

APPENDIX 16-A
2009 WETLANDS BASELINE REPORT

Seabridge Gold Inc.

KSM PROJECT 2009 Wetlands Baseline Report

SEABRIDGE GOLD



KSM PROJECT

2009 WETLANDS BASELINE REPORT

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SEABRIDGE GOLD

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Executive Summary

Seabridge Gold Inc. has proposed the development of the KSM gold-copper mining project approximately 65 km northwest of Stewart, British Columbia. Rescan Environmental Services Ltd. has been contracted to complete environmental and socio-economic baseline studies in support of an Environmental Assessment (EA). This report presents results of wetland baseline studies. Wetlands are a necessary study component because they represent special communities that a number of federal, provincial, and regional organizations have recognized as integral to a properly functioning environment. Wetlands support processes specific only to wetlands and offer a diversity of habitat for a variety of wildlife species. The objectives of this baseline report are to:

1. survey, map, and classify potentially affected wetlands in the study area;
2. describe wetland function;
3. identify potentially rare or unique wetlands; and
4. produce a baseline report describing wetland ecosystems in the study area.

Wetland surveys were carried out in September 2008 and July 2009; 111 wetland surveys were conducted resulting in 94 surveyed wetlands. Wetland mapping indentified 554.3 ha of wetlands within the study area. Four federal wetland classes were observed in the study area with open water wetlands being the most common and swamps covering the largest area. These federal classes were further divided into 21 wetland association types based on floristic characteristics of individual wetlands.

Ecosystem survey data and wetland hydrology data were used to establish wetland function. Wetland functions are a series of process specific to wetlands and are of a hydrological, biochemical, ecological, and habitat nature. These primary functions are valued by society because they ensure:

1. adequate water supply and flood protection (hydrological function);
2. clean surface water resources because water is filtered as it is transferred to groundwater systems (biochemical function);
3. a diversity ecosystems and large wetland complexes (ecological function); and
4. wildlife habitat for a variety of species (habitat function).

KSM PROJECT

2009 WETLANDS BASELINE REPORT

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Acronyms and Abbreviations

Acronyms and abbreviations used in this document are defined where they are first used. The following list of abbreviations will assist readers who may choose to review only portions of the document.

BC CDC	British Columbia Conservation Data Centre
BEC	Biogeoclimatic Ecosystem Classification
CWH	Coastal Western Hemlock BEC Zone
Dy	Dynamic Hydrodynamic Index
ESSF	Engelmann Spruce Subalpine Fir BEC Zone
GIF	Ground Inspection Form
GIS	Geographic Information System
ICH	Interior Cedar Hemlock BEC Zone
KSM	Kerr-Sulphurets-Mitchell
MH	Mountain Hemlock BEC Zone
Mo	Mobile Hydrodynamic Index
NAD	North American Datum
PAG	Potentially Acid Generating
Rescan	Rescan Environmental Services Ltd.
Seabridge	Seabridge Gold Inc.
SHIM	Sensitive Habitat Inventory Mapping
Sl	Sluggish Hydrodynamic Index
SMR	Soil Moisture Regime
SNR	Soil Nutrient Regime
St	Stagnant Hydrodynamic Index
TEM	Terrestrial Ecosystem Mapping
TMF	Tailing Management Facility
TRIM	Terrestrial Resource Information Management
UTM	Universal Transverse Mercator
VM	Very Moist SNR
VW	Very Wet SNR
W	Wet SNR

1. Introduction

1.1 PROJECT PROPONENT

The proponent for the KSM (Kerr-Sulphurets-Mitchell) Project is Seabridge Gold Inc. (Seabridge), a publicly traded junior gold company with common shares trading on the Toronto Stock Exchange in Canada and on the American Stock Exchange in the United States.

1.2 KSM PROJECT LOCATION

The KSM Project is a gold/copper project located in the mountainous terrain of northwestern British Columbia, approximately 950 km northwest of Vancouver, British Columbia, and approximately 65 km northwest of Stewart, British Columbia (Figure 1.2-1). The proposed Project lies approximately 20 km southeast of Barrick Gold's recently-closed Eskay Creek Mine and 30 km northeast of the Alaska border. The proposed processing plant and tailing management facility will be located about 15 km southwest of the community of Bell II on Highway 37.

The north and west parts of the Project area drain towards the Unuk River, which crosses into Alaska and enters the Pacific Ocean at Burroughs Bay. The eastern part of the Project area drains towards the Bell-Irving River, which joins the Nass River and empties into the Canadian waters of Portland Inlet. Elevations in the Project area range from under 240 m at the confluence of Sulphurets Creek with the Unuk River, to over 2,300 m at the nearby peak of the Unuk Finger.

1.3 KSM PROJECT DESCRIPTION

The KSM Project is a large proposed gold-copper mining project. Reserve figures released in a preliminary feasibility study announced on March 31, 2010 include 1.6 billion tonnes of ore containing 30.2 million ounces of gold, 7 billion pounds of copper, 133 million ounces of silver and 210 million pounds of molybdenum in the proven and probable categories. This environmental baseline study was designed to address a wide range of alternatives that have been assessed from engineering and cost perspective at various times during the baseline studies. The following project description is the base case for the March 2010 Preliminary Feasibility Study. Maps in subsequent sections of this baseline report may depict slightly different footprint configurations relating to earlier designs that prevailed at the time the fieldwork was completed.

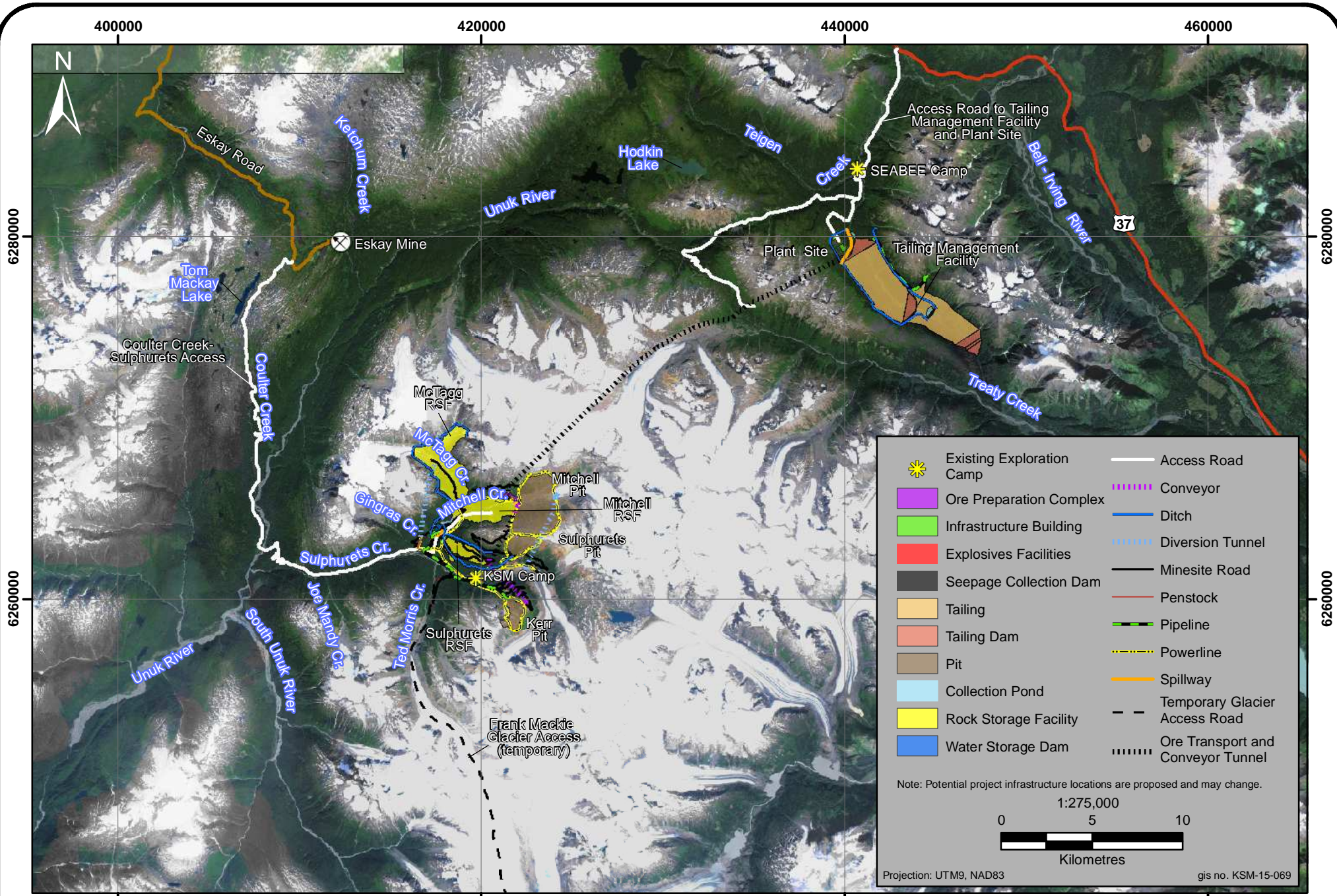
The proposed Project as defined for the purposes of this environmental baseline study will be comprised of two distinct and geographically separate areas (the mining area and processing plant and tailing management area), shown in Figure 1.3-1. The proposed mining area is located in the drainage basin of Sulphurets Creek, a major tributary of the Unuk River. The proposed location of the processing plant and tailing management facility is in the headwaters of tributaries of Teigen and Treaty Creeks, which flow to the Bell-Irving River. The two areas will be connected by a pair of parallel tunnels. An overview of these proposed mine components is provided in the following two Sections..

