

**LICA LONG TERM SOIL ACIDIFICATION MONITORING
TUCKER LAKE SITE ESTABLISHMENT**

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EXECUTIVE SUMMARY

In 2007 LICA commissioned a preliminary study of potential soil and water acidification within the LICA Area which included recommendations for monitoring soil chemistry. The protocol of a long term monitoring program by Alberta Environment and Sustainable Resource Development was adopted by LICA, and a study to examine and select potential sites for monitoring was initiated in fall 2009.

An assessment of potential monitoring sites was conducted in 2009 and 2010, with a number of sites recommended as being suitable for soil monitoring. The criteria for suitable sites for monitoring, description of the site selection process, and application of a soil acidification model to predict potential acidification rates in the sites assessed were described in the 2011 report *Long Term Soil Acidification Monitoring in the LICA Study Area* (Abboud and Turchenek 2011). The establishment of a monitoring site and collection of the baseline soil chemistry data in Moose Lake Provincial Park was carried out in 2010, and results of the initial sampling and chemical analysis of soil samples are also described in the above report. Another site was established in Whitney Lakes Provincial Park in 2011. A third site located near Tucker Lake was selected in 2012; the establishment and presentation of the baseline soil data for this site is presented in this herein.

As at the Moose Lake and Whitney Lakes sites, long term sampling plots were established at two locations, which are referred to as the North and South Tucker Lake sub-sites. Each sub-site was subdivided into 12 plots and each of these was further subdivided into 12 subplots. One subplot within each of the 12 plots was sampled, thus providing 12 replicates for statistical analysis. Sampling is to occur every four years. The layers sampled in each subplot are the LFH horizon and the 0-2, 2-5, 5-10, 10-15, 15-30, 30-45, and 45-60 cm intervals. At each of the two sub-sites, soil profile descriptions were also completed according to protocols of the Canadian soil classification system. Soil samples were obtained by digging a square pit (about 60 cm x 60 cm) near the centre of each subplot. About one litre of sample was obtained from each of the above soil layers.

Laboratory analyses were completed according to methods applied in the Alberta Environment and Sustainable Resource Development long term monitoring program. After completion of analyses, all remaining sample materials were archived. Data presented in table format in this report represent the baseline conditions for the soil monitoring program at the Tucker Lake site. As sampling of this site is carried out in the future, statistical analyses will be carried out to detect any changes over time.

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Glossary of Terms Abbreviations and Symbols

| | |
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| A horizon | A mineral soil horizon formed at or near the surface in the zone of removal of materials in solution and suspension, or maximum accumulation of organic carbon, or both. |
| AEW | Alberta Environment and Water. |
| AITF | Alberta Innovates Technology Futures. |
| Al ³⁺ | Aluminum ion. |
| B horizon | A mineral soil horizon characterized by one or more of the following: an enrichment in silicate clay, iron, aluminum or humus; a prismatic or columnar structure that exhibits pronounced coatings or staining associated with substantial amounts of exchangeable sodium, and/or an alteration of hydrolysis, reduction, or oxidation to give a change in colour or structure from the horizons above or below, or both. |
| BC:Al ratio | Ratio of base cations to aluminum in water in pores in the soil. BC refers to the sum of the cations calcium, magnesium, sodium and potassium. |
| Brunisolic soil, Brunisol | Brunisols in northeast Alberta are Boreal forest soils that occur mainly in sandy glacial sediments under jack pine forests. The main characteristics of these soils are the presence of a gray coloured topsoil (Ae) horizon) underlain by a brown to reddish brown coloured upper subsoil (Bm horizon). |
| C horizon | A mineral soil horizon comparatively unaffected by the pedogenic processes operative in A and B, except gleying, and the accumulation of carbonates and more soluble salts. |
| Ca ⁺ | Calcium ion. |
| Ca:Al ratio | Ratio of calcium to aluminum in water in pores in the soil. |
| Cation | Ion with a positive charge. |
| Cation exchange | The interchange between a cation in solution and another on the surface of any surface-active material in the soil such as clay or organic matter. |
| Cation exchange capacity | The total amount of exchangeable cations that a soil can adsorb, expressed in centimoles (positive charge) per kg of soil (cmol _c kg ⁻¹). |
| cmol _c kg ⁻¹ | See 'cation exchange capacity' above. |
| Coarse fragments | Soil particles larger than 2 mm diameter; general term for gravel, cobbles, stones and boulders. |
| Drainage | The removal of excess surface water or groundwater from land by natural runoff and percolation, or by surface or subsurface drains. |
| Eolian | Well sorted materials, predominantly sand and silt, deposited by wind (e.g., sand dunes). |

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| Exceedance | An emission whose measured value is more than that allowed by government regulations. |
| Forest floor | All dead vegetable and organic matter including litter and unincorporated humus on the mineral soil surface under forest vegetation; also called the LFH soil horizon, litter layer, or duff layer. |
| Glaciofluvial | Material moved by glaciers and subsequently deposited by streams flowing from the melting ice. The deposits are commonly sorted, such that they consist mainly of sand or gravel. |
| Glacial | Generally refers to the landscape and materials in the landscape that were produced by or derived from glaciers and ice sheets; e.g., sandy, glaciofluvial plain. |
| Horizon, soil | A layer of soil or soil material nearly parallel to the land surface; it differs from adjacent soil layers in properties such as colour, structure, texture, consistence and chemical, biological and mineralogical composition. |
| <i>in situ</i> | In place; commonly refers to an approach to remove bitumen from oil sand while the oil sand deposit is still in place underground. |
| K ⁺ | Potassium ion. |
| kmol | 1,000 mole (see mol L ⁻¹ below). |
| kmol ha ⁻¹ yr ⁻¹ | Kilomoles hydrogen ion equivalents per hectare per year. In assessing the amounts and critical loads of acidifying compounds, the deposition of nitrogen oxide or sulphur dioxide on land or water is converted to equivalent units of acidity (hydrogen ion equivalents) on an area (hectare) basis. Sulphur deposition is commonly expressed as kilograms of sulphur per hectare. One mole of sulphur is 32 grams, and 1 kmol is 32,000 g, or 32 kg. If 32 kilograms of sulphur falls on 1 ha of soil or water, this is equal to 1 kmol ha ⁻¹ . Sulphur is converted to sulphur dioxide (SO ₂), and then to sulphuric acid (H ₂ SO ₄). Since there are two hydrogen ions (H) in H ₂ SO ₄ , the number of hydrogen ions equivalent to 1 kmol of sulphur is 2 kmol. |
| LICA | Lakeland Industry and Community Association. |
| LFH | A soil horizon consisting of an organic layer developed primarily from leaves, twigs, and woody materials, with a minor component of mosses; same as forest floor. |
| Litter | See forest floor, LFH. |
| Mg ⁺ | Magnesium ion. |
| mol L ⁻¹ | Unit of concentration of a substance in water; a mole is the unit amount of a substance. One mole of a substance is the mass that contains the same number of particles (atoms, molecules, ions, or electrons) as there are atoms in 12 grams of the isotope carbon-12. |
| Na ⁺ | Sodium ion. |
| NAD 83 | North American Datum 1983, Geographic coordinate system. This datum must |

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|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | be recorded with GPS coordinates. |
| NH_4^+ | Ammonium ion. |
| NO_2 | Nitrogen dioxide. |
| NO | Nitric oxide. |
| NO_3^- | Nitrate Ion. |
| NO_x | General expression for oxides of nitrogen (mainly $\text{NO} + \text{NO}_2$). |
| PAI | Potential Acid Input; usually expressed as $\text{kmol ha}^{-1} \text{yr}^{-1}$. |
| Parent material | The unconsolidated mineral (e.g., sand, clay, clay till) or organic material (e.g., peat) from which a soil has developed by soil forming processes. |
| pH, soil | The negative logarithm of the hydrogen-ion activity of a soil solution. The degree of acidity or alkalinity of a soil, as determined by a suitable electrode or indicator at a specified moisture content or soil-water (or CaCl_2 solution) ratio and expressed in terms of the pH scale. |
| Precipitation | The rain and snow that falls on the earth's surface. |
| Profile, soil | A vertical section of the soil through all its horizons and extending into the parent material. |
| Reaction, soil | The degree of acidity or alkalinity of a soil, usually expressed as a pH value. Descriptive terms used herein with certain ranges in pH are: acid, less than 5.5; neutral, 5.5-7.4; alkaline, greater than 7.4. |
| Sand | A soil particle between 0.05 and 2.0 mm equivalent diameter. Also, a textural class composed mainly of sand-sized particles. |
| Silt | A soil particle between 0.002 and 0.05 mm equivalent diameter. |
| Soil | The naturally occurring, unconsolidated mineral or organic material at least 0.1 m thick that occurs at the earth's surface and is capable of supporting plant growth. Soil extends from the earth's surface through the genetic horizons, if present, into the underlying material to the depth of the control section (normally 1 or 2 m; 1.6 m in the case of Organic (peat) soils). Soil development involves climatic factors and organisms, conditioned by relief and water regime, acting through time on geological materials, and thus modifying the properties of the parent material. |
| SO_2 | Sulphur dioxide. |
| SO_4^{2-} | Sulphate ion. |
| Solution, soil | The aqueous liquid phase of the soil and its solutes consisting of ions from the surfaces of the soil particles and of other soluble materials. |
| SO_x | General expression for oxides of sulphur (mainly $\text{SO} + \text{SO}_2$). |
| Subsoil | The B horizons of soils with distinct profiles. In soils with weak profile development, the subsoil can be defined as the soil below the plowed soil (or its equivalent of surface soil) in which roots normally grow. |
| Subxeric | Soil moisture condition whereby water moves very rapidly; soil is moist for a short |

period following precipitation.

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| Texture, soil | The relative percentages of the soil separates in a soil (i.e., sand, silt and clay particles). |
| Topsoil | (i) The layer of soil moved in cultivation. (ii) The A horizon. (iii) The Ah horizon. (iv) Presumably fertile soil material used to topdress road banks, gardens and lawns. |
| UTM | Universal Transverse Mercator (cartography); map coordinate system. |
| Water holding capacity | The percentage of water remaining in the soil material after having been saturated and after drainage of free water has practically ceased. |
| WBEA | Wood Buffalo Environmental Association. |
| Weathering | The physical and chemical disintegration, alteration and decomposition of rocks and minerals at or near the earth's surface by biological, chemical, and physical agents or combinations of them. |
| Xeric | Soil moisture condition whereby water moves very rapidly; soil is moist for a negligible to brief period following precipitation. |

1.0 INTRODUCTION

The Lakeland Industry and Community Association has as one of its objectives the implementation of a program to measure, monitor, and collect regional environmental air and soil data in the LICA area (LICA, 2009). In 2009, the Alberta Research Council (now Alberta Innovates – Technology Futures (AITF)) provided recommendations for establishing a long term soil acidification monitoring program and conducted a preliminary assessment of potential soil monitoring sites. The program follows the protocols of the Long Term Soil Acidification Monitoring (LTSAM) program of Alberta Environment (now Alberta Environment and Sustainable Resource Development (AESRD)). The purpose of the AESRD program is to track possible changes in acidification status in different parts of the province. Eight sites were established in the early 1980s, and a ninth site was added in 2008. The AESRD program was recommended by AITF in part because of the presence of a monitoring site already located in the east side of the LICA study area near Cold Lake.

An assessment of potential monitoring sites was conducted in 2009 and 2010, with a number of sites recommended as being suitable for soil monitoring. The criteria for suitable sites for monitoring, description of the site selection process, and application of a soil acidification model to predict potential acidification rates in the sites assessed were described in the 2011 report *Long Term Soil Acidification Monitoring in the LICA Study Area* (Abboud and Turchenek 2011). The establishment of a monitoring site and collection of the baseline soil chemistry data in Moose Lake Provincial Park was carried out in 2010, and results of the initial sampling and chemical analysis of soil samples are also described in the above report. Another site was established in Whitney Lakes Provincial Park in 2011. The establishment of a third site near Tucker Lake and presentation of the baseline soil data for this site is presented herein.

2.0 METHODS

2.1 SITE SELECTION

A site located near Tucker Lake was selected for establishment of soil acidification monitoring plots principally because of the suitability of soils and due to its location, which is characterized by potentially elevated levels of acidic deposition as indicated by modelling carried out by AMEC Earth & Environmental (2007). Site selection information is presented in the 2011 report *Long Term Soil Acidification Monitoring in the LICA Study Area* (Abboud and Turchenek, 2011). Attributes of the soil at this site, summarized from the above noted 2011 report, include pH(CaCl₂) of about 4.5 in both the LFH (also called litter or duff) and the surface mineral soil, and low cation exchange capacity and exchangeable base saturation percentage.

The site is located in a jack pine stand similar to those at the Moose Lake and Whitney Lakes sites. A soil acidification model was applied to both the Moose Lake and Whitney Lake soils. The soil model showed that the pH could decrease by about a half unit in 50 years at an acid deposition rate of 0.3 kmol ha⁻¹yr⁻¹, and by a full unit in 50 years at a 0.5 kmol ha⁻¹yr⁻¹ rate. The soil model also showed that within 50 years the exchangeable base saturation percentage and the base cation to aluminum ratio could decrease to relatively low levels, even at very low rates of acid deposition. The current deposition rate is estimated to be 0.14 to 0.17 kmol ha⁻¹yr⁻¹ (AMEC Earth & Environmental 2007).

Soil models are not expected to be accurate in prediction, but are useful in indicating trends. The modelling of the Moose Lake and Whitney Lake soils suggests that soil chemistry changes could occur within the possible lifetime of industrial activities in the region. The soil parameter with the greatest potential change is base saturation percentage, with changes consisting of decreases to levels that could affect vegetation growth, according to previous research.

2.2 Plot Establishment

The sampling design for monitoring was based on a stratified random sampling procedure as originally established by AESRD in the Long Term Soil Acidification Monitoring program (Roberts et al., 1989). Two sub-sites (24 m X 24 m) were located within each site in order to alleviate concerns about loss of a site through fire or other agent, and each sub-site was subdivided into 12 plots (6 m X 8 m) which were assigned letters from A to L. The plots were further subdivided into 12 subplots (2 m X 2 m). In some locations with small areas of uniform jack pine stands, the plot sizes were 18 m by 18 m and subplot sizes were 1.5 m x 1.5 m.

