	5.00	2	0.2	1.11	0.4	9	1.5	49.30	3	Pouce Coupe		
Stoney Creek	Vanderhoof	5	39809	31.08	12372.64	58623	9.26	1	0	630	1.07	1.00	11655	479	19.90	0.82	1.00	82.2	17.90	0.00	0.00	15.00	1.19	0.56	8.38	25146.6	0.429	6.43	0.00	2	0.2	1.92	0.4	9	5	48.91	4	Stoney Creek			
Tabor Creek	Prince George	5	28413	15.17	4310.25	35186	4.98	1	0	824	2.34	1.00	4461	0	12.68	0.00	1.00	99.99	0.01	0.00	0.00	15.00	1.32	0.62	9.30	9595.25	0.273	4.09	0.00	3	0.4	1.56	0.4	12	3.33	5	48.72	6	Tabor Creek		
Lower Beaton	Fort St. John	6	601951	2.49	14988.58	738686	0.13	0.2	0	660	0.09	0.00	133747	2983	18.11	0.40	1.00	74.20	25.80	0.00	> 100	1.00	11.00	0.75	0.35	5.28	152378.6	0.206	3.09	10.00	2	0.2	1.52	0.4	9	5	48.38	7	Lower Beaton		
Chilco-Murray	Vanderhoof	3	15557	27.25	4239.28	29493	3.79	1	0	511	1.73	1.00	12907	0	43.76	0.00	1.00	36.2	63.79	0.00	0.00	15.00	1.38	0.66	9.75	17657.28	0.599	8.98	0.00	1	0	1.96	0.4	6	3.33	5	48.06	5	Chilco-Murray		
Halfway River	Fort St. John	6-7	726259	5.27	38273.85	940173	0.07	0.2	0	370	0.04	0.00	20156	25516	2.14	2.71	1.00	95.65	4.35	0.00	90	1.00	11.00	0.28	0.13	1.97	84315.8	0.090	1.35	0.00	4	0.8	2.57	0.6	21	5	45.32	11	Halfway River		
Naver	Prince George	5	85057	33.59	28570.65	90119	9.82	1	0	281	0.31	0.00	2523	0	2.80	0.00	1.00	99.84	0.16	0.00	0.00	10.00	0.84	0.39	5.92	31374.65	0.348	5.22	0.00	3	0.4	1.48	0.4	12	5	43.14	9	Naver			
Hansard Creek	Prince George	4	13211	39.62	5234.20	13891	9.44	1	0	0	0.00	0.00	0	0	0.00	0.00	0.00	83.3	16.70	0.00	0.00	5.00	1.41	0.86	9.93	5234.2	0.377	5.65	0.00	3	0.4	1.85	0.4	12	5	42.58	14	Hansard Creek			
Salmon	Prince George	6	384598	20.61	79265.65	445787	2.12	1	0	731	0.16	0.00	11216	0	2.52	0.00	1.00	100.00	0.00	0.00	0.00	10.00	0.82	0.29	4.37	91212.65	0.205	3.07	5.00	2	0.2	1.84	0.4	9	5	41.44	12	Salmon			
Sweden-Culcutz	Prince George	5	92912	21.80	20254.82	107172	4.26	1	0	297	0.28	0.00	6194	0	5.78	0.00	1.00	100.0	0.00	0.00	0.00	10.00	1.21	0.57	8.52	26745.8	0.250	3.74	0.00	2	0.2	1.67	0.4	9	5	41.26	10	Sweden-Culcutz			
Twin Creek	Robson Valley	4	20305	13.36	2712.75	38379	1.44	1	0	0	0.00	0.00	4	0	0.01	0.00	0.00	100.0	0.00	0.00	0.00	5.00	1.54	0.72	10.85	2716.75	0.071	1.06	0.00	5	0.8	2.86	0.6	21	3.33	41.24	26	Twin Creek			
Cache-Wilder	Fort St. John	5	84602	3.06	2588.82	64082	0.00	0.2	0	0	0.00	0.00	19663	0	30.68	0.00	1.00	60.29	39.71	0.00	>100	1.00	11.00	0.65	0.31	4.65	22251.8	0.347	5.21	0.00	2	0.2	1.15	0.4	9	5	39.86	13	Cache-Wilder		
Murray River	Dawson Creek	6	537057	4.35	23361.98	648916	0.07	0.2	0	1094	0.17	0.00	16989	0	2.62	0.00	1.00	99.9	0.10	0.00	13	0.50	8.50	0.29	0.14	2.04	41444.98	0.064	0.96	5.00	4	0.6	2.1	0.6	18	5	39.50	25	Murray River		
Stone Creek	Prince George	4	31017	25.06	7772.86	33584	3.97	1	0	158	0.47	0.00	1258	0	3.75	0.00	1.00	100.0	0.00	0.00	0.00	10.00	0.97	0.46	6.83	9188.86	0.274	4.10	0.00	3	0.4	1.96	0.4	12	1.5	5	39.44	17	Stone Creek		
Chilako River	Prince George	6	330924	19.91	65886.97	328520	1.12	1	0	1229	0.37	0.00	9823	336	2.99	0.10	1.00	89.7	10.26	0.00	0.00	10.00	0.96	0.45	6.75	77275.0	0.235	3.53	0.00	2	0.2	1.93	0.4	9	5	39.28	16	Chilako River			
McCorkall-Trapping	Prince George	4	32067	17.11	5486.66	37153	3.66	1	0	55	0.15	0.00	1160	0	3.12	0.00	1	99.9	0.14	0.00	0.00	10.00	1.12	0.53	7.89	6701.66	0.180	2.71	0.00	2	0.2	2.36	0.6	12	1.5	5	39.09	22	McCorkall-Trapping		
Blueberry River	Fort St. John	5	226456	8.80	19928.13	232434	0.00	0.2	0	10	0.00	0.00	49900	0	21.47	0.00	1.00	78.59	21.41	0.00	>100	1.00	11.00	0.62	0.29	4.35	69838.1	0.300	4.51	0.00	2	0.2	1.45	0.4	9	5	38.86	15	Blueberry River		
Willow	Prince George	6	260071	37.09	96460.33	276206	8.29	1	0	394	0.14	0.00	2731	0	0.99	0.00	0.00	100.0	0.00	0.00	0.00	5.00	0.89	0.42	6.27	99585.33	0.361	5.41	5.00	3	0.4	1.76	0.4	12	5	38.68	23	Willow			
Nevin-Small	Robson Valley	4	21508	7.50	1613.10	65024	3.88	1	0	0	0.00	0.00	4904	32	0.75	0.05	1.00	89.75	10.25	0.00	0.00	10.00	0.09	0.04	0.63	2135.10	0.033	0.49	0.00	5	0.8	2.21	0.6	21	1.5	5	38.63	28	Nevin-Small		
Kakathine River	Dawson Creek	5	310349	5.86	18186.45	409784	0.00	0.2	0	24	0.01	0.00	86496	1133	21.60	0.28	1.00	68.70	31.30	0.00	>100	1.00	11.00	0.54	0.25	3.80	107839.5	0.283	3.95	0.00	2	0.2	1.36	0.4	9	5	37.75	18	Kakathine River		
Crooked River	Prince George	6	188744	31.98	60360.33	218981	8.05	1	0	255	0.12	0.00	97	0	0.04	0.00	0.00	96.30	3.70	0.00	0.00	5.00	0.48	0.23	3.38	60712.33	0.277	4.16	0.00	3	0.4	2.62	0.6	15	5	37.54	30	Crooked River			
Moberly River	Dawson Creek	5	162021	6.76	10952.62	184735	0.00	0.2	0	0	0.00	0.00	5908	0	3.20	0.00	1.00	100.0	0.00	0.00	66	1.00	11.00	0.42	0.20	2.96	16860.62	0.091	1.37	0.00	3	0.4	1.73	0.4	12	5	37.33	20	Moberly River		
Frog River	Mackenzie	6	3507158	7.90	277065.5	256137	0.70	0.2	0	0	0.00	0.00	0	1176	0.00	0.46	0.00	100.0	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.21	0.55	1.086	16.29	0.00	5	0.8	2.27	0.6	21	5	43.29	35	Frog River
Kiwa-Tete	Robson Valley	4	13828	13.82	1911.03	41720	0.61	0.2	0	0	0.00	0.00	21	0	0.05	0.00	0.00	98.8	1.20	0.00	0.00	1.00	0.14	0.07	0.99	1932.03	0.046	0.69	0.00	6	1	2.68	0.6	24	5	36.68	51	Kiwa-Tete			
Alices River	Fort St. John	5	45830	1.54	705.78	84436	0.00	0.2	0	0	0.00	0.00	37162	0	44.01	0.00	1.00	30.36	69.64	0.00	>100	1.00	11.00	1.13	0.53	7.95	37867.8	0.448	6.73	0.00	1	0	1.14	0.4	6	5	36.68	19	Alices River		
Sukunka River	Dawson Creek	6	258083	5.31	13598.01	314658	0.13	0.2	0	859	0.27	0.00	4228	0	1.34	0.00	1.00	58.4	41.56	0.00	0.00	6.00	0.24	0.11	1.69	18685.01	0.059	0.89	5.00	4	0.6	2.61	0.6	18	5	36.58	34	Sukunka River			
Toodoponne River	Mackenzie	5	65311	0.00	0.00	142788	0.00	0	0	46	0.03	0.00	0	6982	0.00	4.89	0.20	100.0	0.00	0.00	0.00	1.00	0.05	0.02	0.35	7028.00	0.049	0.74	5.00	5	0.8	3.4	0.8	24	5	36.08	67	Toodoponne River			
Olsson Creek	Prince George	4	31964	43.71	13871.46	33554	13.38	1	0	0	0.00	0.00	0	0	0.00	0.00	0.00	98.3	1.70	0.00	0.00	5.00	1.11	0.52	7.82	13971.46	0.416	6.25	0.00	3	0.4	2.14	0.6	15	1.5	35.56	36	Olsson Creek			
MacGregor	Prince George	6-7	96668	11.33	10272.68	180460	1.33	1	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	5.00	0.21	0.10	1.48	10272.68	0.057	0.88	0.00	5	0.8	1.97	0.4	18	5	35.33	32	MacGregor			
Gething River	Dawson Creek	5	60901	13.69	8337.35	64535	0.89	0.2	0	250	0.39	0.00	1082	0	1.68	0.00	1.00	96.47	3.53	0.00	0.00	6.00	0.55	0.26	3.87	9669.35	0.150	2.25	0.00	4	0.6	2.02	0.6	18	5	35.12	41	Gething River			
Fraser-Francois	Vanderhoof	6	93134	11.82	11008.44	108329	1.00	1	0	549	0.51	0.00	2607	255	2.41	0.24	1.00	89.34	10.66	0.00	0.00	10.00	0.86	0.40	6.06	14419.4	0.133	2.20	0.00	3	0.4	1.8	0.4	12	5	35.05	24	Fraser-Francois			
Hungary-Slim	Prince George	5	67340	23.23	15643.08	74851	1.98	1	0	60	0.0																														

