Water Quality and Management Of Lake Trout Lakes

Haliburton County: 2014 to 2016

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Ontario

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Water Quality and Management of Lake Trout Lakes

County of Haliburton: 2014 to 2016

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Notice to Reader

This information is being provided to you as a reference for water quality in lake trout lakes in the County of Haliburton and to assist with future planning decisions on lake trout lakes in the County of Haliburton.

The findings, conclusions and recommendations of the Ministry of the Environment and Climate Change (the Ministry) set out in this report are based in part, on information provided by others. The information that has been provided by others and which is relied upon by the Ministry is understood to be factual and correct; however the Ministry cannot guarantee that the information that has been provided by others is accurate or complete.

The findings, conclusions and recommendations of the Ministry set out in this report are based, at least in part, on information collected from recent sampling conducted by Ministry staff. The sampling was conducted in accordance with approved Ministry guidelines and methods for field operations. Water quality samples were analyzed by the Ministry's Laboratory Services Branch in Toronto according to accredited methodologies. Temperature and dissolved oxygen profiles were recorded after calibration of the instruments according to the manufacturer's manual.

Ongoing sampling surveys will be conducted in the future by Ministry staff to evaluate changes in water quality of lake trout lakes in the County of Haliburton.

Although the Ministry endeavours to ensure that the information contained in the summary of the data is as accurate as possible, errors may occasionally occur.

A more detailed description of individual lake trout lakes can be found in a previous report titled Water Quality and Management of Lake trout Lakes; County of Haliburton: 2001-2009. An electronic copy of this report can be obtained by calling the Kingston regional office at 1-800-267-0974 or 613-549-4000.

Other reports describing water quality in Eastern Ontario lake trout lakes can be found on the internet at https://archive.org/details/omote?&and[]=lake%20trout.

Avertissement: Cette publication hautement spécialisée Water Quality and Management of Lake Trout Lakes; County of Haliburton : 2014 to 2016 n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la *Loi sur les services en français*. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère de l'Environnement au 613-549-4000.

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Introduction

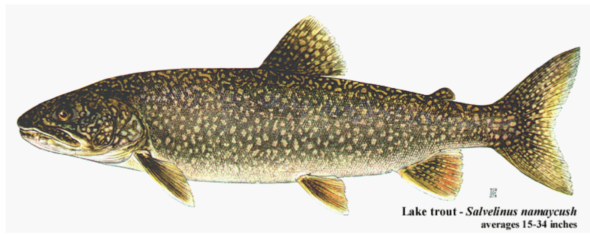
Inland lakes constitute a major environmental, recreational and economic resource for the province of Ontario. In 1990 anglers spent an estimated 2.5 billion dollars in purchases and activities related to fishing in Ontario's inland lakes.[1] Increased demand for waterfront property and the proximity of lakes in southern Ontario to major urban centers has resulted in considerable residential and commercial development on many of our lakes.

Lakes have a finite capacity to accommodate most types of development. One of the primary concerns over shoreline development is its impact to water quality. Land use changes around a lake can have a detrimental effect on water quality. Continuing pressure to develop shorelines requires that periodic water quality assessments be undertaken to assist in planning decisions regarding lake development.

The primary linkage between water quality and shoreline development is nutrient input to the lake. Development can increase the supply and availability of "fertilizing" plant nutrients such as phosphorus and nitrogen. These nutrients promote the growth of algae and other aquatic plants. As the proliferating algae die off they settle to the lake bottom and decompose. The decomposition process consumes oxygen, which reduces the amount of dissolved oxygen (DO) in the bottom waters of the lake. This bottom layer is often referred to as the hypolimnion.

Development can be especially detrimental to lake trout lakes. Habitat requirements for lake trout are more demanding than those of other fish species. Lake trout require clean, clear, deep lakes with well-oxygenated bottom waters. Although lake trout are present in only 1% of Ontario's lakes, these lakes make up 25% of the world's lake trout resource[2]. Lake trout lakes, more than any others, epitomize the ideal of pristine, clear, quintessential wilderness waters.

Lake trout lakes are an important part of our natural heritage and provide high quality angling and recreational



Lake trout - *Salvelinus namaycush* averages 15-34 inches

experiences. In a significant number of Ontario lakes, lake trout populations have been lost or are severely impaired. Unless properly managed, these fisheries and their benefits will be lost forever.

The County of Haliburton (Fig. 1) is an upper tier municipality and is responsible for the preparation of an Official Plan (OP). The *Planning Act* requires municipali decisions to be consistent withthe Provincial Policy Statement (PPS, 2014).

1. MOE, 1997. *Economic analysis of the proposed Lakeshore Development policy: Social-economic value of water in Ontario*. Economic Services Branch, Ministry of the Environment.

2. MOE, MNR & MMAH... 2003. *Lakeshore Capacity Assessment Handbook: Protecting Water Quality in Inland Lakes on Ontario's Precambrian Shield*. Draft Report. February, 2003.

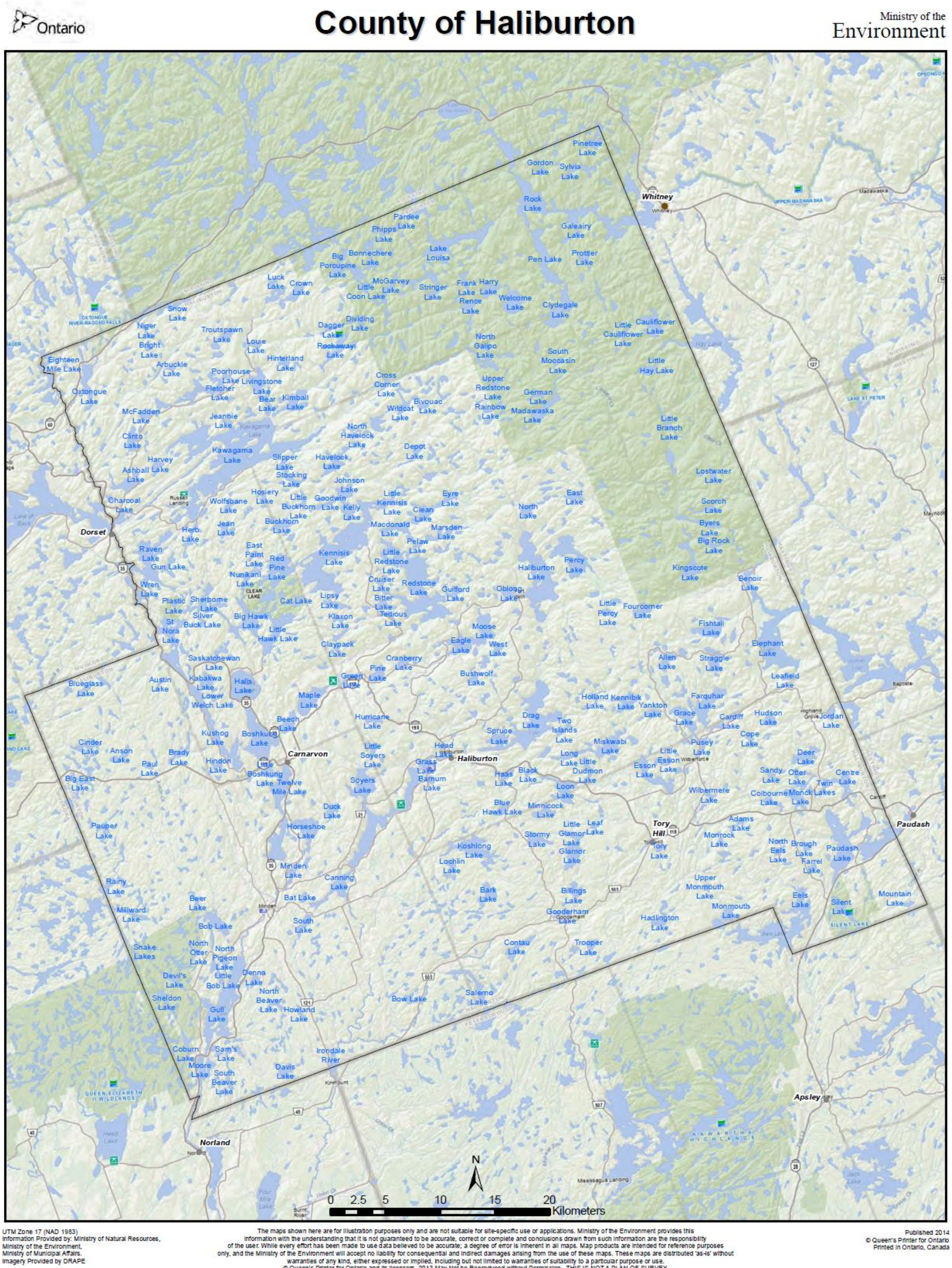


Figure 1. Map of the County of Haliburton

The Provincial Policy Statement outlines matters of provincial interest in land use planning. The PPS requires that development be permitted only if there will be no negative impact on natural heritage features such as fish habitat and water quality. The PPS also requires consideration of environmental lake capacity.

In order to assist the County in developing land use policies pertaining to shoreline development, the Eastern Region of the Ministry of the Environment and Climate Change undertook a water quality assessment of lake trout lakes in Haliburton County during 2014 though 2016. Some lakes were sampled during other years as well.

This report documents the water quality of 90 lakes that the Ministry of Natural Resources and Forestry (MNRF) has identified in Haliburton County that are currently managed by the MNRF as a lake trout fishery. There are numerous other lake trout lakes located within Provincial Parks, are surrounded by Crown Land or have remote access. These lakes were not sampled as part of this survey.

Sources of Phosphorus

In lakes on the Canadian Shield, phosphorus is the most essential nutrient for the growth of algae and aquatic plants. It is found naturally in all aquatic ecosystems. Lakes receive phosphorus from surface runoff from their surrounding land area; from tributary inflows from upstream lakes and wetlands; from atmospheric deposition directly on the lake surface and from the bottom sediments of a lake

which can resolubilize phosphorus under anoxic (no oxygen) conditions.

Surface runoff from the watershed can pick up particles of soil and vegetation containing phosphorus. This surface runoff drains into lakes and their tributary streams.

The phosphorus in atmospheric deposition includes dust, pollen and other wind borne particulates from bare agricultural fields and unpaved roads. Human activities in the vicinity of a lake introduce a supply of phosphorus, sometimes referred to as the artificial or anthropogenic load. Domestic sewage contains high levels of phosphorus and nitrogen. The most common form of sewage disposal servicing shoreline development is the septic tank leaching bed system. A leaching bed provides for an underground release of sewage effluent into the soil. Phosphorus and nitrogen from the effluent can migrate through the ground and impact water resources. Although some of the phosphorus and nitrogen from the sewage effluent is adsorbed by the soil or taken up by vegetation, over the long-term these nutrients may be released to the lake.

Sewage is not the only source of phosphorus arising from shoreline development activities. Land use changes in the immediate vicinity of a lake can result in additional phosphorus inputs. Disturbance of the natural shoreline through the clearing of trees and undergrowth and the addition of lawns, driveways and other landscape features decrease the permeability of the ground.

This "ground hardening" reduces infiltration of water resulting in increased surface runoff to the lake.

The application of fertilizers to lawns and gardens and increased soil erosion caused by the disturbance of the natural shoreline introduce additional sources of phosphorus to the lake.

Effects of Phosphorus

Unlike other aquatic pollutants, phosphorus is not directly toxic to aquatic life. High levels of phosphorus, however, can set off a sequence of events that can have serious impacts on the quality of recreational waters and their fisheries.

Phosphorus, more than any other nutrient, promotes the growth of algae and larger aquatic plants (macrophytes). Because phosphorus in freshwater ecosystems is the nutrient in shortest supply, small additions of phosphorus can result in accelerated growth and increased abundance of algae and macrophytes.

Algae are single celled, mostly microscopic, green plants. A certain amount of algae and aquatic plants are essential for the proper functioning of a healthy lake ecosystem. They provide food and shelter to fish and through the process of photosynthesis release oxygen to the water column. Generally, an increase in the production of algae gives rise to an increase in growth at all levels of the food chain up to and including fish. This causes changes in species composition and reduces levels of oxygen in the bottom waters of deeper lakes. The increase in biological productivity of a lake in response to nutrient enrichment is referred to as eutrophication.

While a certain amount of nutrient enrichment is beneficial, run-away eutrophication can bring about a loss in the recreational value of a body of water and degrade the structure of the biological community. Excessive growth of rooted aquatic plants can blanket the shallow regions and interfere with swimming and boating, while increased concentrations of algae in the water can result in decreased water clarity. Algae and other organic matter eventually settle to the bottom of the lake where they decompose through bacterial action. This decomposition process utilizes oxygen.

Cold water salmonid species of fish, such as lake trout, require cold, well-oxygenated water found at the bottom of deep lakes and are sensitive to oxygen depletion which occurs in the deeper bottom waters. Reduced levels of oxygen in deeper waters force these species to migrate into shallower, warmer, well oxygenated water. These conditions increase the stress levels on lake trout and expose juvenile lake trout to predation.

Lake Trophic Classification

One common method of classifying lakes is on a continuously rising trophic (nutrient enrichment) scale according to their biological productivity. This classification system is normally related to the nutrient concentration levels in a lake system, its water clarity and its algal biomass.

Lakes with relatively little nutrient input and low productivity are referred to as oligotrophic. Oligotrophic lakes are characterized by low levels of algae, exceptionally clear water, low species diversity and a well-oxygenated hypolimnion (deep bottom waters that remain cold throughout the summer). These types of lakes provide conditions that are suitable for salmonid species such as lake trout.

At the other end of the spectrum are the eutrophic (enriched) lakes. These lakes are rich in nutrients and highly productive. Eutrophic lakes are generally characterized by dense populations of aquatic plants and algae, reduced water clarity, and if thermally stratified, depletion or low levels of dissolved oxygen in the hypolimnion. These types of lakes are usually not suitable for cold-water species such as lake trout.

Mesotrophic lakes occupy an intermediate position on the spectrum between eutrophy and oligotrophy and are considered moderately enriched.

While changes to trophic state do not occur at sharply defined stages, numeric criteria are still useful at defining different levels of enrichment (Table 1).

Table 1.   Lake Trophic Classification Scheme

Trophic State	Total Phosphorus (µg/L)	Secchi Disc (m)	Algal Density
Oligotrophic	< 10	> 5	low
Mesotrophic	10 - 20	3 - 5	moderate
Eutrophic	> 20	< 3	high

Lake Processes

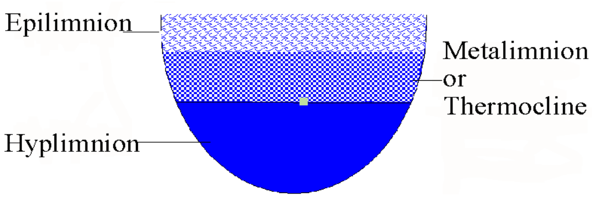
In order to understand factors influencing the water quality of a lake, it is necessary to consider several natural lake processes.   Lakes in southern Ontario, typical of other northern temperate lakes, undergo an annual cycle of physical, chemical and biological changes that affect temperature and oxygen concentrations and significantly influence lake trout habitat.

Physical Changes

During the winter when lakes are ice-covered, water temperatures range from 0°C at the surface to 4°C at the bottom. In the spring, after ice-out, the entire lake volume is at or slightly warmer than 4°C, the temperature of maximum water density. At this time, wind action is capable of mixing the entire lake volume. The net result is relatively uniform well mixed water mass from the surface to the bottom.

Following this brief period of spring mixing, termed spring overturn, warmer weather brings about a gradual warming of the surface waters. The warmer surface water is less dense and therefore floats over the colder, denser bottom water. This temperature-dependent density gradient divides the lake into three distinct thermally stratified layers: the epilimnion, metalimnion and hypolimnion (Fig. 2).

Figure 2. Thermal Stratification of Lakes



The epilimnion is the zone of warm lighter surface water and includes the near shore area called the littoral zone where most of the rooted aquatic plants are found. The hypolimnion is the zone of deep, cold and relatively undisturbed bottom water. During the summer, once this separation of surface and bottom water strata is established, the lake is said to be thermally stratified.

Between the epilimnion and the hypolimnion, there is a zone of rapid decrease in water temperature called the metalimnion. Within this zone, the depth where the maximum decrease in temperature occurs is defined as the thermocline.

During summer stratification, wind-induced physical mixing will circulate warm water throughout the epilimnion. The depth of the epilimnion is determined to some extent by lake area, fetch and local topography, water clarity as well as other features. In general, lakes with a long fetch, flat local topography and large surface area mix more deeply than other lakes. Summer mixing in the epilimnion does not play a role in the temperature regime below the thermocline. The warming of the surface water confines lake trout, which require cold water temperatures, to deeper waters.

During late August or early September, a brief period exists with little net gain or loss of heat, after which the surface of the lake begins to cool. Temperatures in the epilimnion gradually decline and stratification eventually breaks down as the temperature of the surface layer approaches that of the hypolimnion. De-stratification is complete when epilimnetic temperatures equal hypolimnetic temperatures and wind-induced mixing of the water column results in fall overturn. A relatively long period of autumnal circulation distributes oxygen and nutrients throughout the lake until ice cover is established.

Biological Changes

Algal production occurs in the epilimnion where sunlight is available for photosynthesis. Dead algae and other organic matter eventually sink to the hypolimnion and consume dissolved oxygen through decomposition processes. This process can severely deplete the dissolved oxygen levels in the hypolimnion.

The amount of plant biomass or organic matter produced depends upon the availability of nutrients. In freshwater lakes, phosphorus is the nutrient which is normally least available relative to plant requirements and therefore the nutrient which determines the amount of organic matter produced.

Chemical Changes

For lake trout, one of the most important chemical changes in a lake are those which affect the amount of oxygen in the water. During the spring mixing period, oxygen from the atmosphere and photosynthetic activity of algae and macrophytes is uniformly distributed throughout all lake depths. If mixing is complete and of sufficient duration, the oxygen concentration will approach saturation at all depths of the lake. Although most lakes mix completely, some lakes that are very deep and have a small surface area or are sheltered from the wind may undergo only partial mixing in the hypolimnion. These lakes enter the summer stratification period with a dissolved oxygen deficit in the hypolimnion.

Once stratification is established, the surface waters continue to be supplied with oxygen through exchange with the atmosphere and by photosynthesis. Both algae and rooted plants produce oxygen in the presence of inorganic nutrients and light. Although there is a demand for oxygen in the epilimnion by respiration and decomposition, the supply of oxygen usually greatly exceeds the demand. Wind-induced mixing near the surface ensures the distribution of oxygen throughout the epilimnion.

Aquatic life in the hypolimnion depends upon the amount of oxygen acquired during spring overturn.

Since photosynthetic oxygen production is light-dependent and adequate light seldom reaches the hypolimnion, only the surface water is available for photosynthetic oxygen production. In the hypolimnion, the oxygen incorporated during mixing, is gradually consumed over the summer and early fall by biochemical processes. These include: respiration by living organisms, reduction by oxygen-consuming chemical reactions, and most importantly through bacterial decomposition of organic matter (e.g. algae) supplied to the hypolimnion.

Fall overturn results, once again, in the uniform distribution of oxygen to all depths of the lake. Wintertime temperature conditions beneath the ice do not restrict lake trout to the deeper waters.

These lake processes when combined play an important role in determining the quality of lake trout habitat available at the end of the stratified season. In highly sensitive lakes small increases in phosphorus supply can significantly affect lake trout habitat.

Description of Study Lakes

Lake morphometry refers to measures of the physical dimensions of a lake. This includes its shape, depth and area. The lake morphometry determines the lakes flushing rate which is the time required for a lake to replenish its volume through inputs like precipitation and stream inflows.

The morphometric features for lake trout lakes in the County of Haliburton are summarized in Table 2.

Lakes vary greatly in their response to nutrient inputs. The response depends both on the rate of supply of nutrients and the morphometry. The morphometric features act together with water quality to determine the amount of dissolved oxygen habitat available.

The mean depth of a lake can be mathematically expressed as the volume of a lake divided by the surface area. In general, lakes with greater mean depths have higher oxygen concentrations in the hypolimnion. Exceptions include lakes with many bays, islands, multiple basins or small surface areas relative to their maximum depth.

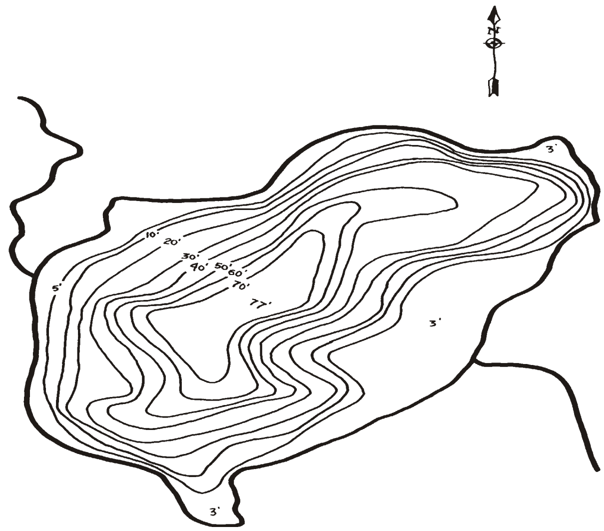
Lakes with multiple basins may have only one basin that is deep enough for lake trout to inhabit. However mean depth includes the surface area and volume of the entire lake even though only one basin may have lake trout habitat. The morphometry of these lakes distorts the relative mean depth in comparison with single basin lakes.

Sampling Methods

Water surveys of lake trout lakes in the County of Haliburton were conducted in 2014, 2015 and 2016. Aproximately 30 lakes were sampled each year. Some lakes couldn't be sampled due to access issues or inclement weather conditions at the time of sampling.

The samples for some lakes from the fall of 2016 were lost in transit to the lab and these lakes were re-sampled in 2017. That data is also included in this report.

The 2014 through 2016 surveys were conducted in the spring (May) and in the fall (September) of each year when the



lakes began cooling off. 2016 was an extremely warm year and sampling was delayed for one to two weeks after the normal sampling period of the second week in September. Some lakes were also sampled in July 2016 to verify temperature and oxygen profiles conducted in the fall of 2016 to ensure all the equipment was working according to specifications.

Sampling stations were located in the deepest hole(s) of each lake in order to obtain a full depth profile. The deep holes were located using historic bathymetric maps and were field verified using electronic depth sounders.

In multi-basin lakes, where significant differences in limnological features may exist, an additional station was sampled at the deepest part of the secondary basin.

During each fall sampling visit, water clarity was measured using a Secchi disc, euphotic zone and one metre over bottom water samples were collected for chemical analyses, and vertical profiles of temperature and dissolved oxygen.

Table 2. Morphometric Features of the County of Haliburton Study Lakes

Lake Name	Surface Area (ha)	Watershed Area (ha)	Shoreline Length (km)	Maximum Depth (m)	Mean Depth (m)	Total Lake Volume ($10^6 m^3$)
Allen	98	468	5.9	29	8.59	8.4
Art	126	956	8.37	29	7.52	9.5
Basshaunt	47	695	4.83	24	7.75	3.67
Bear	95	11,023	9.74	36.6	9.87	9.34
Beech	124	45,995	6.44	26	7.1	8.81
Big Hawk	389	21,895	35.6	54.9	16.7	64.7
Bitter	43	110	4.4	29	11.46	4.92
Bob	220	2276	15.77	64	18.27	40.19
Boshkung	716	77,945	18.18	71	23.27	166.6
Bow	51	324	3.4	43.9	18.06	9.16
Buckskin	32	253.4	3.1	36	11.6	3.734
Clean	160	863	6.76	43.3	14.93	23.94
Clear	96	257.7	7.56	29.57	11.8	1.138008
Clinto	138	180	6.92	21.3	8.03	11.05
Davis	93	1083	8.16	29.9	10.78	10
Deer	190	880	10.14	20.1	8.45	12.5
Delphis	26	99	3.3	28	10.11	2.67
Devils (Lutterworth)	59	815	N/A	39.6	14.66	8.64
Drag	1003	9125	42	54.9	17.96	180.07
Eagle	325	34,826	10.46	22.3	7.05	16.54
Eels	946	8933	62.44	29.87	6.7	63.45
Esson	245	1779	16	32	10.88	26.64
Erye	66	6790	5.3	17.4	8.12	5.33
Farquhar	336	1660	13.5	49.1	17.67	59.4
Fishtail	256	4304	11.75	38.1	17.38	44.48
Fletcher	256	4019	19.79	23.16	7.86	20.136561
Four Corner	98	N/A	6.8	26.52	8.29	8.443
Glamor	194	2276	10.62	22	10.2	19.78
Goodwin	54.2	N/A	N/A	N/A	N/A	N/A
Grace	226	5234.5	8.8	38.7	15.38	34.81
Gull	996	122,600	30.4	49.1	16.5	163
Haliburton	1012.52	26,612	30	54.9	18.36	178.89
Halls	543	23,494	13	80.5	28.22	153.3
Havelock	196	1384	15.45	33.2	10.26	20.14
Hudson	73.7	155	N/A	23	11.15	8.22
Johnson	151	2548	6.6	45.1	18.4	27.8
Kabakwa	115	218	6.12	19.5	6.92	7.94
Kashagawigamog	817	22,856	34.44	39.6	12.98	106.06
Kawagama (Main)	2530	38,838	N/A	73.2	22.88	578.96
Kawagama (Fletcher Bay)	289	6464.9	N/A	42.7	17.83	51.49
Kelly	98.74	2793	6.6	35.66	11.64	11.4911
Kennisis	1417.21	12,089	41.52	67.97	23.5	33.235723
Kimball	213	3192	9.7	67.1	22.89	48.64
Klaxon	43.6	307	5.4	26	9	3.927
Koshlong	409	2565	11.43	43	10.14	41.48
Kushog	600	8669.1	38.3	38.1	9.1	63.2

Table 2 cont'd. Morphometric Features of the County of Haliburton Study Lakes

Lake Name	Surface Area (ha)	Watershed Area (ha)	Shoreline Length (km)	Maximum Depth (m)	Mean Depth (m)	Total Lake Volume ($10^6 m^3$)
Lipsy	69	333	6.2	52.1	17.6	12.14
Little Bob	74	3051	7.64	21.95	8.64	6.38
Little Boshkung	127	77,863	5.8	14.3	6.7	8.43
Little Clean	22	972	1.9	14	7.6	1.67
Little Hawk	344	2132	18.2	93	31.55	108.61
Little Kennisis	231	6350	14.83	43.9	15.09	34.874673
Little Redstone	226	12,801	N/A	62.2	13.31	30.09
Livingstone	185	4203	8.69	36.6	13.04	24.1
Long	88	2088.4	10.62	19.81	5.46	4.811816
Loon	242	N/A	N/A	N/A	N/A	N/A
Lower Fletcher	61	770	N/A	30.48	10.67	6.56
MacDonald	138	332	9.1	39.6	10.87	14.97
Maple	336	44,968	10.6	36.5	11.8	39.3
Marsden	230	11,945	15.1	24	3.81	8.76
McFadden	54	174	4	30.5	1.54	6.27
Miskwabi	264	1241	10.6	44.2	19.86	52.38
Monmouth	76	1474	4.67	17.1	8.49	6.42
Moore	162	105,346	11.75	24.4	4.98	8.08
Moose	289	16,109	12.71	43.89	17.1	48.060081
Mountain (Cardiff)	25	145	2.9	25	8.5	2.13
Mountain (Minden)	319	96,300	13.68	31.39	13.41	44.212857
North	83	839	4.08	33.3	15.56	12.93
North Pigeon	47	184	4.33	39	15.3	7.16
Nunikani	116	15,865	10.62	24.08	7.89	9.112847
Oblong	91	13,282	5.15	27.4	10.49	9.55
Oxtongue	249	58,900	21	26.8	8.99	22.41
Paudash (North Bay)	320	12,859	N/A	46.3	16.54	52.92
Paudash (Joe Bay)	249	2144	N/A	24	9.65	24.02
Percy	34	6576	23.3	33.5	11	37.4
Pusey	57	5484	5.63	38.1	10.67	6.05
Red Pine	384	14,791	19.79	40	10.7	41.08
Redstone	1193	17,435	38.2	82	19.52	232.92
Sheldon	53	1073	9.02	22.6	9.42	4.98
Sherborne	252	1784	24.62	35.1	9.65	24.31
Silent	118	937	11	23.1	6.49	7.68
Slipper	52	999	4.3	34	14.26	7.37
South Anson	71.7	N/A	N/A	28	5.9	N/A
Soyers	331	5210	10.5	48.8	14.34	47.41
St. Nora	264	1675	12.5	39	15.96	42.11
Stocking	64	628	5.6	21.6	8.01	5.1
Stormy	78	603	5.47	24.4	8.68	6.78
Tedious	29.54	470	N/A	22	5.5	1.87
Twelve Mile	337	80,382	12.55	27.4	12.09	40.68
Two Islands	57	577	N/A	23.2	6.64	3.8
Wilbermere	44	7881	5.7	24	7.67	3.39

were taken using a Y.S.I. dissolved oxygen and temperature meter.

The oxygen meter was air calibrated prior to each profile according to the manufacturer's instructions. Surface water samples were collected as

composite (i.e. all depths represented) samples through the euphotic zone. The euphotic zone is the zone in which there is sufficient light to sustain photosynthesis.

For this survey the euphotic zone was defined as twice the Secchi visibility depth. Samples were also collected from one meter above the bottom using a Kemmerer bottle sampler. Water samples were submitted for analysis to the Ministry of the Environment and Climate Change laboratory and analyzed according to standard methods of the Laboratory Services Branch.

Study data collected during the 2014-2016 surveys are presented as summary sheets for water chemistry, temperature and dissolved oxygen profiles and water quality assessments for each individual lake are included as appendi*ces* to this report.

Water Quality and Lake Trout Habitat

Lake trout, *Salvelinus namaycush*, are found in recently glaciated lakes on or near the Precambrian Shield. These lakes are noted for their pristine water quality which includes high clarity, low levels of dissolved solids, organic carbon and phosphorus, high concentrations of dissolved oxygen, cool year-round bottom water temperatures and relatively stable water levels.

Self-sustaining populations of lake trout are found in these lakes because they provide the specific environmental conditions required by the species.

Lake trout are long lived and late maturing with the first spawning of females occurring at 6 to 10 years of age. This late maturation combined with modest egg production and low recruitment makes lake trout extremely vulnerable to over-fishing, and degradation or loss of spawning or summer habitat.

Loss of summer habitat is greatly influenced by shoreline development and phosphorus loading. During summer months, lake trout live in the hypolimnion. The hypolimnion is isolated from the upper waters during this period of stratification and is not replenished with new supplies of oxygen from the atmosphere or through photosynthesis.

To sustain lake trout in the summer months the hypolimnion must retain an adequate amount of dissolved oxygen. As previously described, nutrient enrichment through shoreline development can deplete dissolved oxygen levels in the hypolimnetic waters.

Dissolved Oxygen

Low dissolved oxygen in bottom waters reduces the ability of lake trout to obtain oxygen from the water, which in turn affects their cellular metabolic activity and compromises their ability to swim, feed, grow and avoid predators.

The Ministry of Natural Resources and Forestry (MNR) has determined that a volume-weighted mean hypolimnetic dissolved oxygen concentration of 7 mg/L is required to meet the needs of juvenile lake trout and to ensure that natural recruitment in a lake continues.[3]

In this study, the mean volume-weighted hypolimnetic dissolved oxygen concentrations (MVWHDO) during the critical period were calculated for each lake. Values are presented in Table 3. This level of dissolved oxygen in the hypolimnion has been adopted as the criterion used for protection of lake trout habitat and is determined during the period of late August or early September prior to the beginning of fall overturn. This coincides with the critical period of lowest dissolved oxygen concentrations in the hypolimnion.

The hypolimnion is determined from the temperature profile and is defined as the area of water below the thermocline where temperature change is less than 1 °C per meter of depth.

Volume-weighted mean hypolimnetic dissolved oxygen is calculated in the following way. The hypolimnion is considered in terms of a series of depth strata (usually one meter thick).

Morphometric data obtained from bathymetric maps are required to calculate the volume of each depth stratum. The volume of each stratum is calculated from the individual contour areas of the lake using the following formula:

$$V = \frac{m\,(A_t + A_b) + \sqrt{(A_t * A_b)}}{3}$$

where,

V is volume in cubic metres (m^3)
A_t is the area (ha) of the top of the stratum
A_b is the area (ha) of the bottom of stratum
m is the depth of stratum in metres

The volume of each hypolimnion stratum is multiplied by the oxygen concentration observed for that stratum. These individual concentrations are then summed. The total dissolved oxygen concentration in the hypolimnion is divided by the total volume of water in the hypolimnion to yield a volume-weighted mean hypolimnetic dissolved oxygen concentration.

Other water chemistry parameters were analyzed to measure water quality conditions of the study lakes. These include; total phosphorus, nitrogen ammonia, nitrates, nitrites, total Kjeldahl nitrogen (TKN), dissolved inorganic carbon (DIC), dissolved organic carbon (DOC), pH and total alkalinity.

3. Evans, D.O. 1999. Metabolic scope-for-activity of juvenile lake trout and the limiting effect of reduced dissolve oxygen: defining a new dissolved oxygen criterion for the protection of lake trout habitat. Lakeshore Capacity Assessment Handbook, 2001

Table 3. Mean Volume-Weighted Hypolimnetic Dissolved Oxygen for County of Haliburton Lake Trout Lakes, 2014 – 2017 (mg/L).

Lake Name	Basin	MVWHDO 2014	MVWHDO 2015	MVWHDO 2016	MVWHDO 2017	Lake Name	Basin	MVWHDO 2014	MVWHDO 2015	MVWHDO 2016	MVWHDO 2017
Allen		7.36				**Delphis**		NS			
Art		2.58				**Devils (Lutterworth)**				9.57	
Basshaunt						**Drag**	Basin 1	8.31			
Bear	Basin 1		8.5			**Drag**	Basin 2	8.29			
Bear	Basin 2		7.77			**Drag**	Basin 3	NS			
Bear	Basin 3					**Eagle**		3.2			
Beech						**Eels**	Basin 1	5.34			
Big Hawk	Basin 1		9.48			**Eels**	Basin3	4.97			
Big Hawk	Basin 2		8.69			**Esson**	Basin 1	7.27			
Big Hawk	Basin 3		8.16			**Esson**	Basin 2	6.36			
Bitter	Basin 1		6.83			**Eyre (Black)**			4.36		
Bitter	Basin 2					**Farquhar**		8.75			
Bob	North			7.52		**Fishtail**		8.65			
Bob	South					**Fletcher**	Basin 1		4.84		
Boshkung	North					**Fletcher**	Basin 2		6.71		
Boshkung	South			8.52		**Fletcher**	Basin 3		2.71		
Bow						**Four Corner**					
Buckskin		6.3				**Glamor**		4.14			
Clean (Clear)			8.86			**Goodwin**			5.36	5.1	
Clear	Basin 1					**Grace**		8.11			
Clear	Basin 2					**Gull**	Basin 1			7.34	
Clinto	Basin 1		5.02			**Gull**	Basin 2			7.24	7.07
Clinto	Basin 2		6.87			**Haliburton**	Basin 1	8.76			
Davis						**Haliburton**	Basin 2	8.68			
Deer		5.39				**Haliburton**	Basin 3	8.7			

Table 3 cont'd. Mean Volume-Weighted Hypolimnetic Dissolved Oxygen for County of Haliburton Lake Trout Lakes, 2014 – 2017 (mg/L).

Lake Name	Basin	MVWHDO 2014	MVWHDO 2015	MVWHDO 2016	MVWHDO 2017	Lake Name	Basin	MVWHDO 2014	MVWHDO 2015	MVWHDO 2016	MVWHDO 2017
Halls				9.56	10.37	Klaxon					
Havelock						Koshlong		6.94			
Hudson		6.9				Kushog	Basin 1			7.14	7.65
Johnson			8.48			Kushog	Basin 2			4.33	5.11
Kabakwa				3.1		Kushog	Basin 3				
Kashagawigamog	Basin 1			3.25		Lipsy			7.14		
Kashagawigamog	Basin 2			7.3		Little Bob	Basin 1			1	
Kashagawigamog	Basin 3			2.2		Little Bob	Basin 2			6.79	
Kawagama	Basin 1		9.74			Little Boshkung				1.55	
Kawagama	Basin 2		9.6			Little Clean			0.96		
Kawagama	Basin 3					Little Hawk	Basin 1		9.46		
Kawagama	Basin 4		8.14			Little Hawk	Basin 2		9.61		
Kawagama	Basin 5		8.28			Little Kennisis	Basin 1		7.31	7.66	
Kawagama	Basin 6		9.04			Little Kennisis	Basin 2		6.43	6.25	
Kawagama	Basin 7					Little Redstone			8.37		
Kelly				7.8		Livingstone	Basin 1		8.25		8.14
Kennisis	Basin 1		8.52			Livingstone	Basin 2		1.8		0.88
Kennisis	Basin 2		9.26	9.01		Long		1.94			
Kennisis	Basin 3		9.28			Loon		7.19			
Kennisis	Basin 4		9.26	9.01		Louie					
Kimball	Basin 1		8.08			Lower Fletcher			4.92		
Kimball	Basin 2		8.42			MacDonald	Basin 1		8.64		
Kimball	Basin 3					Maple				5.87	

Table 3 cont'd. Mean Volume-Weighted Hypolimnetic Dissolved Oxygen for County of Haliburton Lake Trout Lakes, 2014 – 2017 (mg/L).

Lake Name	Basin	MVWHDO 2014	MVWHDO 2015	MVWHDO 2016	MVWHDO 2017	Lake Name	Basin	MVWHDO 2014	MVWHDO 2015	MVWHDO 2016	MVWHDO 2017
Marsden			3.84			**Raven**	Basin 1		7.58		
McFadden			5.5	6.99		**Raven**	Basin 2		9.92		
Miskwabi		8.72				**Red Pine**	Basin 1			7.9	
Monmouth		5.31				**Red Pine**	Basin 2			8	
Moore	Basin 1			3.2		**Redstone**	Basin 1		10.06		
Moore	Basin 2					**Redstone**	Basin 2		9.07		
Moose	Basin 1	8.05				**Redstone**	Basin 3		9.66		
Moose	Basin 2	7.87				**Sheldon**					
Mountain (Cardiff)						**Sherborne**	Basin 1				
Mountain (Minden)	Basin 1			5.11	5.46	**Sherborne**	Basin 2		6.93		
Mountain (Minden)	Basin 2					**Sherborne**	Basin 3		6.01		
North		7.12				**Sherborne**	Basin 4		6.63		
North Pigeon				5.6		**Silent**		3.95			
Nunikani	Basin 1					**Slipper**			6.25		
Nunikani	Basin 2					**Soyers**				7.8	
Oblong		7.66				**St. Nora**	South				
Oxtongue	Basin 1		7.21	5.65		**St. Nora**	North			7.86	8.28
Oxtongue	Basin 2		7.09	6.09		**Stocking**			5.41		
Paudash	Basin 1	8.31				**Stormy**		5.36			
Paudash	Basin 2	6.78				**Twelve Mile**				4.79	
Percy	Basin 1	7.14				**Two Islands**		0.94			
Percy	Basin 2	6.99				**Wilbermere**		3.52			
Pusey		5.19									

A summary of the euphotic zone (EUP) data is presented in Table 4 and meter over bottom data (MOB) in Table 5.

Phosphorus

The importance of phosphorus as the limiting nutrient in controlling lake productivity and dissolved oxygen content has been extensively discussed throughout the document.

Nitrogen

Nitrogen like phosphorus is an essential plant nutrient. Nitrogen occurs naturally in all lakes but can also be introduced through human activities. Nitrogen exists in lakes as molecular nitrogen (N_2), ammonia (NH_3), nitrate (NO_3^-), nitrite (NO_2) and organic nitrogen (TKN).

Ammonia is the end product of decomposition and cellular metabolism. In an aqueous solution, the form un-ionized ammonia (NH_3) can be highly toxic to many organisms. The amount of un-ionized ammonia is dependent on pH and water temperature. Generally, the higher the pH and temperature, the higher the concentration of un-ionized ammonia. Bacteria can convert ammonia to nitrite and then to nitrate in a process called nitrification. This process consumes oxygen.

