



Keeyask Generation Project Environmental Impact Statement

Supporting Volume Aquatic Environment



June 2012

APPENDIX 4B
PHYTOPLANKTON, ZOOPLANKTON, AND
AQUATIC MACROINVERTEBRATE TAXA
1999-2004



Table 4B-1: Phytoplankton taxa observed in the Aquatic Environment Study Area, 1999–2002

Taxa	Study Year		
	1999 ¹	2001 ²	2002 ²
Bacillariophyceae (diatoms)			
<i>Achnanthes minutissima</i>	√ ³		√
<i>Achnanthes</i> sp.			√
<i>Amphiprora ornata</i>		√	√
<i>Asterionella formosa</i>	√	√	√
<i>Cocconeis placentula</i>	√	√	√
<i>Cyclotella</i> sp.	√	√	√
<i>Cymatopleura</i> sp.		√	
<i>Cymbella</i> sp.	√	√	√
<i>Diatoma</i> sp.	√	√	√
<i>Fragilaria crotonensis</i>	√	√	√
<i>Fragilaria</i> sp.	√	√	√
<i>Gomphonema</i> sp.			√
<i>Melosira granulata</i>			√
<i>Melosira small</i>			√
<i>Melosira</i> sp.	√	√	√
<i>Navicula small</i>			√
<i>Navicula</i> sp.	√	√	√
<i>Neidium</i> sp.	√		√
<i>Nitzschia sigmoidea</i>			√
<i>Nitzschia</i> sp.	√	√	√
<i>Pinnularia</i> sp.		√	√
<i>Pleurosigma</i> sp.		√	√
<i>Rhizosolenia eriensis</i>	√	√	
<i>Rhizosolenia</i> sp.			√
<i>Stephanodiscus</i> sp.	√	√	√
<i>Surirella</i> sp.		√	
<i>Synedra acus</i>	√	√	√
<i>Synedra ulna</i>	√	√	√
<i>Synedra</i> sp.			√
<i>Tabellaria fenestrata</i>			√
<i>Tabellaria flocculosa</i>			√
<i>Tabellaria</i> sp.		√	√
Chlorophyceae			
<i>Actinastrum hantzschii</i>		√	√
<i>Botryococcus braunii</i>	√	√	√
<i>Characium</i> sp.			√
<i>Chlamydomonas</i> sp.			√
<i>Closterium setaceum</i>		√	
<i>Closterium</i> sp.	√	√	√
<i>Coelastrum microporum</i>	√	√	√
<i>Cosmarium</i> sp.		√	√
<i>Crucigenia quadrata</i>	√		√
<i>Dictyosphaerium</i> sp.	√	√	√
<i>Elakatothrix gelatinosa</i>			√
<i>Eudorina</i> sp.		√	√
<i>Kirchneriella</i> sp.		√	
<i>Monoraphidium</i> sp.	√	√	√
<i>Oocystis</i> sp.	√	√	√
<i>Pediastrum boryanum</i>	√	√	√

Table 4B-1: Phytoplankton taxa observed in the Aquatic Environment Study Area, 1999–2002