1.3.1 Mining Area

It is proposed that the mining area will be accessed by a new road to be constructed from the current Eskay Creek mine road. The access road will be used to transport personnel, heavy mining equipment, mining supplies, and explosives. This new road will trend southwestwards to the headwaters of Coulter Creek and then follow the general course of Coulter Creek to the Unuk River. After crossing the Unuk



FIGURE 1.2-1



River it will follow the north side of the Sulphurets Creek Valley and cross Mitchell Creek. The Unuk River is considered navigable water under the *Navigable Waters Protection Act*. Branch roads will lead to each of the Kerr, Sulphurets and Mitchell deposits. Another branch road will head south parallel to Ted Morris Creek towards the toe of the north flowing tongue of Frank Mackie Glacier to provide access to the explosives manufacturing plant and related explosives magazines.

The support facilities for the mining area are proposed in the vicinity of the confluence of Sulphurets and Mitchell creeks. They will include accommodation for mine employees and administration and maintenance facilities.

The ore deposits will be bulk mined with large shovels and trucks and will use conventional drilling and blasting methods. The Kerr deposit is located on a ridge south of Sulphurets Lake. It is proposed that ore and non-ore mined rock will be transported from the Kerr deposit by conveyor to a tunnel portal (Sulphurets Mitchell tunnel) on the north side of Sulphurets Creek. These materials will be transported through the tunnel by conveyor to the Mitchell Creek Valley where they will be transported to the ore preparation complex or the Mitchell-McTagg rock storage facilities, respectively.

The Sulphurets deposit is located on the south side of the ridge north of Sulphurets Lake. It is proposed that ore will be transported by truck to the Sulphurets Mitchell tunnel and then by conveyor to the ore preparation complex. Non-ore mined rock will be transported to the Sulphurets rock storage facility on the south side of the ridge between the Mitchell Creek and Sulphurets Creek valleys, or to the Mitchell-McTagg rock storage facilities.

The Mitchell deposit straddles the Mitchell Creek Valley in an area recently exposed by the recession of the Mitchell Glacier. Mining of the deposit is proposed on both sides of the valley and to a depth of over 400 m below the current valley bottom. Seabridge proposes to construct a diversion tunnel from near the toe of the Mitchell Glacier, southwards towards the Sulphurets Creek Valley upstream of Sulphurets Lake to divert the flow of Mitchell Creek away from the proposed open pit area. It is proposed that the significant hydraulic head created by this tunnel will be used to drive a hydro-electric plant to generate a small portion of the electricity requirements of the Project.

Large volumes of low grade or barren rock will be removed in order to access the ore in each of the deposits. Non-ore rock removed to access ore will consist of both potentially acid generating (PAG) and not potentially acid generating (not PAG) rock. Rock storage areas have been defined in the Mitchell Creek and McTagg Creek valleys and on the south-facing side of the ridge between Sulphurets Creek and Mitchell Creek valleys. Runoff and seepage from the rock storage areas will be collected in a water storage facility contained behind a dam, to be located in the lower reaches of Mitchell Creek, and treated prior to discharge to the environment. The piped flow from the storage facility to the water treatment plant may be used to drive a hydro-electric plant.

A second diversion tunnel is proposed to direct the flow of McTagg Creek to the Sulphurets Creek Valley, thus avoiding the rock storage areas. The discharge from this tunnel will be available to drive a hydro-electric plant.

A run-of-river hydro-electric plant is proposed to harness the hydraulic head of the cascade in the lower reaches of Sulphurets Creek.

Ore from the deposits will be transported to an ore preparation complex, consisting of crushing and grinding facilities and related ore storage stockpiles, located on the north side of the Mitchell Creek Valley west of the Mitchell pit. Prepared ore will be mixed with water and pumped through one of two parallel 23 km-long tunnels to the process plant, proposed to be located in the drainage of a north-

flowing tributary of Teigen Creek. The tunnels will daylight for a short distance near the divide between the Unuk River drainage and Treaty Creek before proceeding to the plant site in the Teigen Creek drainage. They will accommodate two pipelines to transport ore slurry as well as a return water pipeline, a diesel fuel pipeline, and a transmission line. The tunnels will slope towards Mitchell Creek so that all drainage can be controlled at the mine site and treated as necessary prior to release to the environment.

1.3.2 Processing and Tailing Management Area

The tunnel from the Mitchell Creek Valley will terminate on the south side of the valley formed by a north flowing tributary of Teigen Creek (South Teigen Creek) and a south flowing tributary of Treaty Creek (North Treaty Creek Tributary), adjacent to the plant site.

The plant will use a conventional grinding and flotation flowsheet to produce separate copper/gold and molybdenum concentrates, gold doré and tailing. It will process up to 120,000 tonnes per day of ore to produce an average of 1,200 tonnes per day of concentrate. The concentrate will be dried and transported to the port of Stewart by truck. It is anticipated that approximately 20 to 30 round trips per day will be required using 40 tonne payload trucks.

Vehicle access to the plant site will be by a 14 km long road along Teigen Creek from Highway 37. This road will require bridges to cross Teigen creek, which may be considered to be navigable water, and smaller tributaries.

The tailing will be pumped through pipelines to the tailing management facility located in the upper reaches of the Teigen Creek Valley, extending southeast over the divide into a tributary of the Treaty Creek drainage. The facility will be constructed in two phases: the north cell will be developed between a north dam, to be located across the valley of the south tributary of Teigen Creek near the plant site, and a south dam, to be located near the crest of the valley floor; and a south cell that will be retained by a southeast dam, to be located in the headwaters of the north tributary of Treaty Creek. The proposed facility will have storage capacity for the life of the Project within an area about 8 km long and 1.5 km wide. Seepage from the south and southeast dams will be pumped back into the impoundment to reduce any potential impact on the Treaty Creek drainage. Water diversion channels will be constructed on both flanks of the impoundment, where feasible, to divert clean water away from the impoundment. Supernatant water will be recovered from the impoundment using barge mounted pumps and recycled to the plant for process water. In the event that discharge is required, the excess water in the impoundment will be pumped over the northern dam towards the Teigen Creek drainage. Treatment of discharge water may be required to meet permit conditions.

It is assumed that electricity to power the plant and mine site will be obtained from the provincial electricity grid. A secondary transmission line will be constructed from a switching station, to be located near the point where Highway 37 crosses Snowbank Creek. The secondary line will follow the general alignment of the access road, to the plant site, and then pass through the tunnel to the mine site.

2. Objectives

Wetlands are dynamic, depressional or slightly sloping areas on the landscape that are saturated with water for a significant period of time during the growing season. They include both the wet basin and surrounding transitional areas between wetter zones and upland vegetation (Huel 2000). Wetlands can range from bogs and fens, which are sites that contain small, shallow areas of water that are present for only a few weeks after snow melt, to sites that comprise large, permanent open water zones (Stewart and Kantrud 1971). Wetlands are particularly important ecosystems as they fulfil a wide range of ecological, hydrological, biochemical and habitat functions (Environment Canada 2003). They maintain water quality, regulate water flow, and provide erosion control. They also provide habitat for a wide variety of wildlife, including many economically important game species (Natural Resources Canada 2009).

In British Columbia, wetlands comprise about 5.6% of the land base and provide habitat for most wildlife in the province including many red- and blue-listed wetland dependant species.

This report presents results of a baseline wetland study undertaken by Rescan Environmental Services Ltd. (Rescan) in 2008-2009, on behalf of Seabridge for the KSM Project (the Project). The Project has the potential to directly impact some wetland communities. Additionally, changes to the surrounding landscape hydrology may also affect the permanence and floristic composition of wetlands. Thus, studies of the existing wetlands were initiated. Wetlands were surveyed and mapped using Geographic Information System (GIS) within the study area. The physical, chemical, and biological characteristics of a sample of wetlands, as well as wetland quantity, size, and distribution were studied and/or mapped. Wetland ecosystem functions were identified using relevant field data and information from scientific literature in order to identify wetland ecosystem function. The objectives of the 2009 wetlands study were to:

1. survey, map, and classify wetlands in the study area;
2. describe the functions of identified wetlands;
3. identify potentially rare or unique wetlands; and
4. produce a baseline report describing wetland ecosystems in the study area.

3. Methods

3.1 STUDY AREA

The wetland study area (Figure 3.1-1) is composed of two parts (East and West); these areas occupy 17,974 ha and 40,712 ha respectively totalling 58,686 ha.

3.2 WETLAND ECOSYSTEM SURVEY AND MAPPING

For the purposes of the baseline study wetlands were surveyed and mapped such that the extent of wetlands, their type, size, and distribution could be established. Ecosystem components such as vegetation, soil, and hydrologic information were collected and used to establish wetland type and provide supporting information for descriptions of wetland function. The following presents the methodology for the wetland ecosystem survey, wetland classification, wetland mapping, and wetland function studies.