Components of monitoring plot establishment were as follows:

- at a proposed site, the landscape was examined and two sub-site locations were selected based on uniformity of landscape and tree canopy, and on distance from potential human disturbances and from other types of ecosystems (100 m is suggested; i.e., at least 100 m from neighbouring aspen, muskeg, or other non- jack pine ecosystems);
- plots and subplot dimensions at each sub-site were measured;
- corners of plots were staked with cedar pegs, with about 5-10 cm of the stake left exposed above ground level;
- ~10 cm diameter treated posts were installed, with 1 m exposed above-ground, at the

- corners of each sub-site;
- GPS coordinates, legal location, and distance of the two sub-sites from each other were recorded; and,
- metal or other permanent labels were appended to one corner post at each sub-site.

The two sampling locations at the Tucker Lake site are referred to as the North and South sub-sites. The layout for each of these is presented in Figures 1 and 2.

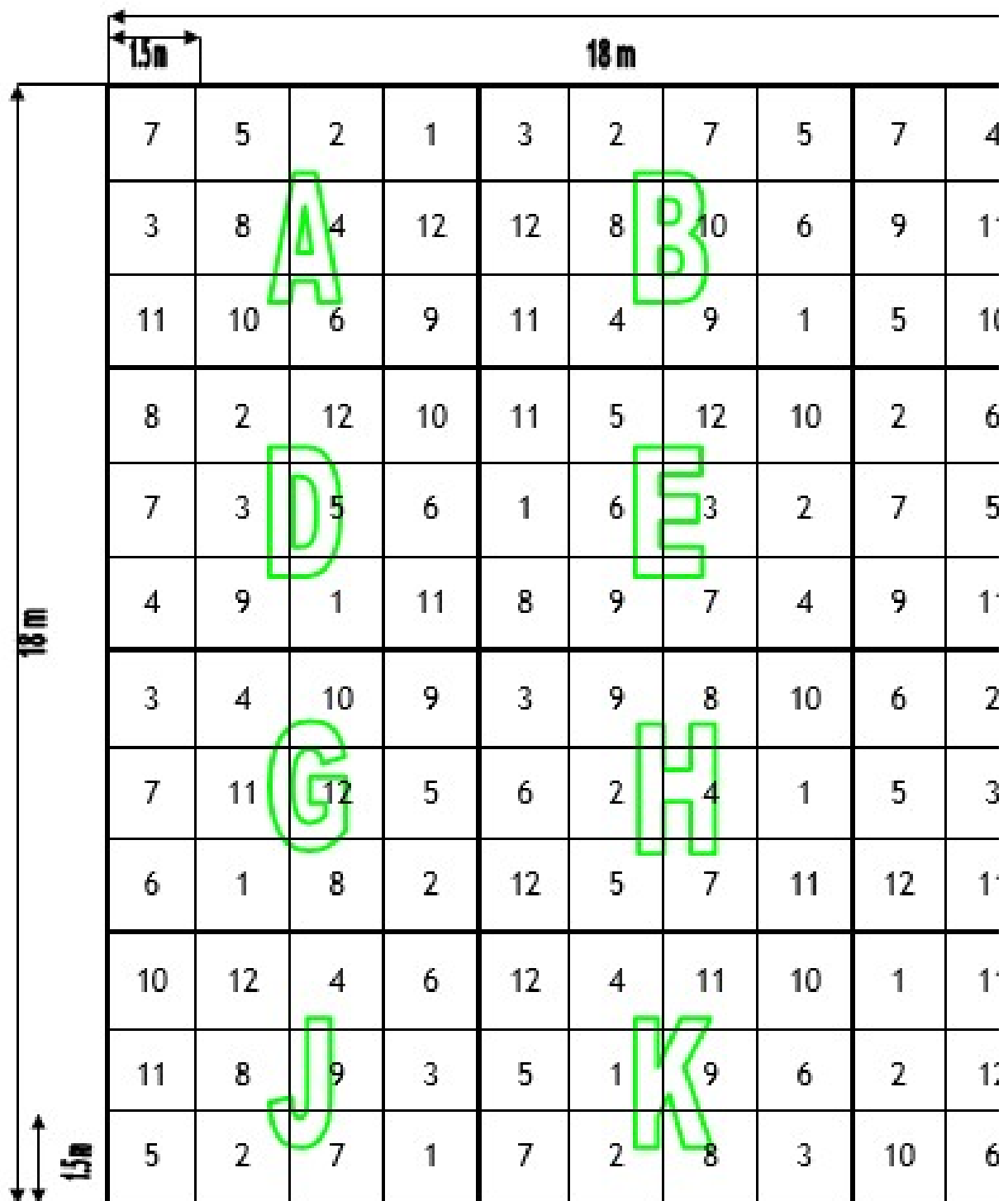
The 12 plots within each sub-site are labelled A to L. The subplots were randomly assigned a number from 1-12, with number 1 indicating the subplot sampled in the first sampling event, number 2 designating the subplot for the second sampling event, and so on. This sampling scheme provides a total of 12 replicates for each sampling event, and 12 sampling events over the course of the monitoring program.

2.3 Soil Sampling

Soil samples are obtained from 8 depths in each subplot, as follows: LFH horizon, 0-2 cm, 2-5 cm, 5-10 cm, 10-15 cm, 15-30 cm, 30-45 cm, and 45-60 cm intervals. In obtaining soil samples, a square pit (about 60 cm x 60 cm) is dug near the centre of each subplot. The sample size from each layer is about 1 litre. The upper soil layers are sampled with a flat scoop, and lower layer samples are obtained by scraping the pit sides. A small area of surface vegetation is carefully removed to reveal the LFH (or duff) layer, which is sampled by scraping the material off the soil surface with a spoon or other suitable utensil. All sampling is completed using plastic gloves, and stainless steel or plastic sampling tools, to avoid contamination.

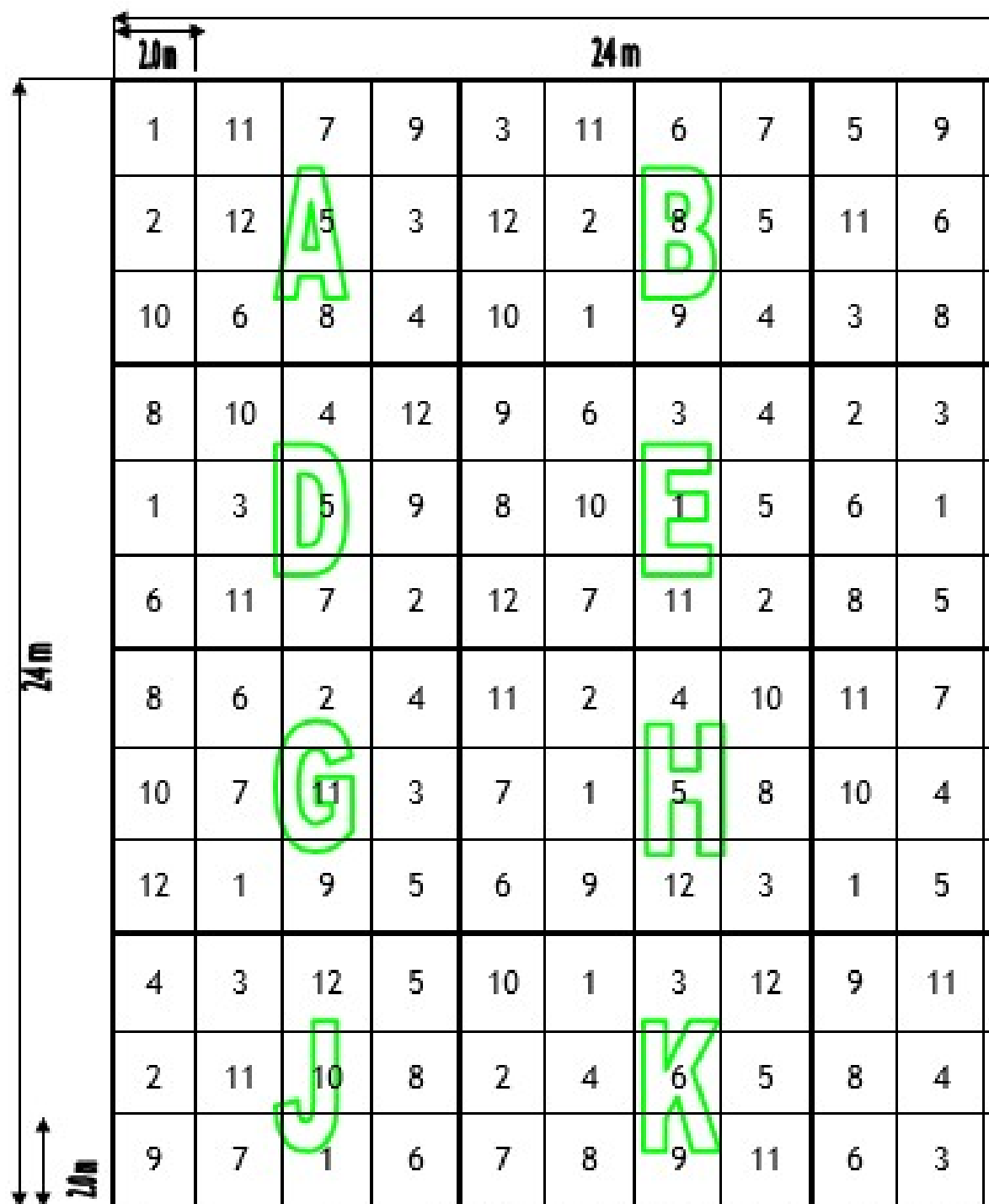
During excavation of soil pits, care is taken to prevent contamination of the soil surface and adjacent subplots. The soils are dug with a shovel, and excavated soil materials are placed on plastic sheets or tarps. After completion of sampling, major soil layers are replaced in the original sequence. Each layer is tamped so that all material is replaced with minimal increase in final volume. The topsoil and vegetation cap, originally cut to open the pit, are replaced. Litter and lichen are spread over the surface so as to leave it with a natural appearance, and to encourage rapid re-establishment of the lichen and any other plants (e.g., bearberry, lingonberry) that may have been disturbed in the sampled area.

Samples are collected in plastic bags and subsequently transported to the lab for analysis. Samples are kept cool, and if there is a delay in processing the samples at the lab, the samples are frozen.



NE corner coordinates (at Plot A): UTM NAD 83: Zone 12, N 60422
 Direction: Bearing of outside boundaries along Plots A, B, C - 155

Figure 1. Plot Layout of the Tucker Lake North Sub-Site



SE corner coordinates (at Plot L): UTM NAD 83: Zone 12, N 6041
 Direction: Bearing of outside boundary along Plots A, B, C: 110

Figure 2. Plot Layout of the Tucker Lake South Sub-Site

2.4 SOIL PROFILE DESCRIPTIONS

Long term soil monitoring is carried out by sampling of discrete layers, as described above. Full profile descriptions area also completed according to protocols of the Canadian Soil Classification System (Soil Classification Working Group 1998) and CanSIS Manual for Describing Soils in the Field (Expert Committee on Soil Survey 1983). A single soil pit was excavated to about 1-metre depth in each of the North and South plots. Natural soil horizons were described and samples were collected for soil texture analysis and for nutrient analysis of the upper soil layers. The soil descriptions are presented in Appendix A.

2.5 LABORATORY ANALYSES

Laboratory analyses were completed according to methods applied in the AESRD long term monitoring program. Samples are initially dried at about 30°C, and then passed through a 2 mm sieve or through a rotary grinder with 2 mm openings. The grinder is used to break up any soil clumps and to separate coarse roots from the soil fine earth fraction. The methods used for the various analyses are listed in Table 1.

Table 1. Analytical Methods used for Soil Analysis

| Parameter | Method | Notes |
|--------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pH (CaCl ₂) | Method 3.11 in McKeague (1978) | The soil-to-solution ratio for litter material is 1:4 and for mineral soil is 1:2. Solution is 0.1 M CaCl ₂ . Measurement is with a combination pH electrode. |
| pH (H ₂ O) | Method 4.12 in McKeague (1978) | As above, using de-ionized water. |
| Soil Texture (% Sand, Silt and Clay) | Method 2.12 in McKeague (1978) | Hydrometer method; does not include pre-treatment for removal of hydrous oxides and organic matter. |
| Electrical Conductivity | Method 4.13 in McKeague (1978) | Measurement occurs in the saturated paste extract of a soil sample. |
| Soluble Ions | Method 3.21 in McKeague (1978) | By the saturated paste method and ICP analysis of the extract. |
| Cation Exchange Capacity - Unbuffered | Method 18.2 in Carter and Gregorich (2008) | By 0.1 M BaCl ₂ (barium chloride) extractant, and measurement of Ba by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectroscopy). |
| Exchangeable Cations | Method 18.2 in Carter and Gregorich (2008) | ICP-OES scan for Ca, Mg, Na, K, Fe, Mn, Al and Si on the unbuffered BaCl ₂ extract. |
| Total Carbon (C), Nitrogen (N), and Sulphur (S) | Method 3.611 in McKeague (1978) | LECO combustion method. |
| Available NH ₄ -N Available NO ₃ -N | Method 4.35 in McKeague (1978) | NH ₄ -N and NO ₃ -N extracted with 2N KCl and measured by steam distillation |
| Available Phosphorous (P) | Ashworth and Mrazek (1995) | Modified Kelowna extract using NH ₄ F, ammonium acetate and acetic acid, with measurement of P colorimetrically by autoanalyzer. |

3.0 MONITORING SITE RESULTS

3.1 LAND DISPOSITION AND REQUIRED PERMITS

The site is situated on Crown Land. A Public Land Standing report for the site location was obtained, and no conflicting land use issues were identified. A surface disposition reflecting the research and monitoring nature of the work is required for this type of site. Application for a disposition is still under preparation, and review by the Public Lands Division of AESRD will be completed subsequent to submission of the application.

3.2 SOIL MONITORING DATA

Soil samples from the North and South Tucker Lake sub-sites were analyzed for various soil parameters, as described above, at the AITF Soil Laboratory in Edmonton. Analysis of all sampled layers was completed for the South sub-site. Analysis was carried out only for the top four layers from the North sub-site. This generally follows practice in the AESRD long term monitoring program wherein analysis focuses on the top layers, which are expected to show any changes first. Deeper layer analyses have not been carried out, except for the first sampling event. All samples, whether analyzed or not, are archived to enable further analysis in the future if necessary.

The complete data are provided in Appendix B. Table 2 presents a summary of data for the main acidification indicators. The data consist of averages, standard deviations and coefficients of variation based on the 12 replicates from each sub-site. The data show that the highest cation exchange capacity levels and of exchangeable bases are in the 0-2 cm mineral layer.

The 2012 sampling event at the Tucker Lake site is the first of several planned sampling events to be carried out at four-year intervals. As monitoring of this site is carried out in the future, statistical analyses will be carried out to detect any changes in the parameters indicated in Table 2 over time.