Taxa	Study Year		
	1999 ¹	2001 ²	2002 ²
<i>Pediastrum duplex</i>	✓	✓	✓
<i>Pediastrum simplex</i>	✓	✓	✓
<i>Pediastrum</i> sp.		✓	✓
<i>Quadrigula</i> sp.		✓	✓
<i>Scenedesmus arcuatus</i>	✓		✓
<i>Scenedesmus bijuga</i>	✓		✓
<i>Scenedesmus dimorphus</i>			✓
<i>Scenedesmus quadricauda</i>	✓	✓	✓
<i>Scenedesmus schroeteri</i>		✓	
<i>Spirogyra</i> sp.		✓	
<i>Tetraedron</i> sp.		✓	
<i>Ulothrix</i> sp.	✓	✓	✓
Chrysophyceae			
<i>Dinobryon bavaricum</i>			✓
<i>Dinobryon</i> sp.		✓	✓
<i>Mallomonas alpina</i>			✓
<i>Mallomonas</i> sp.	✓	✓	✓
<i>Stelexomonas</i> sp.			✓
<i>small chrysophytes</i>	✓	✓	✓
Cryptophyceae			
<i>Cryptomonas</i> sp.	✓	✓	✓
<i>Rhodomonas minuta</i>	✓	✓	✓
Myxophyceae/ Cyanophyceae			
<i>Anabaena flos-aquae</i>			✓
<i>Anabaena planctonica</i>		✓	✓
<i>Anabaena spiroides</i>		✓	✓
<i>Anabaena</i> sp.			✓
<i>Aphanizomenon flos-aquae</i>	✓	✓	✓
<i>Aphanocapsa</i> sp.		✓	✓
<i>Chroococcus</i> sp.			✓
<i>Gomphosphaeria</i> sp.	✓	✓	✓
<i>Lyngbya contorta</i>		✓	
<i>Lyngbya limnetica</i>	✓		
<i>Lyngbya</i> sp.		✓	✓
<i>Merismopedia</i> sp.			✓
<i>Microcystis</i> sp.		✓	✓
<i>Oscillatoria</i> sp.		✓	✓
Euglenophyceae			
<i>Euglena</i> sp.	✓	✓	✓
<i>Trachelomonas</i> sp.	✓	✓	✓
Peridinea (dinoflagellates)			
<i>Ceratium hirudinella</i>		✓	
<i>Gymnodinium</i> sp.	✓		✓
<i>Peridinium</i> sp.		✓	✓
Total Number of Taxa (at Species level)	40	59	76

1. Sampled once during the open-water season
2. Sampled four times during the open-water season and once during the ice-covered season
3. '✓' used to denote 'presence'

Table 4B-2: Zooplankton taxa observed in the Aquatic Environment Study Area, 2001–2002

Taxa	Study Year	
	2001 ¹	2002 ¹
Cladocera (water fleas)		
<i>Alona guttata</i>	√ ²	√
<i>Bosmina longirostris</i>	√	√
<i>Camptocercus rectirostris</i>	√	√
<i>Ceriodaphnia quadrangula</i>	√	√
<i>Chydorus sphaericus</i>	√	√
<i>Daphnia galeata mendotae</i>	√	√
<i>Daphnia longiremis</i>	√	√
<i>Daphnia pulex</i>	√	
<i>Daphnia retrocurva</i>	√	√
<i>Daphnia schoedleri</i>	√	√
<i>Diaphanosoma leuchtenbergianum</i>	√	√
<i>Eubosmina coregoni</i>	√	√
<i>Holopedium gibberum</i>	√	√
<i>Leptodora kindtii</i>	√	√
<i>Leydigia quadrangularis</i>	√	
<i>Sida crystallina</i>	√	
<i>Simocephalus vetulus</i>	√	
Copepoda (copepods)		
Calanoida		
<i>Diaptomus minutus</i>	√	√
<i>Diaptomus sicilis</i>	√	√
<i>Epischura lacustris</i>	√	√
<i>Epischura nevadensis</i>	√	√
<i>Epischura</i> spp.	√	√
<i>Leptodiaptomus ashlandi</i>	√	√
<i>Limnocalanus macrurus</i>	√	√
<i>Skistodiaptomus oregonensis</i>	√	√
Calanoida spp. copepodites	√	√
Cyclopoida		
<i>Acanthocyclops vernalis</i>	√	√
<i>Cyclops bicuspidatus thomasi</i>	√	√
<i>Eucyclops agilis</i>	√	√
<i>Macrocyclus albidus</i>	√	√
Cyclopoida spp. copepodites	√	√
Harpacticoida		
Harpacticoida spp. copepodites	√	
Total Number of Taxa (at Species level)	32	27

1. sampled four times during the open-water season.
 2. '√' used to denote 'presence'.