Total ammonia nitrogen levels in the Haliburton County study lakes ranged from 0.002 to 0.262 mg/L with an average of 0.014 mg/L. The Provincial Water Quality Objective (PWQO) for ammonia is based on its toxic form un-ionized ammonia. The PWQO for un-ionized ammonia is 0.02 mg/L.

Nitrite is rapidly oxidized to nitrate in surface waters and is therefore seldom present in any significant concentrations. Higher levels of nitrites could indicate a source of organic pollution.

Nitrite concentrations ranged from 0.001 to 0.009 mg/L and averaged 0.002 mg/L. There is no PWQO for nitrite. The Canadian Environmental Quality Guidelines (CCME) for the protection of aquatic life is 0.06 mg/L.

Nitrate is readily available to algae and may stimulate the growth of algae and larger plants. Nitrate concentrations ranged from 0.005 to 0.250 mg/L and averaged 0.048 mg/L. There is no current PWQO for nitrate but the current CCME guideline is 13.0 mg/L.

Total Kjeldahl nitrogen (TKN) is a measure of organic nitrogen and is important in assessing the availability of nitrogen and its potential contribution to eutrophication. Nitrogen is seldom limiting in freshwater ecosystems. The TKN concentrations in the study lakes ranged from 0.11 to 0.55 mg/L and averaged 0.25 mg/L. There is no PWQO for TKN.

Carbon

Carbon is a nutrient required for biological processes. It is usually readily available in inorganic or organic forms.

Dissolved organic carbon (DOC) is the largest source of organic carbon in most lakes. DOC is released when living organisms decompose in the lake. The bulk of organic carbon in water consists of humic substances and partly degraded plant and animal matter. Waters with high DOC values are usually highly colored (orange-red) due to high amounts of humic material that reduces water clarity. Reduction in water clarity can affect the success of predation by some predators. High concentrations of organic carbon may also indicate that decomposition processes are very active and may result in lower dissolved oxygen levels in the hypolimnion.The DOC in the study lakes ranged from 0.1 to 7.8 mg/L and averaged 3.8 mg/L. There is no Provincial Water Quality Objective (PWQO) for DOC.

Dissolved inorganic carbon (DIC) is a major nutrient used in photosynthesis by algae and submergent aquatic plants. The total inorganic carbon concentration in freshwater depends on pH.

The DIC levels in the study lakes ranged from 0.1 to 27 mg/L and averaged 3.5 mg/L. There is no PWQO for DIC.

Acidity and Alkalinity

The acidity of a solution is measured on a pH scale. The pH scale is logarithmic. This means that a change in one unit of pH represents a ten-fold increase or decrease in acidity. For example, a pH of 5 is ten times more acidic then a pH of 6 and 100 times more acidic than a pH of 7. A pH of 7 represents a solution that is neither acidic nor alkaline and is referred to as being neutral. Waters below pH 7 are acidic and above 7 are alkaline. To protect aquatic life the Provincial Water Quality Objective for pH is between 6.5 and 8.5. The pH of the study lakes ranged from 5.84 to 8.36.

Alkalinity is the measurement of water's ability to neutralize acids. It usually indicates the presence of carbonate, bicarbonates, or hydroxide ions. Alkalinity results are expressed in terms of an equivalent amount of calcium carbonate. Lakes on the Canadian Shield (granite bedrock) usually have alkalinity values between 0 and 50 mg/L while waters formed on limestone bedrock have values ranging from 100 to 250 mg/L.

Lakes with low alkalinity have little capacity to buffer acidic inputs and are susceptible to acidification (low pH). Lake trout populations are particularly sensitive to acid precipitation inputs to low alkalinity lakes. Many common lake trout food sources have high mortality rates when exposed to slightly lower pHs. The resulting lack of food inhibits growth and reproduction (egg development) of lake trout.

Alkalinity values in the study lakes ranged from a low of 2 mg/L to a high of 115 mg/L with an average of 14.63 mg/L.

Based on acid sensitivity studies carried out by the Ministry in 1989, the study lakes range from not sensitive to moderately sensitive to acid rain inputs[4].

Conductivity

Conductivity measures the ability of water to conduct an electric current. Conductivity is proportional to the total dissolved mineral content and solids in natural waters. The study lakes in the County of Haliburton had conductivities ranging from 16 µs/cm to 218 µs/cm and averaged 48.46 µs/cm.

4. MOE, 1989. *Acid Sensitivity of Lakes in Ontario*. Public Affairs and Communication Branch. Ministry of the Environment, Toronto. 31p.

Table 4a: Summary Chemistry Data for Euphotic Zone (Surface) for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted). Chemical Abbreviations are explained in the Glossary of Terms Section.

Lake	Date	Basin	Secchi (m)	TP	NH_3-N	NO_2-N	NO_3 + NO_2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Allen	14-May-14		4.5	0.007	0.046	0.003	0.167	0.4	4	5.5	7.58	21	64	8.44	2.19	30	0.9	42
Allen	09-Sep-14		3.5	0.011	0.033	0.001	0.042	0.22	4.3	5.4	7.75	24.8	64	8.55	2.07	30	0.5	41
Art	14-May-14		3.2	0.006	0.047	0.004	0.155	0.23	5	1.2	7.02	6	31	3.53	0.79	12	1.5	20
Art	11-Sep-14		9.1	0.01	0.005	0.002	0.054	0.24	5.9	1.7	7.23	7.9	31	3.63	0.755	12	1.1	20
Basshaunt	17-May-16		4.5	0.007	0.01	0.002	0.099	0.25	3.9	1.8	7.24	7.7	31	3.51	0.768	12	0.9	20
Bear	19-May-15	Basin 1	3.5	0.005	0.044	0.004	0.052	0.23	4.4	0.2	6.39	2.0	19	1.69	0.524	6.4	0.8	13
Bear	16-Sep-15	Basin 1	4	0.005	0.03	0.003	0.02	0.24	4.2	1.3	6.64	3.5	21	1.95	0.587	7.3	1.1	13
Bear	16-Sep-15	Basin 2	3.75	0.005	0.038	0.004	0.02	0.29	4.4	1.1	6.7	3.6	21	1.96	0.593	7.3	1	14
Beech	17-May-16		4.4	0.005	0.04	0.006	0.113	0.25	3.6	3.7	7.58	13.7	56	5.73	1.45	20	1.1	36
Big Hawk	21-May-15	Basin 1	6.2	0.005	0.038	0.005	0.02	0.24	3.4	0.5	6.38	3.5	23.0	2.22	0.509	7.6	0.6	15.0
Big Hawk	21-May-15	Basin 2	6.2	0.005	0.046	0.005	0.02	0.23	3.5	0.3	6.43	3.5	22.0	2.16	0.500	7.5	0.9	14.0
Big Hawk	21-May-15	Basin 3	6.2	0.015	0.035	0.004	0.025	0.25	3.4	0.5	6.35	3.2	22	2.11	0.504	7.3	0.7	14
Big Hawk	14-Sep-15	Basin 1	3.4	0.005	0.016	0.002	0.02	0.16	3.4	0.6	6.79	3.5	22	2.04	0.509	7.2	0.5	15
Big Hawk	14-Sep-15	Basin 2	2.5	0.005	0.036	0.002	0.02	0.022	3.6	1	6.83	3.6	23	2.16	0.503	7.5	0.8	15
Big Hawk	14-Sep-15	Basin 3	3.5	0.005	0.02	0.002	0.02	0.2	3.4	1	6.81	3.6	22	2.05	0.503	7.2	0.8	14
Bitter	19-May-15	Basin 1	4.1	0.006	0.041	0.004	0.02	0.12	2.9	1.1	6.71	5.8	28.0	2.52	0.615	8.8	0.5	18.0
Bitter	09-Sep-15	Basin 1	6.5	0.005	0.032	0.001	0.020	0.28	3.0	1.6	7.03	5.5	29.0	2.77	0.651	9.6	0.5	19.0
Bob	18-May-16	North	4.5	0.005	0.037	0.004	0.112	0.23	4.1	2.2	7.43	10	36	4.46	0.877	15	0.8	23
Bob	29-Sep-16	North	3.38	0.005	0.018	0.002	0.02		4.1	2.8	7.43	16.7	39	4.66	1.07	16	0.9	25
Boshkung	17-May-16	North	5.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boshkung	17-May-16	South	5	0.005	0.033	0.008	0.134	0.26	3.3	2.4	7.46	9.6	47	4.55	1.02	16	0.8	30
Boshkung	26-Sep-16	Basin 2	6	0.005	0.009	0.002	0.180	N/A	3.30	3.0	7.3	15.90	48.0	1.1	2.12	16.0	0.5	31.0
Bow	16-May-16		4.75	0.006	0.013	0.001	0.02	0.11	2.4	12.9	8.14	48.8	118	16.4	3.3	55	1.2	77
Buckskin	15-May-14		4.4	0.006	0.042	0.004	0.163	0.23	3.9	2	6.64	2.5	21	2.5	0.374	7.8	1.2	14
Buckskin	10-Sep-14		4.5	0.008	0.021	0.001	0.052	0.22	4.1	0.6	6.66	3.3	21	2.43	0.351	7.5	0.6	14
Clean	19-May-15	Basin 1	9.0	0.019	0.043	0.004	0.02	0.20	2.7	0.8	6.75	3.1	21.0	2.07	0.504	7.2	2.6	14.0
Clean	16-Sep-15	Basin 1	5.4	0.005	0.025	0.002	0.03	0.20	2.7	0.9	6.87	4.0	21.0	2.04	0.514	7.2	1.1	14.0
Clinto	20-May-15	Basin 1	7.3	0.006	0.049	0.003	0.02	0.14	2.5	0.7	6.72	3.1	20.0	1.72	0.577	6.7	0.6	13.0
Clinto	20-May-15	Basin 2	7.5	0.005	0.058	0.003	0.02	0.13	2.3	0.7	6.67	2.4	20.0	1.73	0.577	6.7	1.0	13.0
Clinto	15-Sep-15	Basin 1	4.3	0.018	0.018	0.002	0.02	N/A	2.5	0.3	6.91	4.0	20.0	1.76	0.598	6.9	0.8	13.0
Clinto	15-Sep-15	Basin 2	4.5	0.005	0.029	0.001	0.02	N/A	2.6	0.4	6.89	3.7	20.0	1.74	0.610	6.9	0.9	13.0

Table 4b: Summary Chemistry Data for Euphotic Zone (Surface) for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted).

Lake	Date	Basin	Secchi (m)	TP	NH_3-N	NO_2-N	NO_3 + NO_2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Davis	18-May-16		5	0.006	0.029	0.004	0.053	0.22	5.2	8.7	7.96	33	87	13.3	1.12	38	0.9	57
Deer	13-May-14		4	0.007	0.038	0.003	0.157	0.22	3.7	1.1	6.98	5.1	39	3.64	0.656	12	1.2	25
Deer	08-Sep-14		5	0.01	0.025	0.001	0.066	0.2	3.9	1.6	7.03	7	40	3.64	0.632	12	0.8	26
Devils (Lutterworth)	19-May-16		3.4	0.01	0.032	0.002	0.044	0.19	4.3	0.6	6.8	3.1	16	1.42	0.407	5.2	1.7	10
Devils (Lutterworth)	11-Jul-16		N/A	0.006	0.035	0.002	0.250	N/A	4.20	0.4	6.7	3.50	15.0	1.4	0.40	5.1	1.4	10
Devils (Lutterworth)	28-Sep-16		5.5	0.005	0.005	0.001	0.220	N/A	4.20	1.4	6.7	7.20	16.0	1.4	0.44	5.40	0.5	10
Drag	15-May-14	Basin 1	4.7	0.007	0.04	0.004	0.198	0.28	4.1	4.9	7.49	16.5	60	7.77	1.86	27	1.1	39
Drag	15-May-14	Basin 2	4.6	0.008	0.039	0.003	0.191	0.3	4	4.8	7.5	18.2	60	7.57	2.01	27	1.1	39
Drag	15-May-14	Basin 3	4.4	0.005	0.043	0.003	0.195	0.33	4.2	4.9	7.51	16.6	60	7.73	1.78	27	1.1	39
Drag	11-Sep-14	Basin 1	3.1	0.008	0.005	0.001	0.055	0.22	4.7	4.6	7.66	22.3	57	7.37	1.68	25	1.6	37
Drag	11-Sep-14	Basin 2	3.2	0.009	0.005	0.002	0.054	0.22	5.9	5.2	7.77	24.2	63	7.86	1.83	27	0.7	41
Eagle	14-May-14		5	0.006	0.041	0.004	0.19	0.27	3.5	3.2	7.4	11.6	52	6.05	1.59	22	1.1	34
Eagle	10-Sep-14		3.5	0.009	0.024	0.001	0.054	0.25	3.8	3	7.48	12.9	44	4.91	1.27	17	1	29
Eels	13-May-14	Basin 1	3.5	0.008	0.03	0.002	0.02	0.43	4.8	3.2	7.28	12.3	48	7.24	0.752	21	1.1	31
Eels	13-May-14	Basin 3	3.2	0.007	0.029	0.003	0.02	0.42	4.7	3.4	7.35	12.4	49	7.35	0.727	21	1.5	32
Eels	11-Sep-14	Basin 1	3.2	0.009	0.008	0.002	0.092	0.24	4.9	4.1	7.56	20.1	52	8.23	0.753	24	0.8	34
Eels	11-Sep-14	Basin 3	3.5	0.008	0.005	0.001	0.091	0.23	4.9	4.1	7.53	17.2	51	8.35	0.723	24	0.6	33
Esson	13-May-14	Basin 1	4.25	0.008	0.049	0.003	0.161	0.22	4.2	10.9	7.84	38.1	118	16.2	2.4	50	0.9	77
Esson	13-May-14	Basin 2	4	0.008	0.05	0.004	0.149	0.29	4.4	9.9	7.81	34.2	107	14.9	2.35	47	1	69
Esson	11-Sep-14	Basin 1	4.5	0.009	0.023	0.001	0.1	0.24	4.4	10.6	7.81	46.1	118	16.4	2.27	50	0.5	77
Esson	11-Sep-14	Basin 2	4.5	0.01	0.022	0.001	0.107	0.3	4.6	10.1	7.69	43.2	109	15.2	2.24	47	1.1	71
Erye	20-May-15	Basin 1	3.5	0.005	0.042	0.003	0.02	0.31	5.5	0.2	6.30	2.8	20.0	1.87	0.487	6.7	0.8	13
Eyre	11-Sep-15	Basin 1	3.5	0.006	0.028	0.002	0.02	N/A	4.6	1.2	6.78	4.4	23.0	2.33	0.613	8.3	1.3	15.0
Farquhar	14-May-14		6.25	0.007	0.034	0.003	0.122	0.28	3.4	6.5	7.65	23.3	74	10.5	1.52	32	0.9	48
Farquhar	10-Sep-14		6	0.012	0.023	0.001	0.062	0.23	3.7	6.3	7.76	30.2	74	10.8	1.44	33	0.6	48
Fishtail	13-May-14		5.1	0.007	0.037	0.003	0.209	0.22	4.5	3.4	7.36	11.9	49	6.7	1.22	22	0.5	32
Fishtail	09-Sep-14		3	0.009	0.027	0.001	0.053	0.31	5.4	3.6	7.57	15.9	50	6.8	1.16	22	0.5	32
Fletcher	20-May-15	Basin 1	4.2	0.005	0.033	0.003	0.02	0.21	4.9	0.8	6.53	4.3	23.0	1.89	0.8	8.0	0.6	15.0
Fletcher	20-May-15	Basin 2	5.2	0.005	0.036	0.003	0.02	0.22	4.7	0.7	6.52	4.0	23.0	1.91	0.772	8.0	0.7	15
Fletcher	20-May-15	Basin 3	4.3	0.005	0.041	0.004	0.02	0.21	4.8	0.6	6.52	4.0	23.0	1.92	0.799	8.1	0.8	15.0
Fletcher	16-Sep-15	Basin 1	3.5	0.006	0.046	0.003	0.02	N/A	4.8	1.3	6.84	5.4	24.0	2.04	0.865	8.7	1.1	16.0
Fletcher	16-Sep-15	Basin 2	4.5	0.005	0.034	0.003	0.02	N/A	4.6	1.4	6.74	5.0	24.0	1.96	0.798	8.2	1.3	15.0
Fletcher	16-Sep-15	Basin 3	3.5	0.005	0.028	0.003	0.02	N/A	4.8	1.8	6.83	5.4	24.0	2.02	0.847	8.5	1.3	16

Table 4c: Summary Chemistry Data for Euphotic Zone (Surface) for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted).

Lake	Date	Basin	Secchi (m)	TP	NH_3-N	NO_2-N	NO_3 + NO_2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Glamor	15-May-14		4	0.007	0.053	0.004	0.125	0.31	5.1	8.3	7.75	29.1	90	13.5	1.61	40	1.1	59
Glamor	09-Sep-14		4.45	0.009	0.007	0.001	0.089	0.23	5.1	8.5	7.75	37.1	92	14.1	1.55	42	0.5	60
Goodwin	20-May-15		6.0	0.005	0.045	0.003	0.02	0.14	0.2	3	6.21	2.2	15	1.4	0.367	5	0.7	10
Goodwin	10-Sep-15		5.4	0.005	0.037	0.001	0.02		0.7	3.1	6.54	2.3	16	1.51	0.39	5.4	0.8	10
Goodwin	27-Sep-16		5.5	0.005	0.014	0.002	0.02		3.1	0.7	6.63	6.9	16	1.47	0.361	5.2	0.7	10
Grace	14-May-14		4.75	0.006	0.035	0.003	0.165	0.37	4.2	4.2	7.5	14.3	57	8.04	1.22	25	0.5	37
Grace	09-Sep-14		4.5	0.005	0.028	0.002	0.113	0.25	4.6	4.6	7.45	20.5	58	8.21	1.19	25	0.8	37
Gull	16-May-16	Basin 3	4.5	0.005	0.021	0.003	0.105	0.27	3.3	4.4	7.74	15.6	70	7.62	1.37	25	1.1	45
Gull	16-May-16	Basin 1	4	0.005	0.03	0.004	0.106	0.31	3.4	4.2	7.67	15.5	66	7.12	1.38	23	0.6	43
Gull	16-May-16	Basin 2	3	0.005	0.025	0.004	0.109	0.32	3.5	4.6	7.7	15.9	67	7.06	1.35	23	0.5	44
Gull	28-Sep-16	Basin 3	5.0															
Gull	28-Sep-16	Basin 1	4.5															
Gull	28-Sep-16	Basin 2	5.25															
Gull	13-Sep-17	Basin 1	5.25	0.009	0.023	0.003	0.02		3.5	4	7.42	16.1	63	6.3	1.42	21.6	0.9	41
Gull	13-Sep-17	Basin 2	5	0.006	0.02	0.003	0.02		3.7	4.2	7.45	13.9	62	6	1.4	20.8	0.8	40
Gull	13-Sep-17	Basin 3	5.25	0.006	0.012	0.003	0.02		3.5	4.2	7.49	14.7	64	6.25	1.44	21.6	0.5	41
Haliburton	14-May-14	Basin 1	4.8	0.007	0.041	0.003	0.201	0.31	3.9	2.2	7.19	8.5	39	4.51	1.11	16	1.1	25
Haliburton	14-May-14	Basin 2	4.8	0.007	0.042	0.003	0.2	0.34	3.8	2.6	7.24	10	42	4.95	1.24	17	0.5	27
Haliburton	14-May-14	Basin 3	4.6	0.007	0.039	0.003	0.2	0.3	3.9	2.4	7.24	9.2	42	5.08	1.27	18	08	27
Haliburton	09-Sep-14	Basin 1	N/A	0.011	0.036	0.001	0.033	0.17	4.2	2.5	7.39	12.6	41	4.61	1.13	16	0.8	27
Haliburton	09-Sep-14	Basin 2	4.5	0.009	0.026	0.001	0.081	0.23	4.1	2.6	7.32	12	40	4.68	1.13	16	0.7	26
Haliburton	09-Sep-14	Basin 3	4	0.009	0.036	0.001	0.032	0.21	4.2	2.6	7.45	12.1	40	4.78	1.13	17	0.7	26
Halls	17-May-16		5.5	0.005	0.01	0.001	0.116	0.21	2.8	0.8	7	3.7	26	2.46	0.485	8.1	0.8	17
Halls	29-Sep-16		5.25															
Halls	13-Sep-17		4.25	0.005	0.012	0.002	0.024		2.6	1	6.78	4	29	2.3	0.56	8	0.5	19
Hudson	13-May-14		3.9	0.005	0.054	0.004	0.05	0.15	3	1.4	7.14	6.3	30	3.6	0.697	12	1.4	20
Hudson	09-Sep-14		4.5	0.01	0.037	0.001	0.046	0.23	3.6	1.5	7.23	7.9	29	3.56	0.639	12	0.8	19
Johnson	19-May-15	Basin 1	3.5	0.005	0.037	0.003	0.02	0.19	3.4	0.2	6.22	2.4	17.0	1.62	0.396	5.7	0.5	11
Johnson	16-Sep-15	Basin 1	5.6	0.005	0.027	0.002	0.05	N/A	2.7	1.5	6.96	4.8	22	2.14	0.571	7.7	1.1	14
Kabakwa	17-May-16		5	0.006	0.005	0.001	0.052	0.19	3.4	2.1	7.33	8.5	35	4.66	0.445	13	1.8	23
Kabakwa	27-Sep-16		4.5	0.005	0.017	0.002	0.02		3.9	2.8	7.3	10.8	38	5.02	0.527	15	0.5	25
Kashagawigamog	17-May-16	Basin 1	5.75	0.005	0.041	0.004	0.125	0.29	4.3	6.1	7.82	23.3	86	9.74	1.64	31	1.1	56
Kashagawigamog	17-May-16	Basin 2	5.5	0.005	0.036	0.006	0.131	0.26	4.3	6	7.82	23.8	84	9.57	1.71	31	0.8	55
Kashagawigamog	17-May-16	Basin 3	5.5	0.005	0.038	0.005	0.129	0.27	4.4	6.3	7.77	24.1	85	9.49	1.63	30	0.9	55
Kashagawigamog	12-Jul-16	Basin 2	4.8	0.007	0.031	0.003	0.270		4.30	6.1	7.8	23.8	87.0	9.8	1.8	3.71	1.7	57

Table 4d: Summary Chemistry Data for Euphotic Zone (Surface) for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted).

Lake	Date	Basin	Secchi (m)	TP	NH_3-N	NO_2-N	NO_3 + NO_2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Kashagawigamog	29-Sep-16	Basin 1	3.8	0.006	0.022	0.001	0.020		4.10	6.9	7.8	36	95.0	10.6	2.13	35	0.7	62.0
Kashagawigamog	29-Sep-16	Basin 2	4.6	0.007	0.028	0.002	0.020		4.30	6.6	7.7	30.8	90.0	9.8	2.00	33	0.5	58.0
Kashagawigamog	29-Sep-16	Basin 3	4.4	0.005	0.031	0.001	0.020		4.10	6.6	7.7	57	90.0	10.0	2.03	33	0.5	58.0
Kawagama	19-May-15	Basin 1	3.4	0.007	0.046	0.006	0.02	0.33	3.6	0.7	6.38	3.5	22.0	1.96	0.581	7.3	0.5	14
Kawagama	19-May-15	Basin 2	6.0	0.008	0.040	0.004	0.02	0.29	3.5	0.7	6.28	3.3	22.0	1.94	0.580	7.2	0.5	14
Kawagama	19-May-15	Basin 4	4.6	0.007	0.033	0.005	0.03	0.33	4.2	0.7	6.42	3.8	23.0	2.00	0.654	7.7	0.9	15
Kawagama	19-May-15	Basin 5	4.0	0.007	0.033	0.003	0.02	0.28	3.6	0.7	6.35	3.3	22.0	1.99	0.604	7.5	0.6	14
Kawagama	10-Sep-15	Basin 1	5.1	0.005	0.020	0.001	0.02	N/A	3.2	0.8	6.85	3.6	22.0	2.10	0.591	7.7	1.0	14
Kawagama	10-Sep-15	Basin 2	4.0	0.005	0.030	0.001	0.02	N/A	3.4	0.8	6.88	4.0	22.0	2.01	0.583	7.4	1.4	14
Kawagama	10-Sep-15	Basin 4	3.5	0.005	0.031	0.002	0.02	N/A	3.9	1.0	6.91	4.3	24.0	2.23	0.684	8.4	0.9	15
Kawagama	10-Sep-15	Basin 5	4.9	0.005	0.030	0.002	0.02	N/A	3.4	0.7	6.89	3.6	22.0	2.18	0.616	8.0	0.8	14
Kawagama	10-Sep-15	Basin 6	4.0	0.005	0.026	0.001	0.02	N/A	3.4	0.8	6.89	3.8	22.0	2.07	0.593	7.6	1.2	15
Kelly	19-May-15	Basin 1	5.0	0.005	0.037	0.003	0.02	0.019	3.4	0.2	6.22	2.4	17.0	1.62	0.396	5.7	0.5	11
Kelly	16-Sep-15	Basin 1	6.3	0.005	0.020	0.001	0.04	N/A	3.3	0.7	6.60	2.3	17.0	1.62	0.403	5.7	0.8	11
Kelly	27-Sep-16	Basin 1	4.5	0.005	0.011	0.002	0.02		3.2	0.8	6.63	6.4	18.0	1.65	0.382	5.7	6.5	12.0
Kennisis	20-May-15	Basin 1	7.0	0.006	0.031	0.003	0.020	0.28	3.5	0.6	6.32	3.1	22.0	2.08	0.507	7.3	0.5	14
Kennisis	20-May-15	Basin 2	7.0	0.005	0.038	0.040	0.039	0.26	3.6	0.4	6.27	3.4	22.0	2.12	0.503	7.4	0.5	15
Kennisis	20-May-15	Basin 3	6.7	0.006	0.0471	0.004	0.039	0.29	3.6	0.5	6.34	3.4	22.0	2.08	0.5	7.3	0.8	14
Kennisis	20-May-15	Basin 4	6.8	0.007	0.042	0.004	0.042	0.28	3.6	0.4	6.33	3.0	22.0	2.05	0.497	7.2	0.5	15
Kennisis	15-Sep-15	Basin 1	6.8	0.005	0.034	0.002	0.020	N/A	3.4	0.7	6.77	3.8	23.0	2.20	0.520	7.6	0.6	15
Kennisis	15-Sep-15	Basin 2	5.75	0.005	0.035	0.002	0.02	N/A	3.4	0.4	6.8	3.4	23.0	2.18	0.499	7.5	0.5	15
Kennisis	15-Sep-15	Basin 3	5.0	0.005	0.036	0.002	0.020	N/A	3.4	0.8	6.81	3.6	23.0	2.21	0.506	7.6	0.7	15
Kennisis	15-Sep-15	Basin 4	5.25	0.005	0.034	0.002	0.02	N/A	3.2	1	6.79	3.6	23.0	2.12	0.488	7.4	0.9	15
Kennisis	20-May-16	Basin 1	6.6	0.005	0.033	0.003	0.123	N/A	3.2	0.9	6.86	3.3	22.0	2.16	0.461	7.3	0.6	14
Kennisis	20-May-16	Basin 2	7.0	0.005	0.032	0.003	0.134	N/A	3.2	0.6	6.86	3.3	22.0	2.19	0.455	7.3	0.5	15
Kennisis	20-May-16	Basin 3	6.6	0.005	0.025	0.002	0.137	N/A	3.3	0.6	6.87	3.4	22.0	2.19	0.442	7.3	0.5	14
Kennisis	20-May-16	Basin 4	7.6	0.005	0.031	0.002	0.128	N/A	3.4	0.7	6.86	3.2	22.0	2.15	0.435	7.2	0.6	15
Kennisis	20-Jul-16	Basin 2	6.9	0.010	0.038	0.003	0.1	N/A	3	0.4	6.88	3.6	24.0	2.35	0.49	7.9	0.8	15
Kennisis	27-Sep-16	Basin 2	6	0.005	0.005	0.001	0.021	N/A	3.3	1.2	6.85	9.5	23	2.3	0.503	7.8	0.7	15
Kennisis	27-Sep-16	Basin 4	6	0.006	0.005	0.001	0.02	N/A	3.4	0.9	6.82	7.6	23	2.3	0.508	7.8	0.7	15
Kimball	19-May-15	Basin 1	4.0	0.005	0.044	0.004	0.02	0.18	3.8	0.2	6.29	1.8	18	1.6	0.471	5.9	0.6	12
Kimball	19-May-15	Basin 2	3.25	0.009	0.04	0.004	0.02	0.2	3.8	0.2	6.34	1.9	18	1.61	0.474	6	0.5	12
Kimball	19-May-15	Basin 3	4.25	0.005	0.047	0.004	0.02	0.23	4	0.2	6.26	1.9	18	1.65	0.479	6.1	0.8	12
Kimball	17-Sep-15	Basin 1	6.4	0.005	0.025	0.002	0.094	N/A	3.6	0.4	6.56	2.3	18	1.7	0.483	6.2	0.7	12
Kimball	17-Sep-15	Basin 2	6.25	0.007	0.02	0.002	0.056	N/A	3.6	0.5	6.59	2.6	18	1.67	0.483	6.2	1.1	12
Koshlong	15-May-14	Basin 1	4	0.006	0.044	0.003	0.153	0.24	4.3	0.5	6.75	3.1	28	2.85	0.47	9.1	1.1	18

Table 4e: Summary Chemistry Data for Euphotic Zone (Surface) for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted).

Lake	Date	Basin	Secchi (m)	TP	NH3-N	NO2-N	NO3 + NO2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Koshlong	11-Sep-14	Basin 1	3.5	0.008	0.005	0.001	0.043	.24	4.5	0.9	6.91	4.3	27	2.63	0.442	8.4	0.5	18
Kushog	17-May-16	Basin 1	4	0.005	0.03	0.007	0.148	0.22	3.4	0.8	6.91	3.3	34	2.28	0.503	7.8	1.2	22
Kushog	17-May-16	Basin 2	4.5	0.005	0.017	0.001	0.106	0.22	3.3	2.7	7.5	10.1	51	4.9	1.08	17	1.1	33
Kushog	17-May-16	Basin 3	4.5	0.005	0.037	0.006	0.156	0.28	3.5	1.1	7	4.2	37	2.54	0.474	8.3	0.9	24
Kushog	29-Sep-16	Basin 1	4.25															
Kushog	29-Sep-16	Basin 2	3.75															
Kushog	29-Sep-16	Basin 3	4.1															
Kushog	14-Sep-17	Basin 1	4	0.006	0.015	0.003	0.02		4.1	0.6	6.75	3.6	35	1.9	0.5	6.8	0.6	23
Kushog	14-Sep-17	Basin 2	4.5	0.005	0.018	0.004	0.02		4.2	1	6.88	4.9	38	2.25	0.52	7.8	0.7	25
Lipsy	19-May-15	Basin 1	4	0.006	0.038	0.004	0.02	0.27	4.4	0.2	6.12	2.1	19	1.53	0.436	5.6	0.7	13
Lipsy	09-Sep-15	Basin 1	5	0.013	0.024	0.002	0.02		4	0.5	6.54	2.4	20	1.63	0.438	5.9	1	13
Little Bob	16-May-16	Basin 1	3.5	0.006	0.015	0.002	0.062	0.18	3.6	2.7	7.49	10.2	39	4.79	1	16	1.1	25
Little Bob	16-May-16	Basin 2	3.5	0.006	0.019	0.002	0.072	0.16	3.6	2.8	7.5	11	39	4.7	1.01	16	0.9	26
Little Bob	28-Sep-16	Basin 1	4.2	0.007	0.012	0.002	0.02		3.7	3.9	7.41	17.1	44	5.32	1.2	18	2.4	29
Little Bob	28-Sep-16	Basin 2	4.6	0.006	0.01	0.002	0.02		3.7	3.7	7.41	47.9	43	1.24	1.17	18	1.1	28
Little Boshkung	17-May-16		5	0.005	0.035	0.008	0.118	0.36	3.4	2.4	7.46	9.4	47	4.65	1.05	16	1	31
Little Boshkung	26-Sep-16		6.5	0.008	0.018	0.002	0.210		3.20	2.7	7.4	13.8	50.0	4.7	1.14	16.0	1.1	32
Little Clean	20-May-15	Basin 1	6	0.005	0.037	0.003	0.02	0.14	2.8	1.2	6.63	5.5	24	2.47	0.596	8.6	0.5	16
Little Clean	10-Sep-15	Basin 1	4.5	0.006	0.024	0.001	0.02		2.4	2	7.1	8	29	3.1	0.723	11	1.9	19
Little Hawk	21-May-15	Basin 1	6	0.006	0.036	0.004	0.037	0.23	4.6	0.6	6.17	2.3	21	1.9	0.52	6.9	0.69	13
Little Hawk	21-May-15	Basin 2	6	0.005	0.038	0.005	0.02	0.24	3.4	0.5	6.38	3.5	23	2.22	0.509	7.6	0.6	15
Little Hawk	11-Sep-15	Basin 1	5	0.005	0.024	0.001	0.02		3.1	0.5	6.74	2.6	21	1.88	0.509	6.8	0.9	14
Little Hawk	11-Sep-15	Basin 2	6.85	0.005	0.024	0.001	0.02		3.1	0.6	6.73	2.7	21	1.87	0.507	6.8	0.5	14
Little Kennisis	20-May-15	Basin 1	4	0.006	0.043	0.006	0.099	0.32	5.2	0.2	6.1	2.4	20	1.99	0.451	6.8	0.5	13
Little Kennisis	20-May-15	Basin 2	3.8	0.006	0.045	0.006	0.088	0.34	4.6	0.6	6.05	2.3	20	1.9	0.445	6.6	1	13
Little Kennisis	15-Sep-15	Basin 1	4.5	0.005	0.027	0.004	0.02		4.5	0.9	6.65	3.2	21	1.97	0.467	6.8	1.1	13
Little Kennisis	15-Sep-15	Basin 2	4.5	0.007	0.041	0.003	0.044		4.7	0.3	6.57	3	21	1.98	0.464	6.9	0.8	14
Little Kennisis	20-May-16	Basin 1	6	0.005	0.043	0.004	0.164		4.9	0.5	6.53	2.7	20	1.84	0.377	6.2	0.8	13
Little Kennisis	20-May-16	Basin 2	4.6	0.005	0.031	0.003	0.152		4.8	0.8	6.56	2.6	20	1.93	0.375	6.4	0.8	13
Little Kennisis	12-Jul-16	Basin 1	4.7	0.005	0.042	0.003	0.12		4.3	0.2	6.76	3.6	20	2	0.423	6.7	1.2	13
Little Kennisis	12-Jul-16	Basin 2		0.005	0.051	0.002	0.18		4.2	0.2	6.76	4.1	20	2.02	0.421	6.8	1.3	13
Little Kennisis	27-Sep-16	Basin 1	4	0.005	0.008	0.002	0.041		4.5	0.9	6.75	6.9	21	2.04	0.454	7	0.8	14
Little Kennisis	27-Sep-16	Basin 2	3	0.005	0.018	0.002	0.02		4.9	1.2	6.74	4.9	21	2.09	0.457	7.1	0.7	14
Little Redstone	20-May-15	Basin 1	4.4	0.006	0.045	0.005	0.075	0.34	4.8	0.4	6.29	3.2	21	2.02	0.51	7.1	0.6	14
Little Redstone	15-Sep-15	Basin 1	3.25	0.006	0.031	0.002	0.02	N/A	0.9	4.4	6.82	3.7	23	2.15	0.55	7.6	0.8	19

Table 4f: Summary Chemistry Data for Euphotic Zone (Surface) for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted).

Lake	Date	Basin	Secchi (m)	TP	NH3-N	NO2-N	NO3 + NO2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Livingstone	20-May-15	Basin 1	3.5	0.005	0.041	0.004	0.02	0.21	4.8	0.6	6.52	4	23	1.92	0.799	8.1	0.8	15
Livingstone	20-May-15	Basin 2	4.6	0.005	0.041	0.004	0.058	0.19	4.8	0.6	6.44	3.5	24	2.23	0.678	8.4	0.7	15
Livingstone	16-Sep-15	Basin 1	3.25	0.005	0.018	0.002	0.02	N/A	4.4	1.3	6.86	5.1	25	2.36	0.768	9.1	0.8	16
Livingstone	16-Sep-15	Basin 2	3.75	0.007	0.037	0.002	0.02	N/A	4.2	1.4	6.82	5.3	26	2.29	0.758	8.8	0.9	17
Livingstone	12-Sep-17	Basin 1	3.25	0.005	0.041	0.003	0.02		5.3	0.9	6.91	4.8	24	2	0.7	7.8	0.6	16
Livingstone	12-Sep-17	Basin 2	3.25	0.005	0.036	0.003	0.02		4.5	1.3	6.95	5.2	25	2.05	0.72	8.2	0.9	16
Long	13-May-14		3.75	0.009	0.056	0.003	0.109	0.35	3.2	8.3	7.75	31	92	13.8	1.54	41	0.7	60
Long	09-Sep-14		7	0.012	0.029	0.002	0.123	0.27	3.5	8.6	7.6	38	94	14.4	1.47	42	0.8	61
Loon	15-May-14		3.1	0.006	0.047	0.003	0.025	0.48	5.2	10.2	7.77	36.7	138	17	1.7	49	0.6	90
Loon	10-Sep-14		4	0.013	0.032	0.002	0.068	0.32	5.5	10.3	7.84	45.8	140	17.8	1.6	51	0.6	91
Loon	20-May-15		6.5	0.005	0.045	0.003	0.02	0.14	3	0.2	6.21	2.2	15	1.4	0.367	5	0.7	10
Loon	10-Sep-15		5.5	0.005	0.037	0.001	0.02	N/A	3.1	0.7	6.54	2.3	16	1.51	0.387	5.4	0.8	10
Louie	20-May-15		8.25	0.005	0.038	0.002	0.037	0.23	2.8	0.6	6.37	3.9	22	2.03	0.61	7.6	0.5	14
Louie	14-Sep-15		7	0.028	0.054	0.004	0.05	N/A	5.2	1	6.65	4.3	23	2.27	0.504	7.7	1.9	15
Lower Fletcher	20-May-15		3.5	0.005	0.043	0.005	0.021	0.28	5	0.6	6.41	3.8	24	2.08	0.664	7.9	0.8	15
Lower Fletcher	15-Sep-15		3.13	0.005	0.023	0.002	0.048	N/A	5.4	1.2	6.88	4.4	24	2.07	0.686	8	0.5	16
MacDonald	20-May-15	Basin 1	8.5	0.005	0.042	0.002	0.02	0.12	2.8	1	6.64	4.8	22	2.15	0.576	7.7	1.4	14
MacDonald	16-Sep-15	Basin 1	5.6	0.005	0.027	0.002	0.045	N/A	2.7	1.5	6.96	4.8	22	2.14	0.571	7.7	1.1	14
Maple	17-May-16		4.25	0.005	0.03	0.004	0.119	0.25	3.6	3.6	7.6	13	56	5.59	1.42	20	1.4	36
Maple	27-Sep-16		4.8	0.006	0.007	0.001	0.180	N/A	3.60	3.8	7.4	16.8	55	5.7	1.49	20	0.5	36
Marsden	11-Sep-15		3.75	0.007	0.026	0.002	0.02	N/A	5	1.2	6.69	4.1	22	2.24	0.551	7.9	1.4	14
McFadden	20-May-15		6	0.005	0.041	0.002	0.02	0.14	3.1	1.4	6.88	5.8	31	2.61	0.982	11	0.5	20
McFadden	15-Sep-15		5	0.006	0.027	0.002	0.04	N/A	3.3	2	7.08	6.8	31	2.73	0.992	11	0.5	20
McFadden	15-Sep-15		8	0.006	0.02	0.002	0.026		2.9	1.6	7.14	10.4	31	2.86	1.08	12	0.5	20
Miskwabi	13-May-14		5.5	0.007	0.05	0.003	0.123	0.33	3.5	8.5	7.74	30.3	94	13.7	1.65	41	0.9	61
Miskwabi	08-Sep-14		6.25	0.008	0.024	0.001	0.074	0.22	3.7	8	7.79	37.2	92	14.3	1.54	42	1	60
Monmouth	10-Sep-14		2.83	0.009	0.022	0.001	0.056	0.3	5.7	6.9	7.69	31.5	74	12.1	1.05	35	1.3	48
Moore	16-May-16	Basin 1	4.5	0.005	0.032	0.005	0.113	0.23	3.5	4.6	7.72	15.4	70	7.39	1.38	24	1.1	45
Moore	16-May-16	Basin 2	4.5	0.008	0.029	0.004	0.028	0.15	4.2	11.2	8.07	42.9	140	14.7	3.17	50	1.5	91
Moore	28-Sep-16	Basin 1	4.25	0.006	0.037	0.001	0.02		3.2	4	7.48	21.1	62	6.11	1.42	21	0.5	40
Moore	28-Sep-16	Basin 2	5.75	0.006	0.032	0.001	0.02		3.7	10.2	7.84	38.9	122	13.6	3.08	47	0.5	80
Moose	11-Sep-14	Basin 1	4	0.008	0.01	0.002	0.076	0.19	4	3.8	7.59	17.3	53	5.97	1.6	22	0.5	34
Moose	11-Sep-14	Basin 2	3	0.008	0.014	0.001	0.051	0.2	4	3.6	7.63	16.3	51	5.74	1.52	21	0.5	33
Mountain (Minden)	18-May-16	Basin 1	4.5	0.005	0.006	0.001	0.104	0.28	3.2	2.6	4.49	9.9	50	4.84	1.06	16	1.2	33
Mountain (Minden)	18-May-16	Basin 2	5	0.005	0.015	0.001	0.104	0.25	3.4	0.8	6.97	3.9	37	2.6	0.513	8.6	1	24
Mountain (Minden)	12-Jul-16	Basin 1	6.5	0.005	0.044	0.002	0.250	N/A	3.50	2.6	7.5	10.2	53	5.2	1.16	18	1.0	35

Table 4g: Summary Chemistry Data for Euphotic Zone (Surface) for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted).