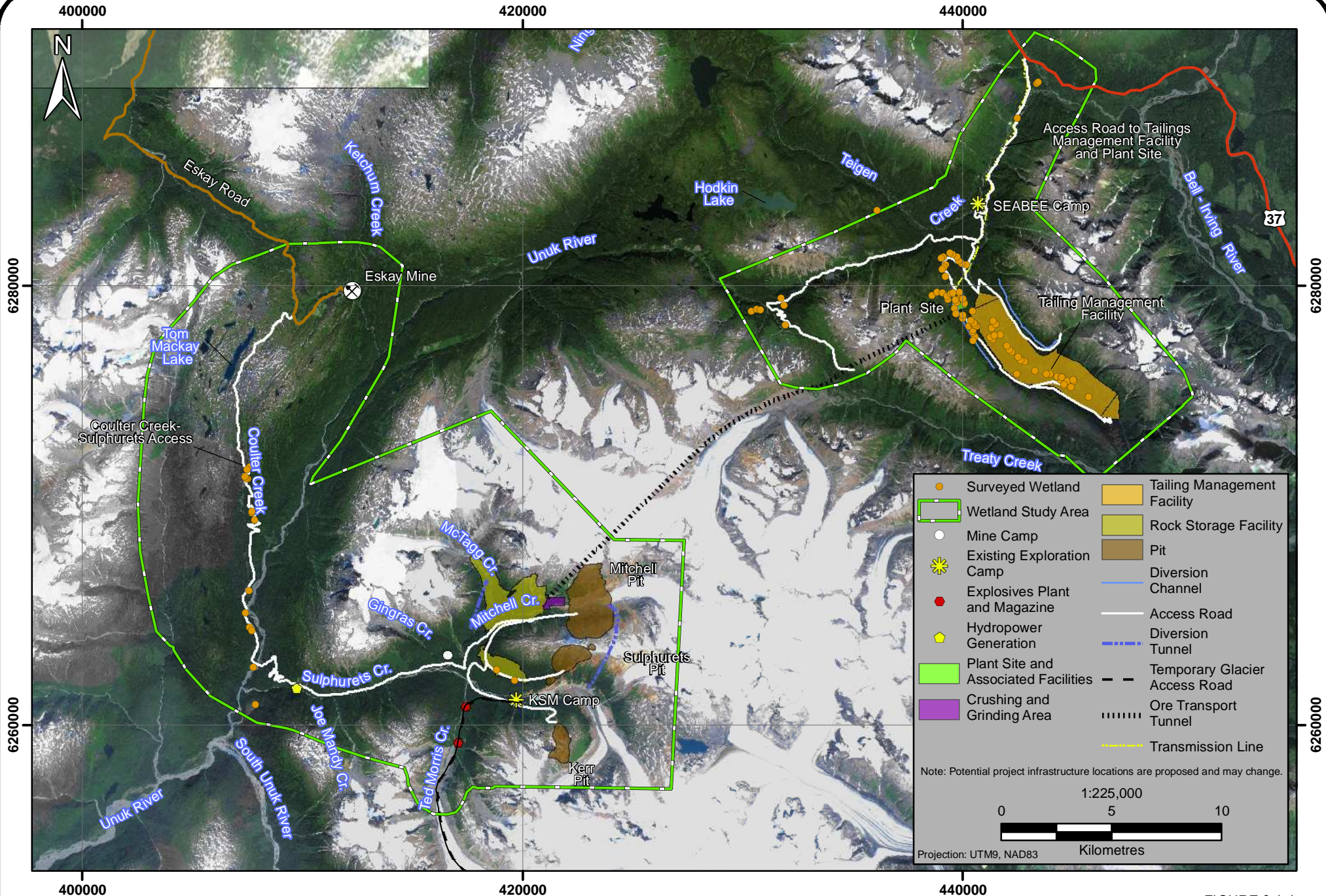
3.2.1 Wetland Ecosystem Survey

Wetlands were surveyed in September 2008 and July 2009; 111 wetland survey plots were established. Survey methods followed *Field Description of Wetland and Related Ecosystems in the Field*, (MacKenzie 1999) and *Wetlands of British Columbia: A Guide to Identification*, (MacKenzie and Moran 2004). Data collected during these field surveys were used to classify wetland ecosystems following the Canadian Wetland Classification System (class level) (Warner and Rubec 1997) and the provincial classification system (association level) (MacKenzie and Moran 2004). Wetland survey locations are displayed in Figure 3.1-1; ecosystem information, including UTM coordinates, is available in Appendix 1.

Prior to field surveys, equipment and field clothing were cleaned using a 1% Virkon solution, to prevent the spread of *Batrachochytrium dendrobatidis* between wetland sites which is a pathogen for amphibians. All wetlands identified in the project footprint were selected for study. Plots were 20 m x 20 m and established in large uniform wetlands or at the centre of wetlands smaller than 400 m². The edges of wetlands smaller than 400 m² were used as the survey plot boundary. A series of soil cores were established throughout each plot. At the centre of the plot a GPS coordinate was recorded and photographs were taken in each cardinal direction, of the soil surface, and of other significant features such as landforms, unique vegetation and wildlife.

Ground Inspection Forms (GIF) were used to record field notes. These forms are normally used to describe terrestrial ecosystems but were adapted for use in the wetland study. Information recorded on the field forms included:

- Plot Number;
- Project ID;
- Surveyor;
- Date;
- Photograph Numbers;
- GPS coordinates in Universal Transverse Mercator (UTM);
- Aspect (slope direction);



- Meso Slope Position (site position in the overall landscape);
- Soil Moisture Regime (SMR);
- Hydrodynamic index;
- Soil Nutrient Regime (SNR) (Table 3.2-1);
- Drainage Mineral Soils (drainage of all soils);
- Moisture Subclasses - Organic Soils (location and types of water features);
- Mineral Soil Texture;
- Organic Soil Texture (notes on decomposition);
- Surface Organic Horizon Thickness;
- Humus Form (decomposition of surface layer);
- Root Restricting Layer;
- Coarse Fragment Content;
- List of Vegetation (dominant/indicator plant species and percent cover); and
- Site Diagram on waterproof paper.

The hydrodynamic index, a measure of vertical and/or lateral water flow through the wetland, was recorded in the GIF form's Soil Moisture Regime field (Table 3.2-1). Moisture Subclasses - Organic Soils was used to comment on water presence above or below the ground and its availability through surface or groundwater pathways. Organic Soil Texture was used to record the texture and decomposition of the organic horizons (humic - very decomposed, mesic - moderate decomposition, fibric - little decomposition). The site diagram space on the GIF was used for a diagram of the soil pit, rooting depth to record measurements of soil water and surface water pH and conductivity. Peat development and the level of decomposition using the von post scale (von post 1-10) of decomposition were also recorded. Raw data are available in Appendix 1.

Table 3.2-1. Wetland Hydrodynamic Index, SMR, and SNR Field Codes

Hydrodynamic Index Code	Soil Moisture Code	Soil Nutrient Code
St - Stagnant	VM - Very Moist	A - Very Poor
Sl - Sluggish	W - Wet	B - Poor
Mo - Mobile	VW - Very Wet	C - Medium
Dy - Dynamic		D - Rich
VD - Very Dynamic		E - Very Rich
		F - Hyper

The soil survey methodologies for wetland ecosystem classification incorporated aspects from *The Canadian System of Soil Classification (CSSC 1987)*, *Towards a Taxonomic Classification of Humus Forms (Green et al. 1993)*, *Describing Ecosystems in the Field (Luttmerding, et al. 1990)*, and *Field Description of Wetland and Related Ecosystems in the Field (MacKenzie 1999)*. These methods require soil identification to a depth of 160 cm or lithic contact. Super-saturated soils and shallow alpine soils made deep sampling impossible at numerous sites. Soil pits were dug to a minimum depth of 40 cm, or when significant contact with the water table or lithic/parent material was made. Plate 3.2-1 shows a typical soil core.

A vegetation species list and relative percent vegetation cover were recorded at each plot. Special focus was placed on wetland association indicator species such as *Carex spp.* (sedge) and *Salix spp.* (willow). Vegetation identification references included: *Plants of Coastal British Columbia* (Pojar and MacKinnon 1994), *Plants of Northern British Columbia* (MacKinnon et. al 1999), and *Plants of the Western Boreal Forest and Aspen Parkland* (Johnson et al. 1995). Species not identified in the field were collected and identified using *The Illustrated Flora of British Columbia: Volumes 1-6* (Douglas et al. 2001). Field data are available in Appendix 2.



Plate 3.2-1. Soil Core from Wetland Site KS20

3.2.2 Wetland Classification

Wetland classification is the process by which ecologically important factors are interpreted so that commonalities among sites are identified. The classification process in BC integrates several classification models into a single hierarchical framework (MacKenzie and Moran 2004). The “Class” concept, as described in the Canadian Wetland Classification System, is used as the broad description of a site. The “Site Association” concept is used as a more precise description of individual sites. Each wetland class (bog, fen, marsh, swamp, shallow open water) is composed of a number of site associations, which are defined as sites capable of supporting a similar community at climax (MacKenzie and Moran 2004).