Table 4B-3: Aquatic macroinvertebrate taxa observed in the Aquatic Environment Study Area, 1999–2004

Scientific Name ¹	Common Name	Assean Watershed ²			Split Lake Area ²			Keyyask Area ²			Stephens Lake Area ²		
		Sed	Plant ⁵	Drift ³	Sed	Plant	Drift ⁵	Sed	Plant	Drift	Sed	Plant ⁴	Drift
Phylum Annelida													
Subclass Oligochaeta	aquatic earthworms	√ ⁷		√	√	√		√	√	√	√	√	√
Subclass Hirudinea	leeches	√		√	√	√		√	√	√	√	√	√
Subphylum Crustacea													
Class Ostracoda		√			√	√		√	√	√	√	√	
Order Amphipoda	scuds	√		√	√	√		√	√	√	√		√
Family Gammaridae		√						√	√	√		√	√
Family Haustoriidae					√				√	√			√
Family Talitridae		√			√	√		√	√	√	√	√	√
Order Diplostraca	clam shrimp	√		√				√	√	√		√	√
Order Lophogastrida	opossum shrimp			√						√			√
Order Mysida		√			√			√	√				
Order Decapoda	crayfish			√	√	√		√	√	√			√
Order Arguloida										√			√
Class Arachnida													
Subclass Acari	mites	√		√	√			√	√	√	√	√	√
Order Araneae	spiders			√					√	√	√		
Phylum Mollusca													
Class Bivalvia	clams							√					
Family Unionidae		√			√			√				√	
Family Pisiidae	fingernail clams	√		√	√	√		√	√	√	√	√	√
Class Gastropoda	snails	√		√	√	√		√	√	√	√	√	√
Family Ancyliidae										√			
Family Hydrobiidae		√			√	√		√	√	√	√	√	
Family Lymnaeidae		√			√			√	√	√	√	√	
Family Physidae		√			√	√		√	√	√	√	√	√

Table 4B-3: Aquatic macroinvertebrate taxa observed in the Aquatic Environment Study Area, 1999–2004

Scientific Name ¹	Common Name	Assean Watershed ²			Split Lake Area ²			Keyyask Area ²			Stephens Lake Area ²		
		Sed	Plant ⁵	Drift ³	Sed	Plant	Drift ⁵	Sed	Plant	Drift	Sed	Plant ⁴	Drift
Family Planorbidae		√			√	√		√	√	√	√	√	√
Family Valvatidae		√			√			√	√		√	√	
Phylum Nematomorpha	horsehair worms									√			
Phylum Platyhelminthes	flatworms			√	√			√	√	√	√		√
Class Hydrozoa	hydras	√		√	√			√	√	√		√	√
Class Insecta - Aquatic	insects												
Order Lepidoptera	butterflies, moths									√			
Order Megaloptera		√		√	√			√		√	√		
Family Sialidae	alderflies				√					√	√	√	
Order Neuroptera				√						√			
Family Sisyridae	spongillafies									√			
Order Odonata													
Suborder Anisoptera	dragonflies	√		√	√				√	√			
Family Gomphidae	clubtails									√			
Family Aeshnidae	darners								√			√	
Suborder Zygoptera	damselflies			√				√	√	√			
Family Coenagrionidae	narrow-winged damselflies	√							√	√		√	
Order Coleoptera				√					√	√		√	√
Family Chrysomelidae	leaf beetles	√							√				
Family Curculionidae	weevils								√				
Family Dytiscidae	predaceous diving beetles	√			√	√			√	√			
Family Gyrinidae	whirligig beetles								√	√		√	
Family Haliplidae	crawling water beetles	√			√	√		√	√	√		√	



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		Sed	Plant ⁵	Drift ³	Sed	Plant	Drift ⁵	Sed	Plant	Drift	Sed	Plant ⁴	Drift
Family Hydrophilidae	water scavenger beetles									√			
Order Hemiptera		√		√	√			√	√	√	√		√
Family Corixidae	water boatman	√			√	√		√	√	√		√	√
Family Gerridae	water striders								√				
Order Ephemeroptera	mayflies	√		√	√			√	√	√	√		√
Family Baetidae		√				√			√	√		√	√
Family Baetiscidae										√			
Family Caenidae		√			√			√	√	√	√	√	
Family Ephemeridae		√			√			√	√	√	√		√
Family Ephemerellidae										√			
Family Heptageniidae						√			√	√			√
Family Leptophlebiidae		√			√	√		√	√	√	√	√	
Family Siphonuridae						√			√	√			
Family Tricorythidae										√			
Order Trichoptera	caddisflies	√		√	√			√	√	√	√	√	√
Family Brachycentridae									√	√			
Family Glossosomatidae										√			
Family Helicopsychidae	snail-case caddisflies							√		√			
Family Hydropsychidae	net-spinning caddisflies				√				√	√	√		√
Family Hydroptilidae	micro-caddisflies									√		√	√
Family Lepidostomatidae		√							√	√		√	√
Family Leptoceridae	long-horn caddisflies	√			√	√		√	√	√	√		√
Family Limnephilidae	northern caddisflies								√	√		√	√
Family Molannidae		√			√						√		
Family Phryganeidae	large caddisflies	√			√	√		√	√	√		√	
Family Polycentropodidae		√			√	√		√	√	√	√	√	√