Lake	Date	Basin	Secchi (m)	TP	NH3-N	NO2-N	NO3 + NO2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Mountain (Minden)	28-Sep-16	Basin 1	5.5	0.005	0.018	0.002	0.020		3.10	3.1	7.34	28.7	52.0	5.1	1.16	17.0	0.5	34.0
Mountain (Minden)	13-Sep-17	Basin 1	5.0	0.005	0.026	0.003	0.020		4.00	3.2	7.4	11.20	48.0	4.5	1.20	16.200	0.8	31.0
North	11-Sep-14		4	0.008	0.014	0.002	0.052	0.25	6.2	0.2	6.48	2	18	1.79	0.4	6.1	0.7	10
North Pigeon	16-May-16		2.75	0.005	0.02	0.001	0.045	0.12	3.3	3.3	7.6	11.6	57	6.28	1.04	20	1.8	37
North Pigeon	11-Jul-16		5.5	0.006	0.045	0.002	0.230	N/A	3.60	3.9	7.5	11.7	60	7.0	1.19	22	0.9	39
North Pigeon			4.5	0.006	0.027	0.002	0.020		3.80	3.7	7.5	24.80	63.0	6.5	1.27	21.000	0.7	41.0
Oblong	14-May-14		4.4	0.006	0.026	0.003	0.026	0.34	3.5	2.5	7.23	9.1	43	4.76	1.19	17	1	28
Oblong	09-Sep-14		4.5	0.006	0.036	0.001	0.056	0.24	4	2.6	7.34	12.3	42	4.73	1.16	17	0.9	27
Oxtongue	19-May-15	Basin 1	3.1	0.005	0.041	0.004	0.058	0.19	4.8	0.6	6.44	3.5	24	2.23	0.678	8.4	0.7	15
Oxtongue	19-May-15	Basin 2	3	0.006	0.044	0.004	0.02	0.26	5.4	0.2	6.4	2.5	27	1.87	0.552	6.9	0.9	18
Oxtongue	17-Sep-15	Basin 1	3.5	0.006	0.045	0.003	0.02	N/A	4.9	1.6	6.72	5.1	35	2.29	0.742	8.8	0.6	23
Oxtongue	17-Sep-15	Basin 2	3.5	0.006	0.026	0.003	0.02	N/A	4.8	1.5	6.79	5.1	36	2.29	0.741	8.8	0.5	23
Oxtongue	30-Sep-16	Basin 1	3.75															
Oxtongue	30-Sep-16	Basin 2	3.3															
Paudash	13-May-14	Basin 1	3.8	0.007	0.039	0.003	0.187	0.39	4.1	4.2	7.41	15.8	84	8.18	1.46	26	1.2	55
Paudash	13-May-14	Basin 2	3.8	0.015	0.0045	0.003	0.151	0.27	3.9	5.7	7.55	18.4	91	9.33	2.06	32	1.2	59
Paudash	08-Sep-14	Basin 1	5.45	0.01	0.046	0.001	0.034	0.26	4.2	4.3	7.58	22.3	87	8.62	1.48	28	1.3	56
Paudash	08-Sep-14	Basin 2	5.4	0.009	0.046	0.001	0.034	0.17	4.2	5.6	7.61	26.3	93	9.77	1.99	33	0.7	60
Percy	14-May-14	Basin 1	3.3	0.005	0.047	0.004	0.207	0.35	5.2	2.2	7.2	8.4	37	4.75	0.977	16	0.8	24
Percy	14-May-14	Basin 2	3.3	0.006	0.045	0.004	0.207	0.45	5.3	2.1	7.19	7.8	37	4.64	1	16	1.1	24
Percy	10-Sep-14	Basin 1	3.05	0.008	0.027	0.002	0.111	0.3	5.7	2.5	7.29	11.2	38	4.64	0.964	16	0.8	24
Percy	10-Sep-14	Basin 2	2.95	0.008	0.027	0.002	0.111	0.3	5.7	2.5	7.29	11.2	38	4.64	0.964	16	0.8	24
Pusey	14-May-14		5	0.01	0.043	0.004	0.164	0.4	3.6	6.8	7.68	25.5	88	11	1.59	34	0.7	57
Pusey	11-Sep-14		4.5	0.01	0.029	0.001	0.109	0.24	4.3	6.3	7.6	28.7	82	10.9	1.49	33	0.6	53
Raven	20-May-15	Basin 1	4.75	0.005	0.037	0.002	0.02	0.23	4.1	0.4	6.17	2.6	22	1.75	0.424	6.1	0.8	14
Raven	20-May-15	Basin 2	4	0.005	0.043	0.003	0.02	0.22	4.5	0.2	6.03	2.1	18	1.54	0.397	5.5	0.6	12
Raven	09-Sep-15	Basin 1	4.87	0.005	0.03	0.001	0.02	N/A	3.9	0.6	6.65	2.7	22	1.75	0.45	6.2	1.4	14
Raven	09-Sep-15	Basin 2	5.25	0.005	0.025	0.004	0.02	N/A	4	0.5	6.65	2.6	21	1.64	0.429	5.9	0.8	13
Red Pine	20-May-16	Basin 1	7.8	0.009	0.030	0.002	0.100	0.20	3.6	1.0	6.82	3.4	25	2.10	0.449	7.1	0.5	16
Red Pine	27-Sep-16	Basin 1	4.0	0.005	0.008	0.001	0.020		3.4	0.9	6.82	9.2	23.0	2.21	0.490	7.5	0.9	15.0
Red Pine	27-Sep-16	Basin 2	4.3	0.005	0.006	0.001	0.020		3.3	1.2	6.85	7.3	23.0	2.27	0.486	7.7	1.0	15.0
Redstone	20-May-15	Basin 1	5.1	0.005	0.043	0.004	0.055	0.15	3.9	0.4	6.39	3.8	24	2.2	0.562	7.8	0.6	15
Redstone	20-May-15	Basin 3	5.1	0.005	0.041	0.004	0.055	0.27	3.9	0.8	6.47	4.2	25	2.33	0.57	8.2	0.6	16
Redstone	15-Sep-15	Basin 1	3.75	0.005	0.024	0.002	0.02	N/A	4	1.3	6.96	4.3	24	2.19	0.563	7.8	0.7	16
Redstone	15-Sep-15	Basin 2	4.5	0.005	0.021	0.002	0.02	N/A	4	1	6.9	4.6	24	2.24	0.565	7.9	0.8	16
Redstone	15-Sep-15	Basin 3	4.5	0.005	0.021	0.002	0.02	N/A	4	1	6.9	4.6	24	2.24	0.565	7.9	0.8	16

Table 4h: Summary Chemistry Data for Euphotic Zone (Surface) for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted).

Lake	Date	Basin	Secchi (m)	TP	NH3-N	NO2-N	NO3 + NO2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Sherborne	21-May-15	Basin 2	5.5	0.005	0.035	0.002	0.02	0.22	3.8	0.2	6.13	1.9	17	1.55	0.414	5.6	0.5	11
Sherborne	21-May-15	Basin 3	3.75	0.005	0.038	0.003	0.02	0.26	4.8	0.2	5.94	1.4	16	1.36	0.383	5	0.5	10
Sherborne	21-May-15	Basin 4	5.5	0.005	0.032	0.003	0.02	0.18	3.9	0.2	6.12	2	17	1.49	0.41	5.4	0.5	11
Sherborne	16-Sep-15	Basin 2	5.6	0.005	0.041	0.002	0.02	N/A	3.4	0.4	6.53	2.4	17	1.6	0.432	5.8	0.9	11
Sherborne	16-Sep-15	Basin 3	4.8	0.005	0.03	0.002	0.02	N/A	3.5	0.4	6.54	2.5	17	1.63	0.425	5.8	1	11
Sherborne	16-Sep-15	Basin 4	5.75	0.005	0.036	0.004	0.02	N/A	4.3	0.6	6.27	1.8	16	1.56	0.413	5.6	0.5	11
Silent	12-Sep-14		4.5	0.01	0.005	0.001	0.058	0.23	4.4	1.5	7.1	6.9	29	3.51	0.584	11	0.5	19
Slipper	10-Sep-15		5	0.005	0.026	0.001	0.02	N/A	3.3	0.7	6.7	3.1	19	1.88	0.464	6.6	0.7	13
Soyers	17-May-16		4.5	0.005	0.038	0.004	0.143	0.28	5.5	3.9	7.62	13.9	59	6.12	1.54	22	1.1	39
Soyers	29-Sep-16		3.63	0.005	0.025	0.001	0.02		4.9	4.3	7.57	25.1	65	6.49	1.85	24	0.5	42
St. Nora	17-May-16	Basin 1	4	0.005	0.04	0.008	0.141	0.24	3.4	0.5	6.82	2.6	25	1.88	0.406	6.4	1.1	16
St. Nora	17-May-16	Basin 2	4	0.005	0.037	0.008	0.121	0.27	3.3	0.5	6.83	2.9	25	1.89	0.423	6.5	1	16
St. Nora	29-Sep-16	Basin 2	4.5															
St. Nora	14-Sep-16	Basin 2	5.5	0.005	0.018	0.003	0.02		3.2	0.5	6.65	3.3	28	1.7	0.46	6	0.5	18
Stocking	20-May-15		4	0.005	0.045	0.003	0.02	0.21	3.8	0.5	6.29	2.7	18	1.77	0.437	6.2	1.3	12
Stocking	10-Sep-15		4.5	0.006	0.032	0.001	0.02	N/A	3.4	0.9	6.64	3	19	1.93	0.486	6.8	0.8	12
Stormy	15-May-14		5.9	0.005	0.009	0.004	0.048	0.21	3.1	0.8	6.83	4.9	35	N/A	N/A	N/A	N/A	N/A
Stormy	12-Sep-14		5	0.009	0.005	0.001	0.092	0.24	4.6	3.3	7.4	13.3	65	6.4	0.633	19	0.5	42
Twelve Mile	17-May-16		5	0.005	0.033	0.004	0.106	0.28	3.2	2.5	7.46	9.5	48	4.55	0.983	15	0.7	32
Twelve Mile	26-Sep16		6.5	0.006	0.005	0.002	0.180	N/A	3.70	3.1	7.3	13.2	50	4.7	1.12	16	0.9	32
Two Islands	14-May-14		5.2	0.008	0.046	0.003	0.158	0.34	3.7	6.8	7.61	25.1	76	11.9	1.04	34	1.2	49
Two Islands	10-Sep-14		3.38	0.011	0.336	0.003	0.052	0.49	4.4	6.9	7.69	32.1	76	12.9	0.983	36	2	50
Wilbermere	14-May-14		3.25	0.008	0.048	0.005	0.194	0.38	4.1	9.2	7.74	32.5	115	14.9	1.94	15	1.2	75
Wilbermere	11-Sep-14		3.75	0.009	0.012	0.002	0.175	0.2	4.2	9	7.65	39.6	112	14.6	1.81	44	0.5	73

Table 5a: Summary Chemistry Data for Metre over Bottom samples for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted) Chemical Abbreviations are explained in the Glossary of Terms Section.

Lake	Date	Basin	TP	NH3-N	NO2-N	NO3 + NO2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Allen	09-Sep-14		0.012	0.03	0.002	0.218	0.24	3.8	6	7.22	26	66	8.66	2.12	30	0.5	43
Art	11-Sep-14		0.013	0.028	0.005	0.263	0.3	5.6	3.1	6.91	10.2	37	3.74	0.781	13	0.9	24
Bear	16-Sep-15	Basin 1	0.025	0.738	0.016	0.02	1.2	8.3	6.6	6.69	13.2	38	3.18	0.932	12	14.1	24
Bear	16-Sep-15	Basin 2	0.012	0.051	0.006	0.219	0.53	4.8	2.3	6.47	4.5	25	2.28	0.708	8.6	4	16
Big Hawk	14-Sep-15	Basin 1	0.013	0.013	0.002	0.19	0.35	3	0.7	6.52	3.5	25	2.24	0.533	7.8	26.9	16
Big Hawk	14-Sep-15	Basin 2	0.009	0.024	0.002	0.139	0.42	3.4	1.2	6.59	4.3	26	2.35	0.53	8.1	0.6	17
Big Hawk	14-Sep-15	Basin 3	0.009	0.024	0.002	0.082	0.34	3	0.7	6.48	3.2	24	2.25	0.516	7.7	0.5	15
Bitter	09-Sep-15	Basin 1	0.012	0.060	0.003	0.04	0.43	2.9	3.7	6.70	7.2	32	3.10	0.678	11	3.4	21
Bow	29-Sep-16	Basin 1	0.011	0.009	0.001	0.164		3.5	3.3	7.16	13.8	39	4.6	1.02	16	2	25
Boshkung	26-Sep-16	Basin 2	0.007	0.005	0.002	0.330	N/A	3.20	3.6	7.3	13.7	51	4.9	1.15	17	0.5	33
Buckskin	10-Sep-14		0.014	0.077	0.003	0.201	0.3	4.8	1.4	6.68	5.4	26	2.6	0.383	8.1	2.5	17
Clean	16-Sep-15		0.006	0.025	0.002	0.16	0.30	2.2	1.2	6.68	3.7	22	2.22	0.523	7.7	0.5	14
Clinto	15-Sep-15	Basin 1	0.011	0.171	0.002	0.02	N/A	2.9	0.8	6.46	4.7	23	1.87	0.616	7.2	1.6	15
Clinto	15-Sep-15	Basin 2	0.012	0.255	0.005	0.02	N/A	2.7	1.0	6.55	5.2	24	1.83	0.613	7.1	1	16
Deer	08-Sep-14		0.009	0.027	0.001	0.217	0.38	3.4	2.2	6.75	7.2	40	3.53	0.616	11	1.3	26
Devils	11-Jul-16		0.014	0.023	0.003	0.320	N/A	4.0	0.7	6.5	2.7	15	1.4	0.41	5.2	1.5	10
Devils	28-Sep-16		0.024	0.005	0.004	0.410	N/A	4.90	2.1	6.7	4.2	16	1.5	0.43	5.4	1.0	11
Drag	11-Sep-14	Basin 1	0.009	0.005	0.001	0.214	0.2	4	5.4	7.43	24.8	62	7.89	1.75	27	0.1	40
Drag	11-Sep-14	Basin 2	0.009	0.005	0.001	0.208	0.17	3.8	5.3	7.5	22.6	61	7.7	1.94	27	0.7	40
Eagle	10-Sep-14		0.009	0.043	0.002	0.26	0.39	3.5	4.5	7.13	17	58	6.35	1.61	22	1.2	38
Eels	11-Sep-14	Basin 1	0.01	0.016	0.003	0.334	0.24	4.6	4.5	7.26	17.2	56	8.17	0.752	24	0.5	37
Eels	11-Sep-14	Basin 3	0.009	0.005	0.002	0.247	0.18	4.2	3.8	7.22	16	49	7.6	0.699	22	0.5	32
Esson	11-Sep-14	Basin 1	0.011	0.017	0.001	0.239	0.28	4	11.5	7.52	47.8	123	17.4	2.29	53	0.8	80
Esson	11-Sep-14	Basin 2	0.015	0.019	0.001	0.25	0.29	4.3	10.4	7.45	42.3	107	15	2.27	47	2.1	69
Erye	11-Sep-15		0.015	0082	0.005	0.04	N/A	5.0	2.2	6.43	4.5	24.0	2.38	0.597	8.4	6.2	16
Farquhar	10-Sep-14		0.014	0.02	0.001	0.171	0.25	3.2	6.5	7.46	28.6	75	10.9	1.45	33	2.8	48
Fishtail	09-Sep-14		0.019	0.061	0.003	0.267	0.49	4.4	4.1	7.17	17.4	51	6.89	1.16	22	0.7	33
Fletcher	16-Sep-15	Basin 1	0.010	0.045	0.005	0.17	N/A	5.0	2.6	6.56	5.7	26	2.14	0.871	8.9	1.3	17
Fletcher	16-Sep-15	Basin 2	0.012	0.025	0.004	0.16	N/A	4.8	2.4	6.48	5.1	26	2.19	0.872	9.1	1.4	17
Fletcher	16-Sep-15	Basin 3	0.013	0.072	0.006	0.02	N/A	5.1	3.8	6.53	6.5	26	2.24	0.889	9.3	4.2	17
Glamor	09-Sep-14		0.011	0.005	0.001	0.054	0.22	4.9	9.2	7.46	39	96	14.5	1.56	43	1.1	62
Goodwin	10-Sep-15		0.011	0.037	0.001	0.02	N/A	0.7	3.1	6.54	2.3	16	1.51	0.39	5.4	0.8	10

Table 5b: Summary Chemistry Data for Metre over Bottom samples for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted)

Lake	Date	Basin	TP	NH3-N	NO2-N	NO3 + NO2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Goodwin	27-Sep-16		0.005	0.014	0.002	0.02		3.1	0.7	6.63	6.9	16	1.47	0.361	5.2	0.7	10
Grace	09-Sep-14		0.01	0.024	0.002	0.205	0.27	4	4.5	7.22	18.2	56	7.93	1.17	25	0.5	36
Gull	13-Sep-17	1	0.006	0.016	0.003	0.081		3.2	5	7.34	16.1	72	7.25	1.52	24.4	0.6	46
Gull	13-Sep-17	2	0.007	0.017	0.003	0.101		3.4	4.8	7.40	17.9	72	7.25	1.54	24.4	0.8	47
Gull	13-Sep-17	3	0.006	0.015	0.003	0.02		3.7	4	7.44	33.5	64	6.2	1.48	21.6	0.8	42
Haliburton	09-Sep-14	Basin 1	0.01	0.029	0.001	0.183	0.23	3.6	2.5	7.03	10.4	39	4.35	1.05	15	0.5	26
Haliburton	09-Sep-14	Basin 2	0.009	0.033	0.001	0.032	0.19	4.2	2.6	7.41	12.1	41	4.52	1.12	17	0.5	26
Haliburton	09-Sep-14	Basin 3	0.009	0.033	0.002	0.183	0.24	3.7	2.6	7.07	11.6	40	4.58	1.12	16	0.6	26
Halls	13-Sep-17		0.005	0.019	0.003	0.02		3.3	0.8	6.8	3.8	25	1.95	0.5	7	0.9	16
Hudson	09-Sep-14		0.014	0.028	0.001	0.152	0.28	2.9	2.3	6.76	8	31	3.55	0.661	12	1.5	20
Johnson	16-Sep-15	Basin 1	0.005	0.020	0.001	0.05		3.3	0.4	6.62	2.5	17	1.63	0.406	5.7	0.6	11
Kabakwa	27-Sep-16		0.005	0.047	0.003	0.02		3.7	3.7	7.3	13	41	5.51	0.546	16	0.6	27
Kashagawigamog	12-Jul-16	Basin 2	0.007	0.030	0.003	0.380		4.20	6.7	7.7	23.50	88	9.7	1.82	32	0.7	57
Kashagawigamog	29-Sep-16	Basin 1	0.007	0.030	0.003	0.380		4.20	6.7	7.7	23.50	88.0	9.7	1.82	32	0.7	57.0
Kashagawigamog	29-Sep-16	Basin 2	0.009	0.020	0.001	0.208		4.00	6.8	7.6	29.10	89.0	10.2	1.98	34	2.5	58.0
Kashagawigamog	29-Sep-16	Basin 3	0.012	0.020	0.001	0.230		4.10	7.0	7.4	38.00	89.0	10.3	1.95	34	1.4	58.0
Kawagama	10-Sep-15	Basin 1	0.006	0.085	0.002	0.03		3.3	1.6	6.81	4.4	25	2.15	0.611	7.9	0.6	16
Kawagama	10-Sep-15	Basin 2	0.007	0.072	0.002	0.02		3.2	1.1	6.75	3.8	24	2.20	0.608	8.0	1.3	16
Kawagama	10-Sep-15	Basin 4	0.011	0.030	0.003	0.06		3.8	1.4	6.66	3.8	25	2.19	0.693	8.3	1.0	16
Kawagama	10-Sep-15	Basin 5	0.006	0.027	0.001	0.03		3.2	1.0	6.61	3.2	23	2.13	0.625	7.9	0.5	15
Kawagama	10-Sep-15	Basin 6	0.023	0.030	0.008	0.03		3.2	1.2	6.57	3.1	23	2.08	0.603	7.7	18.5	15
Kelly	16-Sep-15		0.006	0.024	0.001	0.23		3.0	1.6	6.29	2.5	19	1.7	0.404	5.9	0.9	13
Kelly	26-Sep-16		0.005	0.020	0.002	0.17		3.1	1.3	6.68	7.3	20.0	1.73	0.399	6.0	1.2	13.0
Kennisis	15-Sep-15	Basin 1	0.005	0.028	0.002	0.031		3.2	1.0	6.71	3.4	24	2.32	0.542	8.0	0.7	15
Kennisis	15-Sep-15	Basin 2	0.005	0.043	0.003	0.13	N/A	3.3	0.9	6.71	3.5	23	2.15	0.499	7.4	0.5	15
Kennisis	15-Sep-15	Basin 3	0.005	0.041	0.002	0.247	N/A	3.5	1.1	6.76	3.5	23	2.10	0.497	7.3	0.7	15
Kennisis	15-Sep-15	Basin 4	0.005	0.033	0.002	0.02	N/A	3.2	1.0	6.76	3.7	24	2.31	0.521	7.9	0.5	15
Kennisis	12-Jul-16	Basin 2	0.005	0.037	0.002	0.138	N/A	2.8	0.7	6.72	6.7	23	2.31	0.485	7.8	0.6	15
Kennisis	27-Sep-16	Basin 2	0.006	0.005	0.001	0.155	N/A	3	1.1	6.77	8.8	24	2.31	0.511	7.9	0.9	16
Kennisis	27-Sep-16	Basin 4	0.005	0.005	0.001	0.162	N/A	2.9	1.2	6.81	8.2	24	2.35	0.516	8	0.5	16
Kimball	17-Sep-15	Basin 1	0.012	0.036	0.002	0.237	N/A	3.7	1.7	6.82	5	24	1.89	0.51	6.8	0.8	16
Kimball	17-Sep-15	Basin 2	0.005	0.028	0.002	0.178	N/A	3.4	1.1	6.44	2.2	19	1.72	0.491	6.3	0.7	12
Koshlong	11-Sep-14	Basin 1	0.011	0.009	0.002	0.243	0.26	4.3	1.6	6.73	5.6	31	2.66	0.46	8.5	0.6	20
Kushog	14-Sep-17	Basin 1	0.008	0.014	0.004	0.02		3.7	0.6	6.64	3.7	38	1.95	0.52	7	0.5	24
Kushog	14-Sep-17	Basin 2	0.006	0.014	0.004	0.02		4	1	6.79	4.1	39	2.35	0.52	8	0.7	25

Table 5c: Summary Chemistry Data for Metre over Bottom samples for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted)

Lake	Date	Basin	TP	NH3-N	NO2-N	NO3 + NO2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Lipsy	09-Sep-15	Basin 1	0.106	2.08	0.038	0.02	N/A	17.6	10.8	6.59	17.5	46	2.57	0.525	8.6	46.5	30
Little Bob	14-Sep-17	Basin 1	0.013	0.092	0.003	0.02		3.9	5.6	7.47	23.2	50	6.13	1.31	21	10.3	33
Little Bob	14-Sep-17	Basin 2	0.005	0.018	0.002	0.02		3.1	3.1	7.34	28.7	52	5.06	1.16	17	0.5	34
Little Clean	10-Sep-15	Basin 1	0.023	0.433	0.004	0.02		2.4	6.4	7.02	16.8	46	5.12	0.991	17	12.7	30
Little Hawk	11-Sep-15	Basin 1	0.1	0.029	0.002	0.032		3	1.6	6.47	3.2	23	2.07	0.555	7.5	1.4	15
Little Hawk	11-Sep-15	Basin 2	0.007	0.022	0.001	0.02		2.8	0.8	6.45	2.2	22	1.94	0.535	7.1	0.6	14
Little Kennisis	15-Sep-15	Basin 1	0.007	0.044	0.003	0.037		4.8	0.4	6.65	4	22	2.04	0.483	7.1	0.7	14
Little Kennisis	15-Sep-15	Basin 2	0.028	0.054	0.004	0.05		5.2	1.0	6.65	4.3	23	2.27	0.504	7.7	1.9	15
Little Kennisis	12-Jul-16	Basin 1	0.005	0.051	0.002	0.18		4.2	0.7	5.49	N/A	20	2	0.423	6.7	0.5	13
Little Kennisis	27 Sep-16	Basin 1	0.007	0.011	0.002	0.228		4.4	0.9	6.75	6.9	21	2.04	0.454	7.0	0.8	14
Little Kennisis	27-Sep-16	Basin 2	0.012	0.012	0.005	0.276		5.4	2.4	6.79	8.5	24	2.22	0.473	7.5	2.0	15
Little Redstone	15-Sep-15	Basin 1	0.008	0.025	0.003	0.226		1.4	4.4	6.47	4.3	24	2.15	0.54	7.6	0.5	16
Livingstone	16-Sep-15	Basin 1	0.009	0.023	0.005	0.258		4.6	2.5	6.65	6.4	28	2.32	0.717	8.8	1	18
Livingstone	16-Sep-15	Basin 2	0.021	0.963	0.016	0.02	N/A	6.6	8.1	6.8	21.4	52	4.27	1.7	18	12.6	34
Livingstone	12-Sep-17	Basin 1	0.006	0.03	0.003	0.054		4.4	0.9	6.62	4.6	24	1.95	0.68	7.6	1.1	16
Livingstone	12-Sep-17	Basin 2	0.019	0.613	0.012	0.02		5.3	5	7.26	16.5	48	3.6	1.6	15.4	14.7	31
Long	09-Sep-14		0.014	0.047	0.006	0.179	0.34	3.2	9.5	7.5	39.3	98	14.9	1.47	43	1.4	63
Loon	10-Sep-14		0.015	0.013	0.002	0.217	0.35	5.1	10.8	7.6	46.2	142	18.2	1.63	52	0.9	93
Loon	10-Sep-15		0.011	0.036	0.002	0.02	N/A	2.9	2	6.21	2.1	17	1.57	0.401	5.6	1.5	11
Louie	14-Sep-15	Basin 1	0.005	0.066	0.002	0.02	N/A	3	1.3	6.83	4.4	22	2.18	0.631	8	0.8	15
Lower Fletcher	15-Sep-15	Basin 1	0.017	0.022	0.004	0.285	N/A	6.4	2.9	6.42	5.6	27	2.6	0.773	9.7	1.9	18
MacDonald	16-Sep-15	Basin 1	0.007	0.01	0.001	0.132	N/A	2.5	1.4	6.81	4.5	23	2.26	0.597	8.1	0.9	15
Maple	27-Sep-16	Basin 1	0.007	0.008	0.000	0.002	N/A	3.10	4.6	7.5	25.6	57	5.7	1.47	20	0.5	37
Marsden	11-Sep-15	Basin 1	0.023	0.101	0.009	0.101	N/A	6.4	2.2	6.33	3.8	21	2.13	0.487	7.3	10.1	14
McFadden	15-Sep-15	Basin 1	0.007	0.115	0.001	0.13	N/A	3	3.2	6.75	8.1	34	2.86	1.05	11	0.5	22
McFadden	15-Sep-15		0.022	0.108	0.003	0.069		3.3	3.2	6.98	11.7	35	3.19	1.11	13	5.9	23
Miskwabi	18-Sep-14		0.017	0.023	0.001	0.225	0.27	3.3	8.6	7.45	36.3	94	14.6	1.56	43	1.3	61
Monmouth	10-Sep-14		0.01	0.024	0.003	0.202	0.28	5.2	7.5	7.31	31.4	76	12.1	1.08	35	1	50
Moore	28-Sep-16	Basin 1	0.008	0.014	0.001	0.225		3.4	6	7.23	21.8	75	8.02	1.62	27	1.3	49
Moore	28-Sep-16	Basin 2	0.031	0.076	0.005	0.05		3.9	16.1	7.7	55.3	166	19.8	4.32	67	2.5	108
Moose	11-Sep14	Basin 1	0.008	0.007	0.002	0.211	0.11	3.5	4.2	7.43	20.7	58	6.73	1.82	24	0.5	38
Moose	11-Sep-14	Basin 2	0.009	0.026	0.004	0.219	0.2	3.4	4.2	7.39	17.7	57	6.63	1.8	24	0.5	37
Mountain (Minden)	12-Jul-16	Basin 1	0.011	0.051	0.003	0.390	N/A	3.0	3.2	7.3	9.8	56	5.2	1.14	18	1.7	36
Mountain (Minden)	28-Sep-16	Basin 1	0.006	0.015	0.002	0.206		2.70	3.8	7.4	17.5	57.0	5.5	1.20	19	1.2	37.0

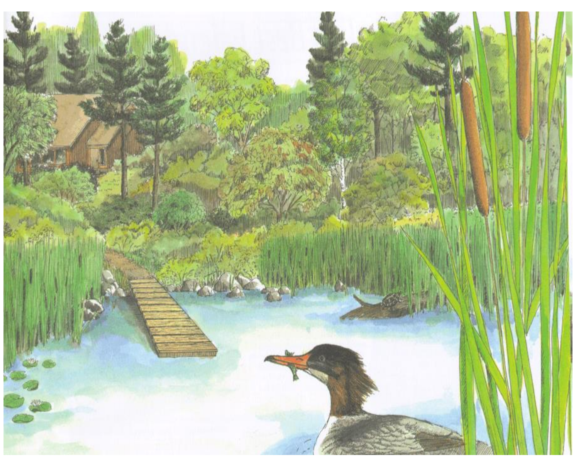
Table 5d: Summary Chemistry Data for Metre over Bottom samples for County of Haliburton Study Lakes (all units in mg/L unless otherwise noted)

Lake	Date	Basin	TP	NH3-N	NO2-N	NO3 + NO2-N	TKN	DOC	DIC	pH (none)	Alk	Cond (us/cm)	Ca	Mg	Hard	TSS	TDS
Mountain (Minden)	12-Jul-16	Basin 1	0.006	0.015	0.002	0.206		2.70	3.8	7.4	17.5	57.0	5.5	1.20	19	1.2	37.0
Mountain (Minden)	28-Sep-16	Basin 1	0.006	0.024	0.003	0.020		3.10	3.3	7.3	12.3	55.0	4.8	1.24	17	0.7	36.0
North	11-Sep-14		0.014	0.01	0.004	0.251	0.27	5.9	0.3	6.18	2	19	1.67	0.381	5.7	1.5	12
North Pigeon	11-Jul-16	Basin 1	0.011	0.037	0.003	0.370	N/A	3.30	4.0	7.4	11.8	63	7.0	1.21	22	1.4	41
North Pigeon	28-Sep-16			0.009	0.018	0.001	0.151		3.10	4.9	7.1	40.8	65.0	6.8	1.33	23	0.9
Oblong	09-Sep-14		0.008	0.041	0.002	0.234	0.27	3.6	3.0	6.96	11.1	43	4.68	1.16	16	1.3	28
Oxtongue	17-Sep-15	Basin 1	0.009	0.023	0.003	0.221	N/A	4.6	1.4	6.14	3.0	28	1.84	0.579	7.0	0.9	18
Oxtongue	17-Sep-15	Basin 2	0.009	0.028	0.003	0.208	N/A	4.7	1.3	6.22	2.4	27	2.03	0.586	7.5	0.7	17
Paudash	08-Sep-14	Basin 1	0.014	0.04	0.001	0.277	0.25	4.0	5.7	7.12	24.3	89	8.59	1.42	27	1.2	58
Paudash	08-Sep-14	Basin 2	0.018	0.045	0.001	0.287	0.33	3.8	7.1	7.21	27.9	96	9.77	2.0	33	1.6	62
Percy	10-Sep-14	Basin 1	0.009	0.023	0.002	0.25	0.31	4.9	2.7	7.03	10.7	38	4.55	0.938	15	0.5	25
Percy	10-Sep-14	Basin 2	0.009	0.023	0.002	0.25	0.31	4.9	2.7	7.03	10.7	38	4.55	0.938	15	0.5	25
Pusey	11-Sep-14	Basin 1	0.009	0.03	0.001	0.324	0.23	3.4	10.5	7.39	42.4	136	18.3	2.17	55	0.7	88
Raven	09-Sep-15	Basin 1	0.02	0.097	0.006	0.126	N/A	5.0	2.2	6.44	2.8	21	1.69	0.429	6.0	12.1	14
Raven	09-Sep-15	Basin 2	0.078	0.34	0.015	0.026	N/A	6.4	3.4	6.66	5.7	27	1.78	0.459	6.3	19.1	17
Red Pine	27-Sep-16	Basin 1	0.007	0.005	0.002	0.191		3.4	1.3	6.77	6.8	23.0	2.24	0.490	7.6	0.9	15.0
Red Pine	27-Sep-16	Basin 2	0.009	0.008	0.001	0.159		3.0	1.5	6.79	7.8	23.0	2.21	0.485	7.5	2.5	15.0
Redstone	15-Sep-15	Basin 1	0.013	0.064	0.011	0.185	N/A	3.8	1.5	6.73	6.2	29	2.3	0.59	8.2	2.2	19
Redstone	15-Sep-15	Basin 2	0.044	0.016	0.002	0.137	N/A	3.3	1	6.62	4.2	25	2.36	0.576	8.3	3.1	16
Redstone	15-Sep-15	Basin 3	0.044	0.016	0.002	0.137	N/A	3.3	1.0	6.62	4.2	25	2.36	0.576	8.3	3.1	16
Sherborne	16-Sep-15	Basin 2	0.005	0.037	0.002	0.02	N/A	3.4	0.2	6.53	2.4	18	1.64	0.431	5.9	0.8	12
Sherborne	16-Sep-15	Basin 3	0.008	0078	0.004	0.02	N/A	3.9	0.8	6.6	3.4	20	1.75	0.444	6.2	4.6	13
Sherborne	16-Sep-15	Basin 4	0.014	0.188	0.007	0.02	N/A	6.5	0.8	6.55	3.3	18	1.73	0.424	6.1	3.7	12
Silent	12-Sep-14		0.011	0.005	0.002	0.251	0.21	4.4	1.9	6.86	8.0	33	3.68	0.595	12	1.2	21
Slipper	10-Sep-15		0.02	0.11	0.006	0.02	N/A	4.0	2.6	6.46	4.6	22	2.16	0.507	7.5	9.2	15
Soyers	29-Sep-16		0.008	0.02	0.002	0.206		4.5	2.34	7.35	28.4	63	6.14	1.71	22	0.5	41
St Nora	14-Sep-17		0.31	0.014	0.003	0.02		3.6	0.4	6.63	2.8	29	1.75	0.48	6.4	0.5	19
Stocking	10-Sep-15		0.029	0.37	0.017	0.02	N/A	6.8	4.4	6.62	8.8	27	2.89	0.641	9.9	24.4	18
Stormy	12-Sep-14	Basin 1	0.015	0.008	0.004	0.288	0.29	4.4	4.3	7.08	15.6	69	6.97	0.651	20	1.2	45
Twelve Mile	26-Sep-16		0.008	0.005	0.001	0.340	N/A	3.10	3.8	7.3	33.6	52	4.9	1.13	17	0.7	34
Two Islands	10-Sep-14	Basin 1	0.009	0.029	0.001	0.05	0.2	3.9	8.7	7.36	35.8	86	13	0.989	37	0.7	56
Wilbermere	11-Sep-14	Basin 1	0.011	0.139	0.007	0.095	0.29	4.2	13.8	7.56	55.6	149	19.6	2.21	58	5.5	97

Lake Capacity Assessment

Lake Capacity Assessment is an analytical tool [5] developed by the Province of Ontario to provide a consistent and uniform approach to quantifying water quality impacts resulting from shoreline development on Precambrian Shield Lakes. Development in this context encompasses any activity that has the potential to have an adverse impact on water quality and aquatic habitat through the creation of additional lots or changes in land use. This includes permanent residences, cottages, resorts, trailer parks, and campgrounds.

Lake Capacity Assessment is based on two main objectives: maintaining water clarity to protect recreational values and ensuring that there is sufficient dissolved oxygen to maintain valued fisheries. The goal of Lake Capacity Assessment is to ensure sustainable development of our inland recreational lakes using a watershed based approach.



5. MOE, MNR, & MMAH. Lakeshore Capacity Assessment Handbook: protecting Water Quality in Inland lakes on Ontario's Precambrian Shield. Consultation Draft. May 2010.

Phosphorus limits the amount of plant (algae) growth in a body of water. As previously explained, too much phosphorus can lead to excessive algal growth, depletion of dissolved oxygen in the hypolimnion and loss of cold water habitat for lake trout.

Phosphorus originates from both natural sources and from shoreline development. On the Precambrian Shield where a significant portion of the land use is still in a natural forested state, the primary controllable source of phosphorus is often shoreline development.

Lake Capacity Assessment is based upon the use of MOE's Lake Capacity Model (LCM). The LCM was first developed in the early 1970's to address the relationship between shoreline development and algal production. It has been subsequently refined and updated, most notably with a component that links shoreline development and dissolved oxygen.

The LCM provides a method for estimating the supply of phosphorus to a lake from land runoff, atmospheric deposition, upstream sources and shoreline development. The model correlates the supply of phosphorus from these sources with the lake's morphometry and water budget to predict phosphorus concentrations in a lake.

The predicted phosphorus concentration can, in turn, be used to derive other indices of lake trophic status such as algal densities, water clarity and dissolved oxygen.

Alternatively, for a given standard of water quality protection, be it a phosphorus or dissolved oxygen level, the model can be used to establish a permissible phosphorus supply for the lake which can in turn be translated into a permissible number of shoreline development units.

For cold-water lake trout lakes, the MNR criterion is a volume-weighted hypolimnetic mean of 7 mg/L dissolved oxygen. Lakes are deemed to be at-capacity or highly sensitive if:

i) Measured volume-weighted mean hypolimnetic dissolved oxygen, taken at the end of the summer, is consistently below the 7 mg/L criterion.

ii) Model predictions conclude that the loading associated with the existing vacant lots of record and/or new development proposal(s) will reduce the volume-weighted mean hypolimnetic dissolved oxygen below the 7 mg/L.

Lakes are deemed to have additional development capacity if:

i) Measured volume-weighted mean hypolimnetic dissolved oxygen, taken at the end of the summer, is consistently above the 7 mg/L criterion.