Table 2. Mean Values of Soil Acidity Parameters at the Tucker Lake Monitoring Site

| Layer | Statistic | pHc | Exch Bases | CEC | BSat | K | Ca | Mg | Al | BC:Al | TC | TN | TS |
|------------|-----------|------|--------------------------|------|------|------------------------|------|------|------|-------|------|-------|-------|
| (cm) | | | (cmol kg ⁻¹) | | | (mol L ⁻¹) | | | | | (%) | | |
| North Plot | | | | | | | | | | | | | |
| LFH | Mean | 4.4 | na | na | na | na | na | na | na | na | 37.8 | 1.1 | 0.1 |
| | SD | 0.3 | na | na | na | na | na | na | na | na | 7.6 | 0.3 | 0.03 |
| | CV | 0.06 | na | na | na | na | na | na | na | na | 0.20 | 0.25 | 0.26 |
| 0-2 | Mean | 4.6 | 4.7 | 5.2 | 0.8 | 12.7 | 27.3 | 5.4 | 6.1 | 8.4 | 2.39 | 0.07 | 0.01 |
| | SD | 0.3 | 4.3 | 4.3 | 0.1 | 5.1 | 9.3 | 1.8 | 3.7 | 6.6 | 1.56 | 0.06 | 0.005 |
| | CV | 0.06 | 0.92 | 0.82 | 0.15 | 0.40 | 0.34 | 0.34 | 0.60 | 0.79 | 0.65 | 0.84 | 0.72 |
| 2-5 | Mean | 4.6 | 1.5 | 1.9 | 0.7 | 5.7 | 17.4 | 3.6 | 8.0 | 2.9 | 0.68 | 0.02 | 0.002 |
| | SD | 0.2 | 1.1 | 1.1 | 0.1 | 2.3 | 8.5 | 1.8 | 3.5 | 1.0 | 0.40 | 0.01 | 0.001 |
| | CV | 0.05 | 0.73 | 0.58 | 0.18 | 0.39 | 0.49 | 0.49 | 0.44 | 0.35 | 0.59 | 0.55 | 0.50 |
| 5-10 | Mean | 4.6 | 0.8 | 1.1 | 0.7 | 3.9 | 11.2 | 2.5 | 6.9 | 2.2 | 0.37 | 0.01 | 0.002 |
| | SD | 0.2 | 0.3 | 0.3 | 0.1 | 2.1 | 3.8 | 1.1 | 2.2 | 0.5 | 0.18 | 0.00 | 0.001 |
| | CV | 0.04 | 0.41 | 0.23 | 0.19 | 0.55 | 0.34 | 0.43 | 0.32 | 0.23 | 0.48 | 0.00 | 0.36 |
| 10-15 | Mean | 4.6 | 0.6 | 0.9 | 0.6 | 3.0 | 9.0 | 2.2 | 6.2 | 2.3 | 0.27 | <0.01 | 0.001 |
| | SD | 0.2 | 0.2 | 0.1 | 0.1 | 1.8 | 3.0 | 1.1 | 2.3 | 1.0 | 0.07 | 0.00 | 0.000 |
| | CV | 0.04 | 0.28 | 0.13 | 0.20 | 0.59 | 0.33 | 0.49 | 0.38 | 0.45 | 0.27 | 0.00 | 0.36 |
| 15-30 | Mean | 4.8 | 0.5 | 0.8 | 0.7 | 2.4 | 6.5 | 1.6 | 4.2 | 2.4 | na | na | na |
| | SD | 0.2 | 0.2 | 0.1 | 0.1 | 1.7 | 2.2 | 0.8 | 1.5 | 0.7 | na | na | na |
| | CV | 0.04 | 0.30 | 0.17 | 0.18 | 0.71 | 0.34 | 0.50 | 0.36 | 0.29 | na | na | na |
| 30-45 | Mean | 4.8 | 0.5 | 0.7 | 0.7 | 2.2 | 4.3 | 1.3 | 5.8 | 1.5 | na | na | na |
| | SD | 0.2 | 0.1 | 0.1 | 0.1 | 1.5 | 1.3 | 0.4 | 3.2 | 0.8 | na | na | na |
| | CV | 0.05 | 0.31 | 0.16 | 0.21 | 0.69 | 0.30 | 0.31 | 0.56 | 0.54 | na | na | na |
| 45-60 | Mean | 4.7 | 0.4 | 0.6 | 0.7 | 2.1 | 3.0 | 1.2 | 7.0 | 1.1 | na | na | na |
| | SD | 0.2 | 0.2 | 0.1 | 0.2 | 1.2 | 1.0 | 0.4 | 4.2 | 0.6 | na | na | na |
| | CV | 0.05 | 0.42 | 0.23 | 0.26 | 0.60 | 0.34 | 0.33 | 0.60 | 0.53 | na | na | na |
| South Plot | | | | | | | | | | | | | |
| LFH | Mean | 4.1 | na | na | na | na | na | na | na | na | 33.3 | 1.02 | 0.10 |
| | SD | 0.2 | na | na | na | na | na | na | na | na | 4.60 | 0.16 | 0.02 |
| | CV | 0.04 | na | na | na | na | na | na | na | na | 0.14 | 0.15 | 0.24 |
| 0-2 | Mean | 4.4 | 3.1 | 4.1 | 0.7 | 14.9 | 32.0 | 6.1 | 6.7 | 6.5 | 2.57 | 0.08 | 0.01 |
| | SD | 0.2 | 1.7 | 1.9 | 0.1 | 9.1 | 14.6 | 2.3 | 3.1 | 2.5 | 1.63 | 0.06 | 0.004 |
| | CV | 0.04 | 0.55 | 0.48 | 0.14 | 0.61 | 0.46 | 0.37 | 0.45 | 0.38 | 0.63 | 0.73 | 0.54 |
| 2-5 | Mean | 4.5 | 1.5 | 2.0 | 0.7 | 6.0 | 19.9 | 3.8 | 8.6 | 3.1 | 0.89 | 0.02 | 0.00 |
| | SD | 0.2 | 0.9 | 0.9 | 0.1 | 2.2 | 8.1 | 1.2 | 2.6 | 1.6 | 0.36 | 0.01 | 0.00 |
| | CV | 0.04 | 0.59 | 0.46 | 0.17 | 0.37 | 0.41 | 0.32 | 0.30 | 0.50 | 0.41 | 0.54 | 0.38 |
| 5-10 | Mean | 4.5 | 0.7 | 1.2 | 0.6 | 3.8 | 13.5 | 2.8 | 8.1 | 2.4 | 0.45 | 0.01 | 0.001 |
| | SD | 0.2 | 0.4 | 0.4 | 0.1 | 1.4 | 5.1 | 0.9 | 3.0 | 0.8 | 0.15 | 0.001 | 0.000 |
| | CV | 0.05 | 0.51 | 0.31 | 0.19 | 0.38 | 0.38 | 0.32 | 0.38 | 0.35 | 0.33 | 0.11 | 0.34 |
| 10-15 | Mean | 4.6 | 0.4 | 0.8 | 0.5 | 2.6 | 9.1 | 2.0 | 5.7 | 2.5 | 0.27 | <0.01 | 0.001 |
| | SD | 0.1 | 0.1 | 0.2 | 0.1 | 1.4 | 5.1 | 0.9 | 3.0 | 0.8 | 0.06 | 0.00 | 0.000 |
| | CV | 0.03 | 0.33 | 0.19 | 0.20 | 0.56 | 0.56 | 0.44 | 0.53 | 0.34 | 0.24 | 0.00 | 0.000 |

Abbreviations: pHc – pH measured in 0.01M CaCl₂
CEC – cation exchange capacity
K, Ca, Mg, Al – water soluble cations
TC – total carbon
TS – total sulphur
SD – standard deviation
na – not available or not applicable

Exch Bases – sum of exchangeable K, Na, Ca and Mg
BSat – base saturation (sum of exchangeable base/CEC)
BC:Al – ratio of (K+Ca+Mg) concentration to Al concentration
TN – total nitrogen
Mean – average of 12 replicates (or subplots) in each plot
CV – coefficient of variation

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APPENDIX A

SOIL PROFILE DESCRIPTIONS TUCKER LAKE LONG TERM SOIL ACIDIFICATION MONITORING SITE

Tucker Lake – North Sub-Site

Location: Zone 12U E0523307 N6042273 (UTM NAD83)
South of west end of Tucker Lake

Classification:

Subgroup: Eluviated Dystric Brunisol

Family: Sandy, siliceous, neutral, cold, subarid family

Series: Nestow

Landform:

Genetic Material: Glaciofluvial

Surface Expression: Undulating/inclined; 2-9% slope

Drainage/ Perviousness: Very rapidly drained; high perviousness

Site Features: Site gently inclined; non stony

Vegetation: a1 ecosite phase (Beckingham and Archibald 1996); jack pine/
/lichen/moss

Profile Description:

| | | |
|-----|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| LF | 4 to 0 cm | Brown, dark gray and black; non to slightly decomposed lichen, moss and needles. |
| Ae | 0 to 4 cm | Brown (10YR 5/3, moist); sand; single grain; loose; abundant, fine to medium roots; 2-5% fragments; clear, wavy boundary. |
| AB | 4 to 12 cm | Yellowish brown (10YR 5/4, moist); sand; single grain; loose; few, fine roots; 1-2% coarse fragments; gradual, wavy boundary. |
| Bm1 | 12 to 25 cm | Strong brown (7.5YR 5/6, moist); sand; single grain; loose; few, fine to medium roots; 1-2% coarse fragments; gradual, wavy boundary. |
| Bm2 | 25 to 62 cm | Yellowish brown (10YR 5/6, moist); sand; single grain; loose; very few coarse fragments; very few roots; 2-5% coarse fragments; gradual, wavy boundary. |
| Bm3 | 62 to 100 cm | Brownish yellow (10YR 6/8, moist); sand; single grain; loose; very few roots; 2-5% coarse fragments. |

Tucker Lake - South Sub-Site

Location: Zone 12U E0523421 N6041973 (UTM NAD83)
South of west end of Tucker Lake

Classification:
Subgroup: Eluviated Dystric Brunisol
Family: Sandy, siliceous, neutral, cold, subarid family
Series: Nestow

Landform:
Genetic Material: Glaciofluvial
Surface Expression: Undulating; 2-5% slopes

Drainage/ Perviousness: Very rapidly drained; high perviousness

Site Features: Site is gently undulating, with overall slope to southwest

Vegetation: a1 ecosite phase (Beckingham and Archibald 1996); jack pine/
/lichen/moss

Profile Description:

| | | |
|-----|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LF | 4 to 0 cm | Dark brown, dark gray and black; non to slightly decomposed needles, lichen and moss. |
| Ahe | 0 to 4 cm | Dark grayish brown with gray (10YR 2/2 to 4/2, with 10YR 6/1, dry; mixed, salt and pepper colours); sand; single grain; loose; abundant, fine to coarse roots; <1% coarse fragments. |
| Ae | 4 to 12 cm | Yellowish brown (10YR 5/4, moist); sand; single grain; loose; plentiful, fine to coarse roots; <1% fragments. |
| Bm1 | 12 to 28 cm | Yellowish brown (10YR 5/6, moist); sand; single grain; loose; few, fine to coarse roots; <2% gravel; gradual, smooth boundary. |
| Bm2 | 28 to 56 cm | Yellowish brown (10YR 5.5/6, moist); sand; single grain; loose; very few, fine roots; <1% coarse fragments; gradual, smooth boundary. |
| Bm3 | 56 to 100 cm | Brownish yellow (10YR 6/6, moist); sand; single grain; loose; very few, fine to medium roots; <1% coarse fragments. |

APPENDIX B

LABORATORY DATA –
TUCKER LAKE SOIL MONITORING SITE

Table B1. Soil pH, electrical conductivity and soluble ions at the Tucker Lake North Site