Table C2 continued

Watershed	Forest District	Water-shed Order	Total Forest Area	Total Logging Density	Total Logging Area	Total Land (Ha)	Recent Logging Density	Forestry Score	Community Watershed (Ha)	Urban Area (Ha)	Urban %	Urban Score	Agri-cultiv Area (Ha)	Range Area (Ha)	Agri-cultural %	Range %	Agri-cultural Score	Crown %	Private %	Community Watershed %	Oil & Gas	Oil&Gas Score	NPS Score	Road Density	Weighted Roads	Road Score	Land Use Area (ha)	Land Use Density	Land Use Score	Point Source	Gradient Category	Gradient Category Score	Drainage Density	Drainage Score	Water-shed Score	Fishenes Score	Potable Supply	Total Score	First Rank	Watershed
Pinchi	Fort St. James	6	95109	13.86	13182.11	111259	1.24	1	0	73	0.07	0.00	513	0	0.46	0.00	0.00	100.0	0.00	0.00	0.00	5.00	0.47	0.22	3.31	13768.11	0.124	1.86	5.00	2	0.2	1.91	0.4	9	5	29.17	45	Pinchi		
Upper Muskwa	Fort Nelson	5-6	236101	0.00	0.00	507272	0.00	0	0	0	0.00	0.00	0	324	0.00	0.06	0.00	100.0	0.00	0.00	0.00	0.00	0.02	0.01	0.14	324.00	0.001	0.01	0.00	5	0.8	3.25	0.8	24	5	29.15	111	Upper Muskwa		
Wicked River	Mackenzie	5	20204	0.00	0.00	20204	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.30	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5	0.8	3.09	0.8	24	5	29.00	130	Wicked River	
Masilinka River	Mackenzie	6	205296	7.01	14391.25	205440	0.00	0.2	13166	0	0.00	0.00	0	0	0.00	0.00	0.00	85.2	14.80	24.50	0.00	1.00	0.08	0.04	0.96	14391.25	0.070	1.05	0.00	5	0.8	2.2	0.6	21	5	28.61	88	Masilinka River		
Carbon Creek	Dawson Creek	6	73286	6.39	4683.61	89299	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	97	3	0.00	0.00	1.00	0.11	0.05	0.75	4683.61	0.052	0.79	0.00	5	0.8	2.56	0.6	21	5	28.54	90	Carbon Creek		
Chowika River	Mackenzie	5	82963	6.03	5002.67	82963	0.00	0.2	0	5	0.01	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.05	0.02	0.35	5007.67	0.060	0.91	0.00	5	0.8	2.45	0.6	21	5	28.26	93	Chowika River		
Goat River	Robson Valley	5	45800	8.01	3610.91	72348	0.11	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.04	0.02	0.28	3610.91	0.050	0.75	0.00	5	0.8	2.69	0.6	21	5	28.03	94	Goat River		
Morkill	Robson Valley	5	84712	6.25	5294.50	141386	0.00	0.2	21	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.06	0.03	0.42	5294.50	0.037	0.56	0.00	5	0.8	2.25	0.6	21	5	27.98	96	Morkill		
Swannel Creek	Mackenzie	5	72984	3.00	2189.52	72984	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.9	0.10	0.00	0.00	1.00	0.06	0.03	0.42	2189.52	0.030	0.45	0.00	5	0.8	2.05	0.6	21	5	27.87	97	Swannel Creek		
Clearwater	Mackenzie	5	714520	2.84	2116.37	112196	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.07	0.03	0.49	2116.37	0.019	0.28	0.00	5	0.8	2.85	0.6	21	5	27.78	98	Clearwater		
Lower Finlay	Mackenzie	6-7	347364	2.15	7466.33	488995	0.00	0.2	0	174	0.04	0.00	0	0	0.00	0.00	0.00	99.96	0.04	0.00	0.00	1.00	0.03	0.01	0.21	7462.33	0.016	0.23	0.00	5	0.8	2.86	0.6	21	5	27.45	101	Lower Finlay		
Milligan Creek	Fort St. John	5	96981	0.09	87.28	186020	0.00	0	0	152	0.08	0.00	0	5724	0	3.04	0.00	1.00	100.00	0.00	>100	1.00	10.00	0.41	0.19	2.89	5963.28	0.032	0.48	0.00	1	0	2	0.6	9	5	27.36	53	Milligan Creek	
Clear-Tatsunai	Vanderhoof	3	21019	22.33	4693.54	667304	1.23	1	0	0	0.00	0.00	4494	0	0.67	0.00	0.00	70.0	30.00	0.00	0.00	5.00	0.94	0.44	6.62	9187.54	0.014	0.21	0.00	2	0.2	1.85	0.4	9	1.5	5	27.33	55	Clear-Tatsunai	
Kazchek	Fort St. James	5	198140	11.33	22449.26	244572	0.10	0.2	0	342	0.14	0.00	15	0	0.01	0.00	0.00	99.71	0.36	0.00	0.00	1.00	0.41	0.19	2.89	22806.26	0.093	1.40	5.00	3	0.4	1.8	0.4	12	5	27.29	68	Kazchek		
Narraway River	Dawson Creek	5	48642	0.00	0.00	77109	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.16	0.08	1.13	0.00	0.000	0.00	0.00	4	0.6	3.36	0.8	21	5	27.13	126	Narraway River		
Braid River	Mackenzie	5	85926	0.00	0.00	85926	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.08	0.04	0.60	0.00	0.000	0.00	0.00	5	0.8	3.17	0.8	24	1.5	27.10	123	Braid River		
Hugh-Allen	Robson Valley	5	33191	0.10	33.19	80491	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.00	0.00	0.00	33.19	0.001	0.01	0.00	5	0.8	2.03	0.6	21	5	27.01	113	Hugh-Allen		
Topsy River	Prince George	5	94244	11.02	10395.69	120449	0.77	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.22	0.10	1.55	10395.69	0.086	1.29	0.00	4	0.6	2.2	0.6	18	5	26.84	87	Topsy River		
Eklund-Bevel	Mackenzie	4	67890	19.14	12992.23	67890	0.00	0.2	0	5	0.01	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.41	0.19	2.89	12992.23	0.191	2.87	0.00	4	0.6	1.6	0.4	15	5	26.76	73	Eklund-Bevel		
Blackwater Creek	Mackenzie	5	42227	25.09	10594.75	42227	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.71	0.33	4.95	10594.75	0.251	3.76	0.00	3	0.4	1.83	0.4	12	5	26.71	70	Blackwater Creek		
Camsell	Fort St. James	4	17615	19.99	3521.24	19534	2.00	1	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.99	0.01	0.00	0.00	5.00	0.71	0.33	4.95	3521.24	0.180	2.70	0.00	2	0.2	1.47	0.4	9	5	26.65	60	Camsell		
Omineca River	Mackenzie	6	427438	1.00	4022.00	584503	0.00	0.2	0	64	0.01	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.06	0.03	0.42	4086.00	0.007	0.10	0.00	4	0.6	1.91	0.4	15	5	26.53	82	Omineca River		
Dog-Burnstead	Fort St. James	4	28706	17.98	5164.21	32317	0.05	0.2	89	0	0.23	0.00	89	0	0.28	0.01	0.00	97.37	2.63	0.00	0.00	1.00	0.57	0.27	4.01	5327.21	0.166	2.47	0.00	2	0.2	1.96	0.4	9	5	26.49	69	Dog-Burnstead		
Upper Prophet	Fort Nelson	5-6	274155	0.27	740.22	430249	0.00	0.2	0	97	0.02	0.00	0	6354	0.00	1.24	0.20	100.00	0.00	0.00	0.00	2.00	0.18	0.08	1.27	6197.22	0.014	0.22	0.00	4	0.6	2.44	0.6	18	5	26.48	100	Upper Prophet		
Stanolind	Fort Nelson	5	73779	9.43	6957.36	73779	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.74	0.26	0.00	0.00	1.00	1.84	0.86	12.96	6957.36	0.094	1.41	0.00	1	0	1.18	0.4	6	5	26.37	66	Stanolind		
Necoslie	Fort St. James	5	63803	11.64	7426.67	74108	0.26	0.2	0	426	0.57	0.00	2565	0	3.46	0.00	1.00	85.2	14.80	0.00	0.00	6.00	0.67	0.31	4.72	10417.67	0.141	2.11	0.00	2	0.2	2.25	0.6	12	1.5	26.33	71	Necoslie		
Packsdale-Blackwater	Robson Valley	4	48416	5.53	2677.40	115129	0.04	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.68	0.32	0.00	0.00	1.00	0.05	0.02	0.35	2677.40	0.023	0.35	0.00	5	0.8	2.06	0.6	21	3.33	26.03	106	Packsdale-Blackwater		
Pelly Creek	Mackenzie	6	88100	0.00	0.00	88100	0.00	0	0	25	0.03	0.00	0	0	0.00	0.00	0.00	99.9	0.10	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.000	0.00	0.00	5	0.8	2.47	0.6	21	5	26.00	127	Pelly Creek		
Mid-Finlay	Mackenzie	5	126053	0.02	25.33	239620	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.9	0.00	0.00	0.00	1.00	0.00	0.00	0.00	25.33	0.000	0.00	0.00	5	0.8	2.74	0.6	21	5	26.00	128	Mid-Finlay		
Gataga River	Mackenzie	6	173455	0.00	0.00	173455	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	0.00	5	0.8	2.82	0.6	21	5	26.00	129	Gataga River		
Greer Creek	Vanderhoof	4	36390	4.28	1556.21	36390	0.23	0.2	1	0	0.00	0.00	699	1557	1.92	4.28	1.00	99.9	0.05	0.00	0.00	6.00	0.20	0.09	1.41	3812.21	0.105	1.57	0.00	2	0.2	2.13	0.6	12	5	25.98	74	Greer Creek		
Kwadacha River	Mackenzie	6	125362	0.00	0.00	243665	0.00	0	0	5	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.000	0.00	0.00	5	0.8	3.07	0.8	24	1.5	25.50	153	Kwadacha River		
Wapiti River	Dawson Creek	6	207750	0.79	1641.23	207750	0.00	0.2	0	22	0.01	0.00	5	0	0.00	0.00	0.00	100.00	0.00	0.00	0.00	1.00	0.19	0.09	1.34	1668.23	0.008	0.12	0.00	4	0.6	2.61	0.6	18	5	25.46	107	Wapiti River		
Herrick	Prince George	6	143392	4.37	6266.23	231777	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100	0	0	0	1.00	0.08	0.04	0.56	6266.23	0.027	0.41	0.00	4	0.6	2.51	0.6	18	5	24.97	114	Herrick		
Manson River	Mackenzie	5	138133	11.44	15802.42	152778	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.33	0.15	2.32	15802.42	0.103	1.55	0.00	4	0.6	1.52	0.4	15	5	24.88	81	Manson River		
Seabach	Prince George	5	41812	19.50	8153.34	44366	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00</																								

Table C2 continued

Watershed	Forest District	Water-shed Order	Total Forest Area	Total Logging Density	Total Logging Area	Total Land (Ha)	Recent Logging Density	Forestry Score	Community Watershed (Ha)	Urban Area (Ha)	Urban %	Urban Score	Agri-cultural Area (Ha)	Range Area (Ha)	Agri-cultural %	Range %	Agri-cultural Score	Crown %	Private %	Community Watershed %	Oil & Gas	Oil&Gas Score	NPS Score	Road Density	Weighted Roads	Road Score	Land Use Area (ha)	Land Use Density	Land Use Score	Point Source	Gradient Category	Gradient Category Score	Drainage Density	Drainage Score	Water-shed Score	Fisheries Score	Potable Supply	Total Score	First Matrix Rank	Watershed	
Sowchea	Fort St. James	6	35383	8.65	3060.63	37557	0.00	0.2	0	0	0.00	0.00	38	0	0.10	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.29	0.14	2.04	3098.63	0.083	1.24	0.00	2	0.2	2.28	0.6	12	0		16.28	156	Sowchea		
Capot-Blanc	Fort Nelson	4	86462	1.70	1469.85	86462	0.00	0.2	0	25	0.03	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.02	0.01	0.15	1494.85	0.017	0.26	0.00	2	0.2	1.56	0.4	9	5	15.41	154	Capot-Blanc			
Big Bend-Lucas	Vanderhoof	4	59426	13.67	8123.53	59593	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.7	0.30	0.00	0.00	1.00	0.41	0.19	2.85	8123.53	0.136	2.04	0.00	2	0.2	1.76	0.4	9	0	14.89	148	Big Bend-Lucas			
Gutah	Fort St. John	5	185011	0.79	1461.59	185011	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	6.00	0.14	0.07	0.99	1461.59	0.008	0.12	0.00	1	0	1.43	0.4	6	1.5	14.60	139	Gutah		
Chinchaga	Fort St. John	5	55085	0.00	0.00	75505	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	5.00	0.26	0.12	1.83	0.00	0.000	0.00	0.00	1	0	1.39	0.4	6	1.5	14.33	137	Chinchaga		
Catkin Creek	Fort Nelson	4	133575	0.02	26.72	158434	0.00	0	0	39	0.02	0.00	0	0	0.00	0.00	0.00	100.00	0.00	0.00	0.00	1.00	0.00	0.11	0.05	0.75	65.72	0.000	0.01	0.00	3	0.4	1.96	0.4	12	1.5	14.26	160	Catkin Creek		
Kotcho River	Fort Nelson	6	223777	0.00	924.00	376394	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	23	1.00	5.00	0.14	0.07	0.99	924.00	0.002	0.04	0.00	1	0	1.19	0.4	6	1.5	13.52	151	Kotcho River		
Lower Pettitot	Fort Nelson	5-6	176918	0.00	0.00	176918	0.00	0	0	110	0.06	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	71	1.00	5.00	0.06	0.03	0.42	110.00	0.001	0.01	0.00	1	0	0.77	0.2	3	5	13.43	133	Lower Pettitot
Entiako Creek	Vanderhoof	5	154076	4.25	6548.23	171510	0.00	0.2	0	66	0.04	0.00	0	0	0.00	0.00	0.00	99.81	0.19	0.00	0.00	1.00	0.19	0.09	1.34	6614.23	0.039	0.58	0.00	2	0.2	1.26	0.4	9	1.5	13.42	158	Entiako Creek			
Chedakuz	Vanderhoof	5	113087	7.23	8176.19	113087	0.00	0.2	0	0	0.00	0.00	433	0	0.38	0.00	0.00	99.9	0.14	0.00	0.00	1.00	0.09	0.04	0.60	8609.19	0.076	1.14	0.00	2	0.2	1.48	0.4	9	1.5	13.24	159	Chedakuz			
Kwigiana-Klenteh	Fort Nelson	6	126184	2.18	2750.81	126184	0.00	0.2	0	17	0.01	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	1.00	0.07	0.03	0.49	2767.81	0.022	0.33	0.00	1	0	1.05	0.4	6	5	12.82	161	Kwigiana-Klenteh			
Sahteneh River	Fort Nelson	6	266891	0.54	1441.21	411409	0.00	0.2	0	271	0.07	0.00	0	0	0.00	0.00	0.00	99.32	0.68	0.00	0.00	1.00	6.00	0.20	0.09	1.41	1712.21	0.004	0.06	0.00	1	0	0.98	0.2	3	1.5	11.97	122	Sahteneh River		
Hay River	Fort Nelson	6	271189	2.00	6718.00	433380	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.00	0.00	0.00	0.00	1.00	5.00	0.12	0.06	0.85	6718.00	0.016	0.23	0.00	1	0	0.98	0.2	3	1.5	10.58	150	Hay River		
Klua River	Fort Nelson	6	142978	1.58	2259.05	232253	0.00	0.2	0	47	0.02	0.00	47	355	0.02	0.15	0.00	99.83	0.17	0.00	0.00	1.00	0.14	0.07	0.99	2708.05	0.012	0.17	0.00	1	0	1.58	0.4	6	1.5	9.66	163	Klua River			
Lower Liard	Fort Nelson	6-7	113204	8.00	9056.32	155381	0.00	0.2	0	84	0.05	0.00	0	0	0.00	0.00	0.00	99.98	0.02	0.00	0.00	1.00	0.11	0.05	0.77	9140.32	0.059	0.88	0.00	1	0	0.95	0.2	3	1.5	7.16	162	Lower Liard			

Table C3: Third risk matrix watershed rankings for the Omineca-Peace regional NPS watershed characterization program.