Of the 86 study lakes presented in Table 3 where a fall temperature and dissolved oxygen profile was obtained, 38 lakes had dissolved oxygen concentrations below the 7 mg/L criterion and 42 lakes had a volume-weighted mean dissolved oxygen concentration in the hypolimnion above 7 mg/L. Six lakes had indeterminate dissolved oxygen values.

A municipality may decide on how to allocate remaining development capacity between seasonal residences, permanent residences and other shore-land uses. Municipalities must also consider that many seasonal cottages have converted to permanent residences over the last 10 to 20 years and that this trend will likely continue.

Lake Capacity Assessment addresses only one aspect of water quality, i.e., trophic status as determined by a lake's phosphorus supply. There are other pollutants (bacteria, mercury, and spillage of marine fuel) besides phosphorus that can degrade water quality and impact on aquatic biota.

Other human activities such as agriculture, forestry practices, and marine construction can also have an impact on the lake and its environment. Lake Capacity Assessment does not address these environmental and social issues nor does Lake Capacity Assessment consider social factors such as the loss of wilderness habitat, noise and traffic resulting from increased boat usage or shoreline crowding and density issues. These types of concerns are better addressed by other types of regulatory approaches and planning mechanisms.

Land Use Planning

Land use planning is a network of legislation, policies and planning procedures, which provide a framework for managing Ontario's land use and development. Under Section 3 of the Planning Act, the province issued the Provincial Policy Statement (PPS). The PPS provides direction on matters of provincial interest related to land use planning and development. In exercising their authority, upper and lower-tier planning departments must ensure that the policies in the PPS are met in any planning decisions that are made.

The PPS includes natural heritage policies to protect lake trout habitat and water policies to protect water quality and quantity which are relevant to Lake Capacity Assessment. The PPS also requires consideration of environmental lake capacity. Use of the Lake Capacity Assessment approach and consideration of the results for individual lakes is important to ensure that these natural heritage features are protected and that lake water quality is not degraded.

One method of ensuring this is to have municipalities include policies in Official Plans (OP) for protection of water quality and fish habitat. Another method is through the education of residents, cottagers and the general public about water quality and fish habitat protection. This can be achieved through best management practices such as: having a properly functioning septic system, provision of adequate set-backs in accordance with OP and zoning by-law requirements, maintenance of vegetation and tree cover in the setback buffer, and the elimination of pesticide and fertilizer applications for aesthetic purposes.

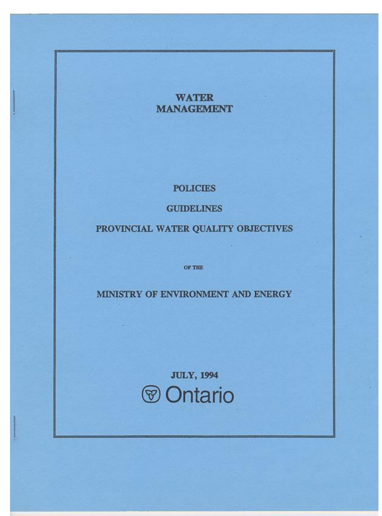
OP policies should include appropriate setbacks for septic systems, buildings and other structures and require non-disturbance of soils and vegetation within the setback area except for minor pathways for access and beach usage.

Policies are also recommended requiring a municipality to use LCA to determine the amount of development a lake can sustain. In the event that municipal planning decisions that are based on lake capacity assessments are challenged in the future, the province will support the municipality before the Ontario Municipal Board.

Amendments to the *Planning Act* in 1996 delegated approval authority to most municipal governments. As a delegated authority, the County of Haliburton is now responsible for approving site specific applications such as subdivisions and severances, and for providing input to lower tier municipalities on zoning matters.

Upper-tier Official Plans are approved by the Ministry of Municipal Affairs through a one-window system whereby partner ministry comments are coordinated into a Provincial response. Both the Ministry of the Environment and Cliamte Change and the Ministry of Natural Resources and Forestry are part of the one-window planning system.

The County of Haliburton has a recently approved Official Plan which includes policies that meet the PPS, as required by the Planning Act. To support the County's Official Plan policies and to ensure that provincial interests are protected in matters related to shoreline development, the Eastern Region of the Ministry of the Environment carried out a water quality assessment for each of the lake trout lakes in the County.



Recommendations

The following recommendations provide the basis for developing Official Plan policies for each lake trout lake in the County of Haliburton and describe best management practices (BMPs) aimed at reducing the input of nutrients to water bodies and minimizing the impacts of shoreline development. Many of these BMPs can be implemented through local zoning by-laws or site plan control for consideration during the planning and construction phase of shoreline development, or are intended as practical and instructive methods that individual shoreline owners can use to minimize their impacts to water quality and fish habitat.

Lakes deemed to be at-capacity

No new shoreline development shall be permitted which will result in increased phosphorus loadings. The 300 meter zone from the high water mark of the lake shall be used as the influence area to assess impacts from new development.

New development may be supported if site-specific hydrogeological/soil information studies demonstrate, to the satisfaction of the MOE, that sewage phosphorus will be attenuated in the long-term by native soils. The MOE should be consulted early in this process to assist in the development of an appropriate term of reference for the study design.

Lakes deemed to have additional development capacity

On these lakes additional development capacity exists. The development of existing registered vacant lots of record and limited new shoreline severances may be permitted. Caution must be exercised in approving large scale development proposals (i.e. subdivisions) or cumulatively a large number of severance applications until such time as more detailed modeling has been undertaken to determine an acceptable nutrient load.

The planning authority should maintain a detailed inventory of existing development, usage, and vacant registered lots on each lake. This information is essential in order to track, manage and properly allocate the remaining development capacity.

Local Councils should establish through their Zoning Bylaws a setback for all structures (excluding docks) of at least 30 meters horizontally from the water's edge. A setback for buildings will discourage other physical improvements such as tile beds, lawns and gardens near the shoreline, thereby widening the buffer of natural vegetation and soil along the lake's edge. The setback also complements fisheries management objectives by minimizing impacts of shoreline activities on the important littoral zone.

3. Recommendations applicable to all lakes

OP policies should include appropriate setbacks for septic systems, buildings and other structures and require non-disturbance of soils and vegetation within the setback area except for minor pathways for access and beach usage

All lots should be of sufficient size and lake frontage to accommodate the safe installation and construction of a well, septic system, and dwelling. The topography, native soil depth and slope of lots should be conducive to development. Development on lands which are bare bedrock, swampy or low-lying should be prohibited.

All sewage waste should be discharged into the septic tank.

All property owners should have their private waste disposal systems inspected to ensure the system meets current standards. Septic systems should be pumped out every three to five years to remove solids and scum. In those cases where a system requires upgrades or replacement, all efforts should be made to relocate the system further from the lake to protect water quality (i.e. minimum of 30 meters).

The municipality should develop an administrative mechanism to ensure all septic tanks and holding tanks are maintained and pumped on a frequent schedule.

Water conservation measures are encouraged to extend the life of a septic tank tile bed system.

All practical measures should be taken to reduce further nutrient loadings from existing sources.

Building site preparation and construction activities should be carried out in a manner that minimizes disruption to the soil and vegetation on the property. All areas that are exposed during construction should be replanted as soon as possible. Hardening of a lot by paved walkways or asphalt driveways, concrete ramps, lawns should be kept to a minimum to reduce storm water runoff and erosion.

Maintain a zone of natural vegetation (trees and shrubs) as a protective buffer between lawns and the lake or leave your entire lot in a natural state. If you must have a lawn or garden, do not fertilize it as the runoff will add excessive nutrients into the lake.

The shallow, near-shore, "littoral" zone supports most of the plant and animal life in a lake. Disruption of any part of this ecosystem threatens the entire cycle of life in the lake. In particular, fish habitat and wildlife may be destroyed, and nutrients may be resuspended from the lake sediments. All property owners should contact the Ministry of Natural Resources and Forestry and the local Conservation Authority before undertaking any dredging or filling activities within the littoral zone.

All projects in and around water which may alter fish habitat should be referred to the Federal Department of Fisheries and Oceans, or their agent, for review and assessment of potential harmful alteration, disruption, or destruction (HADD) of fish habitat. It is an offense, subject to prosecution under the *Fisheries Act*, to destroy fish habitat.

Where subdivision developments are proposed, back shore lot designs generally offer the best means to minimize impacts upon the lake environment. In these situations, the shore-land should be maintained as a natural buffer and deeded either to the municipality or registered to all owners of the development as a common block. Large development proposals should incorporate storm water management controls.

Ongoing water quality monitoring is necessary to assess changes in lake water quality and provide valuable data that can be used in future modeling exercises. All property owners are encouraged to form a lake association to promote lake improvement programs that will assist in maintaining a quality lake environment. Cottage associations and/or individuals can participate in lake water quality monitoring through the Ministry's Lake Partner Program. For more information, please call 1-800-470-8322.

GLOSSARY OF TERMS

Aerobic: With oxygen.

Anaerobic: Without oxygen

Alkalinity (Alk): Alkalinity is a measurement of a lake's ability to buffer acidic (pH) inputs from rain, snow or groundwater. It is linked to the amount of bicarbonate or carbonate in a lake.

Ammonia (NH_3-N): Unpolluted waters are very low in ammonia. Ammonia arises from the aerobic or anaerobic decomposition of nitrogenous organic matter. Higher levels of ammonia are associated with natural wetland areas because they contain lots of organic material. It is also a common constituent of untreated sewage. Ammonia can also be found in fertilizers as soluble ammonia and ammonium salts. There is no PWQO's for ammonia but there is for its more toxic form un-ionized ammonia.

Bathymetry: Detailed topography or contour profile of the bottom of a lake or river

Calcium (Ca): Used for the calculation of water hardness.

Composite Sample Samples obtained from the euphotic zone by using a 1 liter bottle secured in a weighted metal case. There were two small plastic tubes in the bottle cap. The bottle was lowered to the bottom of the euphotic zone and then raised to the surface so that water gradually entered into the bottle as air escaped. In this way representative samples from all depths of the euphotic zone (i.e. a composite sample) of the euphotic zone was obtained.

Conductivity: (Cond) Conductivity is the ability for water to pass an electrical current over a distance and is related to the amount of dissolved ions and temperature. Higher temperatures raise conductivity values substantially. The higher the conductivity the more dissolved ions present in the water and therefore conductivity can provide a good indication of changes in water composition.

DIC: Dissolved inorganic carbon is a major nutrient used in photosynthetic metabolism by algae and submerged larger plants (macrophytes). There is no PWQO for DIC.

DOC: Dissolved organic carbon is largely present as a by-product of photosynthesis and organic inputs from the watershed. It can therefore be an indicator of how productive a lake may be. There is no PWQO for DOC.

Emergent Vegetation: Aquatic vegetation that has a substantial amount of mass that grows above the lake surface. e.g. Cattail.

Epilimnion: see thermal stratification

Euphotic zone: The euphotic zone is the zone of water to which light penetrates. The presence of light supports photosynthesis by algae and larger plants at these depths. In this study, the euphotic zone was defined as twice the Secchi depth.

E. coli: An indicator of fecal contamination from human or animal wastes. The Provincial Water Quality Objective is less than 100 fecal coliform counts per 100 milliliters of water based on a geometric mean of at least 5 samples for swimming areas.

Fetch: Longest distance of water in which wind can blow unimpeded between two points on a lake.

Hardness: **(Hard)** Water hardness is a traditional measure of the capacity of water to react with soap. Hard water requires a considerable amount of soap to produce lather, and it also leads to scaling of hot water pipes, boilers and other household appliances. Water hardness is caused by dissolved polyvalent metallic ions. In fresh waters, the principal hardness-causing ions are calcium and magnesium; strontium, iron, barium and manganese ions also contribute.

Hypolimnion: The area of the lake below the thermocline where water temperature changes less than 1 °C per meter of depth.

Inorganic: relating to or denoting compounds that are not organic (broadly, compounds not containing carbon)..

Kemmerer Bottle: **:**A brass or plastic tube with sealing devices at each end. When lowered to specific depth, the tube can be triggered to seal shut so that only water from the desired depth is collected.

Leachate: A term used to designate liquid waste that leaks from septic systems and landfill sites.

Limiting: nutrient The limiting nutrient is the nutrient that is most in demand for maximum growth of plants such as algae and macrophytes. In most natural lakes phosphorus is the most limiting nutrient.

Magnesium (Mg): Used for the calculation of water hardness.

Nitrate (NO_3-N): A molecule containing nitrogen and oxygen (NO_3) that represents the final oxidation product of ammonia. Nitrates stimulate growth of algae and larger aquatic plants which can contribute to a reduction in oxygen. A high concentration of nitrates may indicate contamination by treated sewage or fertilizers. There is no PWQO for NO_3. Surface waters rarely contain more than 5 mg/L nitrate. Nitrate concentrations tend to be higher in winter and after spring runoff.

Nitrite (NO_2-N): Nitrite is a chemical form of nitrogen that is found in minute quantities in surface waters. The presence of nitrites in water indicates active biological processes influenced by organic inputs. There are no PWQO guidelines for nitrites.

Oligotrophic A category of lake that is defined as being relatively low in plant nutrients and containing abundant oxygen in the deeper parts. .

Organic: Natural matter or compounds with a carbon base.

pH: pH is a measurement of acidity using a logarithmic scale. For example pH 6 is 10 times more acidic than pH 7 and pH 5 is 100 times more acidic than pH 7. A pH of 7 is neutral, pH's below 7 are acidic and above 7 are basic (alkaline). The PWQO for pH is 6.5 - 8.5.

PWQO: Provincial Water Quality Objectives are standards set for surface water quality whose goal is to ensure that the water quality is satisfactory for aquatic life and recreation.

Secchi Depth: A Secchi disk is a 20 cm diameter disk divided into black and white quadrants. The disk is lowered into the water and the maximum depth at which it is still visible is recorded. The Secchi depth gives a working estimate of water clarity.

Submergent Vegetation: Aquatic vegetation that grows below the surface water level.

Thermocline: The thermocline is the zone in the lake where water temperature rapidly decreases with depth. It is usually defined as the area of a lake where water temperature decreases at a rate greater than 1°C per meter depth.

Thermal Stratification: Most deep lakes stratify thermally during the summer months, setting up important biological and physical processes. By late spring as lakes warm up most lakes have established thermal stratification. A warm layer (the epilimnion) then exists in the surface area of a lake usually to a depth of 4 to 5 meters. The middle layer of water is called the thermocline or metalimnion.The bottom layer of water (the hypolimnion) contains cold water (4 - 7

°C) where light rarely penetrates. During late summer the upper layer of water begins to cool off as air temperatures drop. As water cools it becomesheavier, and this allows the upper waters to mix with deeper waters. As temperatures drop in October the lake once again becomes the same temperature from top to bottom. This allows all the waters to mix replenishing much needed oxygen to the bottom of the lake to allow organisms there to survive winter. The thermal stratification process repeats when the ice melts.

TKN: Total Kjeldahl Nitrogen (TKN) measures the amount of ammonia and organic nitrogen. Both of these forms of nitrogen are present in nitrogen containing organic detritus from natural biological activities. There is no PWQO for TKN.

Total Dissolved Solids (TDS): Total Dissolved Solids is a measure of the combined content of all inorganic and organic substances contained in water in a suspended form. Total dissolved solids are normally discussed only for freshwater systems, as salinity comprises some of the ions constituting the definition of TDS. The principal application of TDS is in the study of water quality for streams, rivers and lakes, although TDS is not generally considered a primary pollutant (e.g. it is not deemed to be associated with health effects) it is used as an indication of aesthetic characteristics of drinking water and as an aggregate indicator of the presence of a broad array of chemical contaminants.

Total Phosphorus (TP): Phosphorus is an essential plant nutrient. It is the limiting nutrient that affects the amount of plant growth in a lake. Total phosphorus includes all of the forms of phosphorus both organic and inorganic. Sources of phosphorus include, weathering from igneous rocks, decomposition of organic matter, domestic sewage, agricultural drainage and industrial effluents.

Total Suspended Solids (TSS): Solid organic or inorganic particles that are held in suspension in a solution

Un-ionized Ammonia: The toxic fraction of ammonia that is often used as an indicator of septic system leachate. The amount of un-ionized ammonia relative to total ammonia is dependent on pH and temperature. The PWQO for un-ionized ammonia is 20 µg/L.

Watershed: Area of land drained by a single river and its tributaries or creeks.

LAKE DATA APPENDICES

Lake Data sheets are available for all the study lakes as separate documents either in paper or electronic format.

Data from 2001 to 2009 for County of Haliburton lake trout Lakes was published in a previous report titled **Water Quality and Management of Lake trout Lakes; County of Haliburton: 2001-2009.** An electronic copy of this report can be obtained by calling the Kingston regional office at 1-800-267-0974 or 613-549-4000. Hard copies of this report are available at all Municipal and Ministry of Natural Resources and Forestry offices within the County of Haliburton.

APPENDIX 1

Temperature and Dissolved Oxygen Profiles

Appendix 1a: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-16.

	Allen		Art (Spruce)		Bear		Bear		Big Hawk	
	Basin 1		Basin 1		Basin 1		Basin 2		Basin 1	
Depth	9-Sep-14		9-Sep-14		9-Sep-14		9-Sep-14		14-Sep-15	
(m)	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)
0	20.73	8.57	19.57	8.22	20.55	9.01	20.79	8.86	20.26	8.34
1	20.81	8.55	19.7	8.21	19.9	9.01	20.5	8.79	20.24	8.15
2	20.82	8.55	19.75	8.2	19.77	8.97	19.75	8.89	20.20	8.11
3	20.81	8.55	19.75	8.2	19.53	8.96	19.38	8.83	20.16	8.07
4	20.78	8.54	19.78	8.19	19.04	9	19.19	8.78	20.07	8.03
5	20.75	8.52	19.73	8.15	13.8	11.06	15.18	10.32	15.66	10.34
6	17.65	9.12	10.92	2.83	9.52	11.19	9.8	12.2	11.87	11.29
7	13.43	9.68	8.87	2.14	7.28	9.13	7.38	9.78	8.80	11.85
8	9.92	9.01	8.26	2.05	6.14	8.8	6.24	8.25	7.91	11.24
9	7.94	8.2	7.81	2.34	5.47	8.81	5.61	8.2	7.46	11.07
10	7.91	8.14	7.57	2.34	4.87	9.1	5.06	8.26	6.83	9.92
11	7.08	7.97	6.96	2.91	4.62	9.24	4.77	8.66	6.39	9.12
12	6.41	7.71	6.29	3.6	4.4	9.44	4.67	8.94	5.85	8.65
13	5.98	7.51	5.93	3.89	4.29	9.53	4.61	9.07	5.55	8.54
14	5.63	7.53	5.77	3.75	4.21	9.54	4.54	9.04	5.35	8.45
15	5.4	7.52	5.41	3.5	4.15	9.47	4.49	8.99	5.17	8.33
16	5.21	7.38	5.35	3.03	4.12	9.42	4.44	8.77	5.01	8.29
17	5.05	7.33	5.28	2.81	4.08	9.1	4.38	8.51	4.90	8.32
18	4.91	7.37	5.25	2.57	4.05	8.7	4.35	7.89	4.81	8.35
19	4.85	7.32	5.15	2.17	4.05	8.66	4.34	7.52	4.73	8.39
20	4.76	7.26	5.11	1.74	4.03	8.52	4.32	7.14	4.65	8.43
21	4.68	7.2	5.09	1.35	4.01	8.42	4.32	6.68	4.58	8.43
22	4.62	7.1	5.08	1.11	4.01	8.15	4.31	6.47	4.52	8.48
23	4.6	6.97	5.08	0.85	3.99	7.21	4.3	6.13	4.47	8.54
24	4.58	6.8	5.08	0.77	3.99	7.02	4.29	5.71	4.40	8.57
25	4.55	6.44			4	6.26	4.29	5.08	4.36	8.64
26	4.53	6.11			4	4.06	4.29	4.37	4.32	8.68
27	4.52	5.7			4.01	2.27	4.3	2	4.27	8.65
28	4.48	5.09			4.02	1.43			4.23	8.65
29	4.48	3.49			4.03	1.13			4.20	8.64
30					4.07	0.65			4.17	8.63
31					4.1	0.4			4.16	8.56
32					4.13	0.24			4.13	8.53
33					4.15	0.19			4.12	8.48
34					4.18	0.15			4.10	8.41

Appendix 1b: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Big Hawk			Big Hawk		Big Hawk		Bitter	
	Basin 1 cont'd			Basin 2		Basin 3		Basin1	
Depth	14-Sep-15		Depth	14-Sep-15		14-Sep-15		9-Sep-15	
(m)	Temp	DO	(m)	Temp	DO	Temp	DO	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)
35	4.10	8.37	0	20.34	8.43	20.46	7.92	22.88	8.24
36	4.09	8.35	1	20.29	8.39	20.38	7.88	22.95	8.18
37	4.08	8.20	2	20.25	8.37	20.30	7.88	22.95	8.16
38	4.08	8.15	3	20.01	8.35	20.16	7.88	22.95	8.17
39	4.05	8.12	4	18.47	9.18	19.93	7.90	22.14	8.36
40	4.06	8.04	5	13.51	10.92	19.79	7.92	21.69	8.43
41	4.05	7.99	6	9.94	12.00	14.67	9.47	19.83	9.64
42	4.04	7.83	7	9.07	11.63	9.49	10.87	15.11	12.39
43	4.04	7.73	8	7.92	10.86	8.09	9.94	10.70	12.37
44	4.04	7.63	9	7.57	10.28	7.61	9.04	8.90	11.50
45	4.04	7.51	10	7.11	9.79	6.89	8.38	7.50	10.28
46	4.04	7.44	11	6.85	9.28	6.88	8.27	6.73	9.50
47	4.04	7.42	12	6.53	8.78	6.40	7.70	6.06	8.57
48	4.03	7.24	13	6.02	8.71	5.98	7.60	5.67	7.04
49	4.02	7.04	14	5.75	8.37	5.21	7.52	5.36	6.52
50	4.02	6.55	15	5.56	8.21	4.97	7.49	5.21	6.00
51	4.02	6.23	16	5.34	7.99	4.92	7.49	5.13	5.56
52	4.02	5.70	17	5.21	7.94	4.89	7.44	5.08	5.23
53	4.02	4.39	18	5.10	7.87			5.03	4.88
54	4.03	3.15	19	5.02	7.81			5.00	4.69
55	4.03	1.73	20	4.90	7.74			4.96	4.22
			21	4.82	7.73			4.94	4.04
			22	4.77	7.66			4.93	3.85
			23	4.73	7.60			4.92	3.81
			24	4.66	7.54			4.90	3.62
			25	4.63	7.38			4.89	3.22
			26	4.58	7.06			4.88	2.71
			27	4.56	6.94			4.87	2.07
			28	4.53	6.70			4.84	1.56
			29	4.51	6.40				
			30	4.52	5.96				
			31	4.51	5.93				
			32	4.50	5.83				
			33	4.48	5.70				
			34	4.47	5.41				

Appendix 1c: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Bob			Bob			Boshkung			Boshkung	
	Basin 1			Basin 1 cont'd			Basin 2			Basin 2 cont'd	
Depth	26-Sep-16		Depth	26-Sep-16		Depth	26-Sep-16		Depth	26-Sep-16	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
0	17.66	9.25	35	3.96	6.84	0	18.83	8.94	35	4.92	8.10
1	17.66	9.21	36	3.96	6.65	1	18.91	8.65	36	4.90	8.04
2	17.66	9.20	37	3.95	6.54	2	18.91	8.62	37	4.89	7.98
3	17.66	9.19	38	3.92	6.29	3	18.91	8.61	38	4.88	7.94
4	17.63	9.19	39	3.92	6.00	4	18.90	8.60	39	4.83	7.94
5	17.59	9.18	40	3.91	5.79	5	18.87	8.61	40	4.79	7.92
6	14.74	10.72	41	3.91	5.46	6	18.83	8.61	41	4.76	7.87
7	9.00	9.75	42	3.91	5.30	7	18.75	8.63	42	4.69	7.55
8	7.16	8.70	43	3.91	5.07	8	18.29	8.74	43	4.67	7.42
9	6.29	8.32	44	3.91	4.95	9	14.83	9.74	44	4.66	7.24
10	5.95	7.91	45	3.91	4.83	10	11.76	10.01	45	4.66	7.09
11	5.63	7.73	46	3.91	4.68	11	9.24	10.25	46	4.66	6.99
12	5.45	7.62	47	3.90	4.40	12	7.81	9.37	47	4.64	6.71
13	5.29	7.56	48	3.90	4.05	13	7.08	9.21	48	4.64	6.56
14	5.16	7.58	49	3.90	3.93	14	6.60	9.03	49	4.63	6.20
15	5.02	7.68	50	3.90	3.79	15	6.33	8.93	50	4.63	6.14
16	4.92	7.97	51	3.90	3.66	16	6.01	8.81	51	4.63	6.05
17	4.80	8.22	52	3.90	3.58	17	5.77	8.78	52	4.63	5.91
18	4.72	8.31	53	3.90	3.55	18	5.66	8.76	53	4.62	5.83
19	4.68	8.27	54	3.90	3.37	19	5.53	8.76	54	4.62	5.78
20	4.59	8.22	55	3.90	3.35	20	5.46	8.72	55	4.61	5.72
21	4.52	8.04	56	3.90	3.30	21	5.38	8.71	56	4.61	5.54
22	4.46	7.99	57	3.90	3.27	22	5.31	8.68	57	4.61	5.45
23	4.39	7.91	58	3.91	2.74	23	5.26	8.67	58	4.61	5.42
24	4.31	7.86				24	5.18	8.69	59	4.61	4.68
25	4.28	7.80				25	5.13	8.78			
26	4.22	7.69				26	5.10	8.79			
27	4.20	7.57				27	5.05	8.73			
28	4.17	7.47				28	5.02	8.62			
29	4.09	7.51				29	4.99	8.49			
30	4.05	7.56				30	4.98	8.40			
31	4.05	7.43				31	4.96	8.33			
32	4.03	7.32				32	4.95	8.32			
33	3.99	7.07				33	4.94	8.28			
34	3.99	6.93				34	4.93	8.17			

Appendix 1d: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Buckskin			Buckskin			Clean			Clean	
	Basin 1			Basin 1 cont'd			Basin 1			Basin 1 cont'd	
Depth	10-Sep-14		Depth	10-Sep-14		Depth	10-Sep-15		Depth	10-Sep-15	
(m)	Temp (°C)	DO (mg/L)	(m)	Temp (°C)	DO (mg/L)	(m)	Temp (°C)	DO (mg/L)	(m)	Temp (°C)	DO (mg/L)
0	20.49	8.54	35	4.33	1.12	0	21.17	8.68	35	4.83	6.49
1	20.50	8.49	36	4.33	0.89	1	21.07	8.68	36	4.82	6.42
2	20.50	8.48	37	4.33	0.66	2	20.92	8.69	37	4.82	6.37
3	20.49	8.48	38	4.33	0.39	3	20.73	8.72			
4	20.33	8.49	39	4.33	0.19	4	20.46	8.75			
5	16.40	10.94	40	4.34	0.15	5	20.37	8.75			
6	11.80	12.93				6	20.3	8.75			
7	8.74	12.57				7	20.23	8.72			
8	6.81	11.26				8	19.88	8.86			
9	5.88	7.82				9	15.7	10.77			
10	5.35	7.23				10	11.15	12.54			
11	5.05	7.38				11	8.99	12.66			
12	5.05	7.39				12	8.26	11.76			
13	4.87	7.44				13	7.13	11.72			
14	4.71	7.33				14	6.54	10.86			
15	4.62	7.27				15	6.07	9.9			
16	4.55	6.88				16	5.82	9.36			
17	4.50	6.68				17	5.6	8.95			
18	4.46	6.41				18	5.47	8.4			
19	4.42	6.12				19	5.4	8.25			
20	4.40	5.92				20	5.31	8.19			
21	4.38	5.83				21	5.18	8.04			
22	4.38	5.66				22	5.12	7.88			
23	4.38	5.51				23	5.08	7.77			
24	4.36	4.94				24	5.04	7.62			
25	4.35	4.71				25	4.99	7.44			
26	4.33	4.41				26	4.97	7.38			
27	4.33	3.88				27	4.94	7.29			
28	4.34	3.44				28	4.93	7.24			
29	4.34	2.96				29	4.91	7.15			
30	4.35	2.71				30	4.89	7.05			
31	4.35	2.71				31	4.87	6.81			
32	4.33	2.64				32	4.86	6.74			
33	4.33	2.08				33	4.86	6.68			
34	4.33	1.18				34	4.84	6.58			

Appendix 1e: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Clinto		Clinto		Deer		Devil (Lutterworth)		Devil (Lutterworth)	
	Basin 1		Basin 2		Basin 2		Basin 1		Basin 2	
Depth	10-Sep-15		10-Sep-15		8-Sep-14		11-Jul-16		11-Jul-16	
(m)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
0	20.48	8.83	20.67	8.89	21.22	8.73	24.67	8.27	24.10	8.02
1	20.39	8.56	20.61	8.77	21.16	8.7	24.48	8.28	24.30	7.92
2	20.25	8.56	20.5	8.77	21.11	8.71	24.22	8.31	24.01	7.96
3	20.12	8.56	20.41	8.77	20.95	8.72	22.91	8.44	22.57	8.17
4	20.07	8.56	20.16	8.78	20.7	8.64	20.97	8.72	20.91	8.33
5	20.02	8.56	20.09	8.77	19.81	8.57	15.49	9.47	15.94	9.24
6	19.96	8.56	20.03	8.76	16.06	7.88	11.07	10.12	10.79	10.19
7	19.91	8.54	19.96	8.77	11.81	6.68	8.20	9.32	8.21	10.31
8	19.86	8.54	19.93	8.76	9.48	5.9	7.22	8.85	6.80	9.16
9	19.86	8.53	16.67	9.78	8.68	5.83	5.89	9.32	5.72	9.07
10	15.76	11.98	12.22	13.13	8.03	5.53	5.33	9.73	5.22	8.99
11	12.8	13.11	10.36	13.83	7.61	5.33	5.03	10.45	4.88	9.00
12	10.64	13.5	8.72	13.42	7.27	5.19	4.74	10.16	4.74	9.01
13	9.2	10.39	7.77	10.74	7.04	5.03	4.55	10.01	4.60	9.02
14	8.3	6.61	6.87	4.3	6.8	4.9	4.46	10.00	4.47	9.03
15	7.74	3.21	6.6	2.45	6.71	4.82	4.37	10.01	4.38	9.06
16	7.54	1.58	6.35	1.33	6.56	4.64	4.29	10.02	4.31	9.09
17	7.29	0.89	6.16	0.78	6.39	4.3	4.25	10.02	4.26	9.12
18	7.06	0.57	5.97	0.52	6.3	3.78	4.20	10.02	4.23	9.10
19	7.03	0.46	5.86	0.4	6.19	2.85	4.16	9.98	4.20	9.09
20					6.16	1.69	4.14	9.98	4.17	9.09
21							4.11	9.86	4.15	9.07
22							4.10	9.85	4.14	9.06
23							4.11	9.45	4.12	9.00
24							4.11	9.44	4.10	8.94
25							4.06	9.35	4.09	8.94
26							4.05	9.31	4.10	8.73
27							4.05	9.14	4.06	8.47
28							4.06	8.94	4.06	8.42
29							4.05	8.60	4.05	8.30
30							4.06	8.43	4.04	8.19
31							4.06	8.08	4.05	8.11
32							4.06	7.85	4.05	8.00
33							4.05	7.60	4.05	7.81
34							4.05	7.47	4.05	7.51

Appendix 1f: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Devil (Lutterworth)		Drag			Drag			Drag	
	Basin 1		Basin 1			Basin 1 cont'd			Basin 2	
Depth	28-Sep-16		11-Sep-14		Depth	11-Sep-14		Depth	11-Sep-14	
(m)	Temp	DO	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
0	18.01	8.44	19.01	9.10	**35**	5.08	8.26	**0**	19.60	8.60
1	18.00	8.33	19.17	8.76	**36**	5.07	8.22	**1**	19.78	8.56
2	17.97	8.28	19.04	8.79	**37**	5.06	8.21	**2**	19.89	8.56
3	17.96	8.27	19.20	8.65	**38**	5.05	8.20	**3**	19.94	8.59
4	17.96	8.26	19.24	8.62	**39**	5.01	8.22	**4**	19.97	8.57
5	17.94	8.26	19.24	8.54	**40**	4.99	8.26	**5**	19.96	8.58
6	17.47	8.18	18.02	8.75	**41**	4.98	8.25	**6**	19.87	8.55
7	10.82	8.99	12.01	8.63	**42**	4.97	8.24	**7**	16.42	8.29
8	7.40	8.23	10.51	8.19	**43**	4.95	8.12	**8**	12.63	7.61
9	6.18	7.96	8.03	8.09	**44**	4.95	8.05	**9**	11.24	7.52
10	5.35	7.76	7.94	7.96	**45**	4.96	8.05	**10**	9.20	7.77
11	4.89	7.79	7.72	7.96	**46**	4.95	8.07	**11**	7.26	8.14
12	4.65	7.86	7.40	8.05	**47**	4.95	8.01	**12**	7.10	8.17
13	4.48	7.88	7.07	8.14	**48**	4.95	7.99	**13**	6.12	8.36
14	4.36	7.92	6.78	8.22	**49**	4.93	7.87	**14**	5.82	8.37
15	4.28	7.96	6.61	8.24	**50**	4.90	7.48	**15**	5.69	8.38
16	4.17	7.96	6.39	8.28	**51**	4.89	2.04	**16**	5.56	8.43
17	4.08	8.07	6.24	8.31	**52**	4.89	0.86	**17**	5.46	8.44
18	4.04	8.19	6.06	8.37				**18**	5.40	8.44
19	4.05	8.21	5.95	8.43				**19**	5.36	8.44
20	4.07	7.96	5.76	8.52				**20**	5.33	8.45
21	4.05	7.43	5.66	8.56				**21**	5.27	8.42
22	4.04	7.27	5.58	8.60				**22**	5.20	8.36
23	4.04	7.17	5.46	8.64				**23**	5.18	8.36
24	4.03	7.08	5.46	8.64				**24**	5.18	8.34
25	4.01	6.85	5.41	8.65				**25**	5.15	8.31
26	4.03	6.58	5.32	8.67				**26**	5.12	8.27
27	4.02	6.43	5.27	8.66				**27**	5.08	8.27
28	4.02	6.07	5.24	8.64				**28**	5.06	8.22
29	4.01	5.91	5.20	8.62				**29**	5.05	8.18
30	4.01	5.77	5.18	8.58				**30**	5.04	8.16
31	4.01	5.53	5.15	8.53				**31**	5.03	8.10
32	4.01	4.52	5.14	8.49				**32**	5.02	8.05
33	4.01	4.05	5.12	8.41				**33**	5.02	8.07
34	4.01	3.91	5.09	8.34				**34**	5.02	8.06

Appendix 1g: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Drag			Eagle		Eels		Eels	
	Basin 2 cont'd			Basin 1		Basin 1		Basin 3	
Depth	11-Sep-14		Depth	10-Sep-14		12-Sep-14		12-Sep-14	
(m)	Temp	DO	(m)	Temp	DO	Temp	DO	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)
35.00	5.01	8.05	**0**	20.81	8.51	18.07	9.79	17.93	10.25
36.00	5.01	8.01	**1**	20.86	8.50	18.79	8.55	18.44	8.60
37.00	5.00	7.97	**2**	20.88	8.50	18.99	8.38	18.53	8.38
38.00	5.00	7.96	**3**	20.89	8.53	19.05	8.33	18.57	8.26
39.00	4.99	7.93	**4**	20.90	8.52	19.06	8.35	18.74	8.30
40.00	4.99	7.91	**5**	20.90	8.46	19.08	8.36	18.73	8.31
41.00	4.98	7.55	**6**	18.39	7.63	14.24	7.39	18.70	8.31
			7	14.28	6.92	11.07	5.59	17.44	7.54
			8	10.55	5.34	9.37	4.99	12.75	6.38
			9	9.45	4.73	8.01	5.05	10.52	5.44
			10	8.50	3.99	7.03	5.36	9.72	4.90
			11	7.78	3.31	6.56	5.43	8.92	4.74
			12	7.43	2.90	6.16	5.52	8.54	4.76
			13	7.10	2.40	5.91	5.61	7.92	4.82
			14	6.82	1.95	5.69	5.70	7.61	4.92
			15	6.72	1.57	5.46	5.72	7.38	4.96
			16	6.68	1.31	5.21	5.69	7.28	5.03
			17			5.06	5.68	7.18	5.06
			18			4.97	5.45	7.10	5.06
			19			4.87	5.17	6.94	4.85
			20			4.80	5.06		
			21			4.75	4.79		
			22			4.72	4.41		
			23			4.70	4.13		
			24			4.67	3.86		
			25			4.65	3.55		
			26			4.65	3.21		
			27			4.64	2.98		
			28			4.64	2.82		
			29			4.63	2.76		
			30			4.64	1.42		
			31						
			32						
			33						
			34						

Appendix 1h: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Esson		Eyre (Black)		Farquhar			Farquhar	
	Basin 1		Basin 1		Basin 1			Basin 1 cont'd	
Depth	10-Sep-14		11-Sep-15		11-Sep-15		Depth	11-Sep-15	
(m)	Temp	DO	Temp	DO	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)
0	20.40	8.65	22.10	8.51	20.75	8.67	34	5.03	7.82
1	20.44	8.65	22.16	8.52	20.74	8.67	35	5.02	7.79
2	20.43	8.67	22.19	8.52	20.60	8.67	36	5.00	7.67
3	20.42	8.65	22.16	8.49	20.54	8.66	37	4.99	7.55
4	20.41	8.65	19.23	9.16	20.47	8.67	38	4.99	7.42
5	20.33	8.65	13.94	6.63	20.48	8.66	39	4.99	7.31
6	16.51	8.87	9.48	5.31	20.47	8.68	40	4.99	7.25
7	12.13	9.38	7.42	5.12	20.42	8.68	41	4.99	7.20
8	9.60	8.76	6.40	4.98	20.40	8.67	42	4.99	7.19
9	8.12	8.46	5.77	5.29	20.39	8.68	43	4.99	7.17
10	7.25	8.13	5.36	5.40	18.29	9.16	44	4.99	7.16
11	6.71	7.75	5.06	5.09	15.74	9.75	45	4.98	7.11
12	6.36	7.30	4.79	4.21	13.88	10.50	46	4.98	0.28
13	6.20	7.14	4.71	3.49	11.70	10.99			
14	6.04	7.09	4.57	2.25	10.27	11.14			
15	5.92	7.09	4.50	1.35	9.30	10.90			
16	5.78	7.08	4.48	0.95	8.36	10.96			
17	5.71	6.99			7.48	10.48			
18	5.55	7.01			6.85	10.23			
19	5.41	7.02			6.16	9.95			
20	5.30	7.03			5.84	9.50			
21	5.15	7.03			5.67	9.17			
22	5.01	7.03			5.53	8.94			
23	4.91	6.98			5.47	8.73			
24	4.83	6.63			5.40	8.60			
25	4.76	6.38			5.31	8.51			
26	4.68	6.32			5.26	8.36			
27	4.64	6.15			5.21	8.28			
28	4.59	5.37			5.18	8.23			
29	4.55	3.52			5.15	8.20			
30	4.58	1.72			5.13	8.11			
31					5.12	8.06			
32					5.10	8.02			
33					5.08	7.93			
34					5.06	7.90			