Currently, limited information is available detailing wetland classification at the site level. The principal data source describing wetlands in BC is the Terrain Resource Information Management (TRIM) database. TRIM data are useful for identifying the locations of wetlands >2 ha in area. However, it does not provide detailed ecosystem information and often wetland areas are inaccurately mapped or classified. Wetlands in TRIM are classified as 1) marsh and 2) swamp. These two wetland classes are recognized as two of the five federal wetland classes (Warner and Rubec 1997). Bogs, fens, and shallow open water wetlands (the remaining three federal wetland classes) are not differentiated by TRIM and

are either included in the two TRIM classes or not mapped as wetlands at all. The definitions for marsh and swamp supplied by TRIM (MOELP 1991) are:

1. Marsh - A water-saturated, poorly drained, treeless area intermittently or permanently water covered, having cattail, rushes or grass-like vegetation.
2. Swamp - A water-saturated area, intermittently or permanently covered with water, having shrubs.

It is likely that some shallow open water, fens and tree-less bogs are included in the TRIM marsh class. The TRIM swamp class does not include treed swamps; treed swamp associations can represent a major percentage of wetlands in northwest British Columbia and high elevation biogeoclimatic zones (MacKenzie and Moran, 2004). Bogs and shallow open water are not included in either TRIM class; however, shallow open water wetlands may appear as small “indefinite” and/or “intermittent” lakes in the TRIM data set. Although there are some problems associated with the classification of TRIM wetlands the data set provides a provincially-consistent form of wetland mapping. For this study TRIM wetlands were incorporated into the wetland Geographic Information System (GIS) and used to generate wetland areas where as field study data were used to classify wetlands.

Wetlands were assigned a given wetland class (bog, fen, marsh, swamp, and shallow open water) (Warner and Rubec 1997) using soil matrix, soil nutrient, and vegetation indicators. Wetland ecosystems were then assigned to a site association following the wetland edatopic grids for wetland class and corroborating dominant vegetation, and landscape position. Wetland classification was typically done in the field at the time of the wetland survey; however, wetland classification was checked for accuracy against standard literature once field studies were complete. Wetland classification data were recorded in the wetland database (Appendix 1).

Wetlands occurring in complexes (a number of wetland classes and/or site associations within a wetland ecosystem) were described in terms of the dominate community with a maximum of two subdominant communities. The percentage of each of the communities observed in the wetland complex was estimated and recorded as a decile. Up to three deciles were recorded and described at each site. Wetland area was calculated for each wetland class and association in each decile. This methodology is consistent with Terrestrial Ecosystem Mapping (TEM) methodologies (RISC 1998) and was used to estimate the area of each community type once mapping was complete.

3.2.2.1 *Rare Wetland Ecosystems*

The classification information is used to determine rare and sensitive ecosystems. Riparian area wetlands are considered a sensitive habitat as recorded by the Sensitive Habitat Inventory Mapping (SHIM) project (Mason and Knight 2001); there are also a number of wetlands listed provincially by the BC Conservation Data Centre (BC CDC) (MOE 2007) as either:

- Red-List - Includes any ecological community that is extirpated, endangered, or threatened in British Columbia.
- Blue-List - Includes any ecological community, considered to be of special concern (formerly vulnerable) in British Columbia.

Wetlands in each Biogeoclimatic (BEC) sub-zone were grouped according to wetland association. The wetland associations were compared against a list (BC CDC) of wetland associations in similar BEC sub-zones within the regional forest district. Wetland associations matching those in the BC CDC list would be determined to be listed as red or blue and therefore require special management consideration.

3.2.3 Wetland Mapping

Wetlands were delineated using ArcView GIS 9.3. Field delineations were compared against a 2008 400 mm resolution orthophoto of the study area. Wetlands at each survey location were delineated from the imagery and from available TRIM data. These delineations were recorded in a wetland GIS. Unsurveyed TRIM water features such as TRIM Swamp, TRIM Marsh, TRIM Lake Indefinite, and TRIM Lake Intermittent were added to the GIS, though not all of these features were surveyed. TRIM Lake Definite features were incorporated into the mapping where spatial analysis identified the features as less than 2 ha in area.

Data from Terrestrial Ecosystem Mapping of the study area (Rescan 2010a) data were also incorporated into the wetland GIS. The wettest site series from the Coastal Western Hemlock (CWH), Engelmann Spruce Subalpine Fir (ESSF), Interior Cedar Hemlock (ICH), and Mountain Hemlock (MH) BEC zones were analysed (Table 3.2-2). TEM ecosystem polygons were not considered further where wetlands had previously been mapped through the field delineation. The remaining ecosystem polygons were visually checked against the orthophoto.

Table 3.2-2. Criteria for Wetlands from TEM Polygon Data

Zone	Subzone	Variant	BEC_label	Site Series	Description
CWH	wm		CWHwm	08	wet forest
CWH	wm		CWHwm	09	swamp forest
CWH	wm		CWHwm	10	bog woodlands
CWH	wm		CWHwm	31	non-forested wetland
ESSF	wv		ESSFwv	31	non-forested wetland
ESSF	wv		ESSFwv	09	wet forest
ESSF	wv		ESSFwv	08	very moist-wet forest
ICH	vc		ICHvc	31	non-forested fen/marsh
ICH	vc		ICHvc	52	wet-thicket
ICH	vc		ICHvc	06	very moist-wet forest
MH	mm	2	MHmm2	31	non-forested wetland
MH	mm	2	MHmm2	08	bog forest
MH	mm	2	MHmm2	09	swamp forest

Maps, for the baseline report, of wetland features in the study area were made using ArcView 9.3. Wetland maps show both wetland classification and wetland distribution. Data include:

- Delineated Wetlands (2008-2009)
- TRIM Swamp
- TRIM Marsh
- TRIM Lake Intermittent
- TRIM Lake Indefinite
- TRIM Lake Definite (<2 ha)
- TEM Ecosystem Polygons (MHmm2 08)

3.2.4 Wetland Function

Wetland function is defined as a process or series of processes that a given wetland carries out, such as a wetland's ability to store and filter water. There are four primary functions (Environment Canada 2003) that should be included in an environmental assessment (Environment Canada, 2008). The functions are hydrological, biochemical, ecological, and habitat. Wetland functions include a series of complicated interactions between various wetland components such as water, soil, and vegetation. Aspects of wetland function were studied during baseline studies to establish baseline condition so that environmental monitoring during pre-construction, operations, and post-closure will have a point of reference. Table 3.2-3 shows which aspects of wetland functions are described by field data.

Table 3.2-3. Wetland Function and Associated Fieldwork Component

Wetland Function	Fieldwork Component
Hydrological Function	Ecosystem survey (Hydrodynamics) Static and Continuous Hydrology Survey
Biochemical Function	Ecosystem Survey (Soil water pH and conductivity measurements) Wetland Classification (Wetland class)
Ecological Function	Ecosystem Survey (Wetland size and distribution) Wetland Classification (Wetland complexes, rare or unique wetlands)
Habitat Function	Ecosystem Survey (Wildlife observations)

The principle wetland functions for each wetland class were determined through integrating data collected in support of the functional component of the baseline study (Table 3.2-2), individual wetland class and landscape position, and scientific literature, (JWEL 2007; Environment Canada 2008).

3.3 WETLAND HYDROLOGY

Wetland hydrology studies were conducted during the 2008 and 2009 summer field seasons at three representative wetlands within the proposed KSM Project area. One wetland is located near the confluence of the Unuk and Sulphurets Rivers, on the deposit side of the project (Figure 3.3-1). The other two wetlands are located within the proposed TMF (Figure 3.3-2). The wetland hydrology study consisted of: static and continuous water level measurements. The wetland monitoring sites are summarized in Table 3.3-1. The monitoring sites were selected to provide hydrological data characteristics of the area that could be used to infer the hydrology of wetlands throughout the baseline studies area.

Table 3.3-1. Details of Wetland Hydrological Monitoring Sites

Wetland Name /Well	Location (Northing, Easting)	Number of Wells	Wetland Class and Association	Type of Monitoring
UR1	407716, 6260895	6	Marsh (Wm02)	Continuous, static
STE1	442067, 6277301	7	Swamp (Ws06)	Continuous, static
NTR1	445105, 6275593	6	Fen (Wf04)	Static

**All coordinates in UTM9 NAD83*

406000 408000 410000

6262000

6262000

6260000

6260000



Surveied Wetland
 Wetland UR1
 Well Location
 Access Road

Note: Potential project infrastructure locations are proposed and may change.