Watershed		Forest District	Watershed Order	Total Forest Area (ha)	Total Logging Density	Total Logging Area (ha)	Total Land (Ha)	Recent Logging Density	Forestry Score	Community Watershed (Ha)	Urban Area (Ha)	Urban %	Urban Score	Agr. cultural Area (Ha)	Agr. cultural %	Range %	Agr. cultural Score	Crown %	Private %	Community Watershed %	Oil & Gas	Oil/Gas Score	NPS Score	Road Density	Weighted Road Density	Stream Crossing (Crossing/km road)	Roads + Crossings	Land Use Area (ha)	Land Use Density	Land Waste Permit	Land Storage Permit	Land Water Permit	Land Use Sum	Point Score **	Gradient Category *	Gradient Category Score	Drainage Density	Drainage Score	Fisheries Score	Potable Supply*	Total Score	First Matrix Rank	Watershed
Tabor Creek	Prince George	5	28413	15.17	4310.25	35186	4.98	1	0	824	2.34	1.00	4461	0	12.68	0.00	1.00	99.99	0.01	0.00	0.00	3.00	1.32	0.82	1.15	1.52	9995.25	0.273	0.00	0.00	1.00	1.79	0.00	3	0.4	1.56	0.4	0.67	1	46.09	6	Tabor Creek	
Prince George	Prince George	4	29254	14.44	4224.28	39889	6.57	1	0	14795	37.09	1.00	4718	0	11.83	0.00	1.00	19.22	80.89	0.00	0.00	3.00	2.13	1.00	0.39	0.83	23737.28	0.595	10.00	0.00	1.00	1.43	2.00	2	0.2	1.86	0.4	1	0	43.43	1	Prince George	
Chilco-Murray	Vanderhoof	3	15557	27.25	4239.28	29493	3.79	1	0	511	1.73	1.00	12907	0	43.76	0.00	1.00	36.2	63.79	0.00	0.00	3.00	1.38	0.65	0.92	1.27	17657.28	0.599	0.00	0.00	0.00	1.87	0.00	1	0	1.96	0.4	0.67	1	40.77	5	Chilco-Murray	
McLennan	Robson Valley	5	31824	11.76	3742.50	5640	2.95	1	0	428	7.59	1.00	1025	0	18.17	0.00	1.00	100.0	0.00	0.00	0.00	3.00	0.24	0.11	0.79	0.19	5195.50	0.921	0.00	0.00	0.00	1.11	0.00	5	0.8	1.46	0.4	0.3	1	40.73	2	McLennan	
Pouce Coupe	Dawson Creek	5	65725	10.49	6894.55	163849	0.00	0.2	0	1661	1.01	1.00	94308	0	57.56	0.00	1.00	79.41	20.59	0.00	15	1.00	3.20	1.19	0.56	0.63	102863.55	0.628	2.00	0.00	0.00	1.38	1.00	2	0.2	1.11	0.4	0.3	0	39.40	3	Pouce Coupe	
Stoney Creek	Vanderhoof	5	39809	31.08	12372.64	58623	9.28	1	0	630	1.07	1.00	11665	478	19.90	0.82	1.00	82.3	17.80	0.00	0.00	3.00	1.19	0.56	0.67	0.64	25146.64	0.429	3.00	0.00	0.00	1.23	0.00	2	0.2	1.92	0.4	1	34.13	4	Stoney Creek		
Pine River	Dawson Creek	6-7	334554	6.71	22448.57	386555	0.54	0.2	0	476	0.12	0.00	16569	0	4.28	0.00	1.00	97.40	2.60	0.00	25	1.00	2.20	0.25	0.12	0.54	0.14	39493.57	0.102	4.00	0.00	0.00	0.24	2.00	4	0.6	2.3	0.6	1	29.39	8	Pine River	
Lower Beaton	Fort St. John	6	601951	2.49	14988.58	738686	0.13	0.2	0	660	0.09	0.00	133747	2983	18.11	0.40	1.00	74.20	25.80	0.00	>100	1.00	2.20	0.75	0.35	0.65	0.49	152378.58	0.206	3.00	0.00	0.00	0.69	2.00	2	0.2	1.52	0.4	1	27.65	7	Lower Beaton	
Halfway River	Fort St. John	6-7	726259	5.27	38273.85	940173	0.07	0.2	0	370	0.04	0.00	20156	25516	2.14	2.71	1.00	95.65	4.35	0.00	90	1.00	2.20	0.28	0.13	0.68	0.19	84315.85	0.090	0.00	0.00	0.00	0.28	0.00	4	0.8	2.57	0.6	1	24.33	11	Halfway River	
Naver	Prince George	5	85057	33.59	28570.65	90119	9.82	1	0	281	0.31	0.00	2523	0	2.80	0.00	1.00	99.84	0.16	0.00	0.00	2.00	2.00	0.84	0.39	0.81	0.51	31374.65	0.348	0.00	0.00	0.00	0.86	0.00	3	0.4	1.48	0.4	1	22.27	9	Naver	
Sweden-Clucutz	Prince George	5	92912	21.80	20254.82	107172	4.26	1	0	297	0.29	0.00	6194	0	5.78	0.00	1.00	100.0	0.00	0.00	0.00	2.00	1.21	0.57	0.64	0.77	26745.82	0.250	2.00	0.00	0.00	1.02	0.00	2	0.2	1.67	0.4	1	21.86	10	Sweden-Clucutz		
Salmon	Prince George	6	384598	20.61	79265.65	445787	2.12	1	0	731	0.16	0.00	11216	0	2.52	0.00	1.00	100.00	0.00	0.00	0.00	2.00	0.62	0.29	0.63	0.39	91212.65	0.205	0.00	0.00	0.00	0.60	1.00	2	0.2	1.84	0.4	1	21.15	12	Salmon		
Chilako River	Prince George	6	330924	19.91	65886.97	328520	1.12	1	0	1229	0.37	0.00	9823	336	2.99	0.10	1.00	89.7	10.26	0.00	0.00	2.00	0.96	0.45	0.69	0.66	77274.97	0.235	3.00	0.00	0.00	0.90	0.00	2	0.2	1.93	0.4	1	20.47	16	Chilako River		
Sinkut-McKnight	Vanderhoof	5	45770	17.70	9932.09	56314	6.23	1	0	40	0.07	0.00	6548	356	11.63	0.63	1.00	100.00	0.00	0.00	0.00	2.00	0.74	0.35	0.97	0.72	16876.09	0.300	0.00	0.00	0.00	1.02	0.00	2	0.2	1.85	0.4	0	1	19.79	27	Sinkut-McKnight	
McCorkill-Trapping	Prince George	4	32067	21.11	5486.66	37153	3.86	1	0	55	0.15	0.00	1160	0	3.12	0.00	1.00	99.9	0.14	0.00	0.00	2.00	1.12	0.53	0.50	0.56	6701.66	0.180	0.00	0.00	0.00	0.74	0.00	2	0.2	2.36	0.6	0.3	1	19.54	22	McCorkill-Trapping	
Stone Creek	Prince George	4	31017	25.06	7772.86	33584	3.97	1	0	158	0.47	0.00	1258	0	3.75	0.00	1.00	100.0	0.00	0.00	0.00	2.00	0.97	0.46	0.46	0.47	9188.86	0.274	0.00	0.00	0.00	0.74	0.00	3	0.4	1.95	0.4	0.3	1	19.53	17	Stone Creek	
Moberly River	Dawson Creek	5	162021	6.76	10952.62	184735	0.00	0.2	0	0	0.00	0.00	5908	0	3.20	0.00	1.00	100.0	0.00	0.00	66	1.00	2.20	0.42	0.20	0.92	0.39	16860.62	0.091	1.00	0.00	0.00	0.48	0.00	3	0.4	1.73	0.4	1	19.46	20	Moberly River	
Murray River	Dawson Creek	6	537057	4.35	23361.98	648916	0.07	0.2	0	1094	0.17	0.00	16989	0	2.62	0.00	1.00	99.9	0.10	0.00	13	0.50	1.70	0.29	0.14	0.46	0.13	41444.98	0.064	0.00	0.00	0.00	0.20	1.00	4	0.6	2.1	0.6	1	19.06	25	Murray River	
Nevin -Small	Robson Valley	4	21508	7.50	1613.10	65024	3.88	1	0	0	0.00	0.00	490	32	0.75	0.05	1.00	89.75	10.25	0.00	0.00	2.00	0.09	0.04	0.67	0.06	2135.10	0.033	0.00	0.00	0.00	0.09	0.00	5	0.8	2.21	0.6	0.3	1	19.02	28	Nevin -Small	
Kokikwain River	Dawson Creek	5	310340	5.86	16105.05	409736	0.00	0.2	0	310340	5.86	0.00	8847	1133	21.68	0.28	1.00	68.70	31.30	0.00	>100	1.00	2.20	0.54	0.98	0.37	107539.45	0.263	0.00	0.00	0.00	0.63	0.00	2	0.2	1.36	0.4	1	18.69	18	Kokikwain River		
Blueberry River	Fort St. John	5	226456	8.80	19828.13	232434	0.00	0.2	0	10	0.00	0.00	49900	0	21.47	0.00	1.00	78.59	21.41	0.00	0.00	1.00	2.20	0.62	0.29	0.52	69838.13	0.300	0.00	0.00	0.00	0.62	0.00	2	0.2	1.45	0.4	1	18.80	15	Blueberry River		
Fraser-Francois	Vanderhoof	6	93134	11.82	11008.44	108329	1.00	1	0	549	0.51	0.00	2607	255	2.41	0.24	1.00	89.34	10.66	0.00	0.00	2.00	0.86	0.40	0.66	0.57	14419.44	0.133	2.00	1.00	7.00	0.70	0.00	3	0.4	1.8	0.4	1	18.51	24	Fraser-Francois		
Aloes River	Fort St. John	5	45830	1.54	705.78	84436	0.00	0.2	0	0	0.00	0.00	37162	0	44.01	0.00	1.00	30.36	69.64	0.00	>100	1.00	2.20	1.13	0.53	0.44	0.50	37867.78	0.448	1.00	0.00	0.00	0.95	0.00	1	0	1.14	0.4	1	0	18.28	19	Aloes River
Cache-Wilder	Fort St. John	5	84602	3.06	2588.82	64082	0.00	0.2	0	0	0.00	0.00	19863	0	30.68	0.00	1.00	60.29	39.71	0.00	>100	1.00	2.20	0.65	0.31	0.34	0.22	22251.82	0.347	0.00	2.00	1.00	0.67	0.00	2	0.2	1.15	0.4	1	18.14	13	Cache-Wilder	
Altau	Prince George	6	60000	26.32	16030.81	71181	4.57	1	0	34	0.06	0.00	1470	0	2.07	0.00	1.00	82.45	17.81	0.00	0.00	2.00	0.59	0.26	0.44	0.45	17541.00	0.246	0.00	0.00	0.00	0.68	0.00	2	0.2	2.24	0.6	0.3	1	16.91	30	Altau	
Tako-Bonnalie	Prince George	4	18550	16.22	33008.81	20085	2.55	1	0	0	0.00	0.00	740	0	3.68	0.00	1.00	99.85	0.15	0.00	0.00	2.00	0.79	0.37	0.56	0.44	3748.81	0.187	0.00	1.00	4.00	0.53	0.00	2	0.2	2.34	0.6	0.3	0	16.32	40	Tako-Bonnalie	
Hansard Creek	Prince George	4	13211	39.62	5234.20	13891	9.44	1	0	0	0.00	0.00	0	0	0.00	0.00	0.00	83.3	16.70	0.00	0.00	1.00	1.41	0.66	0.84	0.90	5234.20	0.377	1.00	0.00	1.00	1.28	0.00	3	0.4	1.85	0.4	1	15.44	44	Hansard Creek		
Sukunka River	Dawson Creek	6	256083	5.31	13598.01	314658	0.13	0.2	0	859	0.27	0.00	4228	0	1.34	0.00	1.00	58.4	41.56	0.00	0.00	1.20	0.24	0.11	0.67	0.16	18685.01	0.059	2.00	0.00	0.00	0.22	1.00	4	0.6	2.61	0.6	1	0	15.37	34	Sukunka River	
Willow	Prince George	6	260071	37.09	96460.33	276206	8.29	1	0	394	0.14	0.00	2731	0	0.99	0.00	1.00	100.0	0.00	0.00	0.00	1.00	0.89	0.42	0.81	0.54	98585.33	0.361	1.00	0.00	0.00	0.90	1.00	3	0.4	1.76	0.4	1	0	15.37	23	Willow	
Eight Mile-Septimus	Dawson Creek	4	7828	0.63	64.97	27634	0.00	0.2	0	453	1.61	1.00	19383	0	69.88	0.00	1.00	3.41	96.59	0.00	0.00	1.00	2.20	0.17	0.91	0.89	19990.97	0.719	0.00	0.00	0.00	1.02	0.00	1	0	1.22	0.4	1	1	15.28	31	Eight Mile-Septimus	
Gething River	Dawson Creek	5	60901	13.69	8337.35	64535	0.89	0.2	0	250	0.39	0.00	1082	0	1.68	0.00	1.00	96.47	3.53	0.00	0.00	1.00	1.20	0.55	0.26	0.83	0.46	9669.35	0.150	1.00	0.00	0.00	0.61	0.00	4	0.6	2.02	0.6	1	0	13.92	41	Gething River
Olsson Creek	Prince George	4	31964	43.71	13971.46	33554	13.38	1	0	0	0.00	0.00																															