Appendix 1i: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Fishtail			Fishtail			Fletcher		Fletcher	
	Basin 1			Basin 1 cont'd			Basin 1		Basin 2	
Depth	9-Sep-14		Depth	9-Sep-14		Depth	16-Sep-15		16-Sep-15	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)	(°C)	(mg/L)
0	20.59	8.50	34	4.74	7.03	0	20.57	8.68	20.10	8.68
1	20.58	8.49	35	4.73	6.49	1	20.09	8.44	19.86	8.59
2	20.51	8.47	36	4.72	4.00	2	19.96	8.41	19.78	8.57
3	20.32	8.44	37			3	19.66	8.42	19.44	8.50
4	20.25	8.37	38			4	19.50	8.35	19.31	8.49
5	19.70	8.09	39			5	19.39	8.27	18.22	8.70
6	14.95	7.29	40			6	14.76	6.37	12.06	9.78
7	12.69	7.42	41			7	11.01	4.48	8.67	9.03
8	9.39	8.02	42			8	9.38	4.21	6.47	7.48
9	8.22	8.15	43			9	7.51	4.73	5.21	6.96
10	7.33	8.33	44			10	6.68	4.98	4.79	6.84
11	6.62	8.57	45			11	6.26	5.06	4.61	6.75
12	6.12	8.71	46			12	5.95	5.11	4.41	6.90
13	5.71	8.84				13	5.64	5.07	4.27	7.03
14	5.55	8.91				14	5.49	5.05	4.23	7.14
15	5.45	8.97				15	5.32	4.86	4.23	6.63
16	5.38	9.02				16	5.22	4.73	4.24	5.95
17	5.28	9.03				17	5.15	4.63	4.25	5.78
18	5.18	9.04				18	5.15	4.31	4.25	5.29
19	5.10	9.03				19	5.13	3.82	4.24	4.88
20	5.08	8.99				20	5.10	3.64	4.21	4.09
21	5.04	8.97				21	5.09	3.32	4.19	2.37
22	4.99	8.95				22	5.08	2.98		
23	4.98	8.94				23				
24	4.94	8.96				24				
25	4.93	8.86				25				
26	4.91	8.79				26				
27	4.88	8.65				27				
28	4.86	8.48				28				
29	4.84	8.38				29				
30	4.82	8.29				30				
31	4.79	7.95				31				
32	4.77	7.72				32				
33	4.77	7.58				33				
34	4.75	7.37				34				

Appendix 1j: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Fletcher		Glamour		Goodwin (Loon)		Grace			Grace	
	Basin 3		Basin 1		Basin 1		Basin 1			Basin 1 cont'd	
Depth	16-Sep-15		11-Sep-14		27-Sep-16		9-Sep-14		Depth	9-Sep-14	
(m)	Temp	DO	Temp	DO	Temp	DO	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)
0	20.04	8.64	19.96	8.59	18.16	9.14	20.80	8.43	35	4.91	8.36
1	19.79	8.43	19.98	8.27	18.17	8.85	20.78	8.42	36	4.90	8.21
2	19.67	8.38	20.00	8.26	18.16	8.77	20.76	8.41	37	4.88	8.09
3	19.43	8.39	20.02	8.26	18.14	8.76	20.69	8.41	38	4.86	7.92
4	19.31	8.28	19.92	8.25	18.13	8.74	20.61	8.39	39	4.84	7.79
5	19.15	8.19	19.44	8.20	18.12	8.74	20.52	8.29	40	4.84	7.57
6	16.32	8.12	13.68	7.08	18.11	8.73	20.10	8.23	41	4.84	7.44
7	11.10	4.09	12.41	6.43	18.08	8.73	19.31	8.19	42	4.82	7.24
8	8.92	3.57	8.80	5.58	18.00	8.73	17.31	8.06	43	4.80	6.89
9	7.30	3.50	8.13	4.80	11.76	12.43	14.45	7.64	44	4.80	0.56
10	6.50	3.61	7.62	4.15	9.45	12.46	9.46	8.03			
11	5.92	3.53	7.24	3.84	8.12	11.42	8.73	7.81			
12	5.53	2.43	7.08	3.60	7.23	10.58	8.27	7.66			
13	5.39	1.82	6.93	3.27	6.64	9.36	7.62	7.71			
14	5.32	1.28	6.77	3.05	6.20	8.80	7.08	7.74			
15	5.27	0.90	6.70	2.69	5.81	7.21	6.71	7.83			
16			6.62	2.39	5.60	5.90	6.35	7.93			
17			6.51	1.97	5.50	4.94	6.03	8.06			
18			6.38	1.52	5.41	4.24	5.87	8.11			
19			6.35	0.70	5.35	3.64	5.70	8.17			
20					5.31	2.92	5.60	8.22			
21					5.29	2.36	5.51	8.28			
22					5.28	2.15	5.42	8.42			
23					5.26	1.64	5.37	8.44			
24					5.24	0.98	5.31	8.44			
25					5.22	0.60	5.27	8.50			
26							5.18	8.48			
27							5.13	8.49			
28							5.09	8.49			
29							5.04	8.47			
30							5.01	8.40			
31							4.99	8.42			
32							4.97	8.48			
33							4.96	8.49			
34							4.94	8.46			

Appendix 1k: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Gull			Gull			Gull		Gull	
	Basin 1			Basin 1			Basin 2		Basin 3	
Depth	16-Sep-16		Depth	16-Sep-16		Depth	16-Sep-16		16-Sep-16	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)	(°C)	(mg/L)
0	18.69	8.81	**34**	6.08	6.42	**0**	18.78	9.05	18.76	8.78
1	18.67	8.81	**36**	6.05	6.21	**1**	18.75	8.81	18.78	8.71
2	18.67	8.79	**37**	6.03	6.10	**2**	18.71	8.77	18.79	8.68
3	18.61	8.78	**38**	6.03	6.02	**3**	18.67	8.77	18.77	8.83
4	18.52	8.80	**39**	6.01	5.91	**4**	18.61	8.78	18.76	8.72
5	18.46	8.77	**40**	6.00	5.82	**5**	18.48	8.79	18.76	8.66
6	18.45	8.73				**6**	18.43	8.78	18.75	8.76
7	18.44	8.71				**7**	18.43	8.73	18.35	8.70
8	18.43	8.67				**8**	18.40	8.70	16.32	8.81
9	14.16	9.20				**9**	15.71	9.19	13.36	8.86
10	9.83	8.70				**10**	9.82	9.79	10.30	8.36
11	8.32	7.83				**11**	8.34	8.39	8.77	8.18
12	7.82	7.53				**12**	7.60	7.78	7.93	7.47
13	7.44	7.46				**13**	7.42	7.44	7.49	6.94
14	7.28	7.42				**14**	7.22	7.36	7.29	6.59
15	7.15	7.38				**15**	7.02	7.41	7.17	6.52
16	7.07	7.34				**16**	6.92	7.54	7.10	6.56
17	7.01	7.31				**17**	6.86	7.46	7.04	5.70
18	6.92	7.33				**18**	6.78	7.29	7.00	5.48
19	6.85	7.31				**19**	6.69	7.25	6.97	5.35
20	6.79	7.37				**20**	6.61	7.20	6.94	5.24
21	6.73	7.30				**21**	6.54	7.22		
22	6.66	7.21				**22**	6.46	7.38		
23	6.56	7.42				**23**	6.39	7.28		
24	6.53	7.44				**24**	6.30	7.05		
25	6.49	7.42				**25**	6.22	7.00		
26	6.45	7.33				**26**	6.15	6.97		
27	6.42	7.26				**27**	6.10	6.62		
28	6.38	7.22				**28**	6.07	6.56		
29	6.34	7.18				**29**	5.98	5.86		
30	6.33	7.14				**30**	5.96	5.74		
31	6.27	7.01				**31**	5.91	5.58		
32	6.21	6.82				**32**	5.88	5.23		
33	6.13	6.74				**33**	5.84	4.62		
34	6.09	6.58				**34**				

Appendix 1l: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Gull			Gull			Haliburton			Haliburton	
	Basin 1			Basin 1			Basin 1			Basin 1	
Depth	13-Sep-17		Depth	13-Sep-17		Depth	9-Sep-14		Depth	9-Sep-14	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
0	19.00	8.82	35	6.25	6.35	0	20.60	8.86	35	4.85	8.16
1	18.96	8.85	36	6.22	6.30	1	20.80	8.67	36	4.84	8.15
2	18.85	8.84	37	6.22	6.16	2	20.86	8.69	37	4.82	8.13
3	18.50	8.84	38	6.21	6.14	3	20.88	8.69	38	4.81	8.12
4	18.41	8.70	39	6.20	6.10	4	20.83	8.71	39	4.79	8.10
5	18.36	8.61	40	6.20	6.06	5	20.81	8.70	40	4.78	8.09
6	18.33	8.59	41	6.20	6.04	6	20.81	8.70	41	4.76	8.06
7	18.29	8.60	42	6.19	6.03	7	18.43	8.84	42	4.75	8.00
8	18.01	8.40	43	6.17	6.01	8	11.80	9.80	43	4.74	7.89
9	17.36	8.04	44	6.16	5.99	9	8.11	9.63	44	4.74	7.83
10	13.70	7.49	45	6.16	5.97	10	7.05	9.13	45	4.73	7.80
11	10.89	6.84	46	6.16	5.97	11	6.67	8.97	46	4.73	7.77
12	9.61	6.70	47	6.16	5.96	12	6.45	8.86	47	4.73	7.74
13	9.06	6.80				13	6.27	8.84	48	4.72	7.65
14	8.79	7.04				14	6.15	8.81	49	4.72	7.58
15	8.49	7.08				15	6.01	8.81	50	4.72	7.56
16	8.36	7.09				16	5.93	8.79	51	4.72	7.56
17	8.25	7.15				17	5.85	8.79	52	4.72	7.54
18	8.10	7.15				18	5.77	8.80	53	4.72	5.69
19	7.98	7.36				19	5.72	8.85			
20	7.89	7.37				20	5.68	8.85			
21	7.84	7.18				21	5.64	8.81			
22	7.79	7.14				22	5.61	8.81			
23	7.70	7.21				23	5.57	8.80			
24	7.62	7.23				24	5.53	8.79			
25	7.48	7.26				25	5.47	8.82			
26	7.30	7.20				26	5.43	8.85			
27	7.17	7.15				27	5.40	8.87			
28	7.03	7.15				28	5.30	8.84			
29	6.89	7.19				29	5.22	8.77			
30	6.72	7.23				30	5.18	8.70			
31	6.61	7.26				31	5.05	8.60			
32	6.51	7.26				32	4.93	8.38			
33	6.37	6.85				33	4.89	8.28			
34	6.29	6.42				34	4.88	8.20			

Appendix 1m: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Haliburton			Haliburton			Haliburton			Haliburton	
	Basin 2			Basin 2 cont'd			Basin 3			Basin 3 cont'd	
Depth	9-Sep-14		Depth	9-Sep-14		Depth	9-Sep-14		Depth	9-Sep-14	
(m)	Temp (°C)	DO (mg/L)	(m)	Temp (°C)	DO (mg/L)	(m)	Temp (°C)	DO (mg/L)	(m)	Temp (°C)	DO (mg/L)
0	20.31	8.85	35	4.91	8.57	0	20.51	8.80	35	5.53	8.45
1	20.50	8.72	36	4.89	8.53	1	20.62	8.71	36	5.53	8.44
2	20.56	8.72	37	4.88	8.35	2	20.66	8.72	37	5.53	8.44
3	20.58	8.74	38	4.86	8.15	3	20.70	8.71	38	5.53	8.44
4	20.43	8.77	39	4.87	5.32	4	20.72	8.70	39	5.52	8.38
5	18.58	9.01				5	20.68	8.71	40	5.51	6.14
6	16.56	9.16				6	18.19	8.89			
7	11.65	9.32				7	11.65	9.68			
8	8.83	9.34				8	9.07	9.42			
9	7.26	8.97				9	7.51	9.21			
10	6.76	8.87				10	6.84	9.05			
11	6.52	8.76				11	6.51	8.88			
12	6.12	8.73				12	6.28	8.78			
13	6.03	8.72				13	6.12	8.73			
14	5.95	8.71				14	6.03	8.72			
15	5.77	8.73				15	5.93	8.71			
16	5.72	8.69				16	5.89	8.71			
17	5.68	8.70				17	5.87	8.69			
18	5.65	8.73				18	5.80	8.71			
19	5.62	8.73				19	5.78	8.71			
20	5.57	8.75				20	5.74	8.68			
21	5.46	8.73				21	5.70	8.65			
22	5.44	8.69				22	5.69	8.64			
23	5.39	8.71				23	5.68	8.62			
24	5.35	8.73				24	5.66	8.62			
25	5.28	8.65				25	5.66	8.61			
26	5.26	8.59				26	5.63	8.59			
27	5.24	8.56				27	5.61	8.58			
28	5.22	8.58				28	5.60	8.59			
29	5.14	8.60				29	5.57	8.58			
30	5.08	8.61				30	5.57	8.57			
31	5.04	8.62				31	5.56	8.56			
32	5.01	8.64				32	5.56	8.54			
33	4.97	8.64				33	5.55	8.51			
34	4.94	8.60				34	5.54	8.47			

Appendix 1n: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Halls			Halls			Halls			Halls	
	Basin 1			Basin 1 cont'd			Basin 1			Basin 1 cont'd	
Depth	29-Sep-16		Depth	9-Sep-14		Depth	9-Sep-14		Depth	9-Sep-14	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
0	17.72	9.32	36	4.51	9.48	0	20.20	9.01	36	4.98	10.61
1	17.77	8.99	37	4.49	9.47	1	19.38	9.30	37	4.96	10.58
2	17.77	8.91	38	4.47	9.46	2	18.50	9.44	38	4.95	10.56
3	17.77	8.91	39	4.45	9.46	3	17.87	9.43	39	4.93	10.54
4	17.77	8.89	40	4.44	9.45	4	17.82	9.32	40	4.92	10.54
5	17.72	8.89	41	4.43	9.45	5	17.55	9.28	41	4.92	10.54
6	17.70	8.88	42	4.42	9.44	6	17.38	9.29	42	4.91	10.50
7	17.67	8.90	43	4.42	9.42	7	17.20	9.29	43	4.90	10.41
8	17.18	9.04	44	4.42	9.34	8	15.82	9.33	44	4.90	10.37
9	14.20	10.02	45	4.40	9.31	9	11.07	10.29	45	4.89	10.30
10	10.46	11.24	46	4.42	9.27	10	8.34	10.64	46	4.89	10.28
11	8.30	10.75	47	4.41	9.23	11	7.55	10.42	47	4.88	10.18
12	7.41	10.57	48	4.39	9.12	12	6.91	10.40	48	4.87	10.17
13	6.73	10.14	49	4.38	9.00	13	6.41	10.24	49	4.87	10.15
14	6.41	9.87	50	4.37	8.97	14	6.20	10.18	50	4.87	10.13
15	6.05	9.75	51	4.36	8.92	15	6.03	10.21	51	4.87	10.05
16	5.79	9.63	52	4.36	8.88	16	5.89	10.23	52	4.86	10.04
17	5.63	9.65	53	4.35	8.78	17	5.69	10.24	53	4.86	10.00
18	5.51	9.58	54	4.35	8.74	18	5.63	10.30	54	4.86	9.98
19	5.37	9.52	55	4.35	8.71	19	5.57	10.34	55	4.86	9.90
20	5.21	9.47	56	4.35	8.69	20	5.48	10.37	56	4.86	9.89
21	5.11	9.44	57	4.35	8.66	21	5.40	10.40	57	4.85	9.86
22	5.05	9.43	58	4.35	8.65	22	5.34	10.40	58	4.85	9.84
23	4.94	9.43	59	4.35	8.58	23	5.29	10.48	59	4.85	9.77
24	4.90	9.39	60	4.35	8.52	24	5.25	10.48	60	4.84	9.73
25	4.87	9.44	61	4.35	8.49	25	5.23	10.49	61	4.84	9.64
26	4.82	9.46	62	4.35	8.45	26	5.21	10.44	62	4.84	9.60
27	4.79	9.44	63	4.35	8.44	27	5.18	10.46	63	4.84	9.56
28	4.77	9.43	64	4.35	8.42	28	5.16	10.49	64	4.84	9.51
29	4.74	9.41	65	4.34	8.40	29	5.14	10.44	65	4.83	9.44
30	4.68	9.39	66	4.34	8.36	30	5.12	10.48	66	4.83	9.35
31	4.63	9.40	67	4.34	8.27	31	5.09	10.53	67	4.83	9.23
32	4.60	9.40	68	4.34	8.24	32	5.07	10.52	68	4.83	9.18
33	4.57	9.41	69	4.34	8.22	33	5.05	10.54	69	4.82	9.02
34	4.54	9.44	70	4.33	8.13	34	5.02	10.56	70	4.82	6.71
35	4.53	9.47	71	4.32	6.94	35	5.00	10.56			

Appendix 1o: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Hudson		Johnson			Johnson			Kabakwa		Kashagwigamog	
	Basin 1		Basin 1			Basin 1 cont'd			Basin 1		Basin 1	
Depth	9-Sep-14		16-Sep-15		Depth	16-Sep-15		Depth	27-Sep-16		29-Sep-16	
(m)	Temp	DO	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)	(°C)	(mg/L)
0	20.60	8.66	20.90	8.68	36	4.01	5.27	0	17.99	8.40	17.93	8.75
1	20.68	8.66	20.23	8.74	37	4.00	5.17	1	18.04	8.22	17.94	8.37
2	20.69	8.65	20.04	8.75	38	4.00	5.05	2	18.04	8.18	17.94	8.34
3	20.69	8.64	19.96	8.73	39	3.99	4.92	3	18.05	8.19	17.94	8.34
4	20.58	8.58	19.92	8.71	40	4.00	3.65	4	18.04	8.19	17.94	8.32
5	19.65	8.86	19.75	8.72				5	18.04	8.20	17.93	8.30
6	17.49	9.68	18.96	9.32				6	18.03	8.21	17.92	8.29
7	12.79	11.40	14.82	11.92				7	17.66	8.24	17.91	8.25
8	10.13	11.02	11.02	13.35				8	13.18	8.53	15.45	4.77
9	8.82	9.39	8.62	13.40				9	9.61	6.10	10.99	1.85
10	7.99	8.77	6.81	11.59				10	7.97	4.95	9.52	2.14
11	7.14	8.08	6.21	10.54				11	7.11	3.60	7.33	2.94
12	6.81	7.17	5.83	9.90				12	6.48	2.52	6.64	3.41
13	6.57	6.71	5.24	9.10				13	5.95	1.52	6.37	3.59
14	6.38	6.01	5.01	8.84				14	5.82	1.01	6.16	3.71
15	6.18	5.17	4.82	8.58				15			5.92	3.57
16	6.07	4.96	4.60	8.45				16			5.78	3.53
17	5.99	4.59	4.50	8.36				17			5.69	3.57
18	5.87	4.12	4.45	8.31				18			5.60	3.50
19	5.80	3.53	4.36	8.28				19			5.55	3.22
20	5.74	2.72	4.31	8.29				20			5.45	2.98
21			4.28	8.29				21			5.41	2.63
22			4.24	8.24				22			5.31	1.89
23			4.19	8.20				23			5.29	0.27
24			4.15	8.16				24			5.30	0.24
25			4.14	8.05				25				
26			4.13	7.96				26				
27			4.12	7.86				27				
28			4.10	7.77				28				
29			4.06	7.60				29				
30			4.06	7.39				30				
31			4.04	7.16				31				
32			4.02	6.82				32				
33			4.03	6.57				33				
34			4.02	5.88				34				
35			4.01	5.54				35				

Appendix 1p: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Kashagwigamog		Kashagwigamog		Kawagama			Kawagama			Kawagama	
	Basin 2		Basin3		Basin 1			Basin 1 cont'd			Basin 2	
Depth	29-Sep-16		29-Sep-16		10-Sep-15		Depth	10-Sep-15		Depth	10-Sep-15	
(m)	Temp	DO	Temp	DO	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
0	17.86	8.99	17.82	8.66	21.92	8.38	36	5.08	9.86	0	22.80	8.30
1	17.86	8.68	17.81	8.67	21.84	8.39	37	5.04	9.91	1	22.72	8.29
2	17.86	8.67	17.82	8.66	21.80	8.37	38	4.99	9.94	2	22.51	8.30
3	17.86	8.66	17.80	8.67	21.78	8.33	39	4.94	9.98	3	22.34	8.33
4	17.86	8.65	17.78	8.65	21.77	8.33	40	4.89	10.00	4	22.30	8.31
5	17.86	8.65	17.75	8.64	21.76	8.31	41	4.83	10.01	5	22.25	8.31
6	17.85	8.64	17.74	8.62	21.68	8.32	42	4.78	10.03	6	22.16	8.32
7	17.47	8.44	17.68	8.57	21.42	8.38	43	4.75	10.05	7	22.01	8.31
8	12.49	7.74	11.94	5.77	19.50	8.55	44	4.72	10.05	8	20.45	8.47
9	10.02	7.36	8.96	4.39	19.14	8.47	45	4.69	10.03	9	17.94	8.42
10	8.67	6.95	7.64	3.49	13.11	9.30	46	4.68	10.02	10	9.79	9.57
11	7.27	7.11	6.91	3.21	10.24	9.63	47	4.68	10.01	11	8.61	9.26
12	6.43	7.24	6.57	2.74	8.89	9.69	48	4.65	9.96	12	7.47	9.50
13	5.98	7.42	6.33	2.49	7.68	9.75	49	4.64	9.95	13	7.12	9.53
14	5.73	7.51	6.19	2.26	7.34	9.66	50	4.62	9.97	14	6.91	9.55
15	5.57	7.56	6.12	1.96	7.02	9.63	51	4.61	9.97	15	6.80	9.55
16	5.43	7.60	6.06	1.63	6.79	9.55	52	4.59	9.98	16	6.73	9.55
17	5.34	7.66	6.05	1.41	6.71	9.50	53	4.56	9.97	17	6.62	9.55
18	5.29	7.69	6.03	1.20	6.54	9.54	54	4.54	9.95	18	6.54	9.56
19	5.20	7.74	6.01	1.02	6.40	9.56	55	4.51	9.95	19	6.41	9.59
20	5.11	7.77	5.99	0.83	6.29	9.56	56	4.49	9.94	20	6.29	9.61
21	5.08	7.79			6.15	9.63	57	4.49	9.90	21	6.24	9.63
22	5.00	7.81			6.02	9.67	58	4.48	9.85	22	6.17	9.67
23	4.88	7.86			5.95	9.66	59	4.47	9.79	23	6.10	9.69
24	4.82	7.88			5.87	9.71	60	4.46	9.72	24	6.05	9.70
25	4.77	7.88			5.78	9.75	61	4.44	9.70	25	5.97	9.71
26	4.75	7.45			5.69	9.75	62	4.43	9.67	26	5.89	9.71
27	4.71	7.21			5.59	9.76	63	4.43	9.65	27	5.79	9.72
28	4.67	7.11			5.52	9.77	64	4.42	9.61	28	5.70	9.73
29	4.62	6.94			5.44	9.78	65	4.41	9.59	29	5.60	9.66
30	4.60	6.76			5.39	9.79	66	4.39	9.54	30	5.56	9.59
31	4.58	6.60			5.33	9.85	67	4.36	9.47	31	5.54	9.54
32	4.57	6.41			5.25	9.86	68	4.35	9.27	32	5.44	9.56
33	4.57	6.31			5.19	9.84	69	4.32	9.10	33	5.38	9.63
34	4.53	5.52			5.16	9.85	70	4.31	8.81	34	5.36	9.69
35	4.52	2.24			5.12	9.85	71	4.30	3.67	35	5.29	9.73

Appendix 1q: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Kawagama			Kawagama			Kawagama			Kawagama	
	Basin 2 cont'd			Basin 4			Basin 4 cont'd			Basin 5	
Depth	10-Sep-15		Depth	10-Sep-15		Depth	10-Sep-15		Depth	10-Sep-15	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
36	5.25	9.72	0	22.68	8.17	36	4.49	7.91	0	22.27	8.39
37	5.22	9.71	1	22.60	8.14	37	4.48	7.85	1	22.16	8.36
38	5.20	9.68	2	22.35	8.14	38	4.48	7.80	2	22.05	8.34
39	5.17	9.67	3	22.31	8.13	39	4.49	7.77	3	21.98	8.33
40	5.14	9.67	4	22.25	8.14	40	4.46	7.34	4	21.92	8.33
41	5.13	9.65	5	22.25	8.14	41	4.40	1.73	5	21.33	8.42
42	5.10	9.64	6	22.03	8.14	42			6	20.89	8.44
43	5.07	9.63	7	20.55	8.12	43			7	20.39	8.40
44	5.04	9.61	8	15.43	7.94	44			8	20.28	8.40
45	5.01	9.57	9	12.39	7.94	45			9	17.42	8.54
46	5.00	9.58	10	9.86	7.86	46			10	13.18	8.83
47	5.00	9.63	11	8.82	7.83	47			11	9.74	8.91
48	4.98	9.63	12	7.21	7.86	48			12	8.71	8.78
49	4.97	9.63	13	6.86	7.93	49			13	8.28	8.77
50	4.95	9.63	14	6.03	8.15	50			14	7.78	8.72
51	4.92	9.57	15	5.92	8.19	51			15	7.51	8.70
52	4.91	9.50	16	5.72	8.22	52			16	7.23	8.67
53	4.89	9.44	17	5.51	8.26	53			17	6.88	8.65
54	4.89	9.33	18	5.37	8.28	54			18	6.61	8.63
55	4.89	9.11	19	5.18	8.34	55			19	6.16	8.51
56	4.86	8.99	20	5.03	8.36	56			20	6.02	8.39
57	4.84	8.90	21	4.90	8.39	57			21	5.92	8.20
58	4.84	8.73	22	4.82	8.40	58			22	5.74	8.15
59	4.84	8.63	23	4.78	8.41	59			23	5.61	8.05
60			24	4.76	8.42	60			24	5.54	7.97
61			25	4.73	8.38	61			25	5.51	7.90
62			26	4.65	8.36	62			26	5.46	7.87
63			27	4.64	8.17	63			27	5.45	7.83
64			28	4.63	8.12	64			28	5.40	7.80
65			29	4.61	8.11	65			29	5.34	7.78
66			30	4.59	8.12	66			30	5.29	7.76
67			31	4.57	8.12	67			31	5.24	7.71
68			32	4.56	8.10	68			32	5.19	7.59
69			33	4.52	8.08	69			33	5.18	7.50
70			34	4.50	8.00	70			34	5.16	7.33
71			35	4.50	7.97	71			35	5.14	3.84

Appendix 1r: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Kawagama		Kelly		Kelly		Kennisis		Kennisis	
	Basin 6		Basin 1		Basin 1		Basin 1		Basin 2	
Depth	10-Sep-15		16-Sep-15		27-Sep-16		15-Sep-15		15-Sep-15	
(m)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
0	22.85	8.34	20.47	8.62	18.23	8.91	20.61	8.46	20.40	8.71
1	22.84	8.33	20.33	8.57	18.23	8.90	20.24	8.48	20.33	8.54
2	22.79	8.30	20.26	8.57	18.22	8.90	20.05	8.48	20.06	8.45
3	22.58	8.32	20.22	8.57	18.19	8.90	19.98	8.47	19.89	8.47
4	22.27	8.33	20.09	8.56	18.12	8.91	19.94	8.43	19.83	8.46
5	22.11	8.30	19.98	8.57	18.14	8.89	19.92	8.37	19.77	8.45
6	21.99	8.29	19.67	8.62	18.10	8.88	19.91	8.37	19.76	8.41
7	21.78	8.30	16.75	10.55	18.08	8.88	19.89	8.36	19.73	8.38
8	19.68	8.52	11.06	12.96	18.00	8.84	19.84	8.36	19.26	8.78
9	17.00	8.64	8.77	13.07	13.13	12.66	19.48	8.41	16.34	9.64
10	14.57	8.92	7.18	13.17	9.73	13.28	16.01	9.24	15.52	10.05
11	10.47	9.47	6.47	9.56	7.93	12.21	13.19	10.05	13.55	10.44
12	8.10	9.47	5.93	8.39	7.03	10.23	11.16	10.36	12.09	10.59
13	7.30	9.47	5.53	7.82	6.94	9.93	9.69	10.11	10.45	10.78
14	6.94	9.39	5.08	7.37	6.15	9.19	9.18	9.87	9.49	10.35
15	6.83	9.33	4.87	7.24	5.64	8.07	8.30	9.68	9.03	10.17
16	6.75	9.29	4.79	7.24	5.34	7.76	7.70	9.40	8.32	9.91
17	6.64	9.27	4.66	7.14	5.18	7.50	7.32	9.33	7.99	9.76
18	6.55	9.28	4.61	7.08	5.03	7.16	6.89	9.01	7.78	9.60
19	6.43	9.29	4.56	7.04	4.91	7.16	6.51	9.05	7.06	9.57
20	6.36	9.31	4.45	6.94	4.81	7.12	6.21	9.09	6.74	9.30
21	6.23	9.38	4.39	6.67	4.73	7.05	5.83	9.06	6.48	9.26
22	6.16	9.42	4.34	6.57	4.66	7.06	5.48	8.85	6.15	9.19
23	6.05	9.41	4.33	6.38	4.60	7.14	5.36	8.65	6.04	9.18
24	5.92	9.34	4.31	6.20	4.56	7.16	5.27	8.55	6.00	9.15
25	5.78	9.31	4.30	5.98	4.52	7.34	5.20	8.59	5.94	9.14
26	5.67	9.24	4.30	5.91	4.49	7.39	5.08	8.62	5.91	9.12
27	5.55	9.10	4.28	5.76	4.45	7.41	4.97	8.71	5.87	9.11
28	5.41	8.82	4.28	5.22	4.42	7.42	4.83	8.74	5.80	9.10
29	5.26	8.74	4.26	4.89	4.41	7.39	4.72	8.72	5.76	9.09
30	5.19	8.68	4.26	4.59	4.38	7.17	4.64	8.65	5.75	9.07
31	5.12	8.23			4.37	7.04	4.59	8.61	5.74	9.06
32	4.95	7.12			4.37	6.64	4.58	8.54	5.74	9.07
33	4.85	3.57			4.38	6.17	4.55	8.37	5.74	9.06
34					4.35	5.63	4.52	8.38	5.72	9.06
35					4.34	4.74	4.49	8.28	5.70	9.08

Appendix 1s: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Kennisis			Kennisis			Kennisis			Kennisis	
	Basin 2 cont'd			Basin 3			Basin 3 cont'd			Basin 4	
Depth	15-Sep-15		Depth	15-Sep-15		Depth	15-Sep-15		Depth	15-Sep-15	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
36	5.70	9.09	0	20.48	8.56	36	5.64	9.00	0	20.63	8.50
37	5.69	9.10	1	20.46	8.47	37	5.63	8.99	1	20.60	8.48
38	5.68	9.09	2	20.32	8.46	38	5.63	8.98	2	20.50	8.47
39	5.67	9.09	3	20.15	8.48	39	5.63	8.96	3	19.88	8.53
40	5.66	9.08	4	19.91	8.51	40	5.62	8.96	4	19.83	8.50
41	5.65	9.07	5	19.85	8.49	41	5.62	8.96	5	19.82	8.50
42	5.65	9.06	6	19.82	8.45	42	5.62	8.95	6	19.75	8.44
43	5.64	9.06	7	19.72	8.46	43	5.61	8.95	7	19.71	8.40
44	5.63	9.06	8	19.52	8.61	44	5.59	8.94	8	19.70	8.39
45	5.62	9.08	9	18.80	8.83	45	5.58	8.93	9	19.66	8.38
46	5.62	9.10	10	17.77	9.27	46	5.57	8.90	10	19.32	8.42
47	5.62	9.09	11	14.24	10.20	47	5.56	8.77	11	15.39	9.92
48	5.62	9.08	12	13.06	10.71	48	5.54	8.62	12	11.53	11.03
49	5.61	9.07	13	11.70	10.88	49	5.52	8.38	13	9.87	11.22
50	5.61	9.06	14	10.44	10.96	50	5.45	1.23	14	9.42	10.82
51	5.60	9.03	15	9.58	10.64	51			15	8.95	10.62
52	5.59	9.02	16	8.36	10.24	52			16	8.55	10.38
53	5.59	9.00	17	8.12	9.94	53			17	8.08	10.28
54	5.58	8.99	18	7.49	9.59	54			18	7.61	10.23
55	5.58	8.96	19	6.90	9.64	55			19	7.10	9.84
56	5.58	8.95	20	6.70	9.56	56			20	7.01	9.75
57	5.58	8.91	21	6.51	9.41	57			21	6.56	9.54
58	5.58	8.90	22	6.31	9.41	58			22	6.46	9.24
59	5.58	8.89	23	6.16	9.35	59			23	6.25	9.18
60	5.57	8.89	24	6.07	9.33	60			24	6.10	9.10
61	5.56	8.87	25	5.96	9.30	61			25	6.02	9.11
62	5.56	8.83	26	5.92	9.29	62			26	5.90	9.17
63	5.56	8.81	27	5.89	9.28	63			27	5.85	9.15
64	5.56	8.80	28	5.82	9.23	64			28	5.79	9.14
65	5.55	8.77	29	5.80	9.20	65			29	5.75	9.12
66	5.55	8.70	30	5.72	9.18	66			30	5.74	9.13
67	5.55	8.67	31	5.68	9.13	67			31	5.72	9.14
68	5.55	8.59	32	5.67	9.08	68			32	5.70	9.14
69	5.52	7.27	33	5.66	9.04	69			33	5.69	9.12
70			34	5.65	9.02	70			34	5.68	9.10
71			35	5.65	9.01	71			35	5.66	9.08

Appendix 1t: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Kennisis			Kennisis			Kennisis			Kennisis	
	Basin 4 cont'd			Basin 2			Basin 2 cont'd			Basin 2	
Depth	15-Sep-15		Depth	12-Jul-16		Depth	12-Jul-16		Depth	27-Sep-16	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
36	5.62	9.07	0	22.57	8.51	36	5.25	10.14	0	17.62	9.36
37	5.61	9.04	1	22.54	8.48	37	5.25	10.12	1	17.79	8.82
38	5.61	9.03	2	22.43	8.45	38	5.25	10.13	2	17.80	8.73
39	5.60	9.00	3	22.30	8.47	39	5.24	10.12	3	17.81	8.72
40	5.58	9.00	4	22.23	8.47	40	5.24	10.12	4	17.81	8.70
41	5.55	8.99	5	20.95	8.82	41	5.24	10.10	5	17.81	8.70
42	5.53	8.92	6	19.52	9.31	42	5.23	10.11	6	17.81	8.70
43	5.46	8.85	7	16.51	10.33	43	5.23	10.11	7	17.80	8.70
44	5.39	8.49	8	13.27	11.24	44	5.22	10.11	8	17.79	8.69
45	5.39	8.22	9	10.88	11.59	45	5.22	10.11	9	12.63	9.85
46	5.38	8.10	10	8.84	11.81	46	5.22	10.11	10	10.01	10.65
47	5.38	8.08	11	8.15	11.21	47	5.21	10.11	11	8.76	10.78
48	5.38	8.05	12	7.41	11.05	48	5.21	10.11	12	8.28	10.46
49	5.37	8.02	13	6.86	10.80	49	5.20	10.10	13	7.54	10.20
50	5.33	0.43	14	6.62	10.59	50	5.20	10.09	14	6.91	10.19
51			15	6.34	10.56	51	5.20	10.08	15	6.59	9.83
52			16	5.99	10.47	52	5.20	10.06	16	6.21	9.71
53			17	5.89	10.41	53	5.20	10.08	17	6.02	9.52
54			18	5.80	10.41	54	5.19	10.08	18	5.91	9.43
55			19	5.66	10.35	55	5.19	10.08	19	5.77	9.41
56			20	5.56	10.34	56	5.18	10.09	20	5.69	9.37
57			21	5.49	10.27	57	5.18	10.10	21	5.65	9.33
58			22	5.42	10.26	58	5.18	10.09	22	5.58	9.26
59			23	5.38	10.23	59	5.17	10.07	23	5.56	9.22
60			24	5.35	10.23	60	5.17	10.04	24	5.54	9.20
61			25	5.34	10.22	61	5.17	10.04	25	5.53	9.18
62			26	5.31	10.20	62	5.17	10.03	26	5.51	9.16
63			27	5.30	10.16	63	5.17	10.03	27	5.51	9.11
64			28	5.28	10.16	64	5.17	10.02	28	5.51	9.10
65			29	5.28	10.15	65	5.15	10.02	29	5.49	9.10
66			30	5.27	10.14	66	5.15	9.96	30	5.49	9.10
67			31	5.27	10.15	67	5.10	4.06	31	5.49	9.09
68			32	5.27	10.15	68			32	5.48	9.09
69			33	5.26	10.16	69			33	5.48	9.08
70			34	5.26	10.17	70			34	5.47	9.08
71			35	5.26	10.16	71			35	5.47	9.08

Appendix 1u: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Kennisis			Kennisis			Kennisis			Kimball	
	Basin 2 cont'd			Basin 4			Basin 4 cont'd			Basin 1	
Depth	27-Sep-16		Depth	27-Sep-16		Depth	27-Sep-16		Depth	17-Sep-15	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
36	5.46	9.08	0	17.99	8.87	36	5.28	8.84	0	20.75	8.81
37	5.46	9.07	1	18.02	8.68	37	5.27	8.8	1	20.53	8.81
38	5.46	9.06	2	18.02	8.68	38	5.25	8.79	2	20.51	8.78
39	5.45	9.06	3	18.02	8.68	39	5.21	8.69	3	20.43	8.77
40	5.44	9.06	4	18.03	8.67	40	5.2	8.62	4	20.41	8.74
41	5.43	9.05	5	18.03	8.67	41	5.19	8.56	5	20.07	8.71
42	5.41	9.06	6	18.03	8.66	42	5.19	8.49	6	19.66	8.75
43	5.41	9.04	7	18.03	8.66	43	5.16	8.44	7	16.61	10.64
44	5.40	9.02	8	18.02	8.66	44			8	11.51	10.83
45	5.40	9.01	9	17.86	8.7	45			9	8.49	9.82
46	5.40	9.01	10	10.86	10.45	46			10	7.35	9.10
47	5.39	9.01	11	8.72	10.94	47			11	6.11	9.01
48	5.39	9.01	12	7.48	10.52	48			12	5.63	8.92
49	5.38	9.00	13	6.81	10.28	49			13	5.28	8.67
50	5.38	9.00	14	6.57	10.08	50			14	5.11	8.60
51	5.38	8.99	15	6.32	9.89	51			15	4.99	8.57
52	5.38	8.99	16	6.13	9.73	52			16	4.91	8.57
53	5.37	8.99	17	5.95	9.61	53			17	4.71	8.59
54	5.37	8.97	18	5.87	9.46	54			18	4.63	8.56
55	5.37	8.94	19	5.77	9.4	55			19	4.60	8.54
56	5.36	8.94	20	5.71	9.36	56			20	4.54	8.54
57	5.35	8.91	21	5.65	9.29	57			21	4.46	8.52
58	5.35	8.90	22	5.63	9.24	58			22	4.41	8.53
59	5.35	8.87	23	5.6	9.17	59			23	4.37	8.60
60	5.35	8.81	24	5.57	9.14	60			24	4.35	8.65
61	5.35	8.78	25	5.55	9.14	61			25	4.33	8.67
62	5.35	8.77	26	5.52	9.13	62			26	4.32	8.67
63	5.34	8.75	27	5.49	9.1	63			27	4.30	8.66
64	5.34	8.13	28	5.49	9.09	64			28	4.30	8.65
65	5.31	7.86	29	5.46	9.06	65			29	4.29	8.65
66			30	5.45	9.05	66			30	4.29	8.65
67			31	5.41	8.99	67			31	4.28	8.66
68			32	5.38	8.95	68			32	4.28	8.66
69			33	5.36	8.93	69			33	4.27	8.65
70			34	5.31	8.89	70			34	4.27	8.64
71			35	5.29	8.87	71			35	4.26	8.62