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		Sed	Plant ⁵	Drift ³	Sed	Plant	Drift ⁵	Sed	Plant	Drift	Sed	Plant ⁴	Drift
Family Psychomyiidae	trumpet-net caddisflies									√			
Order Plecoptera	stoneflies			√	√			√	√	√			√
Family Chloroperlidae	green stoneflies									√			
Family Nemouridae	spring stoneflies									√			
Family Perlidae	common stoneflies									√			√
Family Perlodidae	perlodid stoneflies				√					√			√
Family Pteronarcyidae	giant stoneflies									√			
Order Diptera	true flies						√	√	√	√			√
Family Athericidae	short-horned flies			√						√			
Family Blephariceridae	net-winged midges									√			
Family Ceratopogonidae	biting midges	√		√	√	√		√	√	√	√	√	
Family Chaoboridae	phantom midges			√	√			√		√			
Family Chironomidae	non-biting midges	√		√	√	√		√	√	√	√	√	√
Subfamily Chironominae		√			√	√		√	√	√	√		√
Subfamily Orthoclaadiinae		√			√	√		√	√	√	√		√
Subfamily Tanypodinae		√			√	√		√	√	√	√		√
Family Dolichopodidae	longlegged flies				√			√	√	√			
Family Empididae	dance flies			√	√					√			
Family Ephydriidae	shore flies				√					√			
Family Muscidae	stable flies			√				√		√			√
Family Sciomyzidae	marsh flies									√			√
Family Simuliidae	black flies			√						√			√
Family Psychodidae	sand flies						√		√				

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Scientific Name ¹	Common Name	Assean Watershed ²			Split Lake Area ²			Keeyask Area ²			Stephens Lake Area ²		
		Sed	Plant ⁵	Drift ³	Sed	Plant	Drift ⁵	Sed	Plant	Drift	Sed	Plant ⁴	Drift
Family Tipulidae	crane flies			√				√	√	√			
Family Tabanidae	horse flies	√					√	√	√				
Class Insecta – Semi-Aquatic/Terrestrial				√				√			√	√	
Order Collembola	springtails								√				
Order Coleoptera													
Family Staphylinidae	rove beetles								√				
Order Hemiptera													
Family Saldidae	shore bugs									√			
Total Number of Taxa ⁶		39		30	44	25		43	56	85	32	34	40

Sed = sediment

- Scientific names used throughout this report follow the Integrated Taxonomic Information System (ITIS 2007) classification. Taxonomic names Acarina (Hydracarina), Sphaeriidae, Conchostraca, and Mysidacea have been updated to Acari, Pisidiidae, Diplostraca, and Lophogastrida, respectively.
- Data included from Lower Nelson River Information System (LNRIS) database (1999-2004 finalized data imported).
Data that are part of EIS, but not included in the LNRIS database:
Split Lake/York Landing Arm, Sediment-Dwelling, 1997, 1998, and 2000 (TEMA and York Factory First Nation programs not included in LNRIS database)
Stephens Lake, Sediment-Dwelling, 2006 (to be imported to LNRIS database when technical report finalized)
Stephens Lake, Plant-Dwelling, 2005, 2006 (to be imported to LNRIS database when technical report finalized)
- Assean drifting data for 2001 and 2002 only; macroinvertebrates identified to lower taxonomic level in 2003 and 2004 (see Appendix 4A) and this resulted in a step-trend increase to number of taxa.
- 2005 and 2006 data for Stephens Lake not imported to LNRIS database, but included here for comparative purposes.
- Program not conducted.
- Number of taxa reported at Family level; if group identified to higher level, then it was assumed that only one Family was represented and this likely resulted in a conservative estimate of number of taxa.
- '√' used to denote 'presence'.