Table C3 continued

Watershed	Forest District	Watershed Order	Total Forest Area (ha)	Total Logging Density	Total Logging Area (ha)	Total Land (Ha)	Recent Logging Density	Forestry Score	Community Watershed (Ha)	Urban Area (Ha)	Urban %	Urban Score	Agri-cultural Area (Ha)	Range Area (Ha)	Agri-cultural %	Range %	Agri-cultural Score	Crown %	Private %	Community Watershed %	Oil & Gas	Oil&Gas Score	NPS Score	Road Density	Weighted Road Density	Stream Crossing Density (Crossing/k m road)	Roads * Crossings	Land Use Area (ha)	Land Use Density	Land Waste Permit	Land Storage Permit	Water Permit	Land Use Sum	Point Source **	Gradient Category *	Gradient Category Score	Drainage Density	Drainage Score	Fisheries Score	Potable Supply*	Total Score	First Matrix Rank	Watershed
RedWillow	Dawson Creek	5	124949	2.77	3461.09	132766	0.17	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.8	0.20	0.00	0.00	0.00	0.20	0.31	0.15	0.76	0.23	3461.09	0.026	0.00	0.00	0.00	0.26	1.00	2	0.2	1.04	0.4	0.3	0	5.54	117	RedWillow
Canoe River	Robson Valley	4	30491	5.75	1753.23	58232	0.38	0.2	21	146	0.25	0.00	369	0	0.63	0.00	0.00	85.2	4.80	0.00	0.00	0.00	0.20	0.11	0.05	0.37	0.04	2268.23	0.039	1.00	2.00	2.00	0.08	0.00	5	0.8	1.37	0.4	1	5.41	58	Canoe River	
Dog-Burnstead	Fort St. James	4	28706	17.99	5164.21	32317	0.05	0.2	0	74	0.23	0.00	89	0	0.28	0.00	0.00	97.37	2.63	0.00	0.00	0.00	0.20	0.57	0.27	0.84	0.48	5327.21	0.165	0.00	0.00	0.00	0.64	0.00	2	0.2	1.96	0.4	1	5.37	69	Dog-Burnstead	
Omineca River	Mackenzie	6	427348	1.00	4022.00	584503	0.00	0.2	0	64	0.01	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.06	0.03	0.97	0.06	4086.00	0.007	0.00	0.00	0.00	0.07	0.00	4	0.6	1.91	0.4	1	5.17	82	Omineca River	
Fontas Creek	Fort St. John	6	540121	1.00	5880.00	867247	0.00	0	0	185	0.03	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	20	1.00	1.00	0.19	0.09	0.72	0.14	6165.00	0.009	0.00	0.00	1.00	0.15	0.00	2	0	1.53	0.4	1	5.00	119	Fontas Creek	
Upper Petlitot	Fort Nelson	4-5	469064	0.00	0.00	735714	0.00	0	0	488	0.07	0.00	0	0	0.00	0.00	0.00	99.99	0.01	0.00	>100	1.00	1.00	0.14	0.07	1.03	0.14	488.00	0.001	0.00	0.00	0.00	0.14	0.00	1	0	1.09	0.4	1	5.00	124	Upper Petlitot	
Upper Prophet	Fort Nelson	5-6	274155	0.27	740.22	430249	0.00	0.2	0	97	0.02	0.00	6	5354	0.00	1.24	0.20	100.00	0.00	0.00	0.00	0.00	0.40	0.18	0.08	0.72	0.13	6197.22	0.014	0.00	0.00	0.00	0.14	0.00	4	0.6	2.44	0.6	1	4.96	100	Upper Prophet	
Targe-Swanson	Vanderhoof	5	60792	9.94	6042.72	60843	0.00	0.2	0	0	0.00	0.00	165	6043	0.27	99.3	0.20	83.2	16.80	0.00	0.00	0.00	0.40	0.27	0.13	0.63	0.17	12250.72	0.201	0.00	0.00	0.00	0.37	0.00	2	0.2	1.56	0.4	0.3	1	4.74	86	Targe-Swanson
Raush River	Robson Valley	5	30617	0.41	125.53	101127	0.00	0.2	0	16	0.02	0.00	402	0	0.40	0.00	0.00	99.90	0.10	0.00	0.00	0.00	0.20	0.00	0.00	1.41	0.00	543.53	0.005	0.00	0.00	0.00	0.01	0.00	6	1	2.51	0.6	0.3	1	4.37	83	Raush River
Chinehaga	Fort St. John	5	55085	0.00	0.00	75905	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	66	1.00	1.00	0.26	0.12	0.98	0.25	0.00	0.00	0.00	2.00	0.25	0.00	1	0	1.39	0.4	0.3	0	4.20	137	Chinehaga	
Frog River	Mackenzie	6	2224892	7.90	175759.36	256137	0.70	0.2	0	0	0.00	0.00	0	1176	0.00	0.46	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	176935.36	0.691	0.00	0.00	0.00	0.69	0.00	5	0.8	2.27	0.6	1	4.30	35	Frog River	
Stanolind	Fort Nelson	5	73779	9.43	6957.36	73779	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.74	0.26	0.00	0.00	0.00	0.20	1.84	0.86	0.76	1.40	6957.36	0.094	0.00	0.00	0.00	1.49	0.00	1	0	1.18	0.4	1	4.08	66	Stanolind	
Toad River	Fort Nelson	6	155705	0.00	0.00	155705	0.00	0	0	67	0.04	0.00	23	0	0.01	0.00	0.00	88.7	11.30	0.00	0.00	0.00	0.00	0.05	0.02	0.67	0.03	90.00	0.001	1.00	0.00	0.00	0.03	0.00	5	0.8	2.89	0.6	1	4.00	78	Toad River	
Moose	Robson Valley	5	41145	0.00	0.00	114141	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	94.30	5.70	0.00	0.00	0.00	0.00	0.02	0.01	0.57	0.01	0.00	0.000	0.00	0.00	0.01	0.00	5	0.8	2.15	0.6	1	4.00	88	Moose		
Guth	Fort St. John	5	34091	0.79	1461.59	185011	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	56	1.00	1.20	0.14	0.07	0.73	0.10	1461.59	0.008	0.00	0.00	0.00	0.11	0.00	1	0	1.43	0.4	0.3	0	3.97	79	Guth
Nahesche River	Mackenzie	5	109720	5.00	5486.00	153671	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	96.63	3.37	0.00	0.00	0.00	0.20	0.13	0.06	0.69	0.09	6486.00	0.036	1.00	0.00	0.00	0.13	0.00	5	0.8	3.01	0.8	1	3.90	139	Nahesche River	
Davis River	Mackenzie	5	19249	21.88	4211.68	19249	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.05	0.02	0.66	0.03	4211.68	0.219	1.00	1.00	0.00	0.25	0.00	5	0.8	2.37	0.6	1	3.82	91	Davis River	
Ospika River	Mackenzie	6	179045	1.26	2255.97	179045	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.20	0.02	0.01	0.59	0.01	2255.97	0.013	0.00	0.00	0.00	0.02	0.00	5	0.8	3.05	0.8	1	3.79	77	Ospika River	
Ake River	Mackenzie	6	96076	0.17	163.33	96076	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.00	0.00	1.14	0.00	163.33	0.002	0.00	0.00	0.00	0.00	0.00	5	0.8	3.57	0.8	1	3.76	102	Ake River	
South-Cut Thumb	Mackenzie	4	69295	3.71	2176.42	69295	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	94.49	15.51	0.00	0.00	0.00	0.20	0.03	0.02	0.39	0.08	2576.42	0.037	0.00	0.00	0.00	0.12	0.00	5	0.8	2.26	0.6	1	3.75	112	South-Cut Thumb	
Clearwater	Mackenzie	5	74520	2.84	2116.37	112196	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.07	0.03	1.34	0.09	2116.37	0.019	0.00	0.00	0.00	0.11	0.00	5	0.8	2.85	0.6	1	3.66	76	Clearwater	
Blackwater Creek	Mackenzie	5	42227	25.09	10594.75	42227	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.71	0.33	0.65	0.46	10594.75	0.251	0.00	0.00	1.00	0.71	0.00	3	0.4	1.83	0.4	1	3.66	98	Blackwater Creek	
Carbon Creek	Dawson Creek	6	73296	6.39	4683.61	89259	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	97	3	0.00	0.00	0.00	0.20	0.11	0.05	0.49	0.05	4683.61	0.052	1.00	1.00	1.00	0.11	0.00	5	0.8	2.56	0.6	1	3.66	70	Carbon Creek	
Morkill	Robson Valley	5	84712	6.25	5294.50	141386	0.00	0.2	21	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.06	0.03	1.03	0.08	5294.50	0.037	0.00	0.00	0.00	0.10	0.00	5	0.8	2.25	0.6	1	3.65	90	Morkill	
Swanmel Creek	Mackenzie	5	72984	3.04	2189.52	72984	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	98.9	0.10	0.00	0.00	0.00	0.20	0.08	0.04	1.10	0.07	2189.52	0.030	0.00	0.00	0.00	0.10	0.00	5	0.8	2.66	0.6	1	3.65	96	Swanmel Creek	
Masilinka River	Mackenzie	6	205296	7.01	14391.25	205440	0.00	0.2	13166	0	0.00	0.00	0	0	0.00	0.00	0.00	85.2	14.80	24.50	0.00	0.00	0.20	0.08	0.04	3.00	0.02	14391.25	0.070	1.00	0.00	0.00	0.09	0.00	5	0.8	2.2	0.6	1	3.64	97	Masilinka River	
Chowika River	Mackenzie	5	82963	6.03	5002.67	82963	0.00	0.2	0	5	0.01	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.05	0.02	0.48	0.02	5007.67	0.060	0.00	0.00	0.00	0.08	0.00	5	0.8	2.45	0.6	1	3.63	93	Chowika River	
Goat River	Robson Valley	5	45080	8.01	3610.91	72348	0.11	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.04	0.02	0.73	0.03	3610.91	0.050	0.00	0.00	0.00	0.08	0.00	5	0.8	2.69	0.6	1	3.63	94	Goat River	
Torpy River	Prince George	5	94244	11.02	10385.69	120449	0.77	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.22	0.10	0.76	0.17	10385.69	0.086	0.00	0.00	0.00	0.25	0.00	4	0.6	2.2	0.6	1	3.60	87	Torpy River	
Lower Finlay	Mackenzie	6-7	347264	2.15	7469.33	488955	0.00	0.2	0	174	0.01	0.00	0	0	0.00	0.00	0.00	99.98	0.04	0.00	0.00	0.00	0.20	0.03	0.01	0.51	0.02	7469.33	0.027	1.00	0.00	0.00	0.03	0.00	5	0.8	2.86	0.6	1	3.57	101	Lower Finlay	
Manson River	Mackenzie	5	138133	11.44	15802.42	152778	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.33	0.15	0.95	0.31	15802.42	0.103	0.00	0.00	1.00	0.42	0.00	4	0.6	1.52	0.4	1	3.56	81	Manson River	
Eklund-Bevel	Mackenzie	4	67880	19.14	12992.23	67880	0.00	0.2	0	5	0.01	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00	0.00	0.00	0.20	0.41	0.19	0.51	0.21	12997.23	0.191	1.00	0.00</												