Appendix 1v: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Kimball			Kimball			Kimball			Koshlong	
	Basin 1 cont'd			Basin 2			Basin 2 cont'd			Basin 2	
Depth	17-Sep-15		Depth	17-Sep-15		Depth	17-Sep-15		Depth	17-Sep-15	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
36	4.26	8.61	0	20.99	8.72	36	4.31	7.99	0	19.69	8.71
37	4.24	8.61	1	21.00	8.72	37	4.30	7.95	1	19.87	8.29
38	4.18	8.66	2	20.70	8.72	38	4.30	7.92	2	19.89	8.28
39	4.16	8.67	3	20.56	8.72	39	4.30	7.80	3	19.92	8.26
40	4.13	8.70	4	20.41	8.72	40	4.30	7.65	4	19.94	8.25
41	4.12	8.70	5	20.16	8.74	41	4.30	7.51	5	19.74	8.25
42	4.09	8.64	6	20.10	8.71	42	4.30	7.27	6	14.22	7.38
43	4.08	8.59	7	19.90	8.72	43			7	10.46	6.71
44	4.07	8.40	8	17.39	10.44	44			8	10.08	6.66
45	4.06	8.16	9	11.21	10.39	45			9	9.22	6.62
46	4.03	7.72	10	7.98	9.32	46			10	8.70	6.58
47	4.01	7.28	11	6.85	8.88	47			11	7.99	6.65
48	4.01	7.11	12	6.15	8.71	48			12	7.32	6.82
49	4.01	6.97	13	5.77	8.61	49			13	7.04	7.02
50	4.00	6.84	14	5.44	8.42	50			14	6.63	7.22
51	3.99	6.69	15	5.06	8.43	51			15	6.43	7.30
52	3.98	6.18	16	4.92	8.46	52			16	6.28	7.21
53	3.98	5.60	17	4.88	8.46	53			17	6.10	7.02
54	3.98	5.28	18	4.80	8.47	54			18	5.96	7.05
55	3.98	5.12	19	4.68	8.52	55			19	5.85	7.05
56	3.98	4.82	20	4.63	8.54	56			20	5.69	7.09
57	3.98	4.45	21	4.56	8.55	57			21	5.41	7.23
58	3.98	4.13	22	4.54	8.55	58			22	5.31	7.39
59	3.99	2.78	23	4.50	8.54	59			23	5.25	7.43
60			24	4.46	8.54	60			24	5.21	7.42
61			25	4.42	8.51	61			25	5.16	7.39
62			26	4.40	8.49	62			26	5.07	7.36
63			27	4.39	8.47	63			27	5.03	7.35
64			28	4.38	8.46	64			28	4.99	7.32
65			29	4.37	8.43	65			29	4.95	7.20
66			30	4.36	8.42	66			30	4.93	7.15
67			31	4.35	8.37	67			31	4.89	6.98
68			32	4.33	8.32	68			32	4.88	6.81
69			33	4.32	8.27	69			33	4.86	6.32
70			34	4.32	8.21	70			34	4.83	5.70
71			35	4.31	8.11	71			35	4.83	5.52

Appendix 1w: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Koshlong			Kushog		Kushog		Kushog		Kushog	
	Basin 2 cont'd			Basin 1		Basin 2		Basin 3		Basin 1	
Depth	17-Sep-15		Depth	29-Sep-16		29-Sep-16		29-Sep-16		14-Sep-17	
(m)	Temp	DO	(m)	Temp	DO	Temp	DO	Temp	DO	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)
36	4.83	5.39	0	17.51	8.89	17.87	8.72	17.66	8.36	18.67	9.16
37	4.83	5.33	1	17.51	8.70	17.88	8.46	17.66	8.34	18.56	8.98
38	4.82	5.31	2	17.51	8.69	17.88	8.40	17.66	8.32	18.13	9.10
39	4.82	5.15	3	17.48	8.70	17.88	8.39	17.65	8.31	17.72	9.07
40	4.81	3.83	4	17.46	8.69	17.86	8.37	17.65	8.31	17.48	9.05
41	4.82	3.32	5	17.43	8.68	17.84	8.36	17.65	8.32	16.99	8.90
42			6	17.33	8.68	17.79	8.36	17.65	8.30	14.82	8.52
43			7	12.60	8.71	16.04	8.54	17.39	8.36	11.18	7.34
44			8	8.94	8.18	11.77	5.79	10.99	8.11	5.94	8.09
45			9	8.07	6.49	10.88	4.81	9.69	5.42	8.49	7.54
46			10	7.19	6.27	9.84	4.51	9.11	4.69	7.95	7.19
47			11	6.67	6.51	9.24	4.55	8.61	4.38	7.68	7.15
48			12	6.44	6.72	8.74	4.63	7.79	4.10	7.36	7.29
49			13	6.21	6.89	8.40	4.73	7.21	3.90	7.18	7.45
50			14	5.99	7.08	8.26	4.71	6.70	3.87	6.97	7.53
51			15	5.85	7.16	8.04	4.64	5.97	4.05	6.82	7.74
52			16	5.59	7.34	7.91	4.58	5.78	4.10	6.65	7.97
53			17	5.48	7.48	7.67	4.59	5.55	4.10	6.55	8.04
54			18	5.36	7.57	7.43	4.43	5.42	4.11	6.48	8.09
55			19	5.28	7.61	7.34	4.24	5.32	4.09	6.30	8.12
56			20	5.19	7.63	7.25	4.02	5.23	4.07	6.22	8.10
57			21	5.15	7.64	7.15	3.77	5.14	4.05	6.08	8.11
58			22	5.00	7.63	6.98	3.53	5.11	3.53	6.02	8.10
59			23	4.92	7.63	6.92	2.98	5.12	2.87	5.95	8.10
60			24	4.85	7.62	6.90	2.65			5.85	7.92
61			25	4.77	7.51					5.77	7.92
62			26	4.74	7.27					5.67	7.88
63			27	4.74	7.05					5.65	7.77
64			28	4.73	6.55					5.60	7.60
65			29	4.74	5.95					5.58	7.47
66			30							5.56	7.34
67			31							5.55	7.24
68			32							5.54	7.15
69			33							5.52	7.12
70			34							5.51	6.96
71			35							5.51	6.73

Appendix 1x: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Kushog		Lipsy			Lipsy			Little Bob		Little Bob	
	Basin 2								Basin 1		Basin 2	
Depth	14-Sep-17		15-Sep-15		Depth	15-Sep-15		Depth	28-Sep-16		28-Sep-16	
(m)	Temp	DO	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)	(°C)	(mg/L)
0	19.44	8.75	23.37	8.16	36	4.01	6.12	0	17.82	9.06	17.85	9.06
1	19.23	8.81	23.36	8.09	37	4.00	5.97	1	17.7	8.81	17.82	8.76
2	18.60	8.93	23.30	8.07	38	4.00	5.78	2	17.66	8.72	17.71	8.72
3	18.18	8.99	22.99	8.12	39	4.01	5.74	3	17.64	8.7	17.66	8.69
4	17.70	8.95	22.59	8.16	40	4.00	5.55	4	17.61	8.66	17.64	8.66
5	17.49	8.85	20.33	8.38	41	4.00	5.44	5	17.43	8.58	16.96	8.86
6	15.97	8.69	15.21	10.89	42	4.00	5.20	6	12.38	7.07	12.33	10.36
7	13.03	7.68	10.44	11.83	43	4.01	4.93	7	9.03	5.52	8.57	8.82
8	13.04	6.15	7.32	10.34	44	4.01	4.86	8	6.89	4.79	6.92	7.85
9	10.86	5.10	6.05	8.84	45	4.00	4.81	9	5.58	3.48	5.99	7.32
10	10.01	4.77	5.47	7.73	46	3.98	4.70	10	4.73	1.2	5.02	7.1
11	9.57	4.73	5.20	7.47	47	3.96	4.38	11	4.5	0.69	4.46	8.25
12	9.27	4.84	4.98	7.57	48	3.95	2.52	12	4.41	0.36	4.1	8.48
13	8.90	5.09	4.81	7.57	49	3.95	1.41	13	4.35	0.28	3.93	7.82
14	8.61	5.23	4.71	7.55	50	3.94	1.18	14	4.34	0.22	3.89	6.71
15	8.51	5.26	4.60	7.49	51	3.95	1.04	15	4.3	0.2	3.9	5.71
16	8.43	5.28	4.51	7.43	52	3.96	0.87	16	4.29	0.19	3.92	4.71
17	8.30	5.36	4.39	7.37	53			17	4.23	0.18	3.93	3.96
18	8.17	5.43	4.32	7.33	54			18			3.9	2.73
19	7.95	5.47	4.24	7.27	55			19			3.87	2.06
20	7.82	5.40	4.20	7.22	56			20			3.88	1
21	7.75	5.30	4.15	7.16	57			21			3.89	0.69
22	7.67	5.16	4.13	7.02	58			22			3.92	0.39
23	7.63	4.94	4.10	6.98	59			23				
24	7.59	4.77	4.08	6.96	60			24				
25			4.06	6.95	61			25				
26			4.07	6.92	62			26				
27			4.05	6.87	63			27				
28			4.02	6.84	64			28				
29			4.02	6.78	65			29				
30			4.01	6.74	66			30				
31			4.03	6.64	67			31				
32			4.03	6.58	68			32				
33			4.03	6.45	69			33				
34			4.02	6.37	70			34				
35			4.02	6.17	71			35				

Appendix 1y: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Little Boshkung		Little Eyre		Little Hawk			Little Hawk			Little Hawk	
			(Little Clean)		Basin 1			Basin 1			Basin 2	
Depth	26-Sep-16		26-Sep-16		11-Sep-15		Depth	11-Sep-15		Depth	11-Sep-15	
(m)	Temp	DO	Temp	DO	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
0	18.75	8.74	22.97	8.61	22.23	8.32	36	3.91	9.22	0	22.51	8.16
1	18.79	8.63	22.94	8.56	22.23	8.27	37	3.93	9.13	1	22.55	8.11
2	18.80	8.62	22.82	8.58	22.23	8.26	38	3.92	9.06	2	22.55	8.11
3	18.80	8.62	22.51	8.62	22.21	8.26	39	3.93	8.99	3	22.55	8.10
4	18.79	8.61	22.39	8.62	22.18	8.27	40	3.92	8.89	4	22.55	8.10
5	18.79	8.60	20.68	9.45	21.38	8.61	41	3.92	8.81	5	22.30	8.16
6	18.77	8.59	17.38	11.71	18	10.45	42	3.91	8.71	6	19.20	9.61
7	18.36	8.52	13.83	12.33	13.74	12.26	43	3.92	8.54	7	14.14	12.21
8	14.16	8.03	10.88	7.33	9.74	13.25	44	3.91	8.42	8	10.34	13.14
9	11.32	4.60	9.47	1.49	7.93	12.93	45	3.91	8.09	9	7.81	11.78
10	9.96	3.69	8.49	0.65	6.84	11.95	46	3.92	7.81	10	6.56	10.58
11	8.23	1.99	7.47	0.19	5.73	10.43	47	3.92	7.32	11	5.86	9.78
12	7.57	1.12	7.02	0.15	5.05	9.99	48	3.9	6.08	12	5.47	9.66
13	7.42	0.96	6.79	0.14	4.83	9.82	49	3.9	4.2	13	5.21	9.62
14	7.33	0.51	6.78	0.13	4.62	9.78	50			14	4.89	9.67
15	7.35	0.39			4.46	9.62	51			15	4.65	9.64
16					4.3	9.6	52			16	4.51	9.59
17					4.19	9.62	53			17	4.36	9.59
18					4.12	9.65	54			18	4.29	9.57
19					4.07	9.66	55			19	4.22	9.57
20					4.03	9.7	56			20	4.13	9.60
21					3.99	9.73	57			21	4.07	9.61
22					3.97	9.75	58			22	4.05	9.61
23					3.95	9.77	59			23	4.03	9.64
24					3.94	9.77	60			24	4.00	9.67
25					3.93	9.76	61			25	4.00	9.68
26					3.92	9.75	62			26	3.99	9.70
27					3.92	9.72	63			27	3.98	9.70
28					3.92	9.68	64			28	3.98	9.70
29					3.93	9.62	65			29	3.97	9.71
30					3.92	9.58	66			30	3.95	9.72
31					3.92	9.53	67			31	3.95	9.72
32					3.92	9.48	68			32	3.95	9.73
33					3.92	9.42	69			33	3.94	9.72
34					3.91	9.36	70			34	3.94	9.73
35					3.91	9.3	71			35	3.93	9.72

Appendix 1z: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Little Hawk			Little Hawk			Little Kennisis		Little Kennisis	
	Basin 2 cont'd			Basin 2 cont'd			Basin 1		Basin 2	
Depth	11-Sep-15		Depth	11-Sep-15		Depth	9-Sep-15		9-Sep-15	
(m)	Temp	DO	(m)	Temp	DO	(m)	Temp	DO	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)	(°C)	(mg/L)
36	3.93	9.72	**72**	3.91	8.73	**0**	19.88	8.44	19.67	8.30
37	3.93	9.72	**73**	3.91	8.71	**1**	19.71	8.40	19.44	8.27
38	3.93	9.7	**74**	3.91	8.69	**2**	19.52	8.39	19.39	8.23
39	3.93	9.69	**75**	3.91	8.68	**3**	19.48	8.34	19.35	8.21
40	3.93	9.67	**76**	3.91	8.66	**4**	19.36	8.33	19.31	8.21
41	3.92	9.66	**77**	3.90	8.62	**5**	18.82	7.94	18.34	8.12
42	3.92	9.65	**78**	3.90	8.57	**6**	14.81	7.68	11.99	6.85
43	3.93	9.63	**79**	3.90	8.53	**7**	9.07	7.72	8.87	6.66
44	3.93	9.62	**80**	3.90	8.49	**8**	6.71	7.13	6.67	6.75
45	3.92	9.6	**81**	3.91	8.46	**9**	6.14	7.12	6.05	6.79
46	3.92	9.58	**82**	3.90	8.44	**10**	5.78	7.14	5.60	6.88
47	3.92	9.57	**83**	3.92	5.67	**11**	5.44	7.32	5.25	6.95
48	3.92	9.55	**84**			**12**	5.24	7.39	5.12	6.96
49	3.93	9.54	**85**			**13**	5.10	7.45	5.03	6.83
50	3.93	9.5	**86**			**14**	5.04	7.47	4.96	6.79
51	3.93	9.46	**87**			**15**	4.99	7.46	4.92	6.82
52	3.93	9.44	**88**			**16**	4.92	7.46	4.89	6.81
53	3.93	9.4	**89**			**17**	4.84	7.54	4.86	6.78
54	3.93	9.37	**90**			**18**	4.81	7.57	4.85	6.70
55	3.92	9.33	**91**			**19**	4.76	7.62	4.83	6.68
56	3.92	9.3	**92**			**20**	4.74	7.65	4.78	6.51
57	3.92	9.26	**93**			**21**	4.66	7.60	4.76	6.33
58	3.91	9.23	**94**			**22**	4.54	7.55	4.71	6.12
59	3.91	9.2	**95**			**23**	4.46	7.53	4.68	5.65
60	3.91	9.16	**96**			**24**	4.43	7.46	4.67	5.41
61	3.91	9.14	**97**			**25**	4.40	7.42	4.64	4.45
62	3.91	9.12	**98**			**26**	4.38	7.36	4.63	3.28
63	3.91	9.1	**99**			**27**	4.36	7.28	4.63	2.01
64	3.91	9.08	**100**			**28**	4.35	7.23	4.62	0.45
65	3.91	9.05	**101**			**29**	4.34	7.09		
66	3.91	8.99	**102**			**30**	4.32	6.93		
67	3.9	8.95	**103**			**31**	4.32	6.64		
68	3.9	8.87	**104**			**32**	4.32	6.45		
69	3.9	8.82	**105**			**33**	4.30	5.98		
70	3.9	8.79	**106**			**34**	4.29	4.39		
71	3.91	8.75	**107**			**35**	4.28	0.70		

Appendix 1aa: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Little Kennisis		Little Kennisis		Little Redstone			Little Redstone			Livingstone	
	Basin 1		Basin 2								Basin 1	
Depth	27-Sep-16		27-Sep-16		9-Sep-15		Depth	9-Sep-15		Depth	16-Sep-15	
(m)	Temp	DO	Temp	DO	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
0	17.37	8.83	17.65	8.45	19.47	8.63	36	3.96	8.97	0	20.65	8.78
1	17.36	8.57	17.64	8.42	19.42	8.54	37	3.97	8.93	1	20.45	8.77
2	17.36	8.50	17.59	8.43	19.40	8.54	38	3.95	8.90	2	19.87	8.83
3	17.34	8.48	17.46	8.34	19.37	8.53	39	3.95	8.85	3	19.44	8.81
4	17.34	8.49	17.40	8.33	16.27	9.25	40	3.95	8.78	4	19.31	8.76
5	17.32	8.51	17.38	8.33	10.09	10.45	41	3.94	8.64	5	19.14	8.66
6	17.24	8.49	16.33	7.60	7.85	8.31	42	3.94	8.56	6	16.44	8.49
7	10.33	9.21	9.64	6.66	6.97	7.08	43	3.93	8.46	7	9.85	8.73
8	7.89	8.65	7.78	6.74	6.42	6.86	44	3.94	8.34	8	7.73	8.51
9	6.62	8.03	6.17	6.96	5.94	7.07	45	3.95	8.22	9	6.52	8.36
10	5.81	7.88	5.84	7.12	5.53	7.41	46	3.94	8.02	10	6.05	8.33
11	5.62	7.76	5.59	7.20	5.15	7.83	47	3.94	7.82	11	5.73	8.35
12	5.48	7.73	5.46	7.15	4.88	8.01	48	3.94	7.65	12	5.25	8.47
13	5.39	7.65	5.38	7.13	4.65	8.22	49	3.94	7.28	13	5.04	8.52
14	5.30	7.62	5.32	7.10	4.48	8.53	50	3.95	6.13	14	4.86	8.61
15	5.26	7.55	5.28	6.99	4.37	8.64	51	3.95	4.46	15	4.72	8.64
16	5.22	7.51	5.25	6.84	4.25	8.81	52			16	4.61	8.66
17	5.18	7.54	5.22	6.80	4.19	8.97	53			17	4.51	8.69
18	5.14	7.55	5.20	6.79	4.13	9.03	54			18	4.39	8.71
19	5.05	7.57	5.17	6.77	4.08	9.09	55			19	4.26	8.73
20	4.94	7.65	5.17	6.76	4.06	9.13	56			20	4.17	8.70
21	4.91	7.78	5.15	6.75	4.03	9.18	57			21	4.15	8.59
22	4.87	7.87	5.09	6.66	4.02	9.21	58			22	4.14	8.52
23	4.82	7.94	5.02	6.40	4.01	9.22	59			23	4.13	8.38
24	4.80	7.98	4.98	6.07	3.99	9.24	60			24	4.11	8.21
25	4.78	7.96	4.95	5.51	3.98	9.25	61			25	4.10	7.86
26	4.76	7.95	4.93	4.67	3.98	9.25	62			26	4.09	7.22
27	4.74	7.94	4.93	4.02	3.98	9.24	63			27	4.08	7.17
28	4.72	7.91	4.91	3.49	3.97	9.24	64			28	4.07	7.01
29	4.71	7.83			3.97	9.22	65			29	4.07	6.64
30	4.71	7.75			3.96	9.18	66			30	4.06	6.13
31	4.70	7.68			3.96	9.14	67			31	4.06	5.72
32	4.70	7.62			3.96	9.12	68			32	4.05	5.35
33	4.69	7.59			3.96	9.05	69			33	4.05	5.06
34	4.68	7.56			3.96	9.03	70			34	4.05	4.23
35	4.67	7.50			3.97	9.00	71			35	4.06	3.12

Appendix 1ab: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Livingstone		Livingstone		Livingstone		Long		Loon		Louie	
	Basin 2		Basin 1		Basin 2							
Depth	16-Sep-15		12-Sep-17		12-Sep-17		8-Sep-14		10-Sep-14		14-Sep-15	
(m)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
0	21.85	8.72	17.98	8.92	18.63	8.70	22.00	8.65	20.42	8.49	21.12	7.90
1	20.96	8.87	17.43	9.04	17.61	8.72	21.50	8.51	20.43	8.46	21.25	7.91
2	19.91	8.99	16.82	9.06	16.87	8.60	21.25	8.48	20.43	8.46	20.68	8.03
3	19.68	8.88	16.71	8.90	16.70	8.60	21.07	8.46	20.43	8.45	20.54	8.04
4	19.42	8.79	16.52	8.83	16.47	8.56	20.91	8.47	20.42	8.43	20.51	8.02
5	18.59	8.99	16.33	8.74	16.15	7.60	19.30	8.58	20.22	8.01	20.49	8.02
6	13.21	8.46	14.99	7.65	13.34	4.77	17.82	8.83	18.36	8.36	19.03	9.50
7	8.99	5.71	12.15	7.04	8.76	3.92	14.69	9.45	15.52	8.33	14.71	11.88
8	6.95	4.49	8.51	7.89	7.22	2.74	12.59	9.63	13.00	8.20	11.28	12.59
9	6.22	3.91	7.75	8.12	6.64	2.29	11.14	9.30	11.79	7.95	9.20	12.06
10	5.51	2.56	7.37	8.18	5.93	1.42	10.07	8.36	9.94	7.62	7.69	11.57
11	5.03	1.68	6.84	8.58	5.39	1.00	8.61	7.56	8.56	7.49	6.61	10.65
12	4.84	0.90	6.49	8.63	5.15	0.57	7.79	5.64	8.00	7.35	5.61	7.94
13	4.77	0.61	6.20	8.62	5.00	0.20	7.36	4.62	7.71	7.22	5.33	8.77
14	4.60	0.45	5.95	8.64	4.87	0.17	6.92	4.18	7.04	7.24	5.10	8.79
15	4.54	0.34	5.77	8.55	4.79	0.11	6.31	1.07	6.80	7.19	4.77	7.83
16	4.52	0.29	5.59	8.46	4.73	0.11	6.02	0.69	6.70	7.19	4.57	7.43
17	4.53	0.24	5.50	8.46	4.70	0.10	5.65	0.37	6.41	7.22	4.36	6.86
18			5.38	8.53	4.67	0.10	5.41	0.20	6.19	7.28	4.11	6.57
19			5.24	8.35	4.65	0.09	5.34	0.18	5.95	7.32	4.05	6.58
20			5.08	8.10	4.63	0.08	5.29	0.16	5.68	7.34	3.94	6.52
21			4.98	7.90			5.27	0.13	5.43	7.27	3.89	5.92
22			4.93	7.70					5.33	7.18	3.86	5.94
23			4.91	7.67					5.15	7.14	3.84	5.90
24			4.89	7.62					5.10	7.09	3.83	5.76
25			4.86	7.39					5.05	7.03	3.83	5.66
26			4.86	7.37					5.01	6.98	3.84	5.32
27			4.83	7.30					4.98	6.74	3.86	5.17
28			4.82	7.30					4.93	6.50	3.87	5.01
29			4.82	7.25					4.90	6.20	3.87	4.77
30			4.80	7.04					4.88	6.10	3.87	4.33
31			4.80	6.89					4.85	5.84	3.88	4.23
32			4.80	6.78					4.84	5.56	3.88	4.07
33			4.79	6.73					4.83	4.77	3.89	3.74
34			4.78	6.51					4.83	4.40		
35			4.76	6.10					4.79	0.22	3.85	2.71

Appendix 1ac: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Lower Fletcher		MacDonald		Maple		Marsden		McFadden		Miskawbi	
Depth	15-Sep-15		16-Sep-15		27-Sep-16		11-Sep-15		15-Sep-15		8-Sep-14	
(m)	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)
0	20.32	8.52	21.40	8.58	18.24	9.16	22.33	8.33	20.98	8.67	21.06	8.78
1	20.22	8.47	20.85	8.66	18.30	8.51	22.39	8.30	20.89	8.66	20.99	8.73
2	20.02	8.49	20.65	8.65	18.29	8.39	22.33	8.30	20.66	8.69	20.75	8.71
3	19.75	8.48	20.48	8.61	18.28	8.34	22.29	8.30	20.15	8.72	20.60	8.70
4	19.01	8.44	20.42	8.60	18.26	8.32	19.99	6.76	20.07	8.70	20.58	8.68
5	16.17	8.12			18.25	8.30	16.77	2.82	20.02	8.71	20.54	8.69
6	11.25	6.39	20.29	8.61	18.24	8.29	13.54	1.45	18.06	9.25	18.27	9.11
7	9.20	5.31			18.17	8.32	10.20	2.26	14.21	11.14	13.96	10.20
8	7.01	5.28	14.55	11.02	16.02	8.61	7.87	4.18	11.18	12.41	11.02	10.53
9	6.30	5.45			11.22	8.48	6.67	4.74	7.96	11.67	8.45	10.40
10	5.87	5.41	10.16	11.40	8.74	7.91	6.02	4.98			7.76	9.74
11	5.41	5.11	8.12	10.66	7.90	7.52	5.46	4.70	6.46	7.17	7.26	9.34
12	5.13	4.95	7.41	9.45	7.23	6.72	4.98	4.04			6.80	9.31
13	4.92	4.93	6.99	8.70	7.02	6.29	4.88	3.47	5.11	6.03	6.33	9.11
14	4.74	4.95	6.74	8.28	6.81	5.79	4.80	2.86			6.07	9.00
15	4.62	5.00	6.61	7.98	6.74	5.55	4.75	2.41	4.76	5.52	5.83	8.75
16	4.58	5.02	6.44	7.49	6.65	5.34	4.71	2.01			5.60	8.69
17	4.45	5.05	6.31	7.23	6.58	5.03	4.69	1.61	4.59	5.36	5.44	8.71
18	4.37	5.08	6.25	6.99	6.54	4.89	4.67	1.26			5.26	8.67
19	4.30	5.10	6.14	6.59	6.53	4.79	4.66	0.85	4.44	4.86	5.12	8.61
20	4.27	4.97	6.09	6.43	6.48	4.65	4.62	0.73	4.38	4.52	5.06	8.52
21	4.24	4.63	6.02	6.32	6.45	4.54	4.62	0.62	4.34	3.95	4.97	8.38
22	4.21	4.45	5.96	6.31	6.43	4.54			4.32	3.59	4.89	8.33
23	4.17	3.85	5.86	6.31	6.41	4.55			4.33	2.78	4.83	8.31
24	4.14	3.54	5.76	6.27	6.37	4.53						
25	4.13	3.10	5.67	6.03	6.35	4.49			4.30	2.69	4.77	8.36
26			5.59	5.85	6.34	4.41			4.29	2.48	4.75	8.34
27			5.56	5.81	6.34	4.35					4.71	8.33
28					6.34	4.32					4.69	8.32
29			5.52	5.61	6.33	4.30					4.66	8.32
30			5.49	5.56	6.32	4.29					4.63	8.32
31					6.32	4.25					4.63	8.26
32			5.46	5.41	6.31	4.21					4.63	8.11
33			5.44	5.31	6.31	4.18					4.61	7.99
34			5.43	5.26	6.30	4.06					4.59	7.94
35			5.42	5.03	6.30	4.02					4.56	7.92

Appendix 1ad: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Miskawbi			Monmouth		Moore		Moore		Moose	
	cont'd									Basin 1	
Depth	8-Sep-14		Depth	10-Sep-14		28-Sep-16		28-Sep-16		11-Sep-14	
(m)	Temp	DO	(m)	Temp	DO	Temp	DO	Temp	DO	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)
36	4.54	7.89	0	20.71	8.68	18.35	9.21	19.01	9.28	19.80	8.68
37	4.53	7.75	1	20.75	8.62	18.34	8.84	18.80	9.13	19.89	8.59
38	4.53	7.45	2	20.77	8.59	18.32	8.79	18.75	9.10	19.96	8.55
39	4.51	7.21	3	20.77	8.57	18.31	8.77	18.72	9.11	19.98	8.55
40	4.48	7.04	4	20.50	8.45	18.29	8.74	18.69	9.09	19.91	8.54
41	4.48	6.35	5	15.88	6.95	18.29	8.72	18.46	9.08	19.76	8.57
42	4.47	5.82	6	11.86	6.05	18.25	8.69	18.33	9.08	17.56	8.83
43	4.45	0.33	7	9.09	5.84	17.23	7.82	14.53	10.05	12.30	9.23
44			8	7.79	5.86	14.77	6.33	10.81	8.70	8.39	8.63
45			9	7.05	5.82	10.53	5.61	8.32	8.02	7.29	8.22
46			10	6.68	5.76	8.53	4.60	6.55	5.74	6.33	8.21
47			11	6.31	5.51	7.42	3.91	5.60	2.40	6.21	8.16
48			12	6.13	5.20	7.00	3.66	5.12	1.71	5.94	8.22
49			13	5.98	4.58	6.64	3.51	4.88	0.69	5.78	8.25
50			14	5.89	3.97	6.36	3.35	4.47	0.39	5.73	8.25
51			15	5.86	3.63	6.20	3.01	4.25	0.32	5.61	8.23
52			16	5.79	2.38	6.10	2.67	4.04	0.25	5.57	8.25
53			17	5.81	1.71	6.04	2.55	3.99	0.22	5.49	8.17
54			18			5.96	2.33	3.94	0.20	5.44	8.17
55			19			5.92	2.17			5.43	8.18
56			20			5.91	1.95			5.40	8.17
57			21			5.91	1.87			5.36	8.13
58			22			5.90	1.85			5.31	8.09
59			23							5.12	6.80
60			24							5.13	6.97
61			25							5.13	6.65
62			26								
63			27								
64			28								
65			29								
66			30								
67			31								
68			32								
69			33								
70			34								
71			35								

Appendix 1ae: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Moose		Mountain (Cardiff)		Mountain (Cardiff)		Mountain (Cardiff)		North	
	Basin 2		Basin 1		Basin 1		Basin 1			
Depth	11-Sep-14		12-Jul-16		28-Sep-16		13-Sep-17		11-Sep-14	
(m)	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)
0	19.64	8.68	23.02	8.42	18.55	8.79	19.61	8.93	19.08	8.20
1	19.78	8.57	23.23	8.50	18.56	8.54	19.13	9.06	19.14	8.16
2	19.82	8.55	23.25	8.54	18.57	8.53	18.94	9.09	19.18	8.13
3	19.90	8.52	23.25	8.57	18.57	8.52	18.81	9.07	19.21	8.12
4	19.92	8.51	23.25	8.58	18.57	8.53	18.72	9.03	19.24	8.11
5	19.92	8.51	22.83	8.63	18.57	8.53	18.62	8.87	15.25	6.49
6	19.81	8.51	21.98	8.77	18.57	8.53	18.52	8.78	11.73	6.63
7	10.99	9.51	17.78	10.11	18.57	8.53	18.42	8.69	7.96	7.02
8	8.54	8.83	13.70	11.21	18.57	8.53	18.38	8.67	6.15	7.33
9	7.42	8.36	12.02	11.90	17.78	8.43	18.33	8.63	5.44	7.48
10	6.65	7.85	11.31	11.67	13.96	8.71	18.18	8.64	5.30	7.46
11	6.28	7.86	9.80	11.39	9.72	7.72	16.54	7.49	5.19	7.38
12	5.85	7.94	8.97	9.61	8.65	6.71	12.67	7.04	5.11	7.37
13	5.78	7.95	8.31	9.54	7.74	6.53	10.60	6.44	5.05	7.35
14	5.71	7.95	8.04	9.67	7.16	5.82	9.58	6.46	5.00	7.35
15	5.69	7.95	7.45	9.58	6.76	5.82	9.11	6.59	4.94	7.32
16	5.61	7.96	7.30	9.51	6.47	5.55	8.57	6.62	4.88	7.31
17	5.53	7.96	6.77	9.46	6.32	5.04	8.03	6.43	4.82	7.33
18	5.43	7.94	6.70	9.43	6.22	4.73	7.85	5.45	4.76	7.32
19	5.39	7.91	6.52	9.40	6.16	4.58	7.73	5.31	4.66	7.24
20	5.34	7.87	6.39	9.11	6.10	4.47	7.66	5.19	4.63	7.22
21	5.31	7.82	6.31	8.99	6.05	4.33	7.51	4.87	4.59	7.21
22	5.26	7.78	6.21	8.65	6.02	4.28	7.45	4.79	4.54	7.18
23	5.22	7.76	6.20	8.52	5.98	4.21	7.38	4.72	4.49	7.14
24	5.19	7.75	6.13	8.39	5.94	3.87	7.27	4.62	4.46	7.00
25	5.17	7.71	6.09	8.45	5.93	3.52	7.19	4.57	4.44	6.83
26	5.16	7.67	6.06	8.31	5.92	3.34	7.11	4.33	4.40	6.56
27	5.14	7.64	6.03	8.21	5.88	2.94	7.06	3.81	4.40	6.43
28	5.12	7.61	5.98	7.99	5.85	2.64	6.93	3.36	4.38	6.12
29	5.08	7.55	5.93	7.89	5.83	2.39	6.86	2.96	4.37	5.71
30	5.06	7.33	5.90	7.52			6.84	2.62	4.36	5.57
31	5.06	7.15	5.86	7.26					4.36	5.41
32	5.05	6.69	5.84	7.08					4.36	5.06
33			5.81	5.92					4.36	4.66
34										
35										

Appendix 1af: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	North Pigeon		North Pigeon		Oblong		Oxtongue		Oxtongue	
							Basin 1		Basin 2	
Depth	11-Jul-16		28-Sep-16		9-Sep-14		17-Sep-15		17-Sep-15	
(m)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
0	23.99	8.40	18.63	8.83	20.74	8.73	20.42	8.58	20.29	8.55
1	23.80	8.36	18.47	8.61	20.88	8.71	20.39	8.35	20.02	8.36
2	23.67	8.37	18.27	8.56	20.89	8.70	20.26	8.35	19.76	8.32
3	23.39	8.40	18.20	8.55	20.87	8.65	19.35	8.41	19.50	8.33
4	21.55	8.71	18.06	8.53	20.24	8.61	19.03	7.91	19.17	8.21
5	15.44	10.76	17.99	8.47	16.59	10.83	18.40	7.25	18.81	7.39
6	11.17	12.49	17.95	8.43	11.91	12.20	15.54	4.51	14.40	4.39
7	8.69	12.60	13.40	9.42	9.26	10.58	10.87	5.06	8.55	5.49
8	7.23	11.88	9.68	9.01	7.58	9.59	7.86	6.02	7.00	6.67
9	6.38	11.25	7.44	7.59	6.71	8.68	6.60	7.09	6.51	7.04
10	5.82	10.81	6.25	6.91	6.25	8.18	6.13	7.35	6.04	7.39
11	5.26	10.12	5.59	6.78	5.77	7.86	5.96	7.40	5.92	7.43
12	4.85	8.63	5.13	6.28	5.51	7.69	5.83	7.68	5.84	7.50
13	4.65	8.20	4.77	6.10	5.27	7.56	5.75	7.83	5.81	7.44
14	4.48	8.04	4.49	6.04	5.15	7.52	5.69	7.81	5.78	7.42
15	4.33	8.03	4.29	6.23	5.02	7.28	5.63	7.81	5.78	7.43
16	4.21	8.00	4.06	6.73	4.90	6.72	5.54	7.66	5.76	7.45
17	4.11	7.97	3.92	6.72	4.77	6.38	5.49	7.08	5.70	7.44
18	4.06	7.88	3.89	6.27	4.69	6.13	5.47	6.39	5.66	4.08
19	4.04	7.80	3.89	6.01	4.64	5.65	5.37	3.65		
20	4.02	7.62	3.89	5.78	4.60	4.83	5.38	2.51		
21	4.02	7.44	3.89	5.63	4.58	3.76				
22	4.02	7.15	3.89	5.36	4.65	1.56				
23	4.00	7.11	3.91	5.04						
24	3.96	6.81	3.89	5.00						
25	3.96	6.69	3.94	4.72						
26	3.93	6.62	3.92	4.45						
27	3.96	6.60	3.91	4.21						
28	3.95	6.37	3.89	4.05						
29	3.96	6.07	3.86	3.73						
30	3.94	6.04	3.87	3.28						
31	3.94	5.95	3.86	2.75						
32	3.94	5.83	3.87	2.35						
33	3.94	5.74	3.87	1.97						
34	3.93	5.55	3.88	1.77						
35	3.93	4.73	3.88	1.48						

Appendix 1ag: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Oxtongue		Oxtongue		Paudash			Paudash cont'd	
	Basin 1		Basin 2		Basin 1			Basin 1	
Depth	30-Sep-16		30-Sep-16		8-Sep-14		Depth	8-Sep-14	
(m)	Temp	DO	Temp	DO	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)
0	16.30	8.57	16.41	8.54	21.49	8.55	36	4.30	6.82
1	16.30	8.43	16.37	8.53	21.48	8.53	37	4.30	6.62
2	16.29	8.41	16.35	8.51	21.45	8.52	38	4.28	5.68
3	16.28	8.39	16.33	8.49	21.39	8.52	39	4.27	4.60
4	16.28	8.40	16.32	8.47	20.98	8.53	40	4.26	4.23
5	16.28	8.39	16.30	8.45	20.24	8.57	41	4.26	3.41
6	15.76	7.87	16.28	8.45	16.87	9.46	42	4.26	2.88
7	13.08	6.91	14.91	8.57	13.02	10.40	43		
8	8.61	6.47	9.15	7.54	9.48	10.31	44		
9	7.52	6.41	7.65	6.85	7.65	9.86	45		
10	6.99	6.45	7.09	6.59	6.74	9.63	46		
11	6.69	6.55	6.75	6.49	6.26	9.17	47		
12	6.60	6.51	6.66	6.39	5.88	8.86	48		
13	6.53	6.42	6.59	6.31	5.62	8.52	49		
14	6.45	6.38	6.55	6.23	5.36	8.45	50		
15	6.34	6.34	6.53	6.18	5.26	8.41	51		
16	6.24	6.23	6.51	6.14	5.12	8.39	52		
17	6.15	5.77	6.47	6.13	5.02	8.51	53		
18	6.09	5.15	6.42	6.03	4.94	8.61	54		
19	6.04	4.88	6.37	5.84	4.89	8.64	55		
20	5.99	4.68	6.30	5.46	4.80	8.43	56		
21	5.90	2.80	6.26	4.92	4.79	8.43	57		
22	5.85	2.21	6.25	4.46	4.75	8.24	58		
23	5.81	1.47	6.18	2.83	4.71	8.18	59		
24	5.80	1.21			4.67	8.17	60		
25					4.64	8.12	61		
26					4.59	8.12	62		
27					4.59	8.12	63		
28					4.55	8.11	64		
29					4.52	8.10	65		
30					4.47	8.10	66		
31					4.43	7.97	67		
32					4.39	7.80	68		
33					4.36	7.73	69		
34					4.33	7.58	70		
35					4.32	7.02	71		

Appendix 1ah: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Paudash		Percy		Percy		Pusey		Raven	
	Basin 2		North		South		(Dark)		Basin 1	
Depth	8-Sep-14		10-Sep-14		10-Sep-14		9-Sep-14		9-Sep-15	
(m)	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)
0	21.49	8.73	20.50	8.47	20.01	8.47	21.07	8.28	23.30	8.43
1	21.50	8.63	20.51	8.46	20.03	8.44	21.08	8.22	23.30	8.41
2	21.41	8.56	20.55	8.45	20.03	8.39	21.07	8.20	23.30	8.39
3	21.38	8.55	20.25	8.01	20.04	8.38	21.05	8.19	23.30	8.39
4	21.32	8.55	17.94	7.86	20.03	8.38	21.01	8.19	23.24	8.39
5	20.92	8.53	13.82	6.86	18.06	7.48	17.84	7.79	20.81	8.47
6	19.64	8.11	10.80	6.89	14.43	6.68	13.84	6.02	16.62	9.18
7	15.19	9.16	8.54	7.00	9.54	7.15	10.33	6.24	11.74	9.38
8	11.98	9.34	7.34	7.18	7.97	7.28	8.30	6.28	9.11	8.38
9	9.42	8.57	6.90	7.23	7.14	7.16	6.79	6.83	8.04	7.74
10	8.71	7.51	6.72	7.23	6.81	7.12	5.74	7.56	6.81	7.47
11	7.99	7.23	6.51	7.21	6.60	7.07	5.28	7.68	6.41	7.39
12	7.55	7.16	6.42	7.21	6.49	7.05	5.00	7.67	6.02	7.47
13	6.76	6.80	6.28	7.26	6.42	7.03	4.71	7.11	5.68	7.65
14	6.39	6.52	6.23	7.27	6.25	7.05	4.62	6.89	5.40	7.70
15	6.07	6.13	6.12	7.28	6.15	7.00	4.49	6.53	5.17	7.68
16	5.87	6.11	6.01	7.17	6.00	7.01	4.33	5.95	4.98	7.76
17	5.77	6.07	5.90	7.17	5.85	7.15	4.20	4.84	4.77	7.90
18	5.64	6.01	5.79	7.18	5.72	7.02	4.12	4.48	4.61	7.97
19	5.49	5.92	5.65	7.16	5.46	6.69	4.05	4.08	4.47	8.05
20	5.40	5.46	5.56	7.04	5.36	6.50	4.00	3.26	4.37	8.09
21	5.33	5.12	5.49	6.82	5.21	6.28	3.95	2.81	4.26	8.12
22	5.22	4.19	5.48	6.74	5.14	6.04	3.93	2.60	4.20	8.04
23	5.10	2.00	5.47	6.69	5.06	5.77	3.91	2.35	4.17	7.79
24	5.01	1.32	5.41	6.69	4.99	4.80	3.90	2.19	4.16	7.27
25			5.34	6.67	5.04	2.85	3.89	1.97	4.17	7.11
26			5.29	6.63			3.88	1.76	4.17	6.72
27			5.25	6.29			3.87	1.63	4.15	6.36
28			5.21	5.81			3.86	1.46	4.13	5.89
29			5.20	5.66			3.87	1.38	4.12	5.36
30			5.19	5.59			3.86	1.29	4.09	4.74
31			5.19	5.53			3.86	1.14	4.07	3.67
32			5.18	5.12			3.86	1.07	4.07	2.66
33							3.86	1.02	4.07	1.75
34							3.86	0.90	4.07	2.83
35							3.88	0.76	4.07	2.46