| Subplot | Layer (cm) | Sat'n (%) | pH (ext) | EC (dS m ⁻¹) | Na | K | Ca | Mg (mg L ⁻¹) | Al | Fe | Mn | S |
|-----------|------------|-----------|----------|--------------------------|-----|------|------|--------------------------|------|-----|------|-----|
| A1 | 0-2 | 64.4 | 5.5 | 0.21 | 1.2 | 10.1 | 44.9 | 7.8 | 4.0 | 2.0 | 1.5 | 7.3 |
| | 2-5 | 42.8 | 5.0 | 0.17 | 1.9 | 7.1 | 38.3 | 7.7 | 9.6 | 5.5 | 1.0 | 7.4 |
| | 5-10 | 36.0 | 5.0 | 0.11 | 2.2 | 4.3 | 19.6 | 4.4 | 7.8 | 4.6 | 1.1 | 6.8 |
| | 10-15 | 36.0 | 5.3 | 0.07 | 1.4 | 2.4 | 11.4 | 3.0 | 9.7 | 5.6 | 0.5 | 3.8 |
| | 15-30 | 34.4 | 5.6 | 0.08 | 1.7 | 1.6 | 11.1 | 3.1 | 5.3 | 3.9 | <0.1 | 5.3 |
| | 30-45 | 34.8 | 5.7 | 0.04 | 1.2 | 1.3 | 6.1 | 1.8 | 4.9 | 3.3 | <0.1 | 1.9 |
| | 45-60 | 34.0 | 5.7 | 0.03 | 1.1 | 1.7 | 5.0 | 1.6 | 7.4 | 4.8 | 0.1 | 1.5 |
| B1 | 0-2 | 53.4 | 5.1 | 0.14 | 0.9 | 13.8 | 19.1 | 4.8 | 3.5 | 2.2 | 3.3 | 3.9 |
| | 2-5 | 40.4 | 5.1 | 0.06 | 0.5 | 5.7 | 8.8 | 2.1 | 3.6 | 2.3 | 1.9 | 1.9 |
| | 5-10 | 36.4 | 5.3 | 0.05 | 1.4 | 3.0 | 5.9 | 1.2 | 4.0 | 2.6 | 1.1 | 1.4 |
| | 10-15 | 36.0 | 5.3 | 0.04 | 2.6 | 1.6 | 4.9 | 1.0 | 4.8 | 2.9 | 0.4 | 1.1 |
| | 15-30 | 34.8 | 5.3 | 0.03 | 0.9 | 0.7 | 4.3 | 0.6 | 2.4 | 1.5 | 0.1 | 0.8 |
| | 30-45 | 34.4 | 5.5 | 0.02 | 0.8 | 0.8 | 3.7 | 0.6 | 4.2 | 2.9 | <0.1 | 0.6 |
| | 45-60 | 34.4 | 5.6 | 0.02 | 0.7 | 0.9 | 1.9 | 0.6 | 3.6 | 2.6 | <0.1 | 0.5 |
| C1 | 0-2 | 43.2 | 5.2 | 0.17 | 2.0 | 12.7 | 27.1 | 6.3 | 6.8 | 4.2 | 2.9 | 7.7 |
| | 2-5 | 40.3 | 5.0 | 0.10 | 2.7 | 5.8 | 12.7 | 3.5 | 7.4 | 4.1 | 0.9 | 7.9 |
| | 5-10 | 40.4 | 5.2 | 0.06 | 1.5 | 4.1 | 7.7 | 2.1 | 5.9 | 3.7 | 0.3 | 3.4 |
| | 10-15 | 37.2 | 5.4 | 0.06 | 1.4 | 3.4 | 7.5 | 2.0 | 4.3 | 2.9 | 0.1 | 3.0 |
| | 15-30 | 34.4 | 5.5 | 0.05 | 1.3 | 3.0 | 6.9 | 1.8 | 3.3 | 2.2 | <0.1 | 2.5 |
| | 30-45 | 34.4 | 5.8 | 0.04 | 0.8 | 2.9 | 4.6 | 1.2 | 4.2 | 2.8 | <0.1 | 1.2 |
| | 45-60 | 34.4 | 5.9 | 0.03 | 1.5 | 2.2 | 2.7 | 0.8 | 4.2 | 2.8 | <0.1 | 0.9 |
| D1 | 0-2 | 80.4 | 5.3 | 0.15 | 1.1 | 8.4 | 25.0 | 4.9 | 3.1 | 1.7 | 2.1 | 5.6 |
| | 2-5 | 44.0 | 5.3 | 0.11 | 1.1 | 4.7 | 18.1 | 3.4 | 4.2 | 2.1 | 1.8 | 4.2 |
| | 5-10 | 36.8 | 5.4 | 0.08 | 3.1 | 3.5 | 12.5 | 2.3 | 6.9 | 3.7 | 1.2 | 2.8 |
| | 10-15 | 34.8 | 5.4 | 0.06 | 2.2 | 2.7 | 8.0 | 1.7 | 5.5 | 3.4 | 0.6 | 1.8 |
| | 15-30 | 34.4 | 5.6 | 0.04 | 1.6 | 2.0 | 4.9 | 1.0 | 3.0 | 2.3 | 0.1 | 1.2 |
| | 30-45 | 34.4 | 5.4 | 0.03 | 1.0 | 1.2 | 3.3 | 1.0 | 5.4 | 3.7 | <0.1 | 1.0 |
| | 45-60 | 34.4 | 5.3 | 0.03 | 1.2 | 1.1 | 2.7 | 1.0 | 7.0 | 4.6 | <0.1 | 1.0 |
| E1 | 0-2 | 52.4 | 4.9 | 0.19 | 0.6 | 19.9 | 23.7 | 4.8 | 7.7 | 5.7 | 6.4 | 5.3 |
| | 2-5 | 41.0 | 5.4 | 0.10 | 0.6 | 7.6 | 16.4 | 2.8 | 8.4 | 5.1 | 2.5 | 2.6 |
| | 5-10 | 35.6 | 5.5 | 0.08 | 0.7 | 5.2 | 13.6 | 2.5 | 10.2 | 6.2 | 1.3 | 2.1 |
| | 10-15 | 34.4 | 5.5 | 0.05 | 0.8 | 3.2 | 9.4 | 1.9 | 8.3 | 4.9 | 0.4 | 1.6 |
| | 15-30 | 34.4 | 5.7 | 0.04 | 0.9 | 1.9 | 5.9 | 1.2 | 3.1 | 2.2 | <0.1 | 1.0 |
| | 30-45 | 34.0 | 6.0 | 0.03 | 1.6 | 0.8 | 3.8 | 0.8 | 2.5 | 1.8 | <0.1 | 0.9 |
| | 45-60 | 34.4 | 5.7 | 0.02 | 0.8 | 1.0 | 2.3 | 0.7 | 3.4 | 2.6 | <0.1 | 0.9 |
| F1 | 0-2 | 54.0 | 5.4 | 0.13 | 0.6 | 11.2 | 21.7 | 3.8 | 3.7 | 2.1 | 1.8 | 3.7 |
| | 2-5 | 39.2 | 5.3 | 0.08 | 1.0 | 3.1 | 13.7 | 2.5 | 5.6 | 2.9 | 1.8 | 2.3 |
| | 5-10 | 35.6 | 5.5 | 0.05 | 2.1 | 1.7 | 8.8 | 1.7 | 5.7 | 3.1 | 0.6 | 1.4 |
| | 10-15 | 34.8 | 5.4 | 0.04 | 0.8 | 1.3 | 7.3 | 1.3 | 3.8 | 2.2 | 0.3 | 1.2 |
| | 15-30 | 34.4 | 5.4 | 0.04 | 0.8 | 1.4 | 5.2 | 1.0 | 2.9 | 2.0 | <0.1 | 0.9 |
| | 30-45 | 34.8 | 5.4 | 0.03 | 0.8 | 0.9 | 2.7 | 0.9 | 2.9 | 2.0 | <0.1 | 0.7 |
| | 45-60 | 34.4 | 5.2 | 0.02 | 1.0 | 0.9 | 1.5 | 0.8 | 2.4 | 1.6 | <0.1 | 0.6 |

Table B1. Soil pH, electrical conductivity and soluble ions at the Tucker Lake North Site (concluded)

| Subplot | Layer (cm) | Sat'n (%) | pH (ext) | EC (dS m ⁻¹) | Na | K | Ca | Mg (mg L ⁻¹) | Al | Fe | Mn | S |
|---------|------------|-----------|----------|--------------------------|-----|------|------|--------------------------|------|------|------|-----|
| G1 | 0-2 | 44.4 | 4.6 | 0.15 | 1.5 | 10.0 | 17.0 | 3.3 | 10.4 | 6.9 | 7.1 | 5.4 |
| | 2-5 | 35.6 | 4.8 | 0.07 | 1.7 | 3.6 | 9.5 | 1.9 | 8.6 | 5.7 | 1.6 | 2.5 |
| | 5-10 | 34.4 | 5.2 | 0.06 | 1.4 | 2.1 | 8.6 | 1.6 | 6.6 | 4.9 | 0.3 | 1.7 |
| | 10-15 | 34.4 | 5.3 | 0.05 | 1.6 | 2.0 | 7.7 | 1.6 | 8.5 | 6.4 | 0.1 | 1.6 |
| | 15-30 | 34.4 | 5.8 | 0.03 | 2.0 | 1.6 | 4.4 | 1.1 | 7.1 | 5.1 | 0.2 | 0.9 |
| | 30-45 | 34.4 | 5.8 | 0.03 | 1.1 | 2.1 | 3.3 | 1.7 | 14.3 | 10.2 | 0.2 | 0.7 |
| | 45-60 | 34.4 | 6.2 | 0.02 | 2.3 | 2.4 | 2.5 | 1.8 | 16.5 | 12.0 | 0.1 | 0.5 |
| H1 | 0-2 | 39.2 | 5.3 | 0.13 | 1.2 | 10.9 | 22.2 | 5.7 | 8.1 | 5.4 | 2.5 | 4.6 |
| | 2-5 | 35.2 | 5.2 | 0.09 | 1.4 | 9.8 | 13.2 | 4.4 | 14.6 | 9.2 | 2.3 | 3.6 |
| | 5-10 | 35.2 | 5.1 | 0.10 | 1.8 | 8.5 | 11.9 | 4.1 | 11.6 | 7.1 | 1.9 | 3.7 |
| | 10-15 | 34.8 | 4.9 | 0.10 | 2.7 | 7.3 | 13.2 | 4.4 | 8.1 | 5.0 | 1.0 | 5.7 |
| | 15-30 | 34.4 | 5.6 | 0.06 | 1.5 | 6.0 | 7.4 | 2.4 | 6.2 | 4.4 | 0.1 | 3.0 |
| | 30-45 | 34.4 | 5.4 | 0.05 | 1.5 | 4.8 | 5.3 | 1.8 | 6.8 | 4.6 | <0.1 | 2.3 |
| | 45-60 | 34.4 | 5.2 | 0.04 | 1.7 | 3.9 | 3.1 | 1.3 | 7.8 | 5.3 | 0.2 | 2.4 |
| I1 | 0-2 | 109 | 5.5 | 0.17 | 0.6 | 12.1 | 31.7 | 4.4 | 1.3 | 0.8 | 1.1 | 6.4 |
| | 2-5 | 44.8 | 5.9 | 0.09 | 0.8 | 3.7 | 18.4 | 2.7 | 5.3 | 2.6 | 1.0 | 2.3 |
| | 5-10 | 36.0 | 5.9 | 0.06 | 2.3 | 1.9 | 11.8 | 2.0 | 5.4 | 2.7 | 0.5 | 1.7 |
| | 10-15 | 34.8 | 5.7 | 0.05 | 2.6 | 1.5 | 9.0 | 1.9 | 8.3 | 4.6 | 0.2 | 1.3 |
| | 15-30 | 34.4 | 6.0 | 0.04 | 1.1 | 0.7 | 7.6 | 1.3 | 3.9 | 2.9 | <0.1 | 0.8 |
| | 30-45 | 34.4 | 6.0 | 0.03 | 1.0 | 0.9 | 5.4 | 1.5 | 7.4 | 5.3 | <0.1 | 0.6 |
| | 45-60 | 34.4 | 5.9 | 0.03 | 1.0 | 1.0 | 3.6 | 1.3 | 5.8 | 4.2 | <0.1 | 0.5 |
| J1 | 0-2 | 38.8 | 5.3 | 0.12 | 1.7 | 8.7 | 23.9 | 5.9 | 9.9 | 5.8 | 1.7 | 4.4 |
| | 2-5 | 34.8 | 5.3 | 0.10 | 5.3 | 5.8 | 18.1 | 4.4 | 12.0 | 7.3 | 1.1 | 4.3 |
| | 5-10 | 34.4 | 5.1 | 0.09 | 2.2 | 4.6 | 14.1 | 3.4 | 8.2 | 4.8 | 0.6 | 3.9 |
| | 10-15 | 34.4 | 5.1 | 0.11 | 2.9 | 4.6 | 15.5 | 3.9 | 4.7 | 2.9 | 0.5 | 7.3 |
| | 15-30 | 34.8 | 5.4 | 0.08 | 3.4 | 4.5 | 9.8 | 2.6 | 4.0 | 2.8 | 0.2 | 5.7 |
| | 30-45 | 34.4 | 5.6 | 0.05 | 1.5 | 4.2 | 7.0 | 1.8 | 3.1 | 1.9 | <0.1 | 2.5 |
| | 45-60 | 34.4 | 5.4 | 0.04 | 1.5 | 3.4 | 4.6 | 1.4 | 3.2 | 1.9 | <0.1 | 2.0 |
| K1 | 0-2 | 50.0 | 5.0 | 0.25 | 3.8 | 25.3 | 46.3 | 9.6 | 12.8 | 8.5 | 5.2 | 6.7 |
| | 2-5 | 35.6 | 5.1 | 0.16 | 2.6 | 8.9 | 29.3 | 5.9 | 12.2 | 5.7 | 2.6 | 3.4 |
| | 5-10 | 34.8 | 5.2 | 0.08 | 1.3 | 6.7 | 12.8 | 3.3 | 5.9 | 3.2 | 0.9 | 2.0 |
| | 10-15 | 34.4 | 5.1 | 0.06 | 1.2 | 4.4 | 8.0 | 2.6 | 5.9 | 3.3 | 0.5 | 1.5 |
| | 15-30 | 34.4 | 5.3 | 0.05 | 1.4 | 4.2 | 5.8 | 2.3 | 5.3 | 3.1 | 0.2 | 1.2 |
| | 30-45 | 34.4 | 5.2 | 0.04 | 1.4 | 4.4 | 3.3 | 1.7 | 5.6 | 3.5 | 0.1 | 0.8 |
| | 45-60 | 34.4 | 5.2 | 0.03 | 1.3 | 4.5 | 2.4 | 1.5 | 10.1 | 6.0 | 0.2 | 0.6 |
| L1 | 0-2 | 65.2 | 4.9 | 0.15 | 1.0 | 8.8 | 25.5 | 3.4 | 2.2 | 1.2 | 1.9 | 6.9 |
| | 2-5 | 36.0 | 5.0 | 0.07 | 1.3 | 2.9 | 12.3 | 1.8 | 4.9 | 3.5 | 0.6 | 2.6 |
| | 5-10 | 34.8 | 5.2 | 0.05 | 1.3 | 1.4 | 7.2 | 1.3 | 4.7 | 3.6 | 0.3 | 0.9 |
| | 10-15 | 34.4 | 5.2 | 0.05 | 1.6 | 1.3 | 6.3 | 1.2 | 2.2 | 1.8 | 0.3 | 0.8 |
| | 15-30 | 34.4 | 5.8 | 0.04 | 2.9 | 1.0 | 4.2 | 1.0 | 3.3 | 2.4 | 0.2 | 0.6 |
| | 30-45 | 34.4 | 5.5 | 0.03 | 1.4 | 1.9 | 3.6 | 1.2 | 7.8 | 5.0 | <0.1 | 0.5 |
| | 45-60 | 34.4 | 5.6 | 0.03 | 1.6 | 2.1 | 3.7 | 1.2 | 12.1 | 8.0 | <0.1 | 0.5 |