Table C3 continued

Watershed	Forest District	Watershed Order	Total Forest Area (ha)	Total Logging Density	Total Logging Area (ha)	Total Land (Ha)	Recent Logging Density	Forestry Score	Community Watershed (Ha)	Urban Area (Ha)	Urban %	Urban Score	Agri-cultural Area (Ha)	Range Area (Ha)	Agri-cultural %	Range %	Agri-cultural Score	Crown %	Private %	Community Watershed %	Oil & Gas	Oil&Gas Score	NPS Score	Road Density	Weighted Road Density	Stream Crossing Density (Crossing/k m road)	Roads * Crossings	Land Use Area (ha)	Land Use Density	Land Waste Permit	Land Storage Permit	Water Permit	Land Use Sum	Point Source **	Gradient Category *	Gradient Category Score	Drainage Density	Drainage Score	Fisheries Score	Potable Supply*	Total Score	First Matrix Rank	Watershed
Sahteneh River	Fort Nelson	6	266891	0.54	1441.21	411409	0.00	0.2	0	271	0.07	0.00	0	0	0.00	0.00	0.00	99.32	0.68	0.00	44	1.00	1.20	0.20	0.09	0.00	0.00	1712.21	0.004	0.00	0.00	0.00	0.00	0.00	1	0	0.98	0.2	0.3	0	1.95	122	Sahteneh River
Taiuk Creek	Vanderhoof	5	64846	18.98	12307.77	73758	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	63.5	36.50	0.00		0.00	0.20	0.42	0.20	0.59	0.25	12307.77	0.167	0.00	0.00	0.00	0.41	0.00	2	0.2	1.25	0.4	0.3	0	1.72	136	Taiuk Creek
Big Bend-Lucas	Vanderhoof	4	59426	13.67	8123.53	59593	0.00	0.2	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.7	0.30	0.00		0.00	0.20	0.41	0.19	0.64	0.26	8123.53	0.136	0.00	2.00	2.00	0.40	0.00	2	0.2	1.76	0.4	0.3	0	1.70	148	Big Bend-Lucas
Entiako Creek	Vanderhoof	5	154076	4.25	6548.23	171510	0.00	0.2	0	66	0.04	0.00	0	0	0.00	0.00	0.00	99.81	0.19	0.00		0.00	0.20	0.19	0.09	0.45	0.09	6614.23	0.039	0.00	0.00	0.00	0.12	0.00	2	0.2	1.26	0.4	0.3	0	1.40	158	Entiako Creek
Chedakuz	Vanderhoof	5	113087	7.23	8176.19	113087	0.00	0.2	0	0	0.00	0.00	433	0	0.38	0.00	0.00	99.9	0.14	0.00		0.00	0.20	0.09	0.04	0.52	0.05	8609.19	0.078	0.00	0.00	0.00	0.12	0.00	2	0.2	1.48	0.4	0.3	0	1.40	159	Chedakuz
Sowchea	Fort St. James	6	35383	8.65	3060.63	37557	0.00	0.2	0	0	0.00	0.00	36	0	0.10	0.00	0.00	100.0	0.00	0.00		0.00	0.20	0.29	0.14	0.96	0.28	3098.63	0.083	0.00	0.00	2.00	0.36	0.00	2	0.2	2.28	0.6	0	0	1.28	156	Sowchea
Klua River	Fort Nelson	6	142978	1.58	2259.05	232253	0.00	0.2	0	47	0.02	0.00	47	355	0.02	0.15	0.00	99.83	0.17	0.00		0.00	0.20	0.14	0.07	0.50	0.07	2708.05	0.012	0.00	0.00	0.00	0.08	0.00	1	0	1.58	0.4	0.3	0	1.13	163	Klua River
Lower Liard	Fort Nelson	6-7	113204	8.00	9056.32	155381	0.00	0.2	0	84	0.05	0.00	0	0	0.00	0.00	0.00	99.98	0.02	0.00		0.00	0.20	0.11	0.05	0.63	0.07	9140.32	0.059	0.00	0.00	3.00	0.13	0.00	1	0	0.95	0.2	0.3	0	0.96	162	Lower Liard
Osilinka River	Mackenzie	5	143595	7.20	10414.00	210479	0.00	0	0	34	0.02	0.00	82		0.04	0.00	0.00	100.0	0.00	0.00		0.00	0.00	0.08	0.04	0.66	0.05	10530.00	0.050	0.00	0.00	0.00	0.10	0.00	5	0.8	1.65	0.4	0.3	0	0.60	134	Osilinka River
Kwadacha River	Mackenzie	6	125362	0.00	0.00	243665	0.00	0	0	5	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	0.00	0.00	0.00	0.81	0.00	5.00	0.000	0.00	0.00	0.00	0.00	0.00	5	0.8	3.07	0.8	0.3	0	0.60	153	Kwadacha River
Kaiwa River	Prince George	4	18626	0.00	0.00	38376	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	0.00	0.09	0.04	0.72	0.05	0.00	0.000	0.00	0.00	0.00	0.06	0.00	4	0.6	2.45	0.6	0.3	0	0.60	157	Kaiwa River
Fox River	Mackenzie	6	928544	0.02	185.71	185891	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	0.00	0.03	0.01	0.70	0.02	185.71	0.001	0.00	0.00	2.00	0.02	0.00	5	0.8	2.69	0.6	0.3	0	0.60	142	Fox River
Fishing Creek	Fort Nelson	6	88524	0.00	0.00	88524	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	100.0	0.00	0.00		0.00	0.00	0.01	0.00	0.42	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	4	0.6	2.4	0.6	0.3	0	0.60	155	Fishing Creek
Catkin Creek	Fort Nelson	4	133575	0.02	26.72	158434	0.00	0	0	39	0.02	0.00	0	0	0.00	0.00	0.00	100.00	0.00	0.00		0.00	0.00	0.11	0.05	0.72	0.08	65.72	0.000	0.00	0.00	0.00	0.08	0.00	3	0.4	1.96	0.4	0.3	0	0.60	160	Catkin Creek
Robson River	Robson Valley	4	9199	0.00	0.00	41143	0.00	0	0	0	0.00	0.00	0	0	0.00	0.00	0.00	99.8	0.20	0.00		0.00	0.00	0.07	0.03	1.22	0.09	0.00	0.000	0.00	0.00	0.00	0.09	0.00	5	0.8	2.37	0.6	0	0	0.00	147	Robson River

\* Based on Community Watersheds and Domestic Water Permits

\*\* Point Source using February 28, 2003 MOE produced point Source map and a follow-up excel file.



## **Appendix D**

*Watershed Statistics Summary Data Files for OP Risk Matrices*

## **Appendix E**

*Non-Forestry Activity Data Summary (MSRM, 2002)*

Table E1: Non-Forestry summary land use data from Watersheds B.C.

Watershed	Urban Area (ha)	Agricultural Area (ha)	Range Area (ha)	Oil and Gas Wells	Crown Lands (ha)	Private Lands (ha)	Total Lands (ha)	Urban %	Agricultural %	Range %	Crown %	Private %	Forest District
Ahbau	33	1470	0		58501	12680	71181	0.05	2.07	0.00	82.19	17.81	Prince George
Akie River	0	0	0		96076	0	96076	0.00	0.00	0.00	100.0	0.00	Mackenzie
Alces River	0	37162	0	>100	25638	58798	84436	0.00	44.01	0.00	30.36	69.64	Fort St. John
Beaver	0	0	0		162446	0	162446	0.00	0.00	0.00	100.0	0.00	Fort Nelson
Betty-Wendle	0	0	0		45522	0	45522	0.00	0.00	0.00	100.0	0.00	Robson Valley
Big Bend-Lucas	0	0	0		59426	167	19593	0.00	0.00	0.00	99.7	0.30	Vanderhoof
Blackwater Creek	0	0	0		42227	376	42603	0.00	0.00	0.00	100.0	0.00	Mackenzie
Blueberry River	10	49900	0	>100	232434	63335	295769	0.00	16.87	0.00	78.59	21.41	Fort St. John
Bowron River	0	433	29		276072	843	276915	0.00	0.16	0.01	99.7	0.30	Prince George
Braid River	0	0	0		85926	0	85926	0.00	0.00	0.00	100.0	0.00	Mackenzie
Cache-Wilder	0	19663	0	>100	64082	42213	106295	0.00	18.50	0.00	60.29	39.71	Fort St. John
Camsell	0	0	0		19534	1	19535	0.00	0.00	0.00	99.99	0.01	Fort St. James
Canoe River	146	369	0		58232	2930	61162	0.24	0.60	0.00	85.2	4.80	Robson Valley
Capot-Blanc	25	0	0		86462	0	86462	0.03	0.00	0.00	100.0	0.00	Fort Nelson
Carbon Creek	0	0	0		89259	2348	91607	0.00	0	0	97	3	Dawson Creek
Castle Creek	0	52	0		51777	173	51950	0.00	0.10	0.00	99.7	0.30	Robson Valley
Catkin Creek	39	0	0		158434	0	158434	0.02	0.00	0.00	100.00	0.00	Fort Nelson
Chedakuz	0	433	0		113087	159	113246	0.00	0.38	0.00	99.9	0.14	Vanderhoof
Chilako River	1229	9823	336		328520	37577	366097	0.34	2.68	0.09	89.7	10.26	Prince George
Chilco-Murray	511	12907	0		10680	18813	29493	1.73	43.76	0.00	36.2	63.79	Vanderhoof
Chinchaga	0	0	0	66	75505	0	75505	0.00	0.00	0.00	100.0	0.00	Fort St. John
Chowika River	5	0	0		82963	0	82963	0.01	0.00	0.00	100.0	0.00	Mackenzie
Clear-Tatsui	0	4494	0		610755	56549	667304	0.00	22.22	0.00	70.0	30.00	Vanderhoof
Clearwater	0	0	0		112196	0	112196	0.00	0.00	0.00	100.0	0.00	Mackenzie
Columbia River	0	0	0		65829	86	65915	0.00	0.00	0.00	99.9	0.10	Robson Valley
Crooked River	255	97	0		210870	8111	218981	0.12	0.04	0.00	96.30	3.70	Prince George
Davis River	0	0	0		19249	0	19249	0.00	0.00	0.00	100.0	0.00	Mackenzie
Dog-Burns	74	89	0		31467	850	32317	0.23	0.28	0.00	97.37	2.63	Fort St. James
Doig River	0	20634	0	>100	171511	32665	204176	0.00	10.11	0.00	84.00	84.00	Fort St. John
Dome Creek	204	11	0		27153	616	27769	0.73	0.04	0.00	97.8	2.20	Prince George
Dore River	202	80	56		41020	388	41408	0.49	0.19	0.14	99.1	0.90	Robson Valley
Driftwood	43	77	33		188072	25	188097	0.02	0.04	0.02	99.99	0.01	Fort St. James
Dunedin River	53	0	0		331777	0	331777	0.02	0.00	0.00	100.00	0	Fort Nelson
Dunlevy Creek	0	8	263		66889	235	67124	0.00	0.01	0.39	99.65	0.35	Dawson Creek
Eight Mile-Septimus	453	19383	0		945	26749	27694	1.64	69.99	0.00	3.41	96.59	Dawson Creek
Eklund-Bevel	5	0	0		67880	0	67880	0.01	0.00	0.00	100.0	0.00	Mackenzie
Elleh River	61	0	0		139443	0	139443	0.04	0.00	0.00	100.00	0.00	Fort St. John
Entiako Creek	66	0	0		171179	331	171510	0.04	0.00	0.00	99.81	0.19	Vanderhoof
Farrel Creek	7	9247	2116		81627	15130	96757	0.01	9.56	2.19	84.36	15.64	Fort St. John
Firesteel	71	0	2368		169228	0	169228	0.04	0.00	1.93	100.0	0.00	Mackenzie
Fishing Creek	0	0	0		88524	0	88524	0.00	0.00	0.00	100.0	0.00	Fort Nelson
Fontas Creek	185	0	0	20	667247	0	667247	0.03	0.00	0.00	100.00	0.00	Fort St. John
Fox River	0	0	0		185885	6	185891	0.00	0.00	0.00	100.0	0.00	Mackenzie
Fraser-Francois	549	2607	255		96779	11550	108329	0.51	2.41	0.24	89.34	10.66	Vanderhoof
Frog River	0	0	1176		256137	0	256137	0.00	0.00	0.46	100.0	0.00	Mackenzie
Gataga River	0	0	0		421933	0	421933	0.00	0.00	0.00	100.0	0.00	Mackenzie
Geddes Creek	0	0	0		22703	0	22703	0.00	0.00	0.00	100.0	0.00	Fort Nelson
Gething River	250	1082	0		62259	2276	64535	0.39	1.68	0.00	96.47	3.53	Dawson Creek
Goat River	0	0	0		72348	0	72348	0.00	0.00	0.00	100.0	0.00	Robson Valley
Grayling	0	0	0		152077	0	152077	0.00	0.00	0.00	100.0	0.00	Fort Nelson
Greer Creek	0	699	1557		36360	20	36380	0.00	1.92	4.28	99.9	0.05	Vanderhoof
Gutah	0	0	0	56	185011	0	185011	0.00	0.00	0.00	100.0	0.00	Fort St. John
Halfay River	370	20156	25516	90	899269	40904	940173	0.04	2.14	2.71	95.65	4.35	Fort St. John
Hammet Creek	4	0	0		32185	0	32185	0.01	0.00	0.00	100.00	0.00	Prince George
Hansard Creek	0	0	0		11574	2317	13891	0.00	0.00	0.00	83.3	16.70	Prince George
Hay River	105	0	0	80	433380	0	433380	0.02	0.00	0.00	100.00	0.00	Fort Nelson
Herrick	0	0	0		231777	0	231777	0.00	0	0	100	0	Prince George
Hiyu-Moxley	147	173	0		24259	1047	25306	0.58	0.68	0.00	95.9	4.10	Prince George
Holmes River	0	51	24		79343	769	80112	0.00	0.06	0.03	99.0	1.00	Robson Valley
Hugh-Allen	0	0	0		80491	0	80491	0.00	0.00	0.00	100.0	0.00	Robson Valley
Hungary-Slim	60	0	0		74580	271	74851	0.08	0.00	0.00	99.6	0.40	Prince George