Appendix 1ai: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Raven (cont'd)			Raven		Red Pine			Red Pine	
	Basin 1			Basin 2		Basin 1			Basin 1 cont'd	
Depth	9-Sep-15		Depth	9-Sep-15		27-Sep-16		Depth	27-Sep-16	
(m)	Temp	DO	(m)	Temp	DO	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)		(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)
36	4.06	2.15	0	23.61	8.49	17.96	9.08	36	5.43	5.83
37	4.05	1.31	1	23.63	8.41	17.95	8.91	37	5.43	5.57
38	4.05	0.95	2	23.61	8.39	17.94	8.89	38	5.42	5.38
39	4.01	0.46	3	23.60	8.36	17.92	8.87	39	5.38	4.20
40	3.86	0.28	4	23.48	8.35	17.87	8.86	40		
41	3.84	0.21	5	19.62	8.94	17.76	8.84	41		
42			6	13.88	10.33	17.72	8.83	42		
43			7	9.43	8.09	17.57	8.78	43		
44			8	7.61	7.44	17.46	8.71	44		
45			9	6.60	7.10	10.72	10.08	45		
46			10	5.98	7.25	8.86	9.55	46		
47			11	5.46	7.40	8.04	8.95	47		
48			12	5.27	7.40	7.47	8.80	48		
49			13	5.01	7.40	7.01	8.70	49		
50			14	4.79	7.21	6.53	8.38	50		
51			15	4.63	7.45	6.29	8.29	51		
52			16	4.53	7.44	6.08	8.22	52		
53			17	4.49	7.37	5.93	8.15	53		
54			18	4.47	6.97	5.84	8.10	54		
55			19	4.46	6.64	5.73	7.90	55		
56			20	4.45	6.21	5.70	7.81	56		
57			21	4.41	5.92	5.65	7.67	57		
58			22	4.35	5.67	5.60	7.57	58		
59			23	4.36	5.29	5.59	7.44	59		
60			24	4.36	5.03	5.55	7.35	60		
61			25	4.33	4.50	5.53	7.19	61		
62			26	4.33	0.62	5.52	7.06	62		
63			27			5.51	6.95	63		
64			28			5.50	6.88	64		
65			29			5.49	6.83	65		
66			30			5.48	6.75	66		
67			31			5.47	6.57	67		
68			32			5.46	6.42	68		
69			33			5.45	6.30	69		
70			34			5.44	6.18	70		
71			35			5.44	6.05	71		

Appendix 1aj: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

	Red Pine		Redstone			Redstone			Redstone	
	Basin 2		Basin 1			Basin 1 cont'd			Basin 2	
Depth	27-Sep-16		15-Sep-15		Depth	15-Sep-15		Depth	15-Sep-15	
(m)	Temp	DO	Temp	DO	(m)	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)		(°C)	(mg/L)
0	17.88	8.87	19.53	8.84	36	4.71	9.72	0	20.08	9.05
1	17.88	8.72	19.53	8.76	37	4.71	9.72	1	20.05	8.81
2	17.88	8.71	19.48	8.77	38	4.65	9.75	2	19.80	8.79
3	17.88	8.70	19.38	8.78	39	4.64	9.80	3	19.71	8.77
4	17.85	8.71	19.30	8.80	40	4.61	9.85	4	19.70	8.74
5	17.83	8.70	19.25	8.80	41	4.61	9.84	5	19.65	8.76
6	17.81	8.69	19.21	8.81	42	4.58	9.85	6	19.37	8.69
7	17.79	8.69	15.65	9.73	43	4.56	9.86	7	13.92	10.37
8	17.34	8.75	11.05	11.78	44	4.55	9.85	8	8.55	11.10
9	10.50	9.91	8.04	12.70	45	4.54	9.85	9	7.64	10.97
10	8.59	9.25	7.08	12.16	46	4.52	9.84	10	6.62	10.60
11	7.71	8.83	6.65	11.04	47	4.52	9.76	11	6.12	10.09
12	7.16	8.54	6.40	10.52	48	4.51	9.73	12	5.92	9.67
13	6.81	8.34	6.11	9.77	49	4.50	9.71	13	5.86	9.49
14	6.50	7.78	5.98	9.74	50	4.50	9.68	14	5.73	9.43
15	6.34	7.61	5.79	9.69	51	4.50	9.66	15	5.65	9.41
16	6.03	7.54	5.67	9.69	52	4.50	9.59	16	5.61	9.36
17	5.85	7.58	5.56	9.69	53	4.49	9.55	17	5.54	9.36
18	5.79	7.80	5.47	9.69	54	4.48	9.52	18	5.42	9.37
19	5.73	7.80	5.37	9.69	55	4.48	9.48	19	5.37	9.37
20	5.68	7.67	5.30	9.68	56	4.47	9.42	20	5.29	9.27
21	5.65	7.60	5.25	9.68	57	4.47	9.29	21	5.24	9.20
22	5.63	7.55	5.20	9.53	58	4.47	9.20	22	5.16	9.22
23	5.61	7.48	5.13	9.52	59	4.47	9.16	23	5.12	9.25
24	5.58	7.37	5.11	9.49	60	4.46	9.11	24	5.07	9.14
25	5.57	7.27	5.07	9.45	61	4.46	9.04	25	5.05	9.07
26	5.57	7.20	5.05	9.44	62	4.46	8.98	26	5.03	9.05
27	5.55	6.37	5.00	9.48	63	4.46	8.93	27	5.01	9.03
28			4.94	9.55	64	4.46	8.88	28	4.99	9.02
29			4.91	9.59	65	4.46	8.84	29	4.98	8.94
30			4.89	9.57	66	4.46	8.73	30	4.96	8.88
31			4.86	9.57	67	4.46	8.67	31	4.96	8.86
32			4.81	9.60	68	4.45	8.63	32	4.89	7.05
33			4.79	9.60	69	4.45	8.60	33		
34			4.74	9.66	70	4.45	8.52	34		
35			4.72	9.69	71	4.45	7.78	35		

Appendix 1ak: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016.

Depth (m)	Redstone Basin 3 15-Sep-15 Temp (°C)	DO (mg/L)	Depth (m)	Redstone Basin 3 cont'd 15-Sep-15 Temp (°C)	DO (mg/L)	Depth (m)	Sherborne Basin 2 16-Sep-15 Temp (°C)	DO (mg/L)	Sherborne Basin 3 16-Sep-15 Temp (°C)	DO (mg/L)
0	20.37	8.78	**36**	5.24	8.84	**0**	20.46	8.24	20.26	8.30
1	20.15	8.81	**37**	5.24	8.83	**1**	20.21	8.26	20.12	8.30
2	19.78	8.85	**38**	5.24	8.82	**2**	20.01	8.27	20.07	8.29
3	19.67	8.85	**39**	5.24	8.81	**3**	19.91	8.27	19.71	8.33
4	19.64	8.82	**40**	5.24	8.80	**4**	19.69	8.18	19.44	8.32
5	19.58	8.81	**41**	5.24	8.76	**5**	15.27	11.09	14.39	11.65
6	18.65	9.12	**42**	5.24	8.76	**6**	9.77	12.17	9.24	9.58
7	14.99	11.44	**43**	5.24	8.76	**7**	8.15	10.91	6.99	6.50
8	10.88	12.47	**44**	5.24	8.75	**8**	7.42	9.56	5.67	6.04
9	8.04	12.78	**45**	5.24	8.75	**9**	6.47	6.54	5.04	6.24
10	6.77	11.59	**46**	5.23	8.74	**10**	5.94	6.07	4.62	6.57
11	6.52	10.42	**47**	5.23	8.69	**11**	5.48	6.14	4.34	6.79
12	6.17	10.22	**48**	5.23	8.67	**12**	5.26	6.18	4.22	6.84
13	5.97	10.10	**49**	5.23	8.67	**13**	5.07	6.19	4.15	6.85
14	5.80	10.12	**50**	5.22	8.65	**14**	4.88	6.11	4.08	6.84
15	5.73	9.90	**51**			**15**	4.77	5.98	4.07	6.76
16	5.55	9.74	**52**			**16**	4.73	5.94	4.03	6.64
17	5.51	9.66	**53**			**17**	4.67	5.97	4.02	6.58
18	5.47	9.59	**54**			**18**	4.60	6.00	3.99	6.33
19	5.43	9.55	**55**			**19**	4.55	6.07	3.92	6.16
20	5.40	9.51	**56**			**20**	4.52	6.02	3.90	6.04
21	5.37	9.45	**57**			**21**	4.49	5.85		
22	5.37	9.41	**58**			**22**	4.44	5.75	3.90	4.79
23	5.36	9.38	**59**			**23**	4.43	5.62	3.90	4.04
24	5.33	9.36	**60**			**24**	4.40	5.51	3.88	1.46
25	5.30	9.33	**61**			**25**	4.36	5.26	3.91	1.23
26	5.30	9.29	**62**			**26**	4.35	4.75	3.91	0.99
27	5.30	9.24	**63**			**27**	4.35	4.63	3.90	0.76
28	5.28	9.22	**64**			**28**	4.33	4.16	3.91	0.49
29	5.27	9.20	**65**			**29**	4.32	3.84	3.94	0.23
30	5.26	9.15	**66**			**30**	4.31	3.43		
31	5.26	9.08	**67**			**31**	4.29	3.26		
32	5.26	9.00	**68**			**32**	4.28	2.79		
33	5.25	8.98	**69**			**33**	4.27	2.38		
34	5.24	8.92	**70**			**34**	4.27	1.94		
35	5.24	8.90	**71**			**35**				

Appendix 1al: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016

	Sherborne		Silent		Slipper		Soyers			Soyers	
	Basin 4									cont'd	
Depth	16-Sep-15		12-Sep-14		10-Sep-15		10-Sep-15		Depth	10-Sep-15	
(m)	Temp	DO	Temp	DO	Temp	DO	Temp	DO	(m)	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)	(°C)	(mg/L)		(°C)	(mg/L)
0	20.75	8.27	19.24	8.13	22.79	8.33	17.45	8.73	36	4.41	8.39
1	20.51	8.29	19.25	8.06	22.69	8.27	17.47	8.43	37	4.40	8.38
2	20.13	8.27	19.21	8.06	22.53	8.27	17.47	8.42	38	4.39	8.33
3	20.02	8.25	19.17	8.05	22.45	8.26	17.47	8.41	39	4.38	8.25
4	19.77	8.23	19.15	8.05	22.29	8.36	17.47	8.39	40	4.38	8.20
5	15.41	9.64	19.07	8.02	20.38	8.95	17.45	8.37	41	4.37	8.07
6	11.24	12.12	13.81	5.52	15.91	10.79	16.51	7.33	42	4.36	7.92
7	9.02	12.36	9.29	4.41	11.42	11.76	9.71	5.70	43	4.35	7.88
8	7.55	11.44	7.96	4.02	8.69	11.50	8.42	5.88	44	4.34	7.67
9	6.78	9.96	7.17	4.07	7.16	11.30	6.96	6.54	45	4.31	5.06
10	5.98	7.45	6.78	4.3	6.10	10.51	6.20	7.15	46	4.30	2.33
11	5.58	6.78	6.52	4.27	5.36	8.74	5.85	7.36	47	4.30	1.14
12	5.18	6.69	6.23	4.24			5.49	7.53	48		
13	5.10	6.67	6.1	4.19	4.64	7.19	5.31	7.75	49		
14	5.01	6.60	5.96	4.14	4.49	7.11	5.16	7.85	50		
15	4.95	6.58	5.76	4.12	4.39	7.06	5.06	8.03	51		
16	4.92	6.58	5.61	4	4.31	6.96	4.95	8.10	52		
17	4.85	6.59	5.56	3.49	4.24	6.73	4.88	8.25	53		
18	4.78	6.50	5.51	3.11	4.21	6.55	4.83	8.28	54		
19	4.74	6.44	5.46	2.57	4.20	6.02	4.78	8.24	55		
20	4.71	6.32	5.42	1.94	4.18	5.74	4.74	8.29	56		
21	4.71	1.47	5.39	1.06	4.14	5.39	4.71	8.34	57		
22			5.38	0.51	4.13	4.76	4.67	8.35	58		
23			5.35	0.23	4.08	4.36	4.60	8.31	59		
24					4.07	3.25	4.56	8.34	60		
25					4.04	2.46	4.54	8.37	61		
26					4.03	1.77	4.52	8.38	62		
27					4.02	1.54	4.51	8.38	63		
28					4.02	1.28	4.51	8.37	64		
29					4.01	1.05	4.48	8.40	65		
30					4.01	0.84	4.47	8.48	66		
31					4.00	0.73	4.45	8.51	67		
32					4.01	0.57	4.44	8.51	68		
33							4.43	8.47	69		
34							4.42	8.44	70		
35							4.41	8.45	71		

Appendix 1am: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016

	St Nora		St Nora		Stocking		Stormy		Twelve Mile	
	Basin 2		Basin 2							
Depth	29-Sep-16		14-Sep-17		10-Sep-15		12-Sep-15		26-Sep-16	
(m)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
0	17.80	8.79	19.20	8.83	22.35	8.27	18.99	8.15	18.99	8.66
1	17.80	8.79	19.14	8.92	22.30	8.23	18.99	8.16	19.03	8.54
2	17.80	8.79	18.63	9.05	22.29	8.16	19.00	8.16	19.05	8.53
3	17.79	8.79	18.21	9.13	22.27	8.15	19.00	8.17	19.05	8.53
4	17.78	8.79	18.02	9.14	22.23	8.13	18.99	8.16	19.05	8.52
5	17.76	8.77	17.79	9.11	20.22	8.08	18.98	8.16	19.04	8.52
6	17.73	8.77	17.62	8.97	15.57	8.41	15.12	7.57	19.03	8.50
7	13.74	9.77	16.42	9.08	10.42	7.60	11.16	6.85	19.01	8.50
8	10.16	10.62	10.87	9.58	8.00	7.14	9.08	6.66	16.56	9.05
9	7.48	10.21	8.73	9.29	6.52	6.57	7.58	6.50	11.62	10.14
10	6.13	9.24	7.93	9.04	5.95	6.17	6.72	6.02	9.54	9.83
11	5.64	8.68	7.21	8.86	5.67	5.82	6.13	5.76	8.51	8.24
12	5.42	8.46	6.70	8.71	5.42	5.43	5.78	5.59	7.70	7.34
13	4.98	8.36	6.29	8.68	5.25	4.99	5.63	5.29	7.24	5.76
14	4.85	8.25	6.01	8.58	5.10	4.68	5.53	5.13	6.98	4.96
15	4.76	8.17	5.85	8.50	4.99	4.25	5.45	4.95	6.76	4.26
16	4.75	8.03	5.73	8.41	4.90	3.78	5.37	4.86	6.62	4.03
17	4.67	8.01	5.54	8.34	4.82	2.94	5.30	4.62	6.47	3.78
18	4.63	8.02	5.48	8.16	4.77	1.97	5.24	4.13	6.46	3.74
19	4.58	7.82	5.42	8.05	4.73	1.41	5.21	3.35	6.33	3.43
20	4.56	7.67	5.38	7.99	4.67	0.82	5.17	2.87	6.27	2.78
21	4.49	7.65	5.31	7.96	4.64	0.63	5.16	2.03	6.18	2.21
22	4.46	7.72	5.27	7.96	4.66	0.56	5.15	1.67	6.12	1.60
23	4.44	7.73	5.23	7.92			5.14	1.09	6.06	1.37
24	4.43	7.61	5.20	7.80			5.13	0.82	6.05	1.10
25	4.44	7.47	5.16	7.74			5.12	0.35	5.91	0.98
26	4.43	7.10	5.13	7.72			5.12	0.23	5.92	0.60
27	4.41	6.97	5.10	7.68						
28	4.40	6.94	5.09	7.62						
29	4.38	6.82	5.06	7.58						
30	4.37	6.70	5.05	7.44						
31	4.36	6.46	5.03	7.36						
32	4.36	6.35	5.03	7.25						
33	4.34	6.21	5.02	7.11						
34	4.34	5.90	4.99	7.02						
35	4.33	5.58	4.98	6.87						

Appendix 1an: Temperature (Temp) and Dissolved Oxygen (DO) Profiles, 2014-2016

	Two Islands		Wilbermere	
Depth	10-Sep-14		11-Sep-14	
(m)	Temp	DO	Temp	DO
	(°C)	(mg/L)	(°C)	(mg/L)
0	20.75	8.82	19.42	8.91
1	20.82	8.68	19.52	7.58
2	20.85	8.61	19.51	7.57
3	20.84	8.61	19.52	7.56
4	20.80	8.59	18.69	7.31
5	18.83	7.99	15.50	5.97
6	14.72	5.09	15.61	5.07
7	11.46	4.09	10.31	4.66
8	9.39	3.35	7.06	4.50
9	7.93	2.26	6.25	4.41
10	7.03	1.26	5.79	4.41
11	6.39	0.59	5.19	4.55
12	6.14	0.44	4.86	4.27
13	5.94	0.41	4.80	3.47
14	5.80	0.39	4.84	3.19
15	5.71	0.43	4.75	2.64
16	5.66	0.36	4.67	1.28
17	5.58	0.33	4.64	0.90
18	5.51	0.31	4.62	0.60
19	5.48	0.30	4.58	0.41
20	5.46	0.30	4.56	0.30
21	5.45	0.29	4.54	0.21
22	5.43	0.29		
23				
24				
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APPENDIX 2

LAKE CHEMISTRY SUMMARIES
FOR EUPHOTIC ZONE SAMPLES

Allen

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.007 mg/L in May to 0.011 mg/L in September. Historical data from 2001 and 2007 show a range of TP concentrations from 0.004 to 0.008 mg/L. The September 2014 concentration was the highest TP concentration of the three surveys. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Ammonia and nitrate+nitrite concentrations in 2014 were higher than historical concentrations. All other chemical parameters in 2014 were similar to the historical 2001-2007 ranges.

Secchi disk visibility in 2014 ranged from 4.5 m in May to 3.5 m in September. Allen Lake has good to moderate visibility. The historical Secchi depth measurements ranged from 3.9 to 6.5 m.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.36 mg/L. Historical MVWHDO concentrations were 5.99 mg/L in 2001 and 7.04 mg/L in 2007. Under these conditions, lake trout in this lake are not likely to be under stress.

Art (Spruce)

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.006 mg/L in May to 0.01 mg/L in September. Historical data from 2001 and 2007 show a range of TP concentrations from 0.004 to 0.008 mg/L. The September 2014 concentration was the highest TP concentration of the three surveys. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in May 2014 were the highest compared to historical concentrations. Ammonia and nitrate+nitrite concentrations were within historical range in September 2014. All other chemical parameters in 2014 were similar to the historical 2001-2007 ranges.

Secchi disk visibility in 2014 ranged from 3.2 m in May to 9.1 m in September. Art Lake has good to excellent visibility. The historical Secchi depth measurements ranged from 3.1 to 4.9 m. It is likely that the September 2014 measurement is an anomaly.

The 2014 Late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 2.58 mg/L. Historical MVWHDO concentrations were 2.74 mg/L in 2001 and 2.4 mg/L in 2007. Under these conditions, lake trout in this lake are likely to be very stressed.

Basshaunt

Basshaunt was only sampled in May of 2016. Total phosphorus (TP) concentration for the euphotic zone in 2016 was 0.007 mg/L in May. Historical data from 2001 and 2007 show a range of TP concentrations from 0.005 to 0.01 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations were 0.099 mg/L in May. 2016 nitrate+nitrite concentrations were the highest compared to historical concentrations (0.005 to 0.059 mg/L). All other chemical parameters in 2016 were similar to the historical 2001-2007 ranges.

Secchi disk visibility in 2016 was 4.5 m in May. The historical Secchi depth measurements ranged from 3.35 to 4.5 m. Basshaunt Lake has good visibility.

There were no temperature and oxygen profiles taken in 2016. Historical MVWHDO concentrations were 4.69 mg/L in 2001 and 3.53 mg/L in 2007. Under these conditions, lake trout in this lake are likely to be very stressed.

Bear

Total phosphorus (TP) concentrations for the euphotic zone in 2015 was 0.005 mg/L for all sampling events and for both basins. Historical data from 2002, 2004, 2005 and 2009 show a range of TP concentrations from 0.003 to 0.008 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 ranged from 0.02 to 0.052 mg/L. The historical range for nitrate+nitrite concentrations is 0.01 to 0.211mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2001-2007 ranges.

Secchi disk visibility in 2015 ranged from 3.5 m in May to 3.75-4.0 m in September. The historical Secchi depth measurements ranged from 3.0 to 5.75 m. Bear Lake has moderate to good visibility.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.5 mg/L in the main basin. Historical MVWHDO concentrations from 2002 to 2009 ranged from 6.18 to 8.87 mg/L. Under these conditions, lake trout in this lake are not likely to be under stress.

Beech

Beech Lake was only sampled in May of 2016. Total phosphorus (TP) concentration for the euphotic zone in 2016 was 0.005 mg/L in May. Historical data from 2002 and 2008 show a range of TP concentrations from 0.003 to 0.007 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations were 0.113 mg/L in May. 2016 nitrate+nitrite concentrations were the highest compared to historical concentrations. Alkalinity was a little lower in 2016, all other chemical parameters in 2016 were similar to the historical 2002-2008 ranges.

Secchi disk visibility in 2014 was 4.5 m in May and 9.1 m in September. The historical Secchi depth measurements ranged from 3.35 to 4.5 m. Beech Lake has good visibility.

There were no temperature and oxygen profiles taken in 2016. Historical MVWHDO concentrations were 5.37 mg/L in 2002 and 6.27 mg/L in 2008. Under these conditions, lake trout in this lake are likely to be under some stress.

Big Hawk

Total phosphorus (TP) concentration for the euphotic zone in 2015 was 0.005 mg/L for all sampling events and for both Basins 1 and 2. Basin 3 in May 2015 had a TP concentration of 0.015 mg/L. Historical data from 2002 and 2009 show a range of TP concentrations from 0.003 to 0.006 mg/L for Basins 1 and 2. Basin 3 in May 2009 had a TP concentration of 0.018 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 ranged from 0.02 to 0.025 mg/L. The historical range for nitrate+nitrite concentrations is 0.01 to 0.086 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2001-2007 ranges.

Secchi disk visibility in 2015 ranged from 3.5 m in May to 3.75-4.0 m in September. The historical Secchi depth measurements ranged from 3.0 to 5.75 m. Big Hawk Lake has moderate to good visibility.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 9.48 mg/Lin the main basin. Historical MVWHDO concentrations were 8.78 mg/L in 2002 and 9.81 mg/L in 2009. Under these conditions, lake trout in this lake are not likely to be under stress.

Bitter

Total phosphorus (TP) concentrations for the euphotic zone in 2015 were 0.005 mg/L for May and 0.006 mg/L for September. Historical data from 2002, 2004, 2005 and 2008 show a range of TP concentrations from 0.003 to 0.007mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were 0.02 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.038 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2008 ranges.

Secchi disk visibility in 2015 ranged from 4.1 m in May to 6.5 m in September. The historical Secchi depth measurements ranged from 5.9 to 8.0 m. Bitter Lake has excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 9.83 mg/L. Historical MVWHDO concentrations have ranged just below or just above the 7.0 mg/L critical level. Under these conditions, lake trout in this lake are not likely to be under stress.

Bob

Total phosphorus (TP) concentrations for the euphotic zone in 2016 was 0.005 mg/L for all sampling events. Historical data from 2002 to 2008 show a range of TP concentrations from 0.005 to 0.01 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 ranged from 0.02 to 0.112 mg/L. The historical range for nitrate+nitrite concentrations is 0.028 to 0.099 mg/L. Alkalinity was a little lower in 2016, all other chemical parameters in 2016 were similar to the historical 2002-2008 ranges.

Secchi disk visibility in 2016 ranged from 4.5 m in May to 3.38 m in September. The historical Secchi depth measurements ranged from 3.6 to 6.0 m. Bob Lake has good to excellent visibility.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.52 mg/L. Historical MVWHDO concentrations in 2002, 2004, 2007, 2008 and 2010 were consistently above the 7.0 mg/L critical concentration. Under these conditions, lake trout in this lake are not likely to be under stress.

Boshkung

Total phosphorus (TP) concentrations for the euphotic zone in 2016 was 0.005 mg/L for all sampling events. Historical data from 2002, 2004 and 2008 show a range of TP concentrations from 0.002 to 0.011 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 ranged from 0.02 to 0.18 mg/L. The historical range for nitrate+nitrite concentrations is 0.021 to 0.096 mg/L. All other chemical parameters in 2016 were similar to the historical 2002-2008 ranges.

Secchi disk visibility in 2016 ranged from 4.5 m in May to 3.38 m in September. The historical Secchi depth measurements ranged from 3.6 to 6.0 m. Bob Lake has good to excellent visibility.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.52 mg/L. Historical MVWHDO concentrations were 9.5 mg/L in 2002 and 9.64 mg/L in 2008. Under these conditions, lake trout in this lake are not likely to be under stress.

Bow

Bow Lake was sampled only in May of 2016. Total phosphorus (TP) concentrations for the euphotic zone in 2016 was 0.006 mg/L. Historical data from 2001 and 2008 show a TP concentration of 0.004 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 were 0.02 mg/L. Historically nitrate+nitrite concentrations have been 0.005 mg/L. Alkalinity was a little lower in 2016 than historical. All other chemical parameters in 2016 were similar to the historical 2002-2008 ranges.

Secchi disk visibility in 2016 was 4.75 m in May. The historical Secchi depth measurements ranged from 7.67 to 8.5 m. Bow Lake has good to excellent visibility.

No fall temperature or dissolved oxygen profiles were taken in 2016. Historical MVWHDO concentrations were 6.23 mg/L in 2001 and 5.98 mg/L in 2008. Under these conditions, lake trout in this lake are likely to be under some stress.

Buckskin

Total phosphorus (TP) concentrations for the euphotic zone in 2014 were 0.006 mg/L for May and 0.008 mg/L for September. Historical data from 2001, 2004 and

2007 show a range of TP concentrations from 0.003 to 0.01mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.052 to 0.163 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.213 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 ranges.

Secchi disk visibility in 2014 ranged from 4.4 m in May to 4.5 m in September. The historical Secchi depth measurements ranged from 4.2 to 5.5 m. Buckskin Lake has good to excellent water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 6.3 mg/L. Historical MVWHDO concentrations were 5.18 in 2001 and 6.56 mg/L in 2007. Under these conditions, lake trout in this lake are likely to be under some stress.

Clean (Clear)

Total phosphorus (TP) concentrations for the euphotic zone in 2015 were 0.019 mg/L for May and 0.005 mg/L for September. Historical data from 2002 and 2008 show a range of TP concentrations from 0.002 to 0.006 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 ranged from 0.02 to 0.03 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.076 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2001-2007 ranges.

Secchi disk visibility in 2015 ranged from 9.0 m in May to 5.4 m in September. The historical Secchi depth measurements ranged from 6.25 to 8.25 m. Clean Lake has excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was8.56 mg/L. Historical MVWHDO concentrations were 8.69 mg/L in 2008. Under these conditions, lake trout in this lake are not likely to be under stress.

Clear

Clear lake was not sampled in the 2014-2016 time frame.

Clinto

Total phosphorus (TP) concentrations for the euphotic zone in 2015 were 0.005 mg/L for all sampling events for both Basins 1 and 2 except for September 2015 in Basin 1 where the TP concentration was 0.018 mg/L. Historical data from 2002, 2005 and 2009 show a range of TP concentrations from 0.003 to 0.012 mg/L for Basins 1 and 2. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were 0.02 mg/L. The historical range for nitrate+nitrite concentrations is 0.001 to 0.047 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2009 ranges.

Secchi disk visibility in 2015 ranged from 7.3-7.5 m in May to 4.3-4.5 m in September. The historical Secchi depth measurements ranged from 6.25 to 7.0 m. Clinto Lake has good to excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 5.02 and 6.87 mg/L. Historical MVWHDO concentrations were 6.7 mg/L in 2002 and 5.39 mg/L in 2009. Under these conditions, lake trout in this lake are likely to be under some stress.

Davis

Davis Lake was sampled only in May of 2016. Total phosphorus (TP) concentrations for the euphotic zone in 2016 was 0.006 mg/L. Historical TP concentration data from 2002, 2003 and 2008 show a ranged of 0.004 to 0.006 mg/L . When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 were 0.053 mg/L. Historically nitrate+nitrite concentrations have ranged from 0.005 to 0.05 mg/L. Alkalinity was a little lower in 2016 than historical. All other chemical parameters in 2016 were similar to the historical 2002-2008 ranges.

Secchi disk visibility in 2016 was 5.0 m in May. The historical Secchi depth measurements ranged from 3.6 to 7.0 m. Davis Lake has moderate to excellent water clarity.

Davis Lake was not sampled during the late summer/early fall critical period in 2016. The historical mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) concentrations were 3.09 mg/L in 2002 and 3.34 mg/L in 2008. Under these conditions, lake trout in this lake are likely to be stressed.

Deer

Total phosphorus (TP) concentrations for the euphotic zone in 2014 were 0.007 mg/L for May and 0.01 mg/L for September. Historical data from 2001 and 2007 show a range of TP concentrations from 0.003 to 0.009 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.066 to 0.157 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.062 mg/L. All chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 4.0 m in May to 5.0 m in September. The historical Secchi depth measurements ranged from 4.4 to 6.6 m. Deer Lake has good to excellent water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 5.39 mg/L. Historical MVWHDO concentrations were 4.58 in 2001 and 7.91 in 2007. Under these conditions, lake trout in this lake are likely to be under some stress.

Delphis

Delphis Lake was not sampled in the 2014-2016 time period due to access issues.

Devils (Lutterworth)

Total phosphorus (TP) concentrations for the euphotic zone in 2016 were 0.01 mg/L for May and 0.005 mg/L for September. Historical data from 2002 and 2008 show a range of TP concentrations from 0.005 to 0.014 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 ranged from 0.044 to 0.25 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.082 mg/L. All chemical parameters in 2016 were similar to the historical 2002-2008 ranges.

Secchi disk visibility in 2016 ranged from 3.4 m in May to 5.5 m in September. The historical Secchi depth measurements ranged from 3.25 to 3.9 m. Devils Lake has moderate water clarity.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 9.57 mg/L. Historical MVWHDO concentrations were 5.6 mg/L in 2001 and 7.01 mg/L in 2007. Under these conditions, lake trout in this lake are not likely to be under stress.

Drag

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.005 to 0.008 mg/L for May (all 3 basins) and 0.008-0.009 mg/L in September. Historical data from 2001, 2005 and 2007 show a range of TP concentrations from 0.003 to 0.015 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.054 to 0.198 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.233 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 4.4-4.7 m in May to 3.1-3.2 m in September. The historical Secchi depth measurements ranged from 3.5 to 7.75 m. Drag Lake has moderate to excellent water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.31 mg/L. Historical MVWHDO concentrations were 8.6 mg/L in 2001 and 8.92 mg/L in 2007. Under these conditions, lake trout in this lake are not likely to be under stress.

Eagle

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.006 to 0.009 mg/L. Historical data from 2001, 2004 and 2007 show a range of TP concentrations from 0.005 to 0.008 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.054 to 0.19 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.076 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 5.0 m in May to 3.5 m in September. The historical Secchi depth measurements ranged from 3.8 to 6.5 m. Eagle Lake has moderate to excellent water clarity.

The 2014 ate summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 3.2 mg/L. Historical MVWHDO concentrations were 3.43 in 2001 and 1.8 mg/L in 2007. Under these conditions, lake trout in this lake are likely to be under stress.

Eels

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.005 to 0.03 mg/L. Historical data from 2001, 2004 and 2007 show a range of TP concentrations from 0.003 to 0.027 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.02 to 0.092 mg/L. The historical range for nitrate+nitrite concentrations is 0.016 to 0.125 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 3.3 m in May to 3.4 m in September. The historical Secchi depth measurements ranged from 3.3 to 4.9 m. Eels Lake has moderate water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 5.34 mg/L. Historical MVWHDO concentrations were 4.85 mg/L in 2001 and 5.69 mg/L in 2007. Under these conditions, lake trout in this lake are likely to be under some stress.

Esson

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.008 to 0.01 mg/L. Historical data from 2001and 2007 show a range of TP concentrations from 0.004 to 0.016 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.1 to 0.161 mg/L. The historical range for nitrate+nitrite concentrations is 0.006 to 0.094 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 4.0 m in May to 4.5 m in September. The historical Secchi depth measurements ranged from 3.7 to 7.5 m. Esson Lake has moderate to good water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.27 mg/L. Historical MVWHDO concentrations were 6.06 mg/L in 2001, 7.97 mg/L in 2007 and 5.87 mg/L in 2010. Under these conditions, lake trout in this lake are not likely to be under stress in some years but may be in others.

Eyre (Black)

Total phosphorus (TP) concentrations for the euphotic zone in 2015 ranged from 0.005 mg/L in May to 0.006 mg/L in September. Historical data from 2002, 2003, 2004 and 2008 show a range of TP concentrations from 0.004 to 0.016 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2015 was 0.02 mg/L. The historical range for nitrate+nitrite concentrations is 0.037 to 0.09 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2015 was 3.5 m. The historical Secchi depth measurements ranged from 3.5 to 4.75 m. Eyre Lake has moderate to good water clarity.

The 2015 Late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 4.36 mg/L. Historical MVWHDO concentrations were 4.24 in 2003 and 4.12 mg/L in 2008. Under these conditions, lake trout in this lake are likely to be under some stress.

Farquahar

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.007 mg/l in May to 0.012 mg/L in September. Historical data from 2001, 2003, 2004 and 2007 show a range of TP concentrations from 0.004 to 0.01 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.02 to 0.092 mg/L. The historical range for nitrate+nitrite concentrations is 0.062 to 0.122 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 6.25 m in May to 6.0 m in September. The historical Secchi depth measurements ranged from 5.8 to 9.5 m. Farquhar Lake has excellent water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.75 mg/L. Historical MVWHDO concentrations were 8.95 mg/L in 2001 and 9.59 mg/L in 2007. Under these conditions, lake trout in this lake are not likely to be under stress.

Fishtail

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.007 mg/l in May to 0.009 mg/L in September. Historical data from 2001, 2002, 2003, 2004 and 2007 show a range of TP concentrations from 0.004 to 0.008 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.053 to 0.209 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.153 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 5.1 m in May to 3.0 m in September. The historical Secchi depth measurements ranged from 3.0 to 5.4 m. Fishtail Lake has excellent water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.65 mg/L. Historical MVWHDO concentrations were 7.7 mg/L in 2001 and 9.5 mg/L in 2007. Under these conditions, lake trout in this lake are not likely to be under stress.

Fletcher

Total phosphorus (TP) concentrations for the euphotic zone in 2015 were 0.005 mg/L for all sampling sessions and in all basins. Historical data from 2002 and 2009 show a range of TP concentrations from 0.005 to 0.02 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were 0.02 mg/L for all sampling sessions and in all basins. The historical range for nitrate+nitrite concentrations is 0.01 to 0.081 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2009 range.

Secchi disk visibility in 2015 ranged from 5.1 m in May to 3.0 m in September. The historical Secchi depth measurements ranged from 3.0 to 5.4 m. Fishtail Lake has excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 4.84 mg/L. Historical MVWHDO concentrations were 6.12 mg/L in 2001 and 4.45 mg/L in 2009. Under these conditions, lake trout in this lake are likely to be under some stress.

Four Corner

Four Corner Lake was not sampled during the 2014-2016 lake survey due to access problems.

Glamor

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.007 mg/l in May to 0.009 mg/L in September. Historical data from 2001 and 2007 show a range of TP concentrations from 0.006 to 0.012 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.089 to 0.125 mg/L. The historical range for nitrate+nitrite concentrations is 0.015 to 0.052 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 4.0 m in May to 4.45 m in September. The historical Secchi depth measurements ranged from 4.1 to 6.5 m. Glamour Lake has good to excellent water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 4.14 mg/L. Historical MVWHDO concentrations were 2.81mg/L in 2001 and 4.03 mg/L in 2007. Under these conditions, lake trout in this lake are likely to be under stress.

Goodwin (Loon)

Total phosphorus (TP) concentration for the euphotic zone in 2015 and 2016 was 0.005 mg/l for all sampling events. Historical data from 2002, 2005 and 2008 show a range of TP concentrations from 0.003 to 0.012 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 and 2016 was 0.02 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.028 mg/L. Alkalinity was a little lower in 2015 and 2016, all other chemical parameters in were similar to the historical 2002-2008 range.

Secchi disk visibility in 2015 ranged from 6.0 m in May to 5.4 m in September. The historical Secchi depth measurements ranged from 4.5 to 7.75 m. Goodwin Lake has good to excellent water clarity.

The 2015 and 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) were 5.36 and 5.1 mg/L respectively. Historical MVWHDO concentrations were 8.75 mg/L in 2005 and 8.06 mg/L in 2008. Under these conditions, lake trout in this lake are likely to be under some stress in some years and not in others.

Grace

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.006 mg/l in May to 0.005 mg/L in September. Historical data from 2001 and 2007 show a range of TP concentrations from 0.004 to 0.011 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.113 to 0.165 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.068 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 4.75 m in May to 4.5 m in September. The historical Secchi depth measurements ranged from 3.5 to 7.5 m. Grace Lake has good to excellent water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.11 mg/L. Historical MVWHDO concentrations were 8.1 mg/L in 2001 and 8.0 mg/L in 2010. Under these conditions, lake trout in this lake are not likely to be under stress.

Gull

Total phosphorus (TP) concentration for the euphotic zone in 2017 ranged from 0.005 to 0.009 mg/l. Historical data from 2002, 2004 and 2008 show a range of TP concentrations from 0.005 to 0.009 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2017 was 0.02 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.12 mg/L. Alkalinity was a little lower in 2017, all other chemical parameters were similar to the historical 2002-2008 range.

Secchi disk visibility in 2016 and 2017 ranged from 3.0 m to 5.25 m. The historical Secchi depth measurements ranged from 2.7 to 6.0 m. Gull Lake has moderate water clarity.

The 2016 and 2017 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) were 7.24 and 7.07 mg/L respectively. Historical MVWHDO concentrations were 7.62 in 2002 and 7.39 in 2008. Under these conditions, lake trout in this lake are not likely to be under stress.

Haliburton

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.007 mg/l in May to 0.011 mg/L in September. Historical data from 2002, 2007 and 2008 show a range of TP concentrations from 0.003 to 0.012 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.032 to 0.201 mg/L. The historical range for nitrate+nitrite concentrations is 0.005 to 0.068 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 4.0 m to 4.8 m. The historical Secchi depth measurements ranged from 4.5 to 7.0 m. Haliburton Lake has good water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.76 mg/L. Historical MVWHDO concentrations were 10.23 mg/Lm in 2002 and 9.19 mg/L in 2007. Under these conditions, lake trout in this lake are not likely to be under stress.