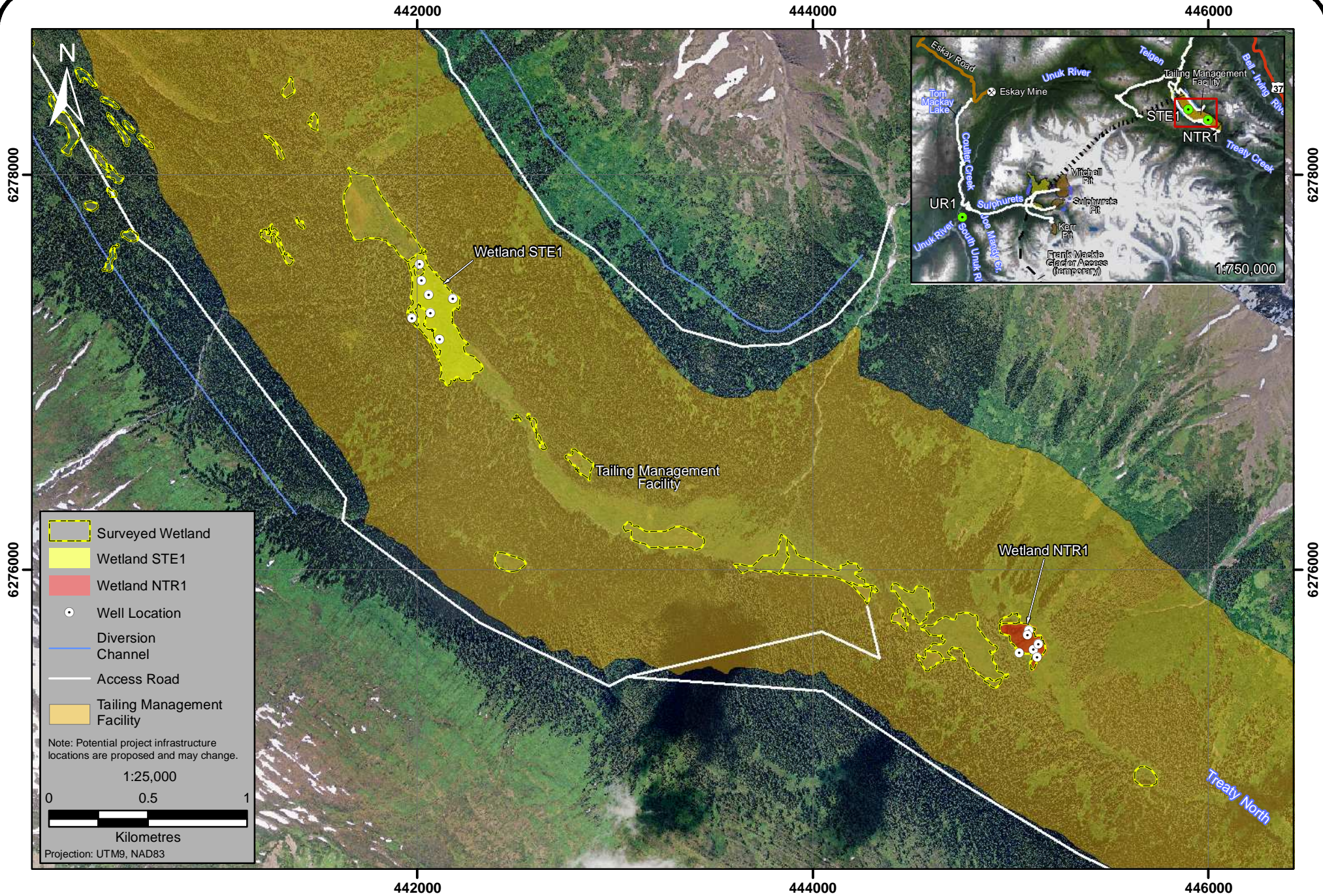
1:25,000

0 0.5 1

Kilometres

Projection: UTM9, NAD83

406000 408000 410000



3.3.1 Shallow Groundwater Behaviour

By definition, wetlands have shallow water tables. At the wetland scale, water table levels are expected to be highest during the spring snow melt period, which generally occurs during late May or early June for the Project area. Substantial areas of open water can be expected to occur at this time of year. High water levels are also expected in September and October, which are normally the wettest months of the year with the greatest precipitation. Lowest annual water table levels are expected to occur in the late summer, after snowpack from the previous winter has been depleted and prior to the commencement of the wet fall period in this part of the province.

3.3.2 Methodology

The purpose of the wetland hydrology monitoring program was to observe changes in water table levels throughout the year, and within different locations of wetlands. The wetlands selected for monitoring were large; therefore, a specific section of each wetland was selected in which to install monitoring wells. The monitoring site was chosen based on a combination of site factors that would facilitate surveying, while also capturing a representative cross section of the larger wetland.

3.3.2.1 Shallow Groundwater Well Installation

Shallow groundwater wells, consisting of 152 cm long, 2.5 cm diameter, slotted PVC pipe with a drive point, were installed approximately 1 m into the ground using a hand auger and a sledge hammer (see Plate 3.3-1a).

Depending on the study wetland, six or seven groundwater wells were installed (see Plate 3.3-1b). Three wells were installed in a lateral cross-section of the wetland perpendicular to the assumed direction of flow. Four to five wells were installed parallel to the assumed direction of flow to create a longitudinal cross-section. Difficult surveying conditions during well installation resulted in longitudinal cross-sections that may not be the most representative of the direction of flow within the wetland (i.e., NTR1 longitudinal cross-section).

All the wells were installed between June 7 and June 10, 2008. A builder's level was used to determine the relative elevation of the ground surface and standpipes of all of the groundwater wells. Geographic coordinates were taken at each well location; stakes and flagging tape were placed in the vicinity of the wells to help locate the wells during successive site visits. Intense clearing of brush was required to conduct the ground surveys, as portions of the wetlands were heavily vegetated. Due to the relatively unstable conditions of the wetland surfaces, surveyed elevations are assumed to have an error of ± 0.1 m.

3.3.2.2 Static Monitoring

Static monitoring was conducted to obtain instantaneous water levels at different times during the field season. The depth of water below the monitoring well standpipes was recorded for each well during every field trip. Water levels, relative to the ground surface, were determined by measuring the standpipe heights upon well installation.

Saturation of wetland soils can lead to ground surface instability. This likely combined with other factors to cause some of the standpipes to creep and shift angles, by as much as 30 cm, between 2008 and 2009. Snow loading, and subsequent snowmelt, may have also caused some change in standpipe orientation. Disturbance by wildlife was evident at some wells as standpipe ends were chewed on. Where any changes in standpipe orientation were observed (e.g., at STE1 and NTR1), standpipe heights were re-measured in 2009 (Appendix 3).



a) Well materials. These consisted of 152 cm long, 2.5 cm diameter, slotted PVC piping with a drive point end. Photo taken: June 2008.



b) Well installation. A hand auger was used to dig holes, and flagging tape was used to facilitate site identification. Where appropriate, water level instrumentation was installed inside the well. Photo taken: June 2008.

Plate 3.3-1. Shallow Groundwater Well Installation.

Results are presented for each wetland, according to longitudinal and lateral transects. A common reference level was determined for each transect, based on a surveyed control point. Distances between the installed wells at each wetland were determined from the GPS-based geographic coordinates. The static monitoring results are found in Appendix 3.

3.3.2.3 Continuous Monitoring

Two of the study wetlands were selected for continuous monitoring. At these sites water levels were recorded using automated pressure transducers. Solinst® leveloggers were installed in two wells at each UR1 and STE1. Water levels were recorded at 15 minute intervals. A barologger was installed at STE1 to allow for the correction of the levelogger data because of changes in atmospheric pressure. No barologger was installed at UR1. For this station, the data from a barologger installed near Sulphurets Lake, located 12.4 km due east within the same valley, and 386 m higher in elevation, were used. Atmospheric pressure patterns between the two sites were assumed to be similar. The difference in elevation is expected to introduce an error of approximately 6% in the continuous monitoring dataset of UR1. All continuous monitoring data are available in Appendix 4.

Only the data recorded between March 15 and October 15 in 2008 and 2009 were considered to be free from freezing effects, and suitable for data analysis

4. Results

4.1 WETLAND ECOSYSTEM CLASSIFICATION

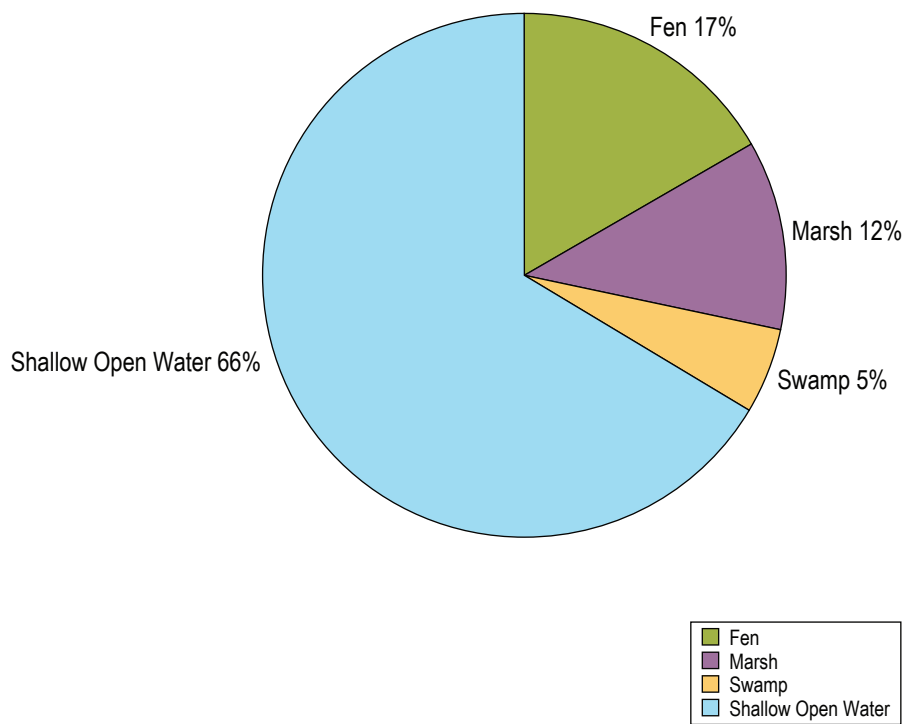
A total of 111 wetland ecosystem surveys were completed in 2008 and 2009 and resulted in the classification and mapping of 94 wetlands. Through GIS analysis a further 442 wetland features were identified. This section summarizes the wetland classes and associations observed in the study area.