Table E1 continued

Watershed	Urban Area (Ha)	Agricultural Area (Ha)	Range Area (Ha)	Oil & Gas Well	Crown Lands (Ha)	Private Lands (Ha)	Total Lands	Urban %	Agricultural %	Range %	Crown %	Private %	Forest District
Ingenika River	3680	91795	211		125031	0	125031	2.94	0.16	0.17	100.0	0.00	Mackenzie
Kakwa River	0	0	0		35378	0	35378	0.00	0.00	0.00	100.0	0.00	Prince George
Kazchek	342	15	0		243862	890	244572	0.14	0.01	0.00	99.71	0.36	Fort St. James
Kenneth Creek	0	0	0		27239	161	27400	0.00	0.00	0.00	99.4	0.60	Prince George
Kiskatinaw River	24	88496	1133	>100	281529	128265	409794	0.01	21.60	0.28	68.70	31.30	Dawson Creek
Kiwas-Tete	0	21	0		41216	504	41720	0.00	0.05	0.00	98.8	1.20	Robson Valley
Kiwigana-Klenteh	17	0	0		126184	0	126184	0.01	0.00	0.00	100.0	0.00	Fort Nelson
Klua River	47	47	355		231856	397	232253	0.02	0.02	0.15	99.83	0.17	Fort Nelson
Kotcho Creek	116	0	0		376394	0	376394	0.03	0.00	0.00	100.00	0.00	Fort Nelson
Kuzkwa	12	0	0	23	193462	419	193881	0.01	0.00	0.00	99.78	0.22	Fort St. James
Kwadacha River	5	0	0		243154	151	243665	0.00	0.00	0.00	100.0	0.00	Mackenzie
Lower Beaton	660	133747	2983	> 100	548055	190631	738686	0.09	18.11	0.40	74.20	25.80	Fort St. John
Lower Finlay	174	0	0		488783	212	488995	0.04	0.00	0.00	99.96	0.04	Mackenzie
Lower Liard	84	0	0		155349	32	155381	0.05	0.00	0.00	99.98	0.02	Fort Nelson
Lower Muskwa	1946	411	0		710199	6587	716786	0.27	0.06	0.00	99.08	0.92	Fort Nelson
Lower Petitiot	110	0	0	71	176918	0	176918	0.06	0.00	0.00	100.0	0.00	Fort Nelson
Lower Prophet	173	594	2346	10	414908	929	415837	0.04	0.14	0.56	99.78	0.22	Fort Nelson
Lower Sikanni	263	0	2025	>100	677655	210	677865	0.04	0.00	0.30	99.97	0.03	Fort St. John
MacGregor	0	0	0		180460	0	180460	0.00	0.00	0.00	100.00	0.00	Prince George
MacLeod River	0	0	0		85866	1	85867	0.00	0.00	0.00	100.0	0.00	Mackenzie
Manson River	0	0	0		152778	0	152778	0.00	0.00	0.00	100.0	0.00	Mackenzie
Maurice River	0	0	0		26773	66	26839	0.00	0.00	0	99.9	0.14	Dawson Creek
McCorkall-Trapping	55	1160	0		31706	5447	37153	0.15	3.12	0.00	85.3	14.70	Prince George
McKale	0	27	0		382411	155	382566	0.00	0.01	0.00	100.0	0.00	Robson Valley
McLennan	428	1025	0		45692	7948	53640	0.80	1.91	0.00	85.2	14.80	Robson Valley
Mesilinka River	0	0	0		205296	144	205440	0.00	0.00	0.00	99.9	0.10	Mackenzie
Mid-Finlay	0	0	0		239820	0	239820	0.00	0.00	0.00	100.00	0.00	Mackenzie
Milligan Creek	152	5724	0	>100	181372	6648	188020	0.08	3.04	0.00	96.46	3.54	Fort St. John
Misinchinka-Colbourne	282	10	0		166570	552	167122	0.17	0.01	0.00	99.9	0.10	Mackenzie
Misinchinsilinka River	298	0	0		40215	683	40898	0.73	0.00	0.00	98.33	1.67	Mackenzie
Missinka-Wichicka	0	0	0		70235	0	70235	0.00	0.00	0.00	100.0	0.00	Prince George
Moberly River	0	5908	0	66	174208	10527	184735	0.00	3.20	0.00	94.30	5.70	Dawson Creek
Moose	0	0	0		114122	19	114141	0.00	0.00	0.00	100.0	0.00	Robson Valley
Morkill	0	0	0		141099	287	141386	0.00	0.00	0.00	99.8	0.20	Robson Valley
Moule	0	0	0		150757	0	150757	0.00	0.00	0.00	100.0	0.00	Fort Nelson
Mugaha Creek	199	0	0		19643	8	19651	1.01	0.00	0.00	99.9	0.10	Mackenzie
Murray River	1094	16989	0	13	627052	21864	648916	0.17	2.62	0.00	96.63	3.37	Dawson Creek
Nabesche River	0	0	0		153671	0	153671	0.00	0.00	0.00	100.0	0.00	Mackenzie
Narraway River	0	0	0		77109	0	77109	0.00	0.00	0.00	100.0	0.00	Dawson Creek
Nation River	0	0	0		689740	1124	690864	0.00	0.00	0.00	99.84	0.16	Mackenzie
Naver	281	2523	0		76783	13336	90119	0.31	2.80	0.00	85.2	14.80	Prince George
Necoslie	426	2565	0		66515	7594	74109	0.57	3.46	0.00	89.75	10.25	Fort St. James
Nevin -Small	0	490	32		63888	1136	65024	0.00	0.75	0.05	98.3	1.70	Robson Valley
Olsson Creek	0	0	0		32274	1280	33554	0.00	0.00	0.00	96.2	3.80	Prince George
Omineca River	64	0	0		584482	21	584503	0.01	0.00	0.00	100.00	0.00	Mackenzie
Osilinka River	34	82	0		210479	0	210479	0.02	0.04	0.00	100.00	0.00	Mackenzie
Ospika River	0	0	0		179045	0	179045	0.00	0.00	0.00	100.0	0.00	Mackenzie
Pack River	192	14	0		33942	110	34052	0.00	0.04	0.00	99.68	0.32	Mackenzie
Packsdale-Blackwater	0	0	0		115054	75	115129	0.00	0.00	0.00	99.9	0.10	Robson Valley
Pelly Creek	25	0	0		88100	0	88100	0.03	0.00	0.00	100.0	0.00	Mackenzie
Pinchi	73	513	0		108365	2894	111259	0.07	0.46	0.00	97.40	2.60	Fort St. James
Pine River	476	16569	0	25	347228	39627	386855	0.12	4.28	0.00	89.76	10.24	Dawson Creek
Pitka Creek	76	1647	0		15072	3907	18979	0.40	8.68	0.00	79.41	20.59	Fort St. James
Pouce Coupe	1661	94308	0	15	31498	132531	163849	1.01	57.56	0.00	19.22	80.89	Dawson Creek
Prince George	14795	4718	0		11606	28283	39889	37.09	11.83	0.38	29.1	70.90	Prince George
Plarmigan-Snowshoe	0	47	0		34789	567	35356	0.00	0.13	0.00	98.4	1.60	Prince George
Racing River	40	162	0		255588	266	255854	0.02	0.06	0.00	99.90	0.10	Fort Nelson
Raush River	16	402	0		100889	238	101127	0.02	0.40	0.00	99.8	0.20	Robson Valley
Red Willow	0	0	0		131724	1042	132766	0.00	0.00	0.00	99.2	0.80	Dawson Creek
Reynolds-Anzac	0	0	0		161486	0	161486	0.00	0.00	0.00	99.8	0.20	Prince George

Table E1 continued

Watershed	Urban Area (Ha)	Agricultural Area (Ha)	Range Area (Ha)	Oil & Gas Well	Crown Lands (Ha)	Private Lands (Ha)	Total Lands	Urban %	Agricultural %	Range %	Crown %	Private %	Forest District
Robson River	0	0	0		40938	205	41143	0.00	0.00	0.00	99.5	0.50	Robson Valley
Rubyrock	0	0	0		37165	254	37419	0.00	0.00	0.00	99.32	0.68	Fort St. James
Sahteneh River	271	0	0	44	411409	0	411409	0.07	0.00	0.00	100.00	0.00	Fort Nelson
Salmon	731	11216	0		398488	47299	445787	0.16	2.52	0.00	89.4	10.60	Prince George
Saxton-Chief	0	2163	0		47606	8738	56344	0.00	3.84	0.00	84.49	15.51	Vanderhoof
Scott-Cut Thumb	0	0	0		69285	139	69424	0.00	0.00	0.00	99.8	0.20	Mackenzie
Scovil-Dastaiga	2	0	0		66173	0	66173	0.00	0.00	0.00	100.0	0.00	Mackenzie
Seebach	0	0	0		44366	0	44366	0.00	0.00	0.00	100.00	0.00	Prince George
Sinkut-McKnight	40	6548	356		41160	15154	56314	0.07	11.63	0.63	73.1	26.91	Vanderhoof
Skeena River	279	36	2567		741348	0	741348	0.04	0.00	0.35	100.0	0.00	Fort St. James
Smith Creek	16	1630	5756		27336	117	27453	0.06	5.94	20.97	99.6	0.43	Vanderhoof
Smith Creek	120	0	0		222604	0	222604	0.05	0.00	0.00	100.0	0.00	Fort Nelson
Sowchea	0	38	0		37461	96	37557	0.00	0.10	0.00	99.74	0.26	Fort St. James
Stanolind	0	0	0		73779	0	73779	0.00	0.00	0.00	100.0	0.00	Fort Nelson
Stone Creek	158	1258	0		27613	5971	33584	0.47	3.75	0.00	82.2	17.80	Prince George
Stoney Creek	630	11665	479		34259	24364	58623	1.07	19.90	0.82	58.4	41.56	Vanderhoof
Sukunka River	859	4228	0		306041	8617	314658	1.34	0.00	0.00	97.26	2.74	Dawson Creek
Sustut River	148	646	0		357429	277	357706	0.04	0.18	0.00	99.9	0.10	Fort St. James
Swannel Creek	0	0	0		72984	0	72984	0.00	0.00	0.00	100.0	0.00	Mackenzie
Sweden-Cluculz	297	6194	0		84552	22620	107172	0.28	5.78	0.00	78.9	21.11	Prince George
Table-Hominka	0	0	0		139440	13	139453	0.00	0.00	0.00	99.99	0.01	Prince George
Tabor Creek	824	4461	0		22345	12841	35186	2.34	12.68	0.00	63.5	36.50	Prince George
Taiuk Creek	0	0	0		73758	0	73758	0.00	0.00	0.00	100.0	0.00	Vanderhoof
Takla	29	0	0		208055	315	208370	0.01	0.00	0.00	99.85	0.15	Fort St. James
Tako-Bonnalie	0	740	0		16717	3368	20085	0.00	3.68	0.00	83.2	16.80	Prince George
Targe-Swanson	0	165	6043		60792	51	60843	0.00	0.27	9.93	99.9	0.10	Vanderhoof
Tay-Averill	0	224	0		27107	3451	30558	0.00	0.73	0.00	88.7	11.30	Prince George
Toad River	67	23	0		155705	0	155705	0.04	0.01	0.00	100.0	0.00	Fort Nelson
Toodogonne River	46	0	6982		142768	0	142768	0.03	0.00	4.89	100.0	0.00	Mackenzie
Torpy River	0	0	0		120100	349	120449	0.00	0.00	0.00	99.7	0.30	Prince George
Trout River	44	0	0		53796	0	53796	0.08	0.00	0.00	100.0	0.00	Fort Nelson
Tsoo Creek	0	0	0		46251	0	46251	0.00	0.00	0.00	100.0	0.00	Fort Nelson
Twin Creek	0	4	0		38247	132	38379	0.00	0.01	0.00	99.7	0.30	Robson Valley
Upper Finlay	0	0	0		246779	0	246779	0.00	0.00	0.00	100.0	0.00	Mackenzie
Upper Muskwa	0	0	324		507237	35	507272	0.00	0.00	0.06	99.99	0.01	Fort Nelson
Upper Petitot	488	0	0	>100	735714	0	735714	0.07	0.00	0.00	100.00	0.00	Fort Nelson
Upper Prophet	97	6	5354		430089	160	430249	0.02	0.00	1.24	99.96	0.04	Fort Nelson
Upper Sikanni	50	0	1	40	214049	27	214076	0.02	0.00	0.00	99.99	0.01	Fort St. John
Wapiti River	22	5	0		207750	0	207750	0.01	0.00	0.00	100.0	0.00	Dawson Creek
Whitefish Creek	35	0	0		56756	417	57173	0.06	0.00	0.00	99.30	0.70	Fort St. James
Wicked River	0	0	0		20204	0	20204	0.00	0.00	0.00	100.0	0.00	Mackenzie
Willow	394	2731	0		261446	14760	276206	0.14	0.99	0.00	94.7	5.30	Prince George

## **Appendix F**

*Forest Harvesting Activity Summary File (MSRM, 2002)*

Table F1: Summary information of forest harvesting activities in Tier II watersheds (from Watershed Statistics).