Halls

Total phosphorus (TP) concentration for the euphotic zone in 2017 was 0.005 mg/L. Historical data from 2002, 2003 and 2008 show a range of TP concentrations from 0.003 to 0.007 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 and 2017 ranged between 0.116 and 0.024 mg/L. The historical range for nitrate+nitrite concentrations is 0.015 to 0.09 mg/L. Alkalinity was a little lower in 2017, all other chemical parameters in were similar to the historical 2002-2008 range.

Secchi disk visibility in 2016 and 2017 ranged from 4.25 m to 5.5 m. The historical Secchi depth measurements ranged from 5.0 to 7.0 m. Halls Lake has excellent water clarity.

The 2016 and 2017 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) were 9.56 and 10.37 mg/L respectively. Historical MVWHDO concentrations were 10.53 mg/L in 2002 and 10.64 in 2008. Under these conditions, lake trout in this lake are not likely to be under stress.

Havelock

Havelock Lake wasn't sampled during the 2014-2016 surveys due to access problems.

Hudson

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.005 mg/l in May to 0.01 mg/L in September. Historical data from 2001 and 2007 show a range of TP concentrations from 0.004 to 0.008 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.046 to 0.05 mg/L. The historical nitrate+nitrite concentrations was 0.005 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 3.9 m in May to 4.5 m in September. The historical Secchi depth measurements ranged from 5.1 to 6.5 m. Hudson Lake has good water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 6.9 mg/L. Historical MVWHDO concentrations were 6.83 mg/L in 2001 and 6.46 mg/L in 2007. Under these conditions, lake trout in this lake are likely to be under a little stress.

Johnson

Total phosphorus (TP) concentrations for the euphotic zone in 2015 were 0.005 mg/l in May and September. Historical data from 2002 and 2008 show a range of TP concentrations from 0.003 to 0.005 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 ranged from 0.02 to 0.05 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.052 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2015 ranged from 3.5 m in May to 5.6 m in September. The historical Secchi depth measurements ranged from 4.8 to 6.5 m. Johnson Lake has good water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.48 mg/L. Historical MVWHDO concentrations were 9.7 mg/L in 2002 and 9.62mg/L in 2008. Under these conditions, lake trout in this lake are not likely to be under stress.

Kabakwa

Total phosphorus (TP) concentration for the euphotic zone in 2016 was 0.006 mg/l in May and 0.005 mg/L in September. Historical data from 2002 and 2008 show a range of TP concentrations from 0.003 to 0.012 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 ranged from 0.02 to 0.052 mg/L. The historical nitrate+nitrite concentrations ranged from 0.006 to 0.042 mg/L. Alkalinity was a little lower in 2016, all other chemical parameters in 2015 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2016 ranged from 5.0 m in May to 4.5 m in September. The historical Secchi depth measurements ranged from 4.9 to 5.0 m. Kabakwa Lake has good water clarity.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 3.1 mg/L. Historical MVWHDO concentrations were 2.06 mg/L in 2008. Under these conditions, lake trout in this lake are likely to be very stressed.

Kashagawigamog

Total phosphorus (TP) concentrations for the euphotic zone in 2016 ranged from 0.005 mg/L to 0.007 mg/L. Historical data from 2002, 2003, 2004 and 2008 show a range of TP concentrations from 0.005 to 0.012 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 ranged from 0.005 to 0.270 mg/L. The historical nitrate+nitrite concentrations ranged from 0.006 to 0.092 mg/L. Alkalinity was a little lower in 2016, all other chemical parameters in 2016 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2016 ranged from 3.8 m to 5.75. The historical Secchi depth measurements ranged from 2.8 to 6.1 m. Kashagawigamog Lake has good water clarity.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.3 mg/L in the main basin. Historical MVWHDO concentrations were 8.2 mg/l in 2002 and 8.89 mg/L in 2008.

The other basins in Kashagawigamog had MVWHDO concentrations less than 5 mg/L Under these conditions, lake trout in this lake are not likely to be under stress in the main basin are likely stressed in other parts of the lake.

Kawagama

Total phosphorus (TP) concentrations for the euphotic zone in 2015 ranged from 0.005 mg/L to 0.008 mg/L. Historical data from 2002 and 2009 show a range of TP concentrations from 0.003 to 0.008 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were 0.02 mg/L in all basins. The historical nitrate+nitrite concentrations ranged from 0.01 to 0.152 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2009 range.

Secchi disk visibility in 2015 ranged from 3.5 m to 6.0 m. The historical Secchi depth measurements ranged from 5.0 to 10.5 m. Kawagama Lake has good to excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 9.74 mg/L in the main basin. Historical MVWHDO concentrations were 10.21 mg/L in 2002 and 10.43 mg/L in 2009. All the six other basins in the lake exceeded 8.0 mg/L. Under these conditions, lake trout in this lake are not likely to be under stress.

Kelly

Total phosphorus (TP) concentration for the euphotic zone in 2015 and 2016 was 0.005 mg/l for all sampling events. Historical data from 2002 and 2008 show a range of TP concentrations from 0.003 to 0.005 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 and 2016 was 0.02 to 0.04 mg/L. The historical range for nitrate+nitrite concentrations is 0.012 to 0.036 mg/L. Alkalinity was a little lower in 2015 and 2016, all other chemical parameters were similar to the historical 2002-2008 range.

Secchi disk visibility ranged from 4.5 to 6.3 m. The historical Secchi depth measurements ranged from 5 to 8.25 m. Kelly Lake has good to excellent water clarity.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.8 mg/L. The profile taken in 2015 had a MVWHDO of 5.8 mg/L and is considered suspect due to instrument problems.

Historical MVWHDO concentrations were 8.04 mg/L in 2002 and 8.12 mg/L in 2008. Under these conditions, lake trout in this lake are not likely to be under stress.

Kennisis

Total phosphorus (TP) concentration for the euphotic zone in 2015 and 2016 ranged from 0.005 to 0.01 mg/L. Historical data from 2002 and 2008 show a range of TP concentrations from 0.002 to 0.008 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 and 2016 ranged from 0.02 to 0.137 mg/L. The historical range for nitrate+nitrite concentrations is 0.01 to 0.113 mg/L. Alkalinity was a little lower in 2015 and 2016, all other chemical parameters were similar to the historical 2002-2008 range.

Secchi disk visibility ranged from 5.0 to 7.6 m. The historical Secchi depth measurements ranged from 5.2 to 9.0 m. Kennsis Lake has good to excellent water clarity.

The 2015 and 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) were 9.26 and 9.01 mg/L respectively in the deep basin. Historical MVWHDO concentrations were 11.21 mg/L in 2003 and 11.64 mg/L in 2008. All the remaining three basins had MVWHDO concentration exceeding 9 mg/L. Under these conditions, lake trout in this lake are not likely to be under stress.

Kimball

Total phosphorus (TP) concentrations for the euphotic zone in 2015 ranged from 0.005 to 0.009 mg/L. Historical data from 2002, 2003, 2004, 2005 and 2009 show a range of TP concentrations from 0.002 to 0.014 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 ranged from 0.02 to 0.094 mg/L. The historical nitrate+nitrite concentrations ranged from 0.01 to 0.122 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2015 ranged from 3.25 to 6.4 m. The historical Secchi depth measurements ranged from 3.1 to 7.5 m. Kimball Lake has moderate to excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) were 8.08 and 8.42 mg/ in Basins 1 and 2 respectively.. Historical MVWHDO concentrations in Basin 1 were 9.52, 7.43, 8.64 and 9.46 mg/L in 2002, 2003, 2004 and 2009 respectively. Under these conditions, lake trout in this lake are not likely to be under stress.

Klaxon

Klaxon Lake was not sampled during the 2014-2016 survey due to access issues.

Koshlong

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.006 to 0.008 mg/L. Historical data from 2001, 2003 and 2007 show a range of TP concentrations from 0.005 to 0.012 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.016 to 0.153 mg/L. The historical nitrate+nitrite concentrations ranged from 0.016 to 0.058 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2014 ranged from 3.5 to 4.0 m. The historical Secchi depth measurements ranged from 3.8 to 6.8 m. Koshlong Lake has moderate to good water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 6.94 mg/L. Historical MVWHDO concentrations were 6.66, 6.68, 7.67 and 6.38 mg/L in 2001, 2003, 2007 and 2011 mg/L respectively. Under these conditions, lake trout in this lake may be under some stress.

Kushog

Total phosphorus (TP) concentration for the euphotic zone in 2017 ranged from 0.005 to 0.006 mg/L. Historical data from 2002, 2003 and 2009 show a range of TP concentrations from 0.004 to 0.012 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2017 was 0.02 mg/L. The historical range for nitrate+nitrite concentrations is 0.01 to 0.103 mg/L. Alkalinity was a little lower in 2017 all other chemical parameters were similar to the historical 2002-2008 range.

Secchi disk visibility ranged from 3.75 to 4.5 m. The historical Secchi depth measurements ranged from 3.0 to 9.0 m. Kushog Lake has good to excellent water clarity.

The 2016 and 2017 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) were 7.14 and 7.65 mg/L in the North basin respectively and 4.33 mg/L and 5.11mg/L respectively in the middle basin. Historical MVWHDO concentrations were 8.1, 7.68 and 7.79 mg/L in the North Basin in 2002, 2003 and 2009. Under these conditions, lake trout in the North Basin are not likely to be under stress. Recent MVWHDO data suggests that lake trout in the middle basin may be under some stress.

Lipsy

Total phosphorus (TP) concentrations for the euphotic zone in 2015 ranged from 0.006 to 0.013 mg/L. Historical data from 2002 and 2008 show a range of TP concentrations from 0.002 to 0.022 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were 0.02 mg/L. The historical nitrate+nitrite concentrations ranged from 0.022 to 0.096 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2015 ranged from 4.0 to 5.0 m. The historical Secchi depth measurements ranged from 5.0 to 6.4 m. Lipsy Lake has good water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.14 mg/L. Historical MVWHDO concentrations were 9.59 mg/L in 2002 and 8.8 mg/L in 2008. Under these conditions, lake trout in this lake are not likely to be under stress.

Little Bob

Total phosphorus (TP) concentrations for the euphotic zone in 2016 ranged from 0.006 to 0.008 mg/L. Historical data from 2002, 2004 and 2008 show a range of TP concentrations from 0.004 to 0.011 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 ranged from 0.02 to 0.072 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.094 mg/L. Alkalinity was a little lower in 2016, all other chemical parameters in 2016 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2016 ranged from 3.5 to 4.6 m. The historical Secchi depth measurements ranged from 3.0 to 5.5 m. Little Bob Lake has good water clarity.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 1.0 mg/L in basin 1 and 6.79 mg/L in Basin 2. Historical MVWHDO concentrations were below 1.2 mg/L in basin 1 and less than the critical 7.0 mg/L concentration in Basin 2. Under these conditions, lake trout in this lake are likely to be under stress.

Little Boshkung

Total phosphorus (TP) concentrations for the euphotic zone in 2016 ranged from 0.005 to 0.008 mg/L. Historical data from 2002 and 2008 show a range of TP concentrations from 0.006 to 0.009 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 ranged from 0.118 to 0.210 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.119 mg/L. Alkalinity was a little lower in 2016, all other chemical parameters in 2016 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2016 ranged from 5.0 to 6.5 m. The historical Secchi depth measurements ranged from 4.4 to 5.8 m. Little Boshkung Lake has good to excellent water clarity.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 1.55 mg/L. Historical MVWHDO concentrations were 4.07 mg/L in 2002 and 1.2 mg/L in 2008. Under these conditions, lake trout in this lake are likely to be highly stressed.

Little Clean (Little Black)

Total phosphorus (TP) concentrations for the euphotic zone in 2015 ranged from 0.005 to 0.006 mg/L. Historical data from 2002, 2003, 2004 and 2008 show a range of TP concentrations from 0.003 to 0.013 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were 0.02 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.11 mg/L. Alkalinity was a little lower in 20156, all other chemical parameters in 2015 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2015 ranged from 4.5 to 6.0 m. The historical Secchi depth measurements ranged from 5.0 to 7.3 m. Little Clean Lake has good to excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 0.96 mg/L. Historical MVWHDO concentrations have been below 1.5 mg/L and therefore lake trout in this lake are likely to be highly stressed.

Little Hawk

Total phosphorus (TP) concentrations for the euphotic zone in 2015 ranged from 0.005 to 0.006 mg/L. Historical data from 2002, 2003 and 2009 show a range of TP concentrations from 0.002 to 0.004 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were from 0.02 to 0.037 mg/L. The historical nitrate+nitrite concentrations ranged from 0.013 to 0.102 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2009 range.

Secchi disk visibility in 2015 ranged from 4.5 to 6.85 m. The historical Secchi depth measurements ranged from 4.6 to 7.5 m. Little Hawk Lake has good to excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) in the two basins ranged from 9.46 to 9.61 mg/L. Historical MVWHDO concentrations have all been above 9.5 mg/L indicating that lake trout in this lake are unlikely to be stressed.

Little Kennisis

Total phosphorus (TP) concentrations for the euphotic zone in 2015 and 2016 ranged from 0.005 to 0.007 mg/L. Historical data from 2002 and 2008 show a range of TP concentrations from 0.003 to 0.021 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 and 2016 ranged from 0.02 to 0.164 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.183 mg/L. Alkalinity was a little lower in 2015 and 2016, all other chemical parameters were similar to the historical 2002-2008 range.

Secchi disk visibility in 2015 and 2016 ranged from 3.8 to 6.0 m. The historical Secchi depth measurements ranged from 3.0 to 6.5 m. Little Kennisis Lake has moderate to good water clarity.

The 2015 and 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) were 7.31 and 7.66 mg/L respectively in Basin 1. Basin 2 concentrations were 6.43 and 6.25 mg/l in 2015 and 2016 respectively. Historical MVWHDO concentrations in both basins were well above the 7.0 mg/L critical level indicating that lake trout in this lake are unlikely be to be stressed.

Little Redstone

Total phosphorus (TP) concentrations for the euphotic zone in 2015 was 0.006 mg/L. Historical data from 2002, 2003 and 2008 show a range of TP concentrations from 0.003 to 0.007 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 ranged from 0.02 to 0.075 mg/L. The historical nitrate+nitrite concentrations ranged from 0.021 to 0.145 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2015 ranged from 3.25 to 4.4 m. The historical Secchi depth measurements ranged from 3.6 to 6.5 m. Little Redstone Lake has moderate to good water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.37 mg/L. Historical MVWHDO concentrations were all well above the 7.0 mg/L critical level indicating that lake trout in this lake are unlikely be to be stressed.

Livingston

Total phosphorus (TP) concentrations for the euphotic zone in 2015 and 2017 ranged from 0.005 to 0.007 mg/L. Historical data from 2002 and 2009 show a range of TP concentrations from 0.004 to 0.011 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 and 2017 ranged from 0.02 to 0.058 mg/L. The historical nitrate+nitrite concentrations ranged from 0.01 to 0.202 mg/L. Alkalinity was a little lower in 2015 and 2017, all other chemical parameters were similar to the historical 2002-2009 range.

Secchi disk visibility in 2015 and 2017 ranged from 3.25 to 4.6 m. The historical Secchi depth measurements ranged from 4.0 to 5.75 m. Livingston Lake has moderate to good water clarity.

The 2015 and 2017 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) were 8.25 and 8.14 mg/L respectively. Historical MVWHDO were also well above the 7.0 mg/L critical level indicating that lake trout in this lake are unlikely be to be stressed. However the shallow north basin MVWHDO has consistently been below 2.4 mg/L.

Long

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.009 to 0.012 mg/L. Historical data from 2001 and 2007 show a range of TP concentrations from 0.008 to 0.048 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.005 to 0.058 mg/L. The historical nitrate+nitrite concentrations ranged from 0.034 to 0.209 mg/L. All chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 3.75 to 7.0 m. The historical Secchi depth measurements ranged from 4.15 to 8.5 m. Long Lake has good to excellent water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 1.94 mg/L. Historical MVWHDO in 2001 and 2007 were below 1.0 mg/L. Lake trout in this like are likely highly stressed.

Loon

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.005 to 0.013 mg/L. Historical data from 2001 and 2007 show a range of TP concentrations from 0.006 to 0.014 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.063 to 0.068 mg/L. The historical nitrate+nitrite concentrations ranged from 0.034 to 0.209 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 3.1 to 4.0 m. The historical Secchi depth measurements ranged from 4.0 to 5.75 m. Loon Lake has moderate to good water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.19 mg/L. Historical MVWHDO concentrations in Loon lake have consistently been above the 7.0 mg/L critical level indicating that lake trout in this lake are unlikely be to be stressed.

Louie

Total phosphorus (TP) concentrations for the euphotic zone in 2015 ranged from 0.005 to 0.028 mg/L. There is no historical data for Louie Lake. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were0.037 and 0.05 mg/L.

Secchi disk visibility in 2015 ranged from 7 to 8.25 m. Louie Lake has excellent water clarity.

The Ministry does not have any depth strata/volume data for Louie Lake and therefore the 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) could not be calculated. Based on the September 2015 dissolved oxygen profile , the MVWHDO would likely be around or just below the 7.0 mg/L guideline. Therefore lake trout in this lake are likely to be a little stressed.

Lower Fletcher

Total phosphorus (TP) concentrations for the euphotic zone in 2015 was 0.005 mg/L. Historical data from 2002 and 2009 show a range of TP concentrations from 0.005 to 0.011 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were from 0.021 to 0.048 mg/L. The historical nitrate+nitrite concentrations ranged from 0.01 to 0.088 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2009 range.

Secchi disk visibility in 2015 was 3.5m The historical Secchi depth measurements ranged from 3.5 to 4.5 m. Lower Fletcher Lake has moderate water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 4.92 mg/L. Historical MVWHDO concentrations in 2009 were 5.79 mg/L. Based on this data lake trout in this lake are likely to moderately stressed.

MacDonald

Total phosphorus (TP) concentrations for the euphotic zone in 2015 was 0.005 mg/L. Historical data from 2002 and 2008 show a range of TP concentrations from 0.004 to 0.02 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were from 0.02 to 0.045 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.044 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2015 was 5.6 to 8.25 m. The historical Secchi depth measurements ranged from 5.3 to 7.8 m. MacDonald Lake has excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.64 mg/L. Historical MVWHDO concentrations were 9.34 and 9.44 mg/L in 2008 and 2002 respectively. This data would indicate that lake trout in this lake are unlikely to be stressed.

Maple

Total phosphorus (TP) concentration for the euphotic zone in 2016 was 0.005 mg/L. Historical data from 2002, 2003, 2004 and 2008 show a range of TP concentrations from 0.006 to 0.014 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 ranged from 0.007 to 0.03 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.079 mg/L. All chemical parameters in 2016 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2016 was 4.25 to 4.8 m. The historical Secchi depth measurements ranged from 3.5 to 6.25 m. Maple Lake has good to excellent water clarity.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 5.87 mg/L. Historical MVWHDO concentrations were 6.69, 4.561, 5.12 and 5.68 mg/L in 2008,2004,2003 and 2002 respectively. This data would indicate that lake trout in this lake are likely to be stressed.

Marsden (Marsh)

Total phosphorus (TP) concentrations for the euphotic zone in 2015 was 0.007 mg/L. Historical data from 2002 show a range of TP concentrations from 0.005 to 0.01 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2015 was 0.02 mg/L. The historical nitrate+nitrite concentrations ranged from 0.008 to 0.071 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002 data.

Secchi disk visibility in 2015 was 3.75 m. The historical Secchi depth measurements ranged from 3.0 to 4.0 m. Marsden Lake has moderate water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 3.84 mg/L. This data would indicate that lake trout in this lake are likely to be highly stressed.

McFadden

Total phosphorus (TP) concentration for the euphotic zone in 2015 was 0.006 mg/L. Historical data from 2002 and 2009 show a range of TP concentrations from 0.003 to 0.008 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were 0.02 and 0.04 mg/L. The historical nitrate+nitrite concentrations ranged from 0.01 to 0.104 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2009 range.

Secchi disk visibility in 2015 was 5.0 to 8.0 m The historical Secchi depth measurements ranged from 5.25 to 6.6 m. McFadden Lake has excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 5.5 mg/L. An additional profile taken in 2016 had a MVWHDO concentration of 7.0 mg/L. Historical MVWHDO concentrations were 7.13 and 9.02 mg/L in 2009 and 2002 respectively. This data would indicate that lake trout in this lake are unlikely to be stressed.

Miskawbi

Total phosphorus (TP) concentration for the euphotic zone in 2014 was 0.007 mg/L. Historical data from 2001 and 2007 show a range of TP concentrations from 0.004 to 0.015 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 were from 0.074 to 0.123 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.127 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 was 5.5 to 6.25 m The historical Secchi depth measurements ranged from 4.5 to 8.0 m. Miskawbi Lake has good to excellent water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.72 mg/L. Historical MVWHDO concentrations were 7.89, 9.02 and 5.55 mg/L in 2010, 2007 and 2001 respectively. This data would indicate that lake trout in this lake are unlikely to be stressed.

Monmouth

Total phosphorus (TP) concentration for the euphotic zone in 2014 was 0.009 mg/L. Historical data from 2001 and 2007 show a range of TP concentrations from 0.004 to 0.011 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 was 0.056 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.101 mg/L. Alkalinity was a little lower in 2014,all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 was 2.83 m The historical Secchi depth measurements ranged from 3.2 to 3.8 m. Monmouth Lake has moderate water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 5.31 mg/L. Historical MVWHDO concentrations were 5.11 and 4.34 mg/L in 2007 and 2001 respectively. This data would indicate that lake trout in this lake are likely to be stressed

Moore

Total phosphorus (TP) concentration for the euphotic zone in 2016 ranged from 0.005 to 0.008 mg/L. Historical data from 2002 and 2008 show a range of TP concentrations from 0.005 to 0.032 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 ranged from 0.02 to 0.113 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.103 mg/L. All chemical parameters in 2016 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2016 was 4.25 to 4.5 m. The historical Secchi depth measurements ranged from 3.2 to 6.75 m. Moore Lake has moderate to excellent water clarity.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 3.2 mg/L. Historical MVWHDO concentrations were 4.5 and 2.93 mg/L in 2008 and 2002 respectively. This data would indicate that lake trout in this lake are likely to be highly stressed.

Moose

Total phosphorus (TP) concentration for the euphotic zone in 2014 was 0.008 mg/L. Historical data from 2001, 2004 and 2007 show a range of TP concentrations from 0.004 to 0.011 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.051 to 0.076 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.065 mg/L. All chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 was 3.0 to 4.0 m. The historical Secchi depth measurements ranged from 4.4 to 6.25 m. Moose Lake has moderate to good water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.05 mg/L in Basin 1. Historical MVWHDO concentrations were 8.16, 7.73 and 7.69 mg/L in 2007, 2004 and 2001 respectively. Basin 2 MVWHDO concentrations were also above the 7.0 mg/L critical guideline. This data would indicate that lake trout in this lake are unlikely to be stressed.

Mountain (Cardiff Twp):

This lake was not sampled during the 2014-2016 survey period.

Mountain (Minden Twp)

Total phosphorus (TP) concentration for the euphotic zone in 2016 and 2017 was 0.005 mg/L. Historical data from 2001 and 2008 show a range of TP concentrations from 0.004 to 0.032 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 and 2017 ranged from 0.02 to 0.25 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.092 mg/L. Alkalinity was a little lower in 2016, all other chemical parameters were similar to the historical 2001-2008 range.

Secchi disk visibility in 2016 and 2017 ranged from 4.5 to 6.5 m. The historical Secchi depth measurements ranged from 3.6 to 8.0 m. Mountain Lake has good to excellent water clarity.

The 2016 and 2017 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) were 5.11 and 5.46 mg/L respectively. Historical MVWHDO concentrations were 6.34, 7.04 and 6.24 mg/L in

2008, 2003 and 2002 respectively. This data would indicate that lake trout in this lake are likely to be moderately stressed.

North

Total phosphorus (TP) concentration for the euphotic zone in 2014 was 0.008 mg/L. Historical data from 2002, 2003, 2005 and 2007 show a range of TP concentrations from 0.005 to 0.008 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2014 was 0.052 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.118 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters were similar to the historical 2002-2007 range.

Secchi disk visibility in 2014 was 4.0 m. The historical Secchi depth measurements ranged from 2.9 to 4.5 m. North Lake has moderate water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.12 mg/L. Historical MVWHDO concentrations were 6.29, 7.75, 7.4 and 6.88 mg/L in 2010, 2007, 2003 and 2002 respectively. This data would indicate that lake trout in this lake are unlikely to be under stress.

North Pigeon

Total phosphorus (TP) concentration for the euphotic zone in 2016 was 0.006 mg/L. Historical data from 2002 and 2008 show a range of TP concentrations from 0.006 to 0.01 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2016 ranged from 0.02 to 0.23 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.026 mg/L. Alkalinity was a little lower in 2016, all other chemical parameters in 2016 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2016 was 2.75 to 5.5 m. The historical Secchi depth measurements ranged from 2.25 to 7 m. North Pigeon Lake water clarity is variable ranging from moderate to excellent.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 5.6 mg/L. Historical MVWHDO concentrations were 4.17, 5.55, 5.77 and 9.77 mg/L in 2010, 2008, 2007and 2002 respectively. This data would indicate that lake trout in this lake are likely to be moderately stressed.

Nunikani

Nunikani Lake wasn’t sampled during the 2014-2017 survey period.

Oblong

Total phosphorus (TP) concentration for the euphotic zone in 2014 was 0.006 mg/L. Historical data from 2002, 2003, 2005 and 2007 show a range of TP concentrations from 0.005 to 0.01 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2014 ranged from 0.026 to 0.036 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.101 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters were similar to the historical 2002-2007 range.

Secchi disk visibility in 2014 was 4.4 m. The historical Secchi depth measurements ranged from 4.2 to 7 m. Oblong Lake has moderate water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.66 mg/L. Historical MVWHDO concentrations were 7.84, 9.5, 6.64 and 7.73 mg/L in 2007, 2005, 2003 and 2002 respectively. This data would indicate that lake trout in this lake are unlikely to be stressed

Oxtongue

Total phosphorus (TP) concentration for the euphotic zone in 2015 and 2016 was 0.006 mg/L. Historical data from 2002, 2003 and 2009 show a range of TP concentrations from 0.004 to 0.007 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2015 and 2016 was 0.02 mg/L. The historical nitrate+nitrite concentrations ranged from 0.01 to 0.101 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters were similar to the historical 2002-2009 range.

Secchi disk visibility in 2015 and 2016 ranged from 3.0 to 3.75 m. The historical Secchi depth measurements ranged from 3.0 to 4.0 m. Oxtongue Lake has moderate water clarity.

The 2015 and 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) in Basin 1 were 7.21 and 5.65 mg/L respectively. Historical MVWHDO concentrations in Basin 1 were 5.66, 5.61 and 7.15 mg/L in 2009, 2003 and 2002 respectively. This data would indicate that MVWHDO concentrations in this lake are variable and lake trout populations may undergo periods of stress.

Paudash

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.007 to 0.01 mg/L. Historical data from 2001, 2003 and 2007 show a range of TP concentrations from 0.004 to 0.016 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.034 to 0.187 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.086 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 3.8 to 5.45 m. The historical Secchi depth measurements ranged from 3.0 to 6.25 m. Paudash Lake has moderate to good water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) in the North Basin was 8.31 mg/L and 6.78 mg/L in Joe Bay. Historical MVWHDO concentrations in the North Basin were 9.34, 8.52 and 7.03 mg/L in 2007, 2003 and 2001 respectively. The historical MVWHDO concentrations in Joe Bay were under the critical 7.0 mg/L guideline. This data would indicate that lake trout in the North Basin of this lake are unlikely to be stressedin the North basin but stressed in Joe Bay.

Percy

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged from 0.007 to 0.015 mg/L. Historical data from 2002, 2003, 2007 and 2008 show a range of TP concentrations from 0.004 to 0.006 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.111 to 0.207 mg/L. The historical nitrate+nitrite concentrations ranged from 0.011 to 0.127 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2002-2008 range.

Secchi disk visibility in 2014 ranged from 2.95 to 3.3 m. The historical Secchi depth measurements ranged from 2.7 to 5.8 m. Percy Lake has moderate water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.14 mg/L in Basin 1 and 6.99 mg/L in Basin 2. Historical MVWHDO concentrations in the Basin 1 were 7.25, 7.7, 7.0 and 7.21 mg/L in 2008, 2007, 2003 and 2002 respectively. The historical MVWHDO concentrations in Basin 2 were just under the critical 7.0 mg/L guideline. This data would indicate that lake trout in the Basin 1 of this lake are unlikely to be stressed and marginally stressed in Basin 2.

Pusey (Dark)

Total phosphorus (TP) concentration for the euphotic zone in 2014 was 0.01mg/L. Historical data from 2001, 2003 and 2007 show a range of TP concentrations from 0.004 to 0.008 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.109 to 0.164 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.076 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001-2007 range.

Secchi disk visibility in 2014 ranged from 4.5 to 5.0 m. The historical Secchi depth measurements ranged from 3.9 to 6.1 m. Pusey Lake has good water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 5.19 mg/L. Historical MVWHDO concentrations were 3.76, 4.04 and 3.76 mg/L in 2007, 2003 and 2001 respectively. This data would indicate that lake trout in this lake are likely to be stressed.

Raven

Total phosphorus (TP) concentration for the euphotic zone in 2015 was 0.005mg/L. Historical data from 2002, 2003 and 2009 show a range of TP concentrations from 0.003 to 0.006 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were 0.02 mg/L. The historical nitrate+nitrite concentrations ranged from 0.01 to 0.106 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002-2009 range.

Secchi disk visibility in 2015 ranged from 4.0 to 5.25 m. The historical Secchi depth measurements ranged from 4.0 to 6.0 m. Raven Lake has good water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.58 mg/L and 9.92 mg/L in Basin1 and Basin 2 respectively. Historical MVWHDO concentrations have all been above the 7.0 mg/L critical guideline. Lake trout in this lake are unlikely to be stressed.

Red Pine

Total phosphorus (TP) concentrations for the euphotic zone in 2016 ranged from 0.005 to 0.009 mg/L. Historical data from 2002 and 2009 show a range of TP concentrations from 0.003 to 0.012 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2016 were 0.02 to 0.1 mg/L. The historical nitrate+nitrite concentrations ranged from 0.01 to 0.102 mg/L. Alkalinity was a little lower in 2016, all other chemical parameters in 2016 were similar to the historical 2002-2009 range.

Secchi disk visibility in 2016 ranged from 4.0 to 7.8 m. The historical Secchi depth measurements ranged from 3.8 to 7.25 m. Raven Lake has good to excellent water clarity.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 8.0 mg/L in both basins. Historical MVWHDO concentrations in the Basin 1 were 8.11 and 8.75 mg/L in 2009 and 2002 respectively. This data would indicate that lake trout in this lake are unlikely to be stressed

Redstone

Total phosphorus (TP) concentrations for the euphotic zone in 2015 was 0.005 mg/L. Historical data from 2008 show a range of TP concentrations from 0.002 to 0.005 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were 0.02 to 0.055mg/L. The historical nitrate+nitrite concentrations ranged from 0.008 to 0.141 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2008 range.

Secchi disk visibility in 2015 ranged from 3.75 to 5.1 m. The historical Secchi depth measurements ranged from 4 to 5.8 m. Redstone Lake has good water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) were 10.06, 9.07 and 9.66 mg/L in basins 1, 2 and 3 respectively. Historical MVWHDO concentrations in the North Basin were 9.34, 8.52 and 7.03 mg/L in 2007, 2003 and 2001 respectively. The historical MVWHDO concentrations in all basins were well above the critical 7.0 mg/L guideline. This data would indicate that lake trout in this lake are unlikely to be stressed

Sheldon

Sheldon Lake wasn't sampled during the 2014-2017 survey period.

Sherborne

Total phosphorus (TP) concentrations for the euphotic zone in 2015 was 0.005 mg/L. Historical data from 2002 and 2009 show a range of TP concentrations from 0.002 to 0.009 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2015 were 0.02 mg/L. The historical nitrate+nitrite concentrations ranged from 0.01 to 0.074 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2008 range.

Secchi disk visibility in 2015 ranged from 3.75 to 5.8 m. The historical Secchi depth measurements ranged from 3.7 to 7.25 m. Sherborne Lake has good water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) were 6.93, 6.01 and 6.63 mg/L in basins 1, 2 and 3 respectively. The historical MVWHDO concentrations in all basins were above the critical 7.0 mg/L guideline. This data would indicate that lake trout in this lake are unlikely to be stressed

Silent

Total phosphorus (TP) concentration for the euphotic zone in 2014 was 0.01 mg/L. Historical data from 2001 and 2007 show a range of TP concentrations from 0.006 to 0.036 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2014 was 0.058 mg/L. The historical nitrate+nitrite concentrations ranged from 0.011 to 0.167 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2008 range.

Secchi disk visibility in 2014 was 4.5 m. The historical Secchi depth measurements ranged from 4.0 to 6.0 m. Silent Lake has good water clarity.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 3.95 mg/L. The historical MVWHDO concentrations were 3.89 and 3.2 in 2007 and 2001. This data would indicate that lake trout in this lake are likely to be highly stressed.

Slipper

Total phosphorus (TP) concentration for the euphotic zone in 2015 was 0.005 mg/L. Historical data from 2002 and 2008 show a range of TP concentrations from 0.003 to 0.005 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2015 was 0.02 mg/L. The historical nitrate+nitrite concentrations ranged from 0.032 to 0.052 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2008 range.

Secchi disk visibility in 2015 was 5.0 m. The historical Secchi depth measurements ranged from 4.5 to 7.25 m. Slipper Lake has good to excellent water clarity.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 6.25 mg/L. The historical MVWHDO concentrations were 7.44 and 7.52 mg/l in 2008 and 2002. This data would indicate that lake trout in this lake are unlikely to be stressed.

South Anson

South Anson was not sampled during the 2014-2016 survey as it is no longer managed as a lake trout lake.

Soyers

Total phosphorus (TP) concentration for the euphotic zone in 2016 was 0.005 mg/L. Historical data from 2001 and 2004, 2005 and 2008 show a range of TP concentrations from 0.009 to 0.013 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2016 ranged from 0.02 to 0.143 mg/L. The historical nitrate+nitrite concentrations ranged from 0.029 to 0.175 mg/L. Alkalinity was a little lower in 2016, all other chemical parameters in 2016 were similar to the historical 2001 to 2008 range.

Secchi disk visibility in 2016 was 3.63 to 4.5 m. The historical Secchi depth measurements ranged from 2.5 to 5.75 m. Soyers Lake water clarity ranges between poor and good.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 7.8 mg/L. The historical MVWHDO concentrations were 9.61, 8.65, 7.8 and 7.08 mg/L in 2007, 2005, 2004 and 2001. This data would indicate that lake trout in this lake are unlikely to be stressed.

St Nora

Total phosphorus (TP) concentrations for the euphotic zone in 2016 and 2017 was 0.005 mg/L. Historical data from 2002 and 2009 show a range of TP concentrations from 0.004 to 0.008 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2016 and 2017 ranged from 0.02 to 0.141 mg/L. The historical nitrate+nitrite concentrations ranged from 0.025 to 0.114 mg/L. Alkalinity was a little lower in 2016 and 2017, all other chemical parameters in 2016 and 2017 were similar to the historical 2002 to 2009 range.

Secchi disk visibility in 2016 and 2017 ranged from 4.0 to 5.5 m. The historical Secchi depth measurements ranged from 2.75 to 6.5 m. St. Nora Lake water clarity ranges between good and excellent.

The 2016 and 2017 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentrations (MVWHDO) in the north basin were 7.86 and 8.28 mg/L respectively. The historical MVWHDO concentrations were 5.72, 8.39 and 8.93 mg/L in 2010, 2009 and 2002. The 2010 profile was not conducted by MOECC staff and is considered suspect. This data would indicate that lake trout in this lake are unlikely to be stressed.

Stocking

Total phosphorus (TP) concentration for the euphotic zone in 2015 was 0.005 mg/L. Historical data from 2002, 2003, 2004 and 2008 show a range of TP concentrations from 0.003 to 0.012 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2015 were 0.02 mg/L. The historical nitrate+nitrite concentrations ranged from 0.014 to 0.096 mg/L. Alkalinity was a little lower in 2015, all other chemical parameters in 2015 were similar to the historical 2002 to 2008 range.

Secchi disk visibility in 2015 was 4.0 to 4.5 m. The historical Secchi depth measurements ranged from 5.0 to 5.75 m. Stocking Lake water clarity is considered to be very good.

The 2015 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 5.41 mg/L. The historical MVWHDO concentrations were 5.81, 5.92, 5.16 and 6.67 mg/L in 2008, 2004, 2003 and 2002. This data would indicate that lake trout in this lake are likely to be stressed

Stormy

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged between 0.005 and 0.009 mg/L. Historical data from 2001 and 2007 show a range of TP concentrations from 0.004 to 0.01 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2014 ranged from 0.048 to 0.092 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.042 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001 to 2007 range.

Secchi disk visibility in 2014 was 5.0 to 5.9 m. The historical Secchi depth measurements ranged from 3.2 to 7.25 m. Stormy Lake water clarity is considered to range from fair to very good.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 5.36 mg/L. The historical MVWHDO concentrations were 6.55 and 5.8 mg/L in 2007 and 2001. This data would indicate that lake trout in this lake are likely to be stressed

Twelve Mile

Total phosphorus (TP) concentrations for the euphotic zone in 2016 ranged between 0.005 and 0.006 mg/L. Historical data from 2002 and 2008 show a range of TP concentrations from 0.003 to 0.01 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentration in 2016 ranged from 0.106 to 0.180 mg/L. The historical nitrate+nitrite concentrations ranged from 0.022 to 0.093 mg/L. Alkalinity was a little lower in 2016, all other chemical parameters in 2016 were similar to the historical 2001 to 2007 range.

Secchi disk visibility in 2016 was 5.0 to 6.5 m. The historical Secchi depth measurements ranged from 3.3 to 6.5 m. Twelve Mile Lake water clarity is considered to range from fair to very good.

The 2016 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 4.79 mg/L. The historical MVWHDO concentrations were 5.47 and 5.39 mg/L in 2008 and 2002. This data would indicate that lake trout in this lake are likely to be stressed.

Two Islands

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged between 0.008 and 0.011 mg/L. Historical data from 2001 and 2007 show a range of TP concentrations from 0.005 to 0.011 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.052 to 0.158 mg/L. The historical nitrate+nitrite concentrations ranged from 0.005 to 0.049 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001 to 2007 range.

Secchi disk visibility in 2014 was 3.4 to 5.2 m. The historical Secchi depth measurements ranged from 3.8 to 8.0 m. Twelve Mile Lake water clarity is considered to range from fair to very good.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 0.94 mg/L. The historical MVWHDO concentrations were 3.25 and 2.23 mg/L in 2007 and 2001. This data would indicate that lake trout in this lake are likely to be stressed.

Wilbermere

Total phosphorus (TP) concentrations for the euphotic zone in 2014 ranged between 0.008 and 0.009 mg/L. Historical data from 2001, 2004 and 2007 show a range of TP concentrations from 0.005 to 0.011 mg/L. When TP concentrations exceed 0.02 mg/L there is an increased likelihood of nuisance algal blooms occurring.

Nitrate+nitrite concentrations in 2014 ranged from 0.175 to 0.194 mg/L. The historical nitrate+nitrite concentrations ranged from 0.034 to 0.129 mg/L. Alkalinity was a little lower in 2014, all other chemical parameters in 2014 were similar to the historical 2001 to 2007 range.

Secchi disk visibility in 2014 was 3.25 to 3.75 m. The historical Secchi depth measurements ranged from 3.8 to 5.1 m. Wilbermere Lake water clarity is considered to range from fair to good.

The 2014 late summer/early fall critical period mean volume weighted hypolimnion dissolved oxygen concentration (MVWHDO) was 3.52 mg/L. The historical MVWHDO concentrations were 2.55, 1.45 and 2.12 mg/L in 2007, 2004, and 2001 respectively. This data would indicate that lake trout in this lake are likely to be highly stressed.