Four of the five wetland classes (fen, marsh, swamp and shallow open water) were observed in the study area (Figure 4.1-1) and classified to wetland association. Bog communities were not encountered during wetland field studies, although their identification was a priority identified in 2008 and they were a community of interest for the 2009 field survey (Rescan 2009a).

Bog type communities (bog forest) were identified in the TEM work; however, these bog forests do not meet the specific criteria of a bog as described in Mackenzie and Moran (2004). The bog forests identified in the TEM were in the MHmm2 08 subzone/variant; Mackenzie and Moran (2004) does not identify bogs specifically within the MH BEC zone. However, small isolated bog communities dominated by species consistent with those typical of MHmm2 08 are described as a Wb04 bog. The (MHmm2 08) communities were mapped and described in the *KSM Project 2009 Vegetation and Ecosystem Mapping Baseline Report* (Rescan 2010a), and are not discussed further in this report.

Three hundred sixty seven TRIM open water wetlands less than 2 ha in size were also identified. Vegetation information is not available for all sites and as such are not differentiated based on vegetation composition. These sites are included in the wetland extent calculations and mapping as “TRIM Open water” (Section 4.2). The wetland function(s) of shallow open water wetlands are described in Section 4.4.

A total of 21 wetland associations were identified as a result of the wetland classification. These associations include a number of TRIM wetlands, shallow open water features, and an unclassified fen and a sedge-willow swamp. Results of the wetland classification are presented in Table 4.1-1 and in discussions of individual wetland associations.



**Proportion of Wetland Classes Observed
in the KSM Wetland Study Area**

FIGURE 4.1-1



Table 4.1-1. Wetland Associations Observed in the KSM Wetland Study

Wetland Class and Association	Total Wetland Observations (Decile 1)	Total Wetland Observations (Decile 2)	Total Wetland Observations (Decile 3)
Fen			
Unclassified	1	-	-
Wf01	1	-	-
Wf03	20	4	-
Wf04	9	20	2
Wf08	1	-	-
Wf12	22	1	-
Wf13	5	-	-
Wf50	11	-	-
Marsh			
Wm01	4	-	-
Wm02	2	-	-
TRIM Marsh	62	-	-
Swamp			
Ws02	1	-	-
Ws06	5	2	-
Ws08	1	-	-
Ws09	6	-	-
Ws54	1	-	-
Willow - Sedge	2	-	-
TRIM Swamp	13	-	-
Shallow Open Water			
Open Water	2	13	1
Yellow Pond Lily	0	2	1
TRIM Open Water	367		
Total	536	42	4

4.1.1 Fen Class

A fen is a nutrient-medium peatland ecosystem dominated by sedges and brown mosses, where mineral-bearing groundwater is within the rooting zone and minerotrophic plant species are common (MacKenzie and Moran 2004) (Plates 4.1-1 to 4.1-8). Fens can have fluctuating water tables and are often rich in dissolved minerals. Surface water flow can be direct, through channels, pools, and other open features that can often form characteristic surface patterns. The vegetation in fens is closely related to the depth and chemistry of groundwater. Shrubs occupy drier sites and minerotrophic graminoid vegetation (grass) is typically found in wetter sites (Warne and Rubec 1997). Eight fen associations were observed in the study area.

Site Association Code:

Wf01

Wetland Class:

Fen

Site Description:

The Wf01 fen site association is the most common fen in British Columbia. It can occupy all but the warmest and driest subzones from low to subalpine elevations, and can be found in basins and hollows, seepage slopes, potholes, and fluvial and lacustrine systems (MacKenzie and Moran 2004). This association was observed only once in the study area (site KS94) (Plate 4.1-1). Vegetation species assemblage at this site comprised a variety of moss, forb and shrub species. *Drepanocladus* sp. and *Sphagnum* sp. dominated the substrate, while *Carex* spp. were abundant throughout the understory. *Salix barclayi* and *S. planifolia* shrubs were present along the periphery. The soil was mesic, with an SMR of VW, an SNR of C, and a von Post level of 4. Soil water had a pH and conductivity of 5.5 and 30 μ s, respectively.

Site Name:

Water sedge - Beaked sedge

Wetland Area:

1.73 ha



Plate 4.1-1. Wf01 Fen at Site KS94.

Site Association Code:

Wf03

Wetland Class:

Fen

Site Description:

These fens occur mainly above 1100 masl and are similar in structure to the Wf12 fens, but generally have less surface water flow (Mackenzie and Moran 2004). Twenty-four Wf03 fen communities were observed within the study area (Plate 4.1-2). Though often the dominant association at most sites, the Wf03 communities also occasionally occurred in complex with Wf04 or Wf12 associations. The Wf03 Fens were dominated by *Carex aquatilis*, with abundant *Sphagnum* spp., *Eriophorum angustifolium*, and *Aulacomnium palustre*. Some sites also supported a variety of shrubby species, including *Salix barclayi*, *S. bebbiana*, and *S. barattiana*. Soils varied between sites, and were characterized as fibric, mesic or humic. SMR varied between VM, W and VW, SNRs were classified from A to C, and von Post levels ranged from 2 to 7. In contrast, water chemistry was relatively consistent between sites, with pH and conductivity ranging from 4.6 to 6.1 and 10 to 50 μs , respectively.

Site Name:

Water sedge - Peat-moss

Wetland Area:

23.2 ha



Plate 4.1-2. Wf03 Fen at Site KW50.

Site Association Code:

Wf04

Wetland Class:

Fen

Site Description:

These fens are common in the subalpine elevations, and often occur on seepage slopes, glacier-fed creeks, and in frost-prone basins (Mackenzie and Moran 2004) (Plate 4.1-3). Thirty-one Wf04 fen associations were observed within the study area. Most of these sites occurred in complex with other fen associations, although several sites also occurred independently. The shrub layer was predominant at these sites, and was generally composed of *Salix barclayi*, *S. sitchensis*, *S. commutata* and/or *S. arbusculooides*. *Carex aquatilis*, *Aulacomnium palustre*, *Eriophrum angustolium* and *Equisetum arvense* were often observed in the understory. Soils varied between sites, and were characterized as fibric, mesic or humic. Recorded SMR levels were between VM, W, and VW; SNR was identified as B-D, and von Post ranged from 1-8. Water chemistry also ranged between sites, with pH and conductivity spanning 5.0 to 6.3 and 30 to 180 μs , respectively.

Site Name:

Barclay's willow - Water sedge - Glow moss

Wetland Area:

23.68 ha



Plate 4.1-3. Wf04 Fen at Site KW42.

Site Association Code:

Wf08

Wetland Class:

Fen

Site Name:

Shore sedge - Buckbean - Hook-moss

Wetland Area:

0.86 ha

Site Description:

The Wf08 association is an uncommon, rich fen site that occurs mainly at higher elevations throughout BC's Interior. These fens occur on pond-side floating mats or in flarks of patterned fens where there is prolonged shallow flooding to no more than several centimetres (MacKenzie and Moran 2004). This association was observed at one site in the study area (site KS90) (Plate 4.1-4). Vegetation species assemblage at these sites comprised a variety of moss, forb, and shrub species. *Drepanocladus* spp. and *Sphagnum* spp. dominated the substrate, while *Carex limosa*, and *Menyanthes trifoliata* were abundant throughout the understory. *Salix barattiana* and *S. arbusculoides* shrubs were present along the periphery. The soil was a mesic organisol, with an SMR of VW, an SNR of B, and a von Post level of 3. Soil water chemistry measurements resulted in a pH and conductivity of 5.9 and 80 μ s, respectively.



Plate 4.1-4. Wf08 Fen at Site KS90.

Site Association Code:

Wf12

Wetland Class:

Fen

Site Description:

These fens are common at subalpine elevations throughout the sub-boreal interior of BC. They occur on gently sloping peatlands where there is continual seepage from snowmelt and groundwater (MacKenzie and Moran 2004). Twenty-three of these communities were observed within the study area. These sites were dominated by *Eriophorum angustifolium* and *Sphagnum* spp., which occurred almost exclusively at some sites. (Plate 4.1-5) At other sites, *Aulacomnium palustre*, *Carex* spp., *Salix commutata*, *S. barclayi*, were also common. The soils were generally mesic or fibric, or occasionally humic, with a von Post level of 2 to 7. The SMR was classified as VM, W, and VW; the SNR ranged from A to C. Water chemistry measurements recorded pH levels between 4.9 and 6.2 and conductivity between 10 and 140 μ s.