Watershed	Total Logged	Recent Logged Area	Total Burned	Total Forest Area	Total Logging Density	Recent Logging Density	Burn Density	Watershed Order	Forest District
Pouce Coupe	6892	0	476	65725	10.49	0.00	0.72	5	Dawson Creek
Eight Mile-Septimus	65	0	0	7828	0.83	0.00	0.00	4	Dawson Creek
Moberly River	10957	0	5042	162021	6.76	0.00	3.11	5	Dawson Creek
Maurice River	1824	0	0	26224	6.96	0.00	0.00	5	Dawson Creek
Gething River	8339	539	4278	60901	13.69	0.89	7.02	5	Dawson Creek
Dunlevy Creek	1315	0	4846	60775	2.16	0.00	7.97	5	Dawson Creek
Carbon Creek	4683	0	37	73296	6.39	0.00	0.05	6	Dawson Creek
Wapiti River	1634	0	9656	207750	0.79	0.00	4.65	6	Dawson Creek
RedWillow	3455	208	0	124949	2.77	0.17	0.00	5	Dawson Creek
Narraway River	0	0	1244	48642	0.00	0.00	2.56	5	Dawson Creek
Kiskatinaw River	18188	0	3072	310349	5.86	0.00	0.99	5	Dawson Creek
Pine River	22443	1792	5151	334554	6.71	0.54	1.54	6-7	Dawson Creek
Murray River	23353	379	6753	537057	4.35	0.07	1.26	6	Dawson Creek
Sukunka River	13589	331	8719	256083	5.31	0.13	3.40	6	Dawson Creek
Lower Liard	9060	0	1928	113204	8.00	0.00	1.70	6-7	Fort Nelson
Smith Creek	5756	165	0	27336	117	2	0	4	Vanderhoof
Dunedin River	1	0	35012	284775	0.00	0.00	12.29	6	Fort Nelson
Catkin Creek	24	0	2604	133575	0.02	0.00	1.95	4	Fort Nelson
Grayling	0	0	28480	152077	0.00	0.00	18.73	6	Fort Nelson
Moule	0	0	43543	150757	0.00	0.00	28.88	5	Fort Nelson
Trout River	0	0	53	53796	0.00	0.00	0.10	5	Fort Nelson
Fishing Creek	0	0	86	88524	0.00	0.00	0.10	6	Fort Nelson
Smith Creek	0	0	37403	222604	0.00	0.00	16.80	6	Fort Nelson
Geddes Creek	0	0	2852	22703	0.00	0.00	12.56	4	Fort Nelson
Lower Petitiot	0	0	0	176918	0.00	0.00	0.00	5-6	Fort Nelson
Upper Petitiot	0	0	17853	469064	0.00	0.00	3.81	4-5	Fort Nelson
Capot-Blanc	1466	0	56	86462	1.70	0.00	0.06	4	Fort Nelson
Tsoo Creek	4081	0	0	46251	8.82	0.00	0.00	5	Fort Nelson
Kiwigana-Klenteh	2753	0	0	126184	2.18	0.00	0.00	6	Fort Nelson
Stanolind	6954	0	372	73779	9.43	0.00	0.50	5	Fort Nelson
Sahteneh River	1443	0	4430	266891	0.54	0.00	1.66	6	Fort Nelson
Lower Muskwa	21186	221	50025	529418	4.00	0.04	9.45	6-7	Fort Nelson
Upper Muskwa	0	0	51179	236101	0.00	0.00	21.68	5-6	Fort Nelson
Lower Prophet	10258	0	41824	314866	3.26	0.00	13.28	6	Fort Nelson
Upper Prophet	748	0	10480	274155	0.27	0.00	3.82	5-6	Fort Nelson
Klua River	2256	0	0	142978	1.58	0.00	0.00	6	Fort Nelson
Beaver	0	0	3702	162446	0.00	0.00	2.28	5	Fort Nelson
Toad River	0	0	36131	155705	0.00	0.00	23.20	6	Fort Nelson
Racing River	0	0	14712	66071	0.00	0.00	22.27	6	Fort Nelson
Hay River	6718	0	19891	271189	3	0	16	6	Fort Nelson
Kotcho	924	0	22510	223777	0	0	8	6	Fort Nelson
Dog-Burnstead	5164	14	0	28706	17.99	0.05	0.00	4	Fort St. James
Necoslie	7426	168	0	63803	11.64	0.26	0.00	5	Fort St. James
Pitka Creek	3941	106	0	16371	24.07	0.65	0.00	5	Fort St. James
Sowchea	3060	0	0	35383	8.65	0.00	0.00	6	Fort St. James
Pinchi	13185	1181	0	95109	13.86	1.24	0.00	6	Fort St. James
Camsell	3522	352	0	17615	19.99	2.00	0.00	4	Fort St. James
Kuzkwa	24093	3835	0	159814	15.08	2.40	0.00	6	Fort St. James
Kazchek	22444	203	45	198140	11.33	0.10	0.02	5	Fort St. James
Takla	13377	0	78	179796	7.44	0.00	0.04	5	Fort St. James
Driftwood	2932	0	7932	145635	2.01	0.00	5.45	6	Fort St. James
Rubyrock	1282	105	0	33087	3.87	0.32	0.00	5	Fort St. James
Whitefish Creek	4301	80	0	49420	8.70	0.16	0.00	5	Fort St. James
Skeena River	3121	96	2873	391211	0.80	0.02	0.73	6	Fort St. James

Table F1 continued

Watershed	Total Logged	Recent Logged Area	Total Burned	Total Forest Area	Total Logging Density	Recent Logging Density	Burn Density	Watershed Order	Forest District
Sustut River	326	0	732	211597	0.15	0.00	0.35	6	Fort St. James
Elleh River	152	0	7717	71832	0.21	0.00	10.74	5	Fort St. John
Gutah	1456	0	525	185011	0.79	0.00	0.28	5	Fort St. John
Lower Sikanni	2721	0	6856	547816	0.50	0.00	1.25	6-7	Fort St. John
Upper Sikanni	0	0	12409	147582	0	0	9	6	Fort St. John
Fontas	5980	0	15512	540121	1	0	3	6	Fort St. John
Chinchaga	0	0	43	55085	0.00	0.00	0.08	5	Fort St. John
Alces River	708	0	0	45830	1.54	0.00	0.00	5	Fort St. John
Cache-Wilder	2587	0	1229	84602	3.06	0.00	1.45	5	Fort St. John
Farrel Creek	3995	360	0	82397	4.85	0.44	0.00	5	Fort St. John
Doig River	4771	0	5983	115115	4.14	0.00	5.20	5	Fort St. John
Blueberry River	19920	0	4196	226456	8.80	0.00	1.85	5	Fort St. John
Milligan Creek	84	0	0	96981	0.09	0.00	0.00	5	Fort St. John
Lower Beaton	15016	793	51299	601951	2.49	0.13	8.52	6	Fort St. John
Halfay River	38310	483	15188	726259	5.27	0.07	2.09	6-7	Fort St. John
Gataga River	0	0	13126	173455	0.00	0.00	7.57	6	Mackenzie
Frog River	262661	7997	418908	8948435	2.94	0.09	4.68	6	Mackenzie
Braid River	0	0	2661	85926	0.00	0.00	3.10	5	Mackenzie
Nabesche River	5491	0	2169	109720	5.00	0.00	1.98	5	Mackenzie
Clearwater	2120	0	2374	74520	2.84	0.00	3.19	5	Mackenzie
Wicked River	0	0	0	20204	0.00	0.00	0.00	5	Mackenzie
Scott-Cut Thumb	2568	0	0	69285	3.71	0.00	0.00	4	Mackenzie
Mugaha Creek	148	0	0	19643	0.75	0.00	0.00	5	Mackenzie
Misinchinsilinka River	3157	262	0	40215	7.85	0.65	0.00	4	Mackenzie
Pack River	6063	869	0	33942	17.86	2.56	0.00	6	Mackenzie
MacLeod River	4580	54	0	85866	5.33	0.06	0.00	5	Mackenzie
Scovil-Dastaiga	4265	468	0	60048	7.10	0.78	0.00	4	Mackenzie
Blackwater Creek	10596	0	0	42227	25.09	0.00	0.00	5	Mackenzie
Manson River	15804	0	509921	138133	11.44	0.00	369.15	5	Mackenzie
Eklund-Bevel	12993	0	0	67880	19.14	0.00	0.00	4	Mackenzie
Mesilinka River	14394	0	702	205296	7.01	0.00	0.34	6	Mackenzie
Ospika River	2263	0	13580	179045	1.26	0.00	7.58	6	Mackenzie
Davis River	4211	0	311	19249	21.88	0.00	1.62	5	Mackenzie
Chowika River	5003	0	793	82963	6.03	0.00	0.96	5	Mackenzie
Swannel Creek	2188	0	4842	72984	3.00	0.00	6.63	5	Mackenzie
Pelly Creek	0	0	8118	88100	0.00	0.00	9.21	6	Mackenzie
Ingenika River	211	0	12646	125031	0.17	0.00	10.11	6-7	Mackenzie
Misinchinka-Colbourne	14927	3600	565	133490	11.18	2.70	0.42	6	Mackenzie
Nation River	40831	452	394	614374	6.65	0.07	0.06	6	Mackenzie
Omineca River	4022	0	4644	427438	1.00	0.00	0.00	6	Mackenzie
Osilinka River	10414	0	1530	143595	7.20	0	1	5	Mackenzie
Lower Finlay	7468	0	4145	347364	2.15	0.00	1.19	6-7	Mackenzie
Akie River	165	0	839	96076	0.17	0.00	0.87	6	Mackenzie
Kwadacha River	0	0	28424	125362	0.00	0.00	22.67	6	Mackenzie
Fox River	165	0	66449	928544	0.02	0.00	7.16	6	Mackenzie
Mid-Finlay	26	0	3089	126653	0.02	0.00	2.44	5	Mackenzie
Upper Finlay	0	0	6898	103432	0.00	0.00	6.67	5	Mackenzie
Toodogonne River	0	0	4690	55311	0.00	0.00	8.48	5	Mackenzie
Firesteel	0	0	1596	63812	0.00	0.00	2.50	6	Mackenzie
Ahbau	16039.00	2742.00	0	60000	26.73	4.57	0.00	5	Prince George
Naver	28567	8349	0	85057	33.59	9.82	0.00	5	Prince George
McCorkall-Trapping	5486	1175	0	32067	17.11	3.66	0.00	4	Prince George
Stone Creek	7774	1232	0	31017	25.06	3.97	0.00	4	Prince George
Tabor Creek	4309	1416	0	28413	15.17	4.98	0.00	5	Prince George
Prince George	4223	1923	0	29254	14.44	6.57	0.00	4	Prince George
Salmon	79267	8153	0	384598	20.61	2.12	0.00	6	Prince George



Table F1 continued

Watershed	Total Logged	Recent Logged Area	Total Burned	Total Forest Area	Total Logging Density	Recent Logging Density	Burn Density	Watershed Order	Forest District
Willow	96458	21556	1213	260071	37.09	8.29	0.47	6	Prince George
Tay-Averill	11832	3236	0	29460	40.16	10.98	0.00	4	Prince George
Olsson Creek	13973	4278	82	31964	43.71	13.38	0.26	4	Prince George
Hansard Creek	5234	1247	0	13211	39.62	9.44	0.00	4	Prince George
Bowron River	80379	6591	2013	246393	32.62	2.67	0.82	6	Prince George
Hiyu-Moxley	4244	711	0	23685	17.92	3.00	0.00	4	Prince George
Kenneth Creek	7970	2082	0	24496	32.54	8.50	0.00	4	Prince George
Hungary-Slim	15644	1335	165	67340	23.23	1.98	0.25	5	Prince George
Dome Creek	3979	1134	142	20861	19.07	5.44	0.68	4	Prince George
Torpy River	10387	727	1003	94244	11.02	0.77	1.06	5	Prince George
Ptarmigan-Snowshoe	3390	535	0	25330	13.38	2.11	0.00	4	Prince George
Tako-Bonnalie	3008	473	0	18550	16.22	2.55	0.00	4	Prince George
Chilako River	65888	3702	19	330924	19.91	1.12	0.01	6	Prince George
Sweden-Cluculz	20254	3960	0	92912	21.80	4.26	0.00	5	Prince George
Seebach	8153	0	0	41812	19.50	0.00	0.00	5	Prince George
Herrick	6267	0	984	143392	4.37	0.00	0.69	6	Prince George
MacGregor	10269	1205	2084	90668	11.33	1.33	2.30	6-7	Prince George
Hammet Creek	6964	0	0	32185	21.64	0.00	0.00	4	Prince George
Crooked River	60353	15198	0	188744	31.98	8.05	0.00	6	Prince George
Kakwa River	0	0	850	18626	0.00	0.00	4.56	4	Prince George
Reynolds-Anzac	6669	2415	2686	122788	5.43	1.97	2.19	5	Prince George
Table-Hominka	15016	3518	0	109402	13.73	3.22	0.00	5	Prince George
Missinka-Wichicika	8172	1947	0	70235	11.64	2.77	0.00	5	Prince George
Morkill	5295	0	379	84712	6.25	0.00	0.45	5	Robson Valley
Goat River	3613	48	0	45080	8.01	0.11	0.00	5	Robson Valley
Twin Creek	2713	292	0	20305	13.36	1.44	0.00	4	Robson Valley
McKate	2251	1211	84	18346	12.27	6.60	0.46	4	Robson Valley
Dore River	1980	219	920	13647	14.51	1.60	6.74	5	Robson Valley
Holmes River	4325	113	1207	33037	13.09	0.34	3.65	4	Robson Valley
Castle Creek	960	305	0	16010	6.00	1.91	0.00	6	Robson Valley
Raush River	127	0	66	30617	0.41	0.00	0.22	5	Robson Valley
Nevin -Small	1614	834	0	21508	7.50	3.88	0.00	4	Robson Valley
Kiwa-Tete	1911	84	0	13828	13.82	0.61	0.00	4	Robson Valley
McLennan	3743	940	545	31824	11.76	2.95	1.71	5	Robson Valley
Robson River	0	0	0	9199	0.00	0.00	0.00	4	Robson Valley
Moose	0	0	1334	41145	0.00	0.00	3.24	5	Robson Valley
Betty-Wendle	737	0	0	19348	3.81	0.00	0.00	4	Robson Valley
Columbia River	6211	110	648	40682	15.27	0.27	1.59	5	Robson Valley
Packsdale-Blackwater	2679	20	4330	48416	5.53	0.04	8.94	4	Robson Valley
Hugh-Allen	33	0	1311	33191	0.10	0.00	3.95	5	Robson Valley
Canoe River	1754	115	1906	30491	5.75	0.38	6.25	4	Robson Valley
Taiuk Creek	12305	0	403	64846	18.98	0.00	0.62	5	Vanderhoof
Sinkut-McKnight	9834	2850	484	45770	21.70	6.23	1.06	5	Vanderhoof
Chilco-Murray	4240	590	0	15557	27.25	3.79	0.00	3	Vanderhoof
Stoney Creek	12374	3695	0	39809	31.08	9.28	0.00	5	Vanderhoof
Clear-Tatsui	4694	258	0	21019	22.33	1.23	0.00	3	Vanderhoof
Fraser-Francois	11010	930	239	93134	11.82	1.00	0.26	6	Vanderhoof
Greer Creek	1557	82	0	36360	4.28	0.23	0.00	4	Vanderhoof
Targe-Swanson	6043	0	0	60792	9.94	0.00	0.00	5	Vanderhoof
Big Bend-Lucas	8126	0	0	59426	13.67	0.00	0.00	4	Vanderhoof
Chedakuz	8171	0	0	113087	7.23	0.00	0.00	5	Vanderhoof
Entiako Creek	6543	0	123	154076	4.25	0.00	0.08	5	Vanderhoof
Saxton-Chief	5139	175	0	47484	10.82	0.37	0.00	4	Vanderhoof

## **Appendix G**

*Fish Information Summary Data (MSRM 2002 and FISS)*

Table G1: Red and blue listed fish presence in Tier II watershed units.