Table B2. Soil pH, electrical conductivity and soluble ions at the Tucker Lake South Site

| Subplot | Layer (cm) | Sat'n (%) | pH (ext) | EC (dS m ⁻¹) | Na | K | Ca | Mg | Al | Fe | Mn | S |
|-----------|--------------|-----------|----------|--------------------------|-----------------------|------|------|------|------|-----|------|------|
| | | | | | (mg L ⁻¹) | | | | | | | |
| A1 | 0-2 | 51.6 | 5.2 | 0.15 | 1.6 | 8.4 | 23.4 | 3.9 | 2.8 | 1.4 | 3.8 | 5.3 |
| | 2-5 | 41.6 | 5.2 | 0.11 | 1.2 | 6.2 | 17.9 | 2.5 | 5.5 | 2.8 | 3.2 | 3.2 |
| | 5-10 | 36.4 | 5.6 | 0.06 | 2.7 | 2.7 | 9.0 | 1.5 | 4.1 | 2.0 | 0.8 | 1.5 |
| | 10-15 | 34.4 | 5.2 | 0.05 | 1.6 | 3.0 | 8.0 | 1.5 | 6.4 | 3.2 | 1.1 | 1.5 |
| B1 | 0-2 | 46.0 | 5.5 | 0.13 | 1.2 | 7.9 | 16.1 | 4.1 | 3.2 | 1.9 | 2.6 | 3.9 |
| | 2-5 | 34.8 | 5.7 | 0.06 | 0.8 | 4.6 | 9.3 | 2.3 | 5.2 | 3.1 | 0.9 | 1.8 |
| | 5-10 | 34.4 | 5.7 | 0.06 | 2.2 | 3.1 | 6.3 | 1.6 | 4.9 | 3.0 | 0.4 | 1.4 |
| | 10-15 | 34.4 | 5.6 | 0.05 | 1.2 | 2.9 | 5.7 | 1.4 | 2.5 | 1.7 | 0.3 | 1.2 |
| C1 | 0-2 | 91.3 | 4.6 | 0.31 | 1.9 | 19.0 | 63.5 | 8.5 | 6.1 | 3.4 | 13.5 | 11.1 |
| | 2-5 | 44.0 | 4.7 | 0.15 | 2.3 | 4.9 | 28.3 | 4.2 | 8.9 | 6.0 | 5.1 | 5.3 |
| | 5-10 | 36.8 | 4.9 | 0.09 | 2.5 | 3.9 | 13.1 | 2.7 | 10.8 | 7.1 | 2.3 | 3.1 |
| | 10-15 | 34.4 | 5.4 | 0.06 | 4.2 | 2.2 | 4.5 | 1.3 | 3.8 | 2.5 | 0.5 | 2.4 |
| D1 | 0-2 | 57.2 | 4.9 | 0.19 | 1.3 | 10.1 | 31.5 | 6.3 | 4.4 | 2.2 | 4.7 | 7.0 |
| | 2-5 | 39.2 | 5.0 | 0.12 | 2.0 | 5.6 | 19.7 | 4.3 | 9.5 | 5.0 | 3.4 | 3.4 |
| | 5-10 | 35.2 | 5.0 | 0.12 | 5.6 | 3.5 | 16.4 | 3.5 | 6.0 | 3.0 | 2.0 | 5.2 |
| | 10-15 | 34.8 | 5.1 | 0.07 | 2.5 | 2.1 | 8.4 | 2.1 | 3.8 | 2.3 | 0.6 | 3.2 |
| E1 | 0-2 | 40.4 | 5.0 | 0.12 | 1.5 | 5.0 | 19.7 | 4.1 | 6.5 | 4.5 | 4.1 | 3.7 |
| | 2-5 | 34.4 | 5.0 | 0.09 | 1.7 | 3.2 | 16.1 | 3.2 | 9.5 | 6.1 | 2.5 | 2.4 |
| | 5-10 | 34.8 | 5.0 | 0.08 | 2.2 | 2.0 | 11.5 | 2.7 | 6.1 | 3.2 | 1.0 | 1.7 |
| | 10-15 | 34.4 | 5.1 | 0.08 | 2.3 | 2.6 | 9.2 | 2.6 | 3.0 | 1.7 | 0.4 | 1.2 |
| F1 | 0-2 | 46.0 | 4.6 | 0.17 | 2.1 | 11.1 | 19.1 | 4.0 | 7.1 | 4.6 | 12.4 | 6.3 |
| | 2-5 | 36.0 | 5.0 | 0.10 | 2.8 | 3.7 | 13.9 | 2.9 | 9.2 | 4.7 | 4.7 | 3.7 |
| | 5-10 | 35.2 | 5.1 | 0.07 | 3.5 | 1.7 | 10.6 | 2.0 | 6.4 | 3.8 | 1.3 | 2.7 |
| | 10-15 | 34.8 | 5.1 | 0.06 | 2.0 | 1.6 | 8.2 | 1.7 | 6.5 | 4.2 | 0.4 | 1.8 |
| G1 | 0-2 | 60.8 | 4.9 | 0.20 | 1.7 | 9.6 | 33.5 | 4.4 | 6.0 | 2.7 | 10.6 | 6.5 |
| | 2-5 | 40.4 | 5.1 | 0.08 | 1.6 | 3.5 | 21.0 | 2.7 | 8.7 | 3.9 | 3.8 | 2.7 |
| | 5-10 | 35.6 | 4.8 | 0.12 | 2.7 | 3.3 | 20.3 | 2.5 | 5.4 | 2.5 | 2.1 | 2.1 |
| | 10-15 | 34.8 | 4.9 | 0.09 | 2.1 | 3.1 | 15.9 | 2.2 | 6.5 | 3.6 | 1.0 | 1.7 |
| H1 | 0-2 | 52.4 | 5.1 | 0.21 | 0.9 | 15.9 | 33.1 | 6.9 | 6.4 | 4.1 | 5.3 | 6.4 |
| | 2-5 | 41.6 | 5.2 | 0.13 | 3.3 | 7.1 | 22.2 | 4.9 | 9.6 | 5.3 | 3.3 | 4.2 |
| | 5-10 | 35.2 | 5.1 | 0.09 | 1.3 | 4.7 | 13.2 | 3.2 | 9.5 | 5.4 | 1.7 | 3.5 |
| | 10-15 | 34.8 | 5.1 | 0.07 | 1.4 | 3.5 | 8.7 | 2.4 | 6.4 | 3.6 | 0.7 | 3.1 |
| I1 | 0-2 | 46.8 | 4.7 | 0.25 | 4.0 | 23.9 | 27.5 | 7.1 | 10.5 | 7.8 | 17.7 | 10.2 |
| | 2-5 | 38.4 | 4.7 | 0.12 | 2.9 | 6.0 | 13.3 | 3.7 | 11.7 | 6.3 | 8.3 | 5.3 |
| | 5-10 | 38.4 | 4.7 | 0.12 | 4.0 | 6.8 | 11.5 | 3.3 | 9.9 | 5.1 | 5.1 | 6.1 |
| | 10-15 | 34.8 | 5.0 | 0.05 | 2.1 | 1.9 | 5.4 | 1.7 | 6.6 | 3.9 | 0.7 | 2.6 |
| J1 | 0-2 | 59.5 | 4.9 | 0.33 | 1.8 | 31.2 | 53.6 | 10.4 | 14.1 | 9.2 | 16.3 | 11.3 |
| | 2-5 | 44.4 | 5.1 | 0.21 | 1.8 | 9.6 | 39.9 | 6.5 | 7.3 | 3.9 | 6.0 | 5.8 |
| | 5-10 | 36.4 | 5.5 | 0.12 | 1.8 | 4.6 | 25.4 | 4.7 | 14.3 | 7.1 | 2.7 | 3.4 |
| | 10-15 | 35.2 | 5.3 | 0.10 | 1.9 | 3.3 | 17.4 | 3.0 | 7.4 | 3.5 | 2.1 | 1.9 |
| K1 | 0-2 | 41.2 | 5.2 | 0.13 | 1.0 | 6.8 | 21.0 | 4.7 | 6.4 | 3.6 | 4.6 | 4.1 |
| | 2-5 | 35.2 | 5.2 | 0.12 | 2.2 | 9.0 | 15.1 | 3.8 | 13.1 | 7.3 | 4.3 | 3.4 |
| | 5-10 | 34.8 | 5.4 | 0.09 | 3.8 | 5.4 | 11.2 | 2.4 | 9.4 | 5.2 | 1.3 | 2.9 |
| | 10-15 | 34.8 | 5.8 | 0.06 | 4.7 | 2.4 | 7.7 | 1.9 | 9.4 | 5.5 | 0.4 | 2.4 |
| L1 | 0-2 | 63.0 | 4.8 | 0.31 | 1.5 | 29.9 | 42.0 | 9.1 | 7.2 | 5.3 | 13.7 | 11.7 |
| | 2-5 | 45.2 | 5.5 | 0.15 | 2.3 | 8.6 | 22.2 | 5.1 | 4.5 | 2.5 | 2.9 | 4.7 |
| | 5-10 | 35.2 | 5.4 | 0.08 | 1.2 | 3.5 | 13.6 | 3.5 | 9.9 | 5.9 | 1.4 | 2.8 |
| | 10-15 | 34.8 | 5.0 | 0.07 | 1.7 | 2.5 | 9.7 | 2.6 | 5.8 | 3.7 | 0.7 | 3.1 |

Table B3. pH(CaCl₂), and Total Carbon, Nitrogen and Sulphur at the Tucker Lake North Site

| Subplot | Layer (cm) | pH (CaCl ₂) | Total Carbon (%) | Total Nitrogen (%) | Total Sulphur (%) |
|-----------|------------|-------------------------|------------------|--------------------|-------------------|
| A1 | LFH | 4.7 | 41.9 | 1.26 | 0.133 |
| | 0-2 | 4.9 | 3.16 | 0.08 | 0.010 |
| | 2-5 | 4.6 | 1.31 | 0.02 | 0.003 |
| | 5-10 | 4.5 | 0.43 | <0.01 | 0.001 |
| | 10-15 | 4.6 | 0.27 | <0.01 | 0.001 |
| | 15-30 | 4.9 | | | |
| | 30-45 | 4.9 | | | |
| | 45-60 | 4.9 | | | |
| B1 | LFH | 4.4 | 28.5 | 0.81 | 0.079 |
| | 0-2 | 4.5 | 2.42 | 0.07 | 0.006 |
| | 2-5 | 4.3 | 0.58 | 0.01 | 0.002 |
| | 5-10 | 4.2 | 0.35 | <0.01 | <0.001 |
| | 10-15 | 4.3 | 0.26 | <0.01 | <0.001 |
| | 15-30 | 4.5 | | | |
| | 30-45 | 4.7 | | | |
| | 45-60 | 4.7 | | | |
| C1 | LFH | 4.5 | 48.4 | 1.61 | 0.165 |
| | 0-2 | 4.7 | 0.76 | 0.02 | 0.002 |
| | 2-5 | 4.5 | 0.30 | <0.01 | <0.001 |
| | 5-10 | 4.6 | 0.20 | <0.01 | <0.001 |
| | 10-15 | 4.7 | 0.21 | <0.01 | 0.001 |
| | 15-30 | 4.8 | | | |
| | 30-45 | 5.0 | | | |
| | 45-60 | 5.0 | | | |
| D1 | LFH | 4.5 | 39.2 | 1.24 | 0.114 |
| | 0-2 | 4.6 | 3.73 | 0.13 | 0.013 |
| | 2-5 | 4.6 | 1.55 | 0.04 | 0.005 |
| | 5-10 | 4.5 | 0.86 | 0.01 | 0.001 |
| | 10-15 | 4.5 | 0.49 | <0.01 | 0.001 |
| | 15-30 | 4.7 | | | |
| | 30-45 | 4.6 | | | |
| | 45-60 | 4.5 | | | |
| E1 | LFH | 4.4 | 46.6 | 1.19 | 0.118 |
| | 0-2 | 4.3 | 1.83 | 0.05 | 0.003 |
| | 2-5 | 4.7 | 0.69 | <0.01 | 0.001 |
| | 5-10 | 4.8 | 0.47 | <0.01 | <0.001 |
| | 10-15 | 4.8 | 0.21 | <0.01 | <0.001 |
| | 15-30 | 4.9 | | | |
| | 30-45 | 5.0 | | | |
| | 45-60 | 4.8 | | | |
| F1 | LFH | 4.6 | 25.4 | 0.63 | 0.069 |
| | 0-2 | 4.7 | 2.36 | 0.05 | 0.005 |
| | 2-5 | 4.6 | 0.76 | 0.01 | <0.001 |
| | 5-10 | 4.7 | 0.29 | <0.01 | <0.001 |
| | 10-15 | 4.6 | 0.24 | <0.01 | <0.001 |
| | 15-30 | 4.6 | | | |
| | 30-45 | 4.6 | | | |
| | 45-60 | 4.5 | | | |

Table B3. pH(CaCl₂), and Total Carbon, Nitrogen and Sulphur at the Tucker Lake North Site (concluded)

| Subplot | Layer (cm) | pH (CaCl ₂) | Total Carbon (%) | Total Nitrogen (%) | Total Sulphur (%) |
|-----------|------------|-------------------------|------------------|--------------------|-------------------|
| G1 | LFH | 4.0 | 40.3 | 1.06 | 0.099 |
| | 0-2 | 4.1 | 1.28 | 0.02 | 0.003 |
| | 2-5 | 4.3 | 0.39 | <0.01 | 0.002 |
| | 5-10 | 4.5 | 0.24 | <0.01 | 0.001 |
| | 10-15 | 4.6 | 0.24 | <0.01 | 0.001 |
| | 15-30 | 4.8 | | | |
| | 30-45 | 5.0 | | | |
| | 45-60 | 5.1 | | | |
| H1 | LFH | 4.2 | 45.3 | 1.51 | 0.159 |
| | 0-2 | 4.6 | 1.11 | 0.03 | 0.004 |
| | 2-5 | 4.6 | 0.27 | <0.01 | 0.001 |
| | 5-10 | 4.5 | 0.20 | <0.01 | 0.002 |
| | 10-15 | 4.4 | 0.27 | <0.01 | 0.002 |
| | 15-30 | 4.9 | | | |
| | 30-45 | 4.7 | | | |
| | 45-60 | 4.5 | | | |
| I1 | LFH | 4.6 | 33.8 | 0.98 | 0.093 |
| | 0-2 | 4.9 | 6.25 | 0.21 | 0.018 |
| | 2-5 | 5.2 | 0.93 | 0.02 | 0.003 |
| | 5-10 | 5.0 | 0.41 | <0.01 | 0.002 |
| | 10-15 | 4.9 | 0.27 | <0.01 | 0.001 |
| | 15-30 | 5.1 | | | |
| | 30-45 | 5.2 | | | |
| | 45-60 | 5.1 | | | |
| J1 | LFH | 4.7 | 41.0 | 1.27 | 0.112 |
| | 0-2 | 4.7 | 0.93 | 0.02 | 0.003 |
| | 2-5 | 4.5 | 0.44 | <0.01 | 0.002 |
| | 5-10 | 4.6 | 0.31 | <0.01 | 0.002 |
| | 10-15 | 4.6 | 0.26 | <0.01 | 0.002 |
| | 15-30 | 4.7 | | | |
| | 30-45 | 5.0 | | | |
| | 45-60 | 4.7 | | | |
| K1 | LFH | 4.5 | 34.3 | 1.27 | 0.114 |
| | 0-2 | 4.5 | 1.56 | 0.04 | 0.005 |
| | 2-5 | 4.6 | 0.37 | <0.01 | 0.002 |
| | 5-10 | 4.6 | 0.30 | <0.01 | 0.001 |
| | 10-15 | 4.6 | 0.21 | <0.01 | 0.001 |
| | 15-30 | 4.6 | | | |
| | 30-45 | 4.5 | | | |
| | 45-60 | 4.4 | | | |
| L1 | LFH | 3.8 | 28.4 | 0.85 | 0.090 |
| | 0-2 | 4.2 | 3.34 | 0.12 | 0.010 |
| | 2-5 | 4.3 | 0.56 | <0.01 | 0.002 |
| | 5-10 | 4.5 | 0.33 | <0.01 | 0.002 |
| | 10-15 | 4.5 | 0.31 | <0.01 | 0.001 |
| | 15-30 | 4.7 | | | |
| | 30-45 | 4.7 | | | |
| | 45-60 | 4.7 | | | |