Site Name:

Narrow-leaved cotton-grass - Marsh-marigold

Wetland Area:

10.56 ha



Plate 4.1-5. Wf12 Fen at Site KW72

Site Association Code:

Wf13

Wetland Class:

Fen

Site Description:

Narrow-leaved cotton-grass - Shore sedge is a relatively common association that occurs in depressions or gradual seepage slopes where standing water persists for most of the growing season (MacKenzie and Moran 2004). Five of these communities were observed within the study area (Plate 4.1-6). Generally lacking any tree or shrub species, these sites were dominated by grasses and forbs. *Eriophorum angustifolia*, *Carex* spp., and *Caltha leptosepala* occurred frequently. Soils were classified as a mesic peat, with an SNR of B-C, and an SMR of W-VW. PH and conductivity were consistent across sites, and ranged from 5.0 to 5.5 and 20 to 50 μ s, respectively.

Site Name:

Narrow-leaved cotton-grass - Shore sedge

Wetland Area:

10.57 ha



Plate 4.1-6. Wf13 Fen at Site KS65.

Site Association Code:

Wf50

Wetland Class:

Fen

Site Description:

The Narrow-leaved cotton-grass - Peat-moss association is found in montane and subalpine areas with surface seepage (MacKenzie and Moran 2004). Eleven Wf50 associations were observed within the study area (Plate 4.1-7). The majority of the observed sites were recorded alone, some were observed in complexes with the Wf04 or Wf03 associations, or shallow open water. The recorded Wf50 associations were dominated by *Eriophorum angustifolium* and *Sphagnum* spp., though a diverse group of forbs also occurred frequently. Other species observed at these sites included *Carex aquatilis*, *Equisetum arvense*, *Coeglossum viride*, *Viola palustris*, *Aulacomnium palustris* and *Fauria crista-galli*. Organic soil texture at these sites ranged from mesic to fibric. Site SMRs included VM, W, and VW while SNR and von Post classifications encompassed B to C and 2 to 6, respectively. Water chemistry ranged from a pH of 4.9 to 6.4 and conductivity was consistently below 60 μs .

Site Name:

Narrow-leaved cotton-grass - Peat-moss

Wetland Area:

7.9 ha



Plate 4.1-7. Wf50 Fen at Site KS78.

Site Association Code:

Unclassified

Wetland Class:

Fen

Site Name:

Unclassified

Wetland Area:

0.23 ha

Site Description:

One site (KS89AIR) (Plate 4.1-8) remained unclassified. This site was surveyed from the air, and thus, detailed vegetation assemblage and soil information is not available. However, it was evident during the survey that graminoid vegetation dominated the site, with shrubs and conifers growing along the surrounding wetland margins.



Plate 4.1-8. Unclassified fen at Site KS89AIR.

4.1.2 Marsh Class

A marsh is a permanently to seasonally flooded non-tidal mineral wetland dominated by emergent grass-like vegetation (MacKenzie and Moran 2004) (e.g., Plate 4.1-9). Marshes are the most heavily used wetland type for most wetland-using wildlife species. They are typically eutrophic and support large standing crops of palatable vegetation, plankton, and aquatic invertebrates. They are the favoured wetland class for most waterfowl, amphibians, and semi-aquatic mammals because they provide good cover, open water, and food. Soils are typically mineral but can also have a well-decomposed organic surface tier (Warner and Rube 1997; MacKenzie and Moran 2004). Three marsh associations were observed in the study area, including TRIM Marsh which encompasses a number of non-identified wetland associations.

Site Association Code:

Wm01

Wetland Class:

Marsh

Site Description:

This association is the most widespread marsh association in the province. These marshes are found on sites that are inundated by shallow low energy flood waters, on the margins of beaver ponds, lakes, and palustrine basins (MacKenzie and Moran 2004). This community was observed at sites KS10B, KS19, and KS29 (Plate 4.1-9). The Wm01 association at Site KS10B occurred in a complex with shallow open water. Species diversity at these sites was low; vegetation was dominated by *Carex sitchensis* and/or *C. aquatilis*. *Salix* spp. shrubs and wetland adapted forbs, such as *Equisetum arvense* and *Scirpus microcarpus*, also occurred occasionally. Soil types comprised fibric or mesic peat, with SMRs of W to VW, SNRs of C to D and von Post levels ranging from 1 to 9. Soil water pH was 5.5 to 7.1, and conductivity (where measured) was 120 μ s.

Site Name:

Beaked sedge - Water sedge

Wetland Area:

4.05 ha



Plate 4.1-9. Wm01 Marsh at Site KS29.

Site Association Code:

Wm02

Wetland Class:

Marsh

Site Description:

The Wm02 association is generally found on back-levee depressions along low-gradient streams, bays of large lakes and flooded fens (Mackenzie and Moran, 2004). This community was observed at two sites (KS34 and KS35) (Plate 4.1-10) in the study area. KS35 was characterized by a dense herbaceous layer of *Carex aquatilis* and *Comarum palustre*, with occasional *Salix* spp. and *Alnus crispa* shrubs along the margins of the wetland. The soil type was a fibric peat, with an SMR of VM, an SNR of C and a von Post of 3. Soil water pH was 6.1 and conductivity was 120 μs .

Site Name:

Swamp horsetail - Beaked sedge

Wetland Area:

20.87 ha



Plate 4.1-10. Wm02 Marsh at Site KS35.

4.1.3 Swamp Class

A swamp is a nutrient-rich wetland ecosystem with significant groundwater inflow, periodic surface aeration, and elevated microsites supporting the growth of trees and tall shrubs (MacKenzie and Moran 2004) (Plates 4.1-12 to and 4.1-17). Swamps generally have more than 30% tree or tall shrub cover. Soils are often gleyed mineral soils with a surface layer of anaerobically decomposed woody peat. In general, there are three physically different swamp communities (1) shrub-thicket, (2) coniferous forest, and (3) hardwood (deciduous) swamps (Warner and Rubec 1997). Swamps have a more vertical structure than other wetland classes and support more diverse avifaunal assemblages (MacKenzie and Moran 2004). Further, forested swamps typically have an open canopy that appears to be favoured by many bird and bat species (MacKenzie and Moran 2004; Lausen 2006). Eight swamp associations were observed in the study area including an unclassified association and TRIM swamps.

Site Association Code:

Ws02

Wetland Class:

Swamp

Site Description:

This association occurs on beaver-flooded flats of small creeks, peripheral zones of wetlands and lakeshores where there is early season flooding, continuous seepage near the surface, and poor drainage (MacKenzie and Moran, 2004). This association was observed at site KW93 (Plate 4.1-12). *Alnus tenuifolia* dominated the shrub layer, while *Carex sitchensis* dominated the herb layer. Other species, including, *Equisetum arvense*, *Salix lucida* and *Sambucus racemosa*, also occurred occasionally. Soil moisture level was classified as VW.

Site Name:

Mountain alder - Pink spirea - Sitka sedge

Wetland Area:

16.15 ha



Plate 4.1-12. Ws02 Swamp at Site KS93.

Site Association Code:

Ws06

Wetland Class:

Swamp

Site Description:

Sitka willow - Sitka sedge swamps are relatively uncommon at low elevations, and are usually associated with fluvial systems or linked basins (Mackenzie and Moran 2004). This association was observed at five sites within the study area (KS3, KS5, KS9, KS35B, KS92) (Plate 4.1-13). The herb layer was primarily composed of *Carex sitchensis* and *Equisetum arvense*. A variety of shrubs, including *Salix barclayi* and *S. sitchensis*, also occurred frequently. Overall, the *Sphagnum* spp. moss layer at these sites was poorly developed. Soils were classified with a von Post of 1-3, an SMR of W to VW, and an SNR of A-D. Water chemistry measurements, where evaluated, recorded a pH of 5.5 to 6.5 and conductivity between 120 and 160 μ s.

Site Name:

Sitka willow - Sitka sedge

Wetland Area:

15.72 ha



Plate 4.1-13. Ws06 Swamp at Site KS93.

Site Association Code:

Ws08

Wetland Class:

Swamp

Site Description:

The Ws08 association occurs on lower and toe slopes and margins of wetlands, where there is significant flow of mineral-rich groundwater (Mackenzie and Moran 2004). Within the study area, two Ws08 associations were observed (KS80 and KS80B) (Plate 4.1-14). These sites were characterized by a diverse layer of shrubby vegetation, including *Abies lasiocarpa*, *Salix barattiana*, and *Alnus crispa*. The substrate was characterized by an SMR of W, an SNR of D, and von Post of 10. Conductivity and pH were 30 μ s and 5.7, respectively.

Site Name:

Subalpine fir - Sitka valerian - Common horsetail

Wetland Area:

0.58 ha



Plate 4.1-14. Ws08 Swamp at Site KS80.

Site Association Code:

Ws09

Wetland Class:

Swamp

Site Description:

The Ws09 association is found in palustrine basins and back-levee depressions with high water tables. These sites are strongly mounded, with conifers on elevated microsites and standing water in between mounds (Mackenzie and Moran, 2004). Six sites within the study area, two of which were part of shallow open water complexes, were classified as Ws09 associations (Plate 4.1-15). Shrubby vegetation at these sites was dominated by *Cornus stolonifera* and *Ribes hudsonianum*, while *Picea* spp. and *Tsuga heterophylla* dominated the tree layer. The understory vegetation was dominated by *Lysichiton americanus* and *Dryopteris expansa*. However, the strong mounding that characterizes these sites also enabled growth of a diversity of other, herbaceous and moss species. Soils were predominantly mesic, or occasionally fibric, with peat depths ranging from 40 to 110 cm. Soil SMR was classified as W to VW, SNR as C to D and von Post as 3 to 5. Water chemistry pH and conductivity were 5.8 to 6.5 and 40 to 110 μs , respectively.