Watershed	Brassey Minnow	Goldeye	Round Whitefish	White Sturgeon	Steelhead	Spoonhead Sculpin	Pygmy Whitefish	Dolly Varden	Inconnu	Coho Salmon	Cutthroat Trout*	Fathead Minnow	Lake Cisco	Bull Trout	Arctic Grayling	Salmonid Presence	Total	Score
Ahbau																0.33	0.33	1.5
Akie River														0.67		0.33	1	5
Alces River															0.67	0.33	1	5
Beaver															0.67	0.33	1	5
Betty-Wendle																0.33	0.33	1.5
Big Bend-Lucas																	0	0
Blackwater Creek														0.67	0.67	0.33	1.67	5
Blueberry River						0.67									0.67	0.33	1.67	5
Bowron River								0.67								0.33	1	5
Braid River																0.33	0.33	1.5
Cache-Wilder														0.67	0.67	0.33	1.67	5
Camsell															0.67	0.33	1	5
Canoe River								0.67								0.33	1	5
Capot-Blanc		0.67														0.33	1	5
Carbon Creek								0.67						0.67	1	0.33	2.67	5
Castle Creek																0.33	0.33	1.5
Catkin Creek																0.33	0.33	1.5
Chedakuz																0.33	0.33	1.5
Chilako River								0.67								0.33	1	5
Chilco-Murray							0.67									0.67	3.33	
Chinchaga																0.33	0.33	1.5
Chowika River														0.67	1	0.33	2	5
Clear-Tatsui																0.33	0.33	1.5
Clearwater														0.67	1	0.33	2	5
Columbia River																	0	0
Crooked River	0.67							0.67						0.67		0.33	2.34	5
Davis River						0.67		0.67						0.67	1	0.33	3.34	5
Dog-Burnstead								0.67						0.67		0.33	1.67	5
Dolg River															0.67	0.33	1	5
Dome Creek								0.67						0.67		0.33	1.67	5
Dore River																0.33	0.33	1.5
Driftwood								0.67							0.67	0.33	1.67	5
Dunedin River														0.67		0.33	1	5
Dunlevy Creek																0.33	0.33	1.5
Eight Mile-Septimus																	0	0
Eklund-Bevel															1		1	5
Elleh River		0.67				0.67			0.67						0.67	0.33	3.01	5
Entiako Creek																0.33	0.33	1.5
Farrel Creek														0.67	0.67		1.34	5
Firesteel								0.67								0.33	1	5
Fishing Creek																0.33	0.33	1.5
Fontas		0.67				0.67									0.67	0.33	2.34	5
Fox River																0.33	0.33	1.5
Fraser-Francois				0.67				0.67						0.67		0.33	2.34	5
Frog River			0.67					0.67						0.67	0.67	0.33	3.01	5
Gataga River														0.67	0.67	0.33	1.67	5
Goddies Creek																0.33	1.67	5
Gething River								0.67						0.67	1	0.33	2.67	5
Goat River														0.67		0.33	1	5
Grayling														0.67	0.67		1.34	5
Greer Creek										0.67						0.33	1	5
Gutah																0.33	0.33	1.5
Halfway River														0.67	0.67	0.33	1.67	5
Hammet Creek																0.33	0.33	1.5
Hansard Creek								0.67								0.33	1	5
Hay River																0.33	0.33	1.5
Herrick								0.67						0.67		0.33	1.67	5
Hiyu-Moxley																0.33	0.33	1.5
Holmes River								0.67								0.33	1	5
Hugh-Allen								0.67						0.67		0.33	1.67	5
Hungary-Slim								0.67						0.67		0.33	1.67	5
Ingenika River								0.67							1	0.33	2	5

Table G1 continued

Watershed	Brassey Minnow	Goldeye	Round Whitefish	White Sturgeon	Steelhead	Spoonhead Sculpin	Pygmy Whitefish	Dolly Varden	Inconnu	Coho Salmon	Cutthroat Trout*	Fathead Minnow	Lake Cisco	Bull Trout	Arctic Grayling	Salmonid Presence	Total	Score	
Kakwa River																0.33	0.33	1.5	
Kazchek								0.67								0.33	1	5	
Kenneth Creek								0.67						0.67		0.33	1.67	5	
Kiskatinaw River						0.67		0.67			1	0.67			0.67	0.33	4.68	5	
Kiwa-Tete														0.67		0.33	1	5	
Kiwigana-Klenteh		0.67														0.33	1	5	
Klua River																0.33	0.33	1.5	
Kotcho																0.33	0.33	1.5	
Kuzkwa																0.33	0.33	1.5	
Kwadacha River																0.33	0.33	1.5	
Lower Beaton		0.67			0.67 (spottail shiner)	0.67									0.67	0.33	2.34	5	
Lower Finlay								0.67						0.67	1	0.33	2.67	5	
Lower Liard																0.33	0.33	1.5	
Lower Muskwa							0.67	0.67	0.67					0.67	0.67	0.33	3.68	5	
Lower Pettitot													1		0.67	0.33	2	5	
Lower Prophet							0.67	0.67	0.67					0.67	0.67	0.33	3.68	5	
Lower Sikanni														0.67	0.67	0.33	1.67	5	
MacGregor	0.67							0.67						0.67		0.33	2.34	5	
MacLeod River								0.67						0.67		0.33	1.67	5	
Manson River							0.67	0.67						0.67	1	0.33	3.34	5	
Maurice River															0.67	0.33	1	5	
McCorkall-Trapping																0.33	0.33	1.5	
McKate																0.33	0.33	1.5	
McLennan																0.33	0.33	1.5	
Meslinka River								0.67						0.67	0.67	0.33	2.34	5	
Mid-Finlay								0.67						0.67	1	0.33	2.67	5	
Milligan Creek							0.67									0.67	0.33	1.67	5
Misinchinka-Colbourne																0.33	1	5	
Misinchinslinka River								0.67								0.67	0.33	1.67	5
Missinka-Wichicika			0.67					0.67						0.67	0.67	0.33	3.01	5	
Moberly River								0.67						0.67	0.67	0.33	2.34	5	
Moose								0.67								0.33	1	5	
Morkill								0.67						0.67		0.33	1.67	5	
Moule														0.67	0.67	1.34	5		
Mugaha Creek						0.67		0.67						0.67	1		3.01	5	
Murray River	0.67							0.67						0.67	0.67	0.33	3.01	5	
Nabesche River								0.67						0.67	1	0.33	2.67	5	
Narraway River														0.67	0.67	0.33	1.67	5	
Nation River								0.67						0.67	1	0.33	2.67	5	
Naver								0.67		0.67				0.67		0.33	2.34	5	
Necoslie																0.33	0.33	1.5	
Nevin -Small																0.33	0.33	1.5	
Olsson Creek																0.33	0.33	1.5	
Omineca River								0.67						0.67	1	0.33	2.67	5	
Osilinka River																0.33	0.33	1.5	
Ospika River								0.67						0.67	1	0.33	2.67	5	
Pack River								0.67						0.67	1	0.33	2.67	5	
Packsdale-Blackwater														0.67		0.67	0.67	3.33	
Pelly Creek		0.67						0.67						0.67		0.33	2.34	5	
Pinchi							0.67	0.67								0.33	1.67	5	
Pine River								0.67						0.67	0.67	0.33	2.34	5	
Pitka Creek																0.33	0.33	1.5	
Pouce Coupe																0.33	0.33	1.5	
Prince George								0.67								0.33	1	5	
Ptarmigan-Snowshoe														0.67		0.33	1	5	
Racing River														0.67		0.33	1	5	
Raush River																0.33	0.33	1.5	
RedWillow																0.33	0.33	1.5	
Reynolds-Anzac								0.67						0.67	1	0.33	2.67	5	
Robson River																	0	0	
Rubyrock																0.33	0.33	1.5	

Table G1 continued

Watershed	Brassey Minnow	Goldeye	Round Whitefish	White Sturgeon	Steelhead	Spoonhead Sculpin	Pygmy Whitefish	Dolly Varden	Inconnu	Coho Salmon	Cutthroat Trout*	Fathead Minnow	Lake Cisco	Bull Trout	Arctic Grayling	Salmonid Presence	Total	Score
Sahteneh River																0.33	0.33	1.5
Salmon								0.67								0.33	1	5
Saxton-Chief																0.33	0.33	1.5
Scott-Cut Thumb							0.67									0.33	1	5
Scovil-Dastaiga						0.67								0.67		0.33	1.67	5
Seebach								0.67								0.33	1	5
Sinkut-McKnight																	0	0
Skeena River																0.33	0.33	1.5
Smith Creek								0.67								0.33	1	5
Smith River			0.67											0.67	0.67		2.01	5
Sowchea																	0	0
Stanlind		0.67						0.67								0.33	1.67	5
Stone Creek																0.33	0.33	1.5
Stoney Creek							0.67										0.67	5
Sukunka River														0.67	0.67	0.33	1.67	5
Sustut River																0.33	0.33	1.5
Swannel Creek														0.67	0.67	0.33	1.67	5
Sweden-Cluculz							0.67			0.67					0.67	0.33	1.67	5
Table-Hominka							0.67	0.67						0.67	0.67	0.33	3.01	5
Tabor Creek								0.67									0.67	3.33
Taiuk Creek																0.33	0.33	1.5
Takla			0.67					0.67						0.67		0.33	2.34	5
Tako-Bonnalie																0.33	0.33	1.5
Targe-Swanson																0.33	0.33	1.5
Tay-Averill																0.33	0.33	1.5
Toad River														0.67	0.67	0.33	1.67	5
Toodogonne River								0.67						0.67	0.67	0.33	2.34	5
Torpy River								0.67						0.67		0.33	1.67	5
Trout River														0.67	0.67	0.33	1.67	5
Tsoo Creek		0.67														0.33	1.67	5
Twin Creek								0.67								0.33	1	5
Upper Finlay								0.67						0.67	0.67	0.33	2.34	5
Upper Muskwa						0.67		0.67	0.67					0.67	0.67	0.33	3.68	5
Upper Pettitot																0.33	1	5
Upper Prophet							0.67		0.67					0.67	0.67	0.33	3.01	5
Upper Sikanni														0.67	0.67	0.33	1.67	5
Wapiti River														0.67	0.67	0.33	1.67	5
Whitefish Creek							0.67									0.33	1	5
Wicked River								0.67						0.67	0.67	0.33	2.34	5
Willow								0.67								0.33	1	5

\* Cutthroat Trout refers to Westslope cutthroat

Bolded grayling values indicate Red-Listed because they are Williston stocks.

## **Appendix H**

*Sample Tier II Review Cover Letter*

Omineca-Peace Watershed Characterization Program *For:* Ministry of Environment  
2002/03 Year End Report

March 19, 2003

To Whom it may Concern  
Ecosystem Biologist  
Ministry of Environment  
Prince George, BC

....

Dear to whom it may concern,

First, let me thank-you for your continued participation in this program.

After speaking with you in August 2002, the candidate watersheds you provided were ranked along with those suggested by other government staff within the Omineca-Peace region. From these candidates we selected 13 watersheds for monitoring in 2002/03. Their year end summary reports are currently under review by regional MOE contract staff.

Due to the large number of watersheds in the Omineca-Peace region the prioritization process was subdivided into Tier 1 and Tier 2 as shown in the attached framework. The Tier 1 process involved the ranking of priority watersheds that you and others have provided. The Tier 2 process requires the ranking of all watersheds based upon the density and diversity of development. Again, to ensure resources are wisely used we are asking staff that participated in the Tier 1 process to review the priority list for their district to ensure that our designations of land use development are appropriate. To ensure consistency across districts we have set development level thresholds. Specifically, forest harvesting activities should be within the last five years, for oil & gas we are interested in areas having more than 10 oil and/or gas wells, and for agriculture we are interested in areas of high cropland, livestock, and rang usage.

To help with your efforts I have enclosed a district map showing the watershed boundaries we are using and a watershed checklist. The checklist specifies the same watersheds identified on the map. Further, it identifies those watersheds (or sub-basins within identified watersheds) included in the Tier I monitoring program. Please use either the map or the checklist to identify those areas you have concerns about or know of high density development. Further, please indicate any watersheds that may be extensively developed over the next few years because we will append them to this year's report for future consideration.

Finally, I have attached the risk matrix so that you can see how we plan to rank the watersheds. If you are interested in either the Tier 1 report or the final project report please contact Mrs. Gabriele Matscha at 565-7103 or by email at [Gabriele.Matscha@gov.bc.ca](mailto:Gabriele.Matscha@gov.bc.ca). Thank you for your time and efforts, which have greatly benefited the program.

Sincerely,

John Rex, M.Sc. R.P.Bio  
Rex Environmental Services.  
206 Nicholson Street North  
Prince George, BC  
V2M 3H2