Table B4. pH(CaCl₂), and Total Carbon, Nitrogen and Sulphur at the Tucker Lake South Site

| Subplot | Layer (cm) | pH (CaCl ₂) | Total Carbon (%) | Total Nitrogen (%) | Total Sulphur (%) |
|-----------|------------|-------------------------|------------------|--------------------|-------------------|
| A1 | LFH | 4.3 | 26.8 | 0.74 | 0.062 |
| | 0-2 | 4.5 | 1.81 | 0.06 | 0.006 |
| | 2-5 | 4.5 | 0.84 | 0.02 | 0.003 |
| | 5-10 | 4.6 | 0.37 | <0.01 | 0.001 |
| | 10-15 | 4.5 | 0.32 | <0.01 | 0.001 |
| B1 | LFH | 4.0 | 36.8 | 1.02 | 0.109 |
| | 0-2 | 4.6 | 1.77 | 0.06 | 0.005 |
| | 2-5 | 4.8 | 0.50 | <0.01 | 0.002 |
| | 5-10 | 4.6 | 0.30 | <0.01 | 0.001 |
| | 10-15 | 4.7 | 0.25 | <0.01 | 0.001 |
| C1 | LFH | 4.2 | 35.6 | 1.10 | 0.102 |
| | 0-2 | 4.1 | 5.02 | 0.17 | 0.016 |
| | 2-5 | 4.2 | 1.15 | 0.03 | 0.003 |
| | 5-10 | 4.3 | 0.48 | <0.01 | 0.002 |
| | 10-15 | 4.5 | 0.20 | <0.01 | <0.001 |
| D1 | LFH | 4.0 | 34.8 | 1.22 | 0.152 |
| | 0-2 | 4.3 | 2.78 | 0.09 | 0.008 |
| | 2-5 | 4.4 | 0.72 | 0.01 | 0.003 |
| | 5-10 | 4.3 | 0.43 | <0.01 | 0.001 |
| | 10-15 | 4.4 | 0.24 | <0.01 | 0.001 |
| E1 | LFH | 4.1 | 33.1 | 1.03 | 0.107 |
| | 0-2 | 4.4 | 0.98 | 0.02 | 0.003 |
| | 2-5 | 4.4 | 0.42 | <0.01 | 0.001 |
| | 5-10 | 4.4 | 0.27 | <0.01 | 0.001 |
| | 10-15 | 4.6 | 0.19 | <0.01 | 0.001 |
| F1 | LFH | 3.9 | 26.1 | 0.84 | 0.101 |
| | 0-2 | 4.0 | 1.38 | 0.03 | 0.005 |
| | 2-5 | 4.3 | 0.62 | <0.01 | 0.001 |
| | 5-10 | 4.4 | 0.32 | <0.01 | 0.001 |
| | 10-15 | 4.5 | 0.26 | <0.01 | 0.001 |
| G1 | LFH | 3.8 | 32.0 | 0.88 | 0.086 |
| | 0-2 | 4.3 | 2.55 | 0.07 | 0.006 |
| | 2-5 | 4.5 | 0.75 | <0.01 | 0.002 |
| | 5-10 | 4.3 | 0.51 | <0.01 | 0.001 |
| | 10-15 | 4.4 | 0.40 | <0.01 | 0.001 |
| H1 | LFH | 4.1 | 37.1 | 1.22 | 0.119 |
| | 0-2 | 4.5 | 1.86 | 0.05 | 0.005 |
| | 2-5 | 4.5 | 1.16 | 0.02 | 0.003 |
| | 5-10 | 4.5 | 0.53 | <0.01 | 0.001 |
| | 10-15 | 4.5 | 0.27 | <0.01 | 0.001 |

Table B4. pH(CaCl₂), and Total Carbon, Nitrogen and Sulphur at the Tucker Lake South Site (concluded)

| Subplot | Layer (cm) | pH (CaCl ₂) | Total Carbon (%) | Total Nitrogen (%) | Total Sulphur (%) |
|-----------|------------|-------------------------|------------------|--------------------|-------------------|
| I1 | LFH | 4.2 | 35.0 | 1.19 | 0.096 |
| | 0-2 | 4.2 | 1.58 | 0.04 | 0.004 |
| | 2-5 | 4.2 | 0.86 | <0.01 | 0.002 |
| | 5-10 | 4.2 | 0.70 | <0.01 | 0.002 |
| | 10-15 | 4.4 | 0.24 | <0.01 | 0.001 |
| J1 | LFH | 4.3 | 35.3 | 0.98 | 0.083 |
| | 0-2 | 4.5 | 6.21 | 0.20 | 0.011 |
| | 2-5 | 4.7 | 1.53 | 0.03 | 0.003 |
| | 5-10 | 4.9 | 0.72 | 0.01 | 0.001 |
| | 10-15 | 4.8 | 0.29 | <0.01 | <0.001 |
| K1 | LFH | 4.2 | 40.2 | 1.15 | 0.124 |
| | 0-2 | 4.6 | 1.20 | 0.04 | 0.004 |
| | 2-5 | 4.7 | 0.68 | 0.01 | 0.001 |
| | 5-10 | 4.7 | 0.31 | <0.01 | <0.001 |
| | 10-15 | 4.8 | 0.19 | <0.01 | <0.001 |
| L1 | LFH | 4.0 | 26.4 | 0.89 | 0.074 |
| | 0-2 | 4.3 | 3.70 | 0.13 | 0.010 |
| | 2-5 | 4.7 | 1.48 | 0.05 | 0.003 |
| | 5-10 | 4.7 | 0.53 | 0.01 | 0.001 |
| | 10-15 | 4.5 | 0.34 | <0.01 | 0.001 |

Table B5. Exchangeable Cations, Cation Exchange Capacity and Base Saturation at the Tucker Lake North Site

| Subplot | Layer (cm) | pH (CaCl ₂) | Na | K | Ca | Mg | Al | Fe | Mn | Bases | CEC | Base Saturation |
|---------|------------|-------------------------|--------------------------|------|------|------|------|-------|-------|-------|------|-----------------|
| | | | (cmol kg ⁻¹) | | | | | | | | | |
| A1 | LFH | 4.7 | | | | | | | | | | |
| | 0-2 | 4.9 | 0.01 | 0.10 | 9.32 | 0.87 | 0.08 | <0.01 | 0.31 | 10.3 | 10.7 | 0.96 |
| | 2-5 | 4.6 | 0.01 | 0.06 | 3.19 | 0.39 | 0.18 | 0.01 | 0.07 | 3.6 | 3.91 | 0.93 |
| | 5-10 | 4.5 | 0.01 | 0.05 | 0.72 | 0.16 | 0.28 | 0.01 | 0.03 | 0.9 | 1.26 | 0.74 |
| | 10-15 | 4.6 | <0.01 | 0.03 | 0.58 | 0.14 | 0.27 | 0.01 | 0.02 | 0.7 | 1.05 | 0.71 |
| | 15-30 | 4.9 | <0.01 | 0.03 | 0.60 | 0.17 | 0.23 | 0.02 | <0.01 | 0.8 | 1.05 | 0.76 |
| | 30-45 | 4.9 | <0.01 | 0.02 | 0.38 | 0.13 | 0.16 | 0.01 | <0.01 | 0.5 | 0.71 | 0.75 |
| | 45-60 | 4.9 | <0.01 | 0.02 | 0.31 | 0.11 | 0.14 | 0.01 | <0.01 | 0.4 | 0.60 | 0.75 |
| B1 | LFH | 4.4 | | | | | | | | | | |
| | 0-2 | 4.5 | <0.01 | 0.13 | 1.97 | 0.32 | 0.23 | <0.01 | 0.28 | 2.4 | 2.93 | 0.83 |
| | 2-5 | 4.3 | <0.01 | 0.06 | 0.63 | 0.12 | 0.30 | <0.01 | 0.11 | 0.8 | 1.22 | 0.66 |
| | 5-10 | 4.2 | <0.01 | 0.03 | 0.31 | 0.06 | 0.38 | 0.01 | 0.04 | 0.4 | 0.83 | 0.47 |
| | 10-15 | 4.3 | <0.01 | 0.02 | 0.26 | 0.04 | 0.43 | 0.02 | 0.01 | 0.3 | 0.79 | 0.41 |
| | 15-30 | 4.5 | <0.01 | 0.01 | 0.22 | 0.03 | 0.32 | 0.02 | <0.01 | 0.3 | 0.60 | 0.44 |
| | 30-45 | 4.7 | <0.01 | 0.02 | 0.24 | 0.04 | 0.24 | 0.02 | <0.01 | 0.3 | 0.55 | 0.54 |
| | 45-60 | 4.7 | <0.01 | 0.01 | 0.18 | 0.06 | 0.16 | 0.01 | <0.01 | 0.3 | 0.43 | 0.61 |
| C1 | LFH | 4.5 | | | | | | | | | | |
| | 0-2 | 4.7 | <0.01 | 0.13 | 1.43 | 0.25 | 0.15 | 0.01 | 0.13 | 1.8 | 2.10 | 0.86 |
| | 2-5 | 4.5 | <0.01 | 0.06 | 0.39 | 0.10 | 0.32 | 0.02 | 0.02 | 0.6 | 0.91 | 0.61 |
| | 5-10 | 4.6 | 0.01 | 0.06 | 0.36 | 0.09 | 0.32 | 0.02 | 0.01 | 0.5 | 0.87 | 0.59 |
| | 10-15 | 4.7 | <0.01 | 0.06 | 0.40 | 0.11 | 0.32 | 0.03 | <0.01 | 0.6 | 0.92 | 0.62 |
| | 15-30 | 4.8 | <0.01 | 0.05 | 0.39 | 0.12 | 0.24 | 0.02 | <0.01 | 0.6 | 0.82 | 0.68 |
| | 30-45 | 5.0 | <0.01 | 0.05 | 0.33 | 0.10 | 0.12 | 0.01 | <0.01 | 0.5 | 0.61 | 0.79 |
| | 45-60 | 5.0 | <0.01 | 0.03 | 0.28 | 0.09 | 0.10 | 0.01 | <0.01 | 0.4 | 0.52 | 0.80 |
| D1 | LFH | 4.5 | | | | | | | | | | |
| | 0-2 | 4.6 | <0.01 | 0.09 | 6.48 | 0.71 | 0.14 | <0.01 | 0.50 | 7.3 | 7.92 | 0.92 |
| | 2-5 | 4.6 | <0.01 | 0.07 | 3.12 | 0.33 | 0.31 | <0.01 | 0.33 | 3.5 | 4.17 | 0.84 |
| | 5-10 | 4.5 | <0.01 | 0.05 | 1.04 | 0.14 | 0.28 | 0.01 | 0.08 | 1.2 | 1.59 | 0.77 |
| | 10-15 | 4.5 | <0.01 | 0.04 | 0.54 | 0.10 | 0.34 | 0.02 | 0.02 | 0.7 | 1.06 | 0.65 |
| | 15-30 | 4.7 | <0.01 | 0.04 | 0.41 | 0.09 | 0.27 | 0.02 | <0.01 | 0.5 | 0.84 | 0.65 |
| | 30-45 | 4.6 | <0.01 | 0.02 | 0.28 | 0.09 | 0.24 | 0.02 | <0.01 | 0.4 | 0.64 | 0.60 |
| | 45-60 | 4.5 | <0.01 | 0.02 | 0.25 | 0.09 | 0.25 | 0.01 | <0.01 | 0.4 | 0.62 | 0.57 |
| E1 | LFH | 4.4 | | | | | | | | | | |
| | 0-2 | 4.3 | <0.01 | 0.15 | 1.84 | 0.23 | 0.45 | 0.01 | 0.41 | 2.2 | 3.10 | 0.72 |
| | 2-5 | 4.7 | <0.01 | 0.08 | 1.32 | 0.15 | 0.24 | <0.01 | 0.18 | 1.5 | 1.96 | 0.79 |
| | 5-10 | 4.8 | <0.01 | 0.05 | 0.82 | 0.11 | 0.18 | 0.01 | 0.06 | 1.0 | 1.22 | 0.80 |
| | 10-15 | 4.8 | <0.01 | 0.04 | 0.55 | 0.09 | 0.17 | 0.01 | 0.01 | 0.7 | 0.88 | 0.78 |
| | 15-30 | 4.9 | <0.01 | 0.03 | 0.37 | 0.08 | 0.17 | 0.02 | <0.01 | 0.5 | 0.66 | 0.72 |
| | 30-45 | 5.0 | <0.01 | 0.02 | 0.31 | 0.08 | 0.12 | 0.01 | <0.01 | 0.4 | 0.53 | 0.76 |
| | 45-60 | 4.8 | <0.01 | 0.02 | 0.23 | 0.08 | 0.15 | 0.01 | <0.01 | 0.3 | 0.48 | 0.67 |
| F1 | LFH | 4.6 | | | | | | | | | | |
| | 0-2 | 4.7 | <0.01 | 0.12 | 3.91 | 0.38 | 0.17 | <0.01 | 0.30 | 4.4 | 4.89 | 0.90 |
| | 2-5 | 4.6 | <0.01 | 0.04 | 1.28 | 0.16 | 0.25 | <0.01 | 0.15 | 1.5 | 1.89 | 0.78 |
| | 5-10 | 4.7 | <0.01 | 0.03 | 0.62 | 0.09 | 0.21 | 0.01 | 0.03 | 0.7 | 0.98 | 0.75 |
| | 10-15 | 4.6 | <0.01 | 0.02 | 0.48 | 0.08 | 0.27 | 0.01 | 0.01 | 0.6 | 0.87 | 0.66 |
| | 15-30 | 4.6 | <0.01 | 0.03 | 0.33 | 0.07 | 0.32 | 0.02 | <0.01 | 0.4 | 0.77 | 0.56 |
| | 30-45 | 4.6 | <0.01 | 0.02 | 0.18 | 0.07 | 0.28 | 0.02 | <0.01 | 0.3 | 0.57 | 0.48 |
| | 45-60 | 4.5 | <0.01 | 0.02 | 0.08 | 0.06 | 0.28 | 0.01 | <0.01 | 0.2 | 0.45 | 0.34 |

Table B5. Exchangeable Cations, Cation Exchange Capacity and Base Saturation at the Tucker Lake North Site (concluded)

| Subplot | Layer (cm) | pH (CaCl ₂) | Na | K | Ca | Mg | Al | Fe | Mn | Bases | C.E.C. | Base Saturation |
|---------|------------|-------------------------|--------------------------|------|-------|------|------|-------|-------|-------|--------|-----------------|
| | | | (cmol kg ⁻¹) | | | | | | | | | |
| G1 | LFH | 4.0 | | | | | | | | | | |
| | 0-2 | 4.1 | <0.01 | 0.08 | 0.96 | 0.13 | 0.76 | 0.02 | 0.31 | 1.2 | 2.26 | 0.51 |
| | 2-5 | 4.3 | <0.01 | 0.03 | 0.49 | 0.08 | 0.56 | 0.03 | 0.05 | 0.6 | 1.23 | 0.49 |
| | 5-10 | 4.5 | <0.01 | 0.02 | 0.50 | 0.08 | 0.31 | 0.03 | 0.01 | 0.6 | 0.95 | 0.64 |
| | 10-15 | 4.6 | <0.01 | 0.02 | 0.48 | 0.08 | 0.27 | 0.02 | <0.01 | 0.6 | 0.87 | 0.67 |
| | 15-30 | 4.8 | <0.01 | 0.02 | 0.49 | 0.10 | 0.15 | 0.01 | <0.01 | 0.6 | 0.78 | 0.79 |
| | 30-45 | 5.0 | <0.01 | 0.03 | 0.42 | 0.16 | 0.11 | 0.01 | <0.01 | 0.6 | 0.73 | 0.84 |
| | 45-60 | 5.1 | <0.01 | 0.03 | 0.44 | 0.19 | 0.07 | 0.01 | <0.01 | 0.7 | 0.73 | 0.90 |
| H1 | LFH | 4.2 | | | | | | | | | | |
| | 0-2 | 4.6 | <0.01 | 0.11 | 1.23 | 0.24 | 0.22 | <0.01 | 0.12 | 1.6 | 1.92 | 0.82 |
| | 2-5 | 4.6 | <0.01 | 0.07 | 0.42 | 0.13 | 0.21 | <0.01 | 0.04 | 0.6 | 0.86 | 0.71 |
| | 5-10 | 4.5 | <0.01 | 0.06 | 0.33 | 0.11 | 0.28 | 0.01 | 0.03 | 0.5 | 0.82 | 0.61 |
| | 10-15 | 4.4 | <0.01 | 0.07 | 0.42 | 0.15 | 0.40 | 0.02 | 0.02 | 0.6 | 1.07 | 0.60 |
| | 15-30 | 4.9 | <0.01 | 0.07 | 0.39 | 0.15 | 0.19 | 0.02 | <0.01 | 0.6 | 0.82 | 0.75 |
| | 30-45 | 4.7 | <0.01 | 0.04 | 0.22 | 0.09 | 0.17 | 0.01 | <0.01 | 0.4 | 0.54 | 0.67 |
| | 45-60 | 4.5 | <0.01 | 0.03 | 0.15 | 0.06 | 0.24 | 0.01 | <0.01 | 0.2 | 0.49 | 0.50 |
| I1 | LFH | 4.6 | | | | | | | | | | |
| | 0-2 | 4.9 | <0.01 | 0.16 | 14.00 | 1.08 | 0.06 | <0.01 | 0.49 | 15.2 | 15.8 | 0.97 |
| | 2-5 | 5.2 | <0.01 | 0.05 | 2.57 | 0.21 | 0.05 | <0.01 | 0.12 | 2.8 | 2.99 | 0.94 |
| | 5-10 | 5.0 | <0.01 | 0.03 | 1.18 | 0.13 | 0.09 | <0.01 | 0.04 | 1.3 | 1.47 | 0.91 |
| | 10-15 | 4.9 | <0.01 | 0.03 | 0.72 | 0.11 | 0.14 | 0.02 | 0.01 | 0.9 | 1.02 | 0.84 |
| | 15-30 | 5.1 | <0.01 | 0.02 | 0.64 | 0.10 | 0.15 | 0.02 | <0.01 | 0.8 | 0.93 | 0.82 |
| | 30-45 | 5.2 | <0.01 | 0.02 | 0.53 | 0.13 | 0.10 | 0.01 | <0.01 | 0.7 | 0.80 | 0.86 |
| | 45-60 | 5.1 | <0.01 | 0.02 | 0.42 | 0.14 | 0.10 | 0.01 | <0.01 | 0.6 | 0.70 | 0.84 |
| J1 | LFH | 4.7 | | | | | | | | | | |
| | 0-2 | 4.7 | <0.01 | 0.09 | 1.61 | 0.30 | 0.18 | <0.01 | 0.08 | 2.0 | 2.25 | 0.89 |
| | 2-5 | 4.5 | <0.01 | 0.07 | 0.79 | 0.18 | 0.28 | 0.01 | 0.03 | 1.0 | 1.35 | 0.77 |
| | 5-10 | 4.6 | <0.01 | 0.05 | 0.48 | 0.12 | 0.32 | 0.02 | 0.01 | 0.7 | 1.00 | 0.65 |
| | 10-15 | 4.6 | 0.01 | 0.06 | 0.49 | 0.13 | 0.38 | 0.02 | 0.01 | 0.7 | 1.09 | 0.62 |
| | 15-30 | 4.7 | <0.01 | 0.06 | 0.36 | 0.10 | 0.34 | 0.02 | <0.01 | 0.5 | 0.87 | 0.59 |
| | 30-45 | 5.0 | <0.01 | 0.06 | 0.36 | 0.11 | 0.19 | 0.01 | <0.01 | 0.5 | 0.73 | 0.73 |
| | 45-60 | 4.7 | <0.01 | 0.04 | 0.24 | 0.10 | 0.24 | 0.01 | <0.01 | 0.4 | 0.63 | 0.60 |
| K1 | LFH | 4.5 | | | | | | | | | | |
| | 0-2 | 4.5 | <0.01 | 0.13 | 2.11 | 0.33 | 0.22 | 0.02 | 0.17 | 2.6 | 2.97 | 0.86 |
| | 2-5 | 4.6 | <0.01 | 0.07 | 0.82 | 0.17 | 0.33 | 0.01 | 0.05 | 1.1 | 1.45 | 0.73 |
| | 5-10 | 4.6 | <0.01 | 0.06 | 0.48 | 0.13 | 0.27 | 0.01 | 0.02 | 0.7 | 0.97 | 0.68 |
| | 10-15 | 4.6 | <0.01 | 0.04 | 0.30 | 0.11 | 0.34 | 0.02 | 0.01 | 0.5 | 0.82 | 0.56 |
| | 15-30 | 4.6 | <0.01 | 0.05 | 0.26 | 0.12 | 0.37 | 0.02 | <0.01 | 0.4 | 0.82 | 0.53 |
| | 30-45 | 4.5 | <0.01 | 0.04 | 0.16 | 0.11 | 0.42 | 0.02 | <0.01 | 0.3 | 0.75 | 0.41 |
| | 45-60 | 4.4 | <0.01 | 0.04 | 0.17 | 0.12 | 0.35 | 0.01 | 0.01 | 0.3 | 0.70 | 0.46 |
| L1 | LFH | 3.8 | | | | | | | | | | |
| | 0-2 | 4.2 | <0.01 | 0.09 | 4.97 | 0.37 | 0.24 | <0.01 | 0.40 | 5.4 | 6.08 | 0.89 |
| | 2-5 | 4.3 | <0.01 | 0.04 | 0.79 | 0.09 | 0.42 | 0.03 | 0.03 | 0.9 | 1.39 | 0.66 |
| | 5-10 | 4.5 | <0.01 | 0.03 | 0.37 | 0.06 | 0.47 | 0.03 | <0.01 | 0.5 | 0.96 | 0.47 |
| | 10-15 | 4.5 | <0.01 | 0.02 | 0.23 | 0.04 | 0.40 | 0.03 | <0.01 | 0.3 | 0.72 | 0.41 |
| | 15-30 | 4.7 | <0.01 | 0.02 | 0.25 | 0.07 | 0.22 | 0.01 | 0.01 | 0.3 | 0.58 | 0.59 |
| | 30-45 | 4.7 | 0.01 | 0.04 | 0.44 | 0.13 | 0.19 | <0.01 | <0.01 | 0.6 | 0.81 | 0.77 |
| | 45-60 | 4.7 | 0.01 | 0.04 | 0.55 | 0.10 | 0.18 | 0.01 | <0.01 | 0.7 | 0.89 | 0.78 |

Table B6. Exchangeable Cations, Cation Exchange Capacity and Base Saturation at the Tucker Lake South Site

| Subplot | Layer (cm) | pH (CaCl ₂) | Na | K | Ca | Mg | Al | Fe | Mn | Bases | C.E.C. | Base Saturation |
|---------|------------|-------------------------|--------------------------|------|------|------|------|-------|-------|-------|--------|-----------------|
| | | | (cmol kg ⁻¹) | | | | | | | | | |
| A1 | LFH | 4.3 | | | | | | | | | | |
| | 0-2 | 4.5 | <0.01 | 0.08 | 2.77 | 0.26 | 0.33 | <0.01 | 0.54 | 3.1 | 3.97 | 0.78 |
| | 2-5 | 4.5 | <0.01 | 0.05 | 1.18 | 0.11 | 0.29 | <0.01 | 0.20 | 1.3 | 1.83 | 0.73 |
| | 5-10 | 4.6 | <0.01 | 0.04 | 0.46 | 0.07 | 0.28 | <0.01 | 0.04 | 0.6 | 0.89 | 0.64 |
| | 10-15 | 4.5 | <0.01 | 0.03 | 0.32 | 0.05 | 0.32 | <0.01 | 0.03 | 0.4 | 0.75 | 0.54 |
| B1 | LFH | 4.0 | | | | | | | | | | |
| | 0-2 | 4.6 | <0.01 | 0.08 | 1.84 | 0.29 | 0.21 | <0.01 | 0.27 | 2.2 | 2.68 | 0.82 |
| | 2-5 | 4.8 | <0.01 | 0.05 | 0.84 | 0.15 | 0.17 | <0.01 | 0.05 | 1.0 | 1.26 | 0.82 |
| | 5-10 | 4.6 | <0.01 | 0.04 | 0.43 | 0.09 | 0.27 | 0.02 | 0.01 | 0.5 | 0.85 | 0.65 |
| | 10-15 | 4.7 | <0.01 | 0.03 | 0.25 | 0.06 | 0.22 | 0.02 | <0.01 | 0.3 | 0.58 | 0.59 |
| C1 | LFH | 4.2 | | | | | | | | | | |
| | 0-2 | 4.1 | 0.01 | 0.15 | 6.42 | 0.55 | 0.42 | 0.01 | 1.11 | 7.1 | 8.67 | 0.82 |
| | 2-5 | 4.2 | <0.01 | 0.03 | 1.51 | 0.15 | 0.46 | 0.01 | 0.25 | 1.7 | 2.42 | 0.70 |
| | 5-10 | 4.3 | <0.01 | 0.03 | 0.52 | 0.08 | 0.40 | 0.01 | 0.08 | 0.6 | 1.11 | 0.56 |
| | 10-15 | 4.5 | 0.01 | 0.02 | 0.14 | 0.04 | 0.31 | 0.03 | 0.01 | 0.2 | 0.56 | 0.38 |
| D1 | LFH | 4.0 | | | | | | | | | | |
| | 0-2 | 4.3 | <0.01 | 0.08 | 3.95 | 0.47 | 0.43 | <0.01 | 0.57 | 4.5 | 5.49 | 0.82 |
| | 2-5 | 4.4 | <0.01 | 0.04 | 0.99 | 0.15 | 0.37 | 0.01 | 0.14 | 1.2 | 1.70 | 0.70 |
| | 5-10 | 4.3 | 0.01 | 0.04 | 0.48 | 0.10 | 0.48 | 0.02 | 0.05 | 0.6 | 1.16 | 0.53 |
| | 10-15 | 4.4 | <0.01 | 0.03 | 0.26 | 0.07 | 0.43 | 0.02 | 0.01 | 0.4 | 0.82 | 0.43 |
| E1 | LFH | 4.1 | | | | | | | | | | |
| | 0-2 | 4.4 | <0.01 | 0.04 | 1.09 | 0.17 | 0.28 | <0.01 | 0.17 | 1.3 | 1.76 | 0.74 |
| | 2-5 | 4.4 | <0.01 | 0.02 | 0.57 | 0.09 | 0.32 | 0.01 | 0.06 | 0.7 | 1.07 | 0.64 |
| | 5-10 | 4.4 | <0.01 | 0.02 | 0.36 | 0.08 | 0.36 | 0.01 | 0.02 | 0.5 | 0.86 | 0.54 |
| | 10-15 | 4.6 | <0.01 | 0.03 | 0.23 | 0.08 | 0.33 | 0.01 | 0.01 | 0.3 | 0.68 | 0.48 |
| F1 | LFH | 3.9 | | | | | | | | | | |
| | 0-2 | 4.0 | <0.01 | 0.07 | 1.01 | 0.14 | 0.63 | 0.01 | 0.53 | 1.2 | 2.39 | 0.51 |
| | 2-5 | 4.3 | <0.01 | 0.03 | 0.59 | 0.09 | 0.45 | 0.01 | 0.16 | 0.7 | 1.33 | 0.53 |
| | 5-10 | 4.4 | <0.01 | 0.02 | 0.46 | 0.08 | 0.40 | 0.01 | 0.04 | 0.6 | 1.02 | 0.56 |
| | 10-15 | 4.5 | <0.01 | 0.02 | 0.35 | 0.07 | 0.38 | 0.02 | 0.01 | 0.4 | 0.85 | 0.51 |
| G1 | LFH | 3.8 | | | | | | | | | | |
| | 0-2 | 4.3 | 0.01 | 0.07 | 3.30 | 0.24 | 0.64 | <0.01 | 0.89 | 3.6 | 5.14 | 0.70 |
| | 2-5 | 4.5 | <0.01 | 0.04 | 1.23 | 0.09 | 0.31 | <0.01 | 0.21 | 1.4 | 1.88 | 0.72 |
| | 5-10 | 4.3 | <0.01 | 0.03 | 0.63 | 0.06 | 0.41 | 0.01 | 0.06 | 0.7 | 1.20 | 0.60 |
| | 10-15 | 4.4 | <0.01 | 0.03 | 0.45 | 0.06 | 0.39 | 0.01 | 0.02 | 0.5 | 0.97 | 0.56 |
| H1 | LFH | 4.1 | | | | | | | | | | |
| | 0-2 | 4.5 | <0.01 | 0.10 | 2.82 | 0.35 | 0.29 | 0.01 | 0.39 | 3.3 | 3.95 | 0.83 |
| | 2-5 | 4.5 | <0.01 | 0.06 | 1.68 | 0.22 | 0.39 | 0.01 | 0.20 | 2.0 | 2.55 | 0.77 |
| | 5-10 | 4.5 | <0.01 | 0.04 | 0.51 | 0.09 | 0.32 | 0.01 | 0.05 | 0.6 | 1.02 | 0.63 |
| | 10-15 | 4.5 | 0.01 | 0.08 | 0.40 | 0.08 | 0.37 | 0.03 | 0.02 | 0.6 | 0.98 | 0.58 |
| I1 | LFH | 4.2 | | | | | | | | | | |
| | 0-2 | 4.2 | 0.01 | 0.11 | 0.99 | 0.18 | 0.44 | 0.01 | 0.48 | 1.3 | 2.23 | 0.58 |
| | 2-5 | 4.2 | 0.01 | 0.05 | 0.54 | 0.10 | 0.54 | 0.01 | 0.30 | 0.7 | 1.55 | 0.45 |
| | 5-10 | 4.2 | 0.01 | 0.05 | 0.43 | 0.09 | 0.57 | 0.01 | 0.16 | 0.6 | 1.32 | 0.44 |
| | 10-15 | 4.4 | <0.01 | 0.02 | 0.19 | 0.05 | 0.40 | 0.02 | 0.02 | 0.3 | 0.70 | 0.37 |

Table B6. Exchangeable Cations, Cation Exchange Capacity and Base Saturation at the Tucker Lake South Site (concluded)

| Subplot | Layer (cm) | pH (CaCl ₂) | Na | K | Ca | Mg | Al | Fe | Mn | Bases | C.E.C. | Base Saturation |
|---------|---------------|----------------------------|--------------------------|------|------|------|------|-------|-------|-------|--------|--------------------|
| | | | (cmol kg ⁻¹) | | | | | | | | | |
| J1 | LFH | 4.3 | | | | | | | | | | |
| | 0-2 | 4.5 | 0.01 | 0.19 | 3.30 | 0.40 | 0.33 | 0.02 | 0.71 | 3.9 | 4.96 | 0.79 |
| | 2-5 | 4.7 | 0.01 | 0.07 | 2.93 | 0.28 | 0.30 | 0.01 | 0.38 | 3.3 | 3.97 | 0.83 |
| | 5-10 | 4.9 | <0.01 | 0.04 | 1.57 | 0.16 | 0.18 | <0.01 | 0.15 | 1.8 | 2.10 | 0.85 |
| | 10-15 | 4.8 | <0.01 | 0.03 | 0.55 | 0.08 | 0.18 | <0.01 | 0.06 | 0.7 | 0.91 | 0.73 |
| K1 | LFH | 4.2 | | | | | | | | | | |
| | 0-2 | 4.6 | <0.01 | 0.07 | 1.66 | 0.24 | 0.28 | <0.01 | 0.38 | 2.0 | 2.63 | 0.75 |
| | 2-5 | 4.7 | <0.01 | 0.06 | 0.65 | 0.12 | 0.29 | 0.01 | 0.13 | 0.8 | 1.25 | 0.66 |
| | 5-10 | 4.7 | <0.01 | 0.04 | 0.46 | 0.08 | 0.27 | 0.02 | 0.04 | 0.6 | 0.90 | 0.64 |
| | 10-15 | 4.8 | 0.01 | 0.03 | 0.48 | 0.08 | 0.25 | 0.02 | <0.01 | 0.6 | 0.88 | 0.69 |
| L1 | LFH | 4.0 | | | | | | | | | | |
| | 0-2 | 4.3 | 0.01 | 0.18 | 3.02 | 0.41 | 0.48 | 0.01 | 0.76 | 3.6 | 4.87 | 0.74 |
| | 2-5 | 4.7 | <0.01 | 0.08 | 2.51 | 0.34 | 0.25 | <0.01 | 0.34 | 2.9 | 3.53 | 0.83 |
| | 5-10 | 4.7 | <0.01 | 0.05 | 0.98 | 0.18 | 0.22 | <0.01 | 0.07 | 1.2 | 1.49 | 0.81 |
| | 10-15 | 4.5 | <0.01 | 0.03 | 0.42 | 0.10 | 0.40 | 0.02 | 0.02 | 0.5 | 0.99 | 0.55 |

Table B7. Nutrients and Texture in Pedogenic Horizons of the Tucker Lake North and South Monitoring Sub-Sites

| Sub-Site | Horizon | Depth (cm) | Plant Avail. (NO ₃ +NO ₂)-N (mg kg ⁻¹) | Plant Avail. NH ₄ -N (mg kg ⁻¹) | Plant Avail. N (mg kg ⁻¹) | Plant Avail. P (mg kg ⁻¹) | Sand (%) | Silt (%) | Clay (%) |
|--------------|---------|------------|---------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------|---------------------------------------|----------|----------|----------|
| North | LFH | 4-0 | <0.05 | 32.4 | 32.4 | 29.4 | | | |
| | Ae | 0-4 | <0.05 | 0.95 | 1.0 | 11.6 | 95 | 3 | 2 |
| | AB | 4-12 | <0.05 | 0.58 | 0.6 | 31.9 | 98 | 0 | 2 |
| | Bm1 | 12-25 | <0.05 | 0.72 | 0.7 | 44.5 | 98 | 0 | 2 |
| | Bm2 | 25-62 | | | | | 98 | 0 | 2 |
| | Bm3 | 62-100 | | | | | 98 | 0 | 2 |
| South | LFH | 4-0 | <0.05 | 41.3 | 41.3 | 9.5 | | | |
| | Ahe | 0-4 | <0.05 | 2.22 | 2.2 | 2.7 | 95 | 3 | 2 |
| | Ae | 4-12 | <0.05 | 0.55 | 0.6 | 54.1 | 92 | 5 | 3 |
| | Bm1 | 12-28 | <0.05 | 0.52 | 0.5 | 64.1 | 93 | 4 | 3 |
| | Bm2 | 28-56 | | | | | 96 | 2 | 2 |
| | Bm3 | 56-100 | | | | | 96 | 2 | 2 |

APPENDIX C

TUCKER LAKE LONG TERM ACID DEPOSITION MONITORING SITE PHOTOGRAPHS



Photo C1. Jack Pine Stand at Tucker Lake North Monitoring Sub-Site



Photo C2. Soil Profile at Tucker Lake North Monitoring Sub-Site



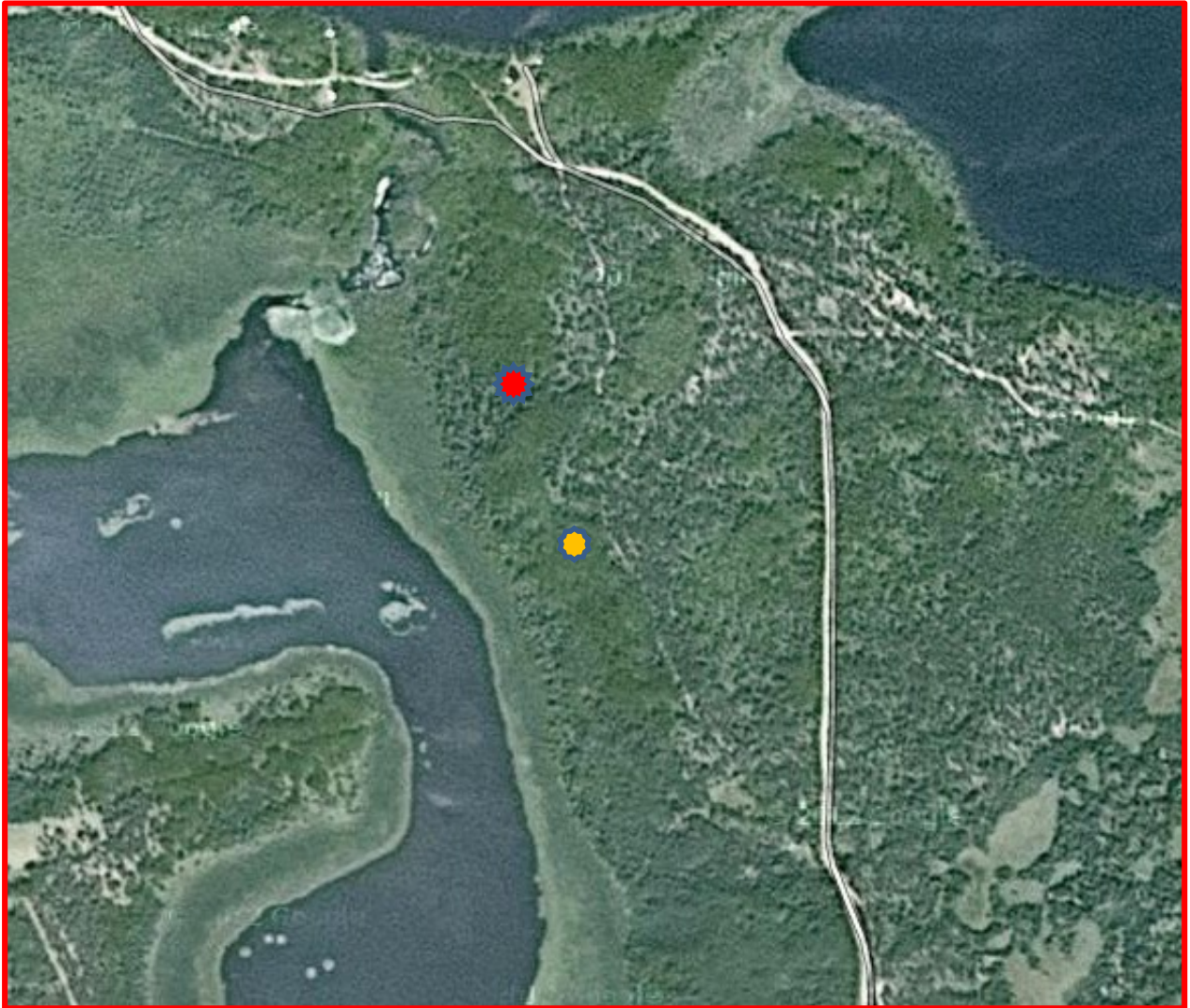
Photo C3. Jack Pine Forest Stand at Tucker Lake South Monitoring Sub-Site



Photo C4. Soil Profile at Tucker Lake South Monitoring Sub-Site

APPENDIX D

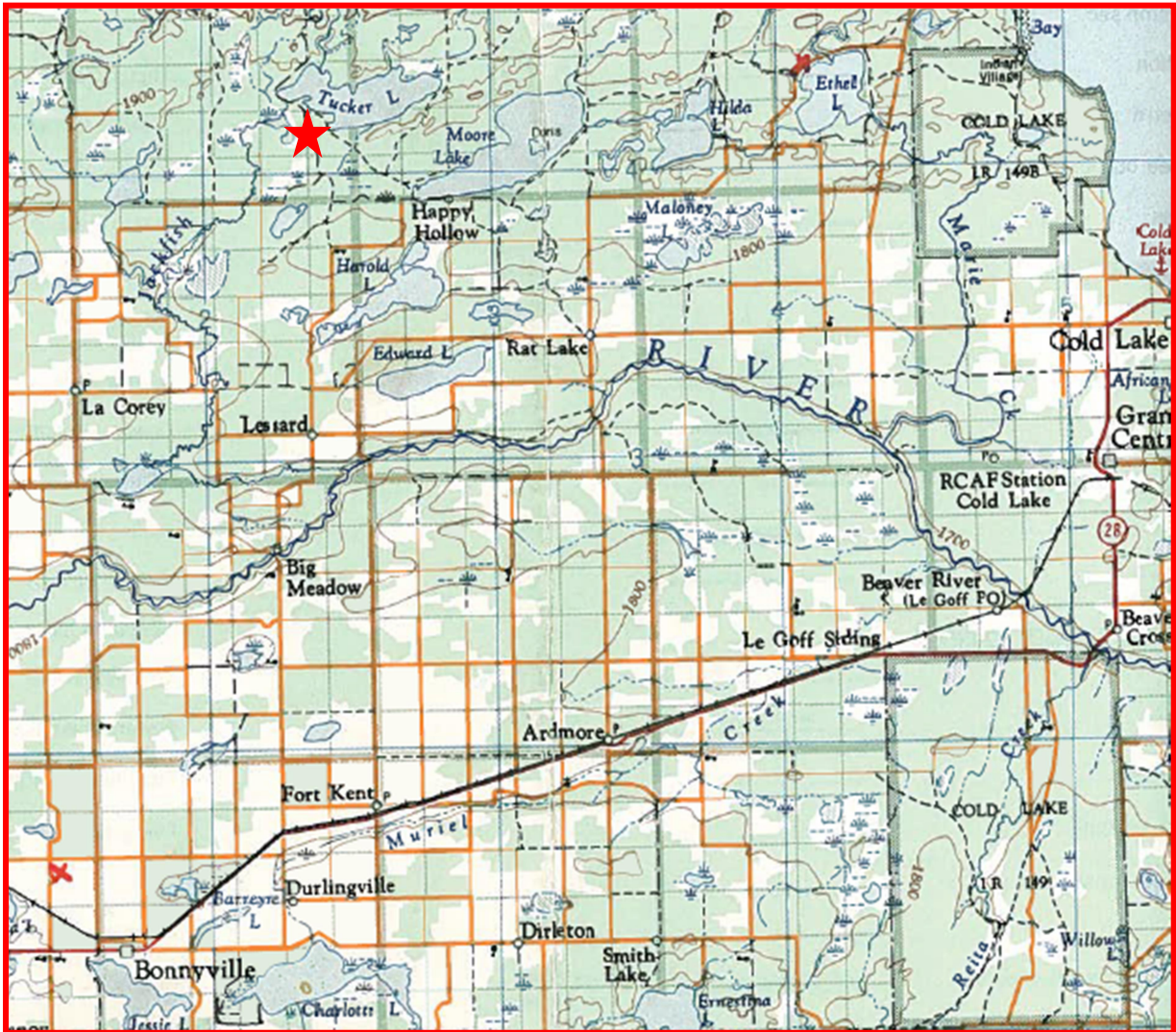
LOCATION OF TUCKER LAKE SOIL MONITORING SITE AND SUB-SITES



Map D1. Locations of Soil Monitoring Sub-Sites at the Tucker Lake LTSAM Site

Red – North Sub-Site

Gold – South Sub-Site



Map D2. Location of Tucker Lake LTSAM Site (at red star)