Site Name:

Black spruce - Skunk cabbage - Peat-moss

Wetland Area:

1.69 ha



Plate 4.1-15. Ws09 Swamp at Site KS30.

Site Association Code:

Ws54

Wetland Class:

Swamp

Site Description:

This association is generally found in low-lying areas on floodplains and receiving sites along toe slopes and wetland margins (Mackenzie and Moran 2004). One site, which formed a complex with a shallow open water wetland, was classified as a Western red cedar - Western hemlock - Skunk cabbage association (Plate 4.1-16). The site lacked well-developed shrub and tree layers; however, the dense herbaceous layer was dominated by *Carex aquatilis*, *Lysichiton americanus* and *Dryopteris expansa*. Soils were mesic, and had an SMR of W, an SNR C and von Post of 4. Water chemistry pH and conductivity were 6.0 and 50 μ s, respectively.

Site Name:

Western redcedar - Western hemlock - Skunk cabbage

Wetland Area:

0.2 ha



Plate 4.1-16. Ws54 Swamp at Site KS26.

Site Association Code:

Willow-sedge

Wetland Class:

Swamp

Site Description:

Differences in climatic regimes, site conditions, and hydrological changes, as well as the stochastic establishment capacity of *Salix* spp., allow for a wide range of willow-sedge associations (Mackenzie and Moran 2004). The general Willow-Sedge association was created as a classification for sites that do not fit in the more specific willow/sedge associations listed above and in Mackenzie and Moran (2004). Within the study area, two sites (KS4 and KS8) were classified as Willow-Sedge associations. KS4 (Plate 4.1-17) supported a diversity of willow species, including *Salix barattiana*, *S. commutata*, *S. stolonifera*, and *S. sitchensis*, although *S. barclayi* was most prevalent. *Carex aquatilis* and *Equisetum arvense* were the dominant forbs/graminoids at this site. In contrast, the only *Salix* species recorded at KS8, was *S. sitchensis*. Forbs and graminoids, particularly *Equisetum arvense*, were more abundant at KS8 than at KS4. However, both sites were characterized by poorly drained mineral soils with little organic material, SMRs of W to VW, and soil water pH of 5.5 to 5.9.

Site Name:

Willow sp. - Sedge sp.

Wetland Area:

1.9 ha



Plate 4.1-17. Willow-sedge association at KS4

4.1.4 Shallow Open Water Class

Shallow open water wetlands are ecosystems permanently flooded by still or slow-moving water and dominated by rooted and floating, leaved aquatic plants. Shallow open water wetlands are often the transition from bogs, fens, marshes and swamps to permanent deep water bodies (i.e., sluggish streams and lakes) (Warner and Rubec 1997; MacKenzie and Moran 2004). They are among the most important habitat for wildlife and fish because of cover and high prey densities (MacKenzie and Moran 2004). Sedimentation and nutrient loading are the biggest concern for these wetlands because changes in turbidity block light penetration which alters where submerged rooted aquatic vegetation can grow (MacKenzie and Moran 2004). A variety of shallow open water features were observed throughout the study area, including a Yellow Pond Lily dominated site and number of non-vegetated open water features. GIS analysis identified approximately 102 ha of open water, although the majority was TRIM open water features less than 2 ha in area. Plate 4.1-18 presents a Yellow Pond Lily wetland observed at Site KS14, while Plate 4.1-19 presents a large open water feature at KS76.



Plate 4.1-18. Yellow Pond Lily Open Water Wetland in Complex with a Wf12 Fen at Site KS14.



Plate 4.1-19. Open Water Feature at Site KS76.

4.2 WETLAND EXTENT

Wetlands accounted for an area of 554.3 ha representing 1% of the study area. On a proportional basis, this is less than the total area of wetlands estimated to cover British Columbia. The average size of a wetland within the study area is 1.03 ha (Table 4.2-1); the largest wetland area was approximately 75 ha and was identified at 444903 6288695 UTM 9N NAD83 near the Teigen and Snowbank Creek confluence. The five largest wetlands observed were TRIM swamp wetlands. The area of each wetland class is presented in Table 4.2-2.

TRIM wetlands accounted for the majority of the area of wetlands. However, of the wetland classes surveyed, fens covered largest area at 78.8 ha (Table 4.2-2). Wetland classes were further classified to association. The surveyed associations with the largest area were the Wf03 and Wf04 fen wetlands (Table 4.2-3); this table shows the area of each wetland association within each decile. The distribution of each wetland association is presented in Figures 4.2-1 to 4.2-18.

Table 4.2-1. Summary Statistics of Wetland Area

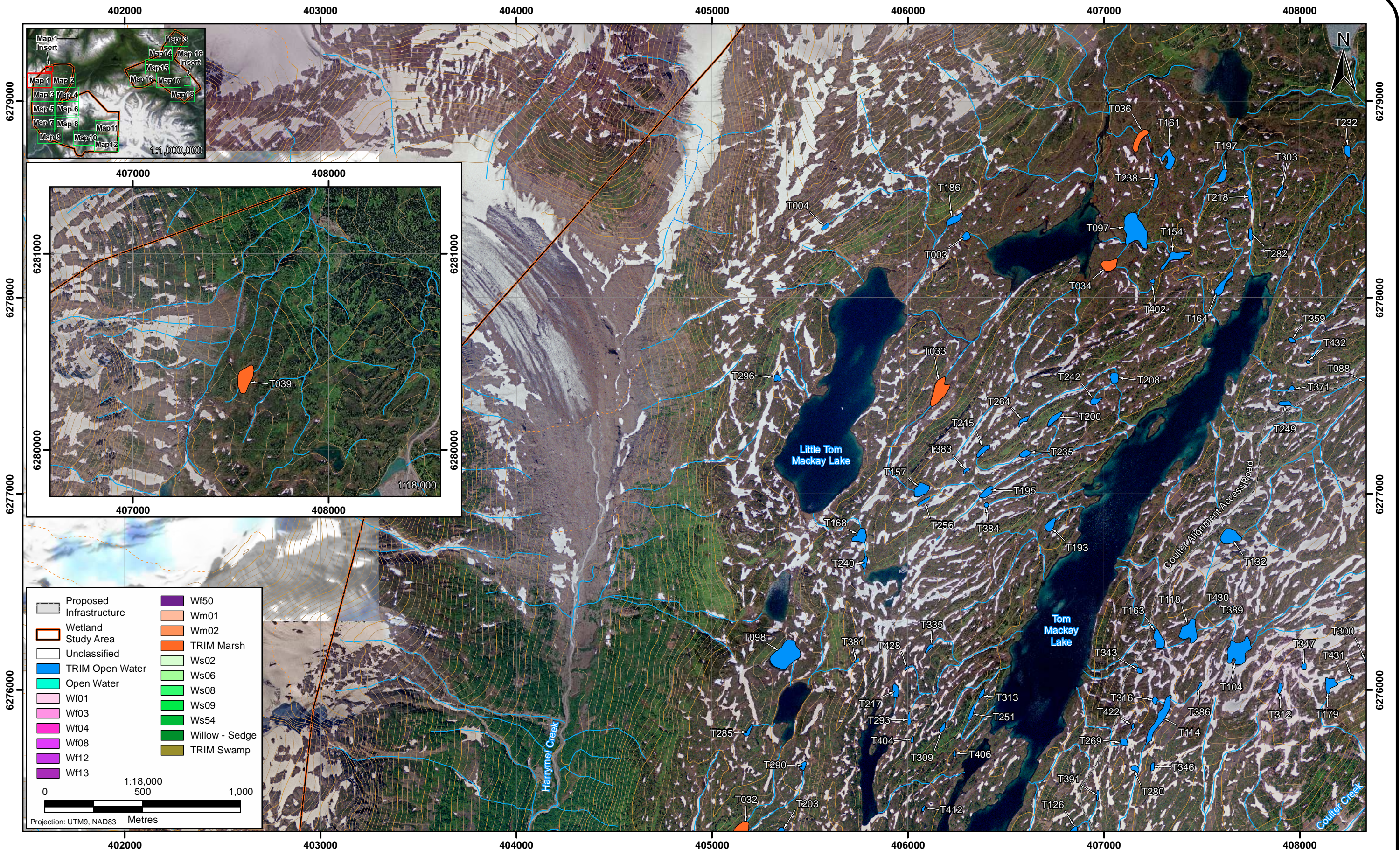
	Total Wetland	Primary Ecosystem (Decile 1)	Secondary Ecosystem (Decile 2)	Tertiary Ecosystem (Decile 3)
Total Area (ha)	554.33	538.28	15.25	0.79
Average Size (ha)	1.03	1.0	0.36	0.20
Minimum Size (ha)	0.0002	0.0002	0.0104	0.0759
Maximum Size (ha)	75.29	75.29	3.37	0.35
Total	536	536	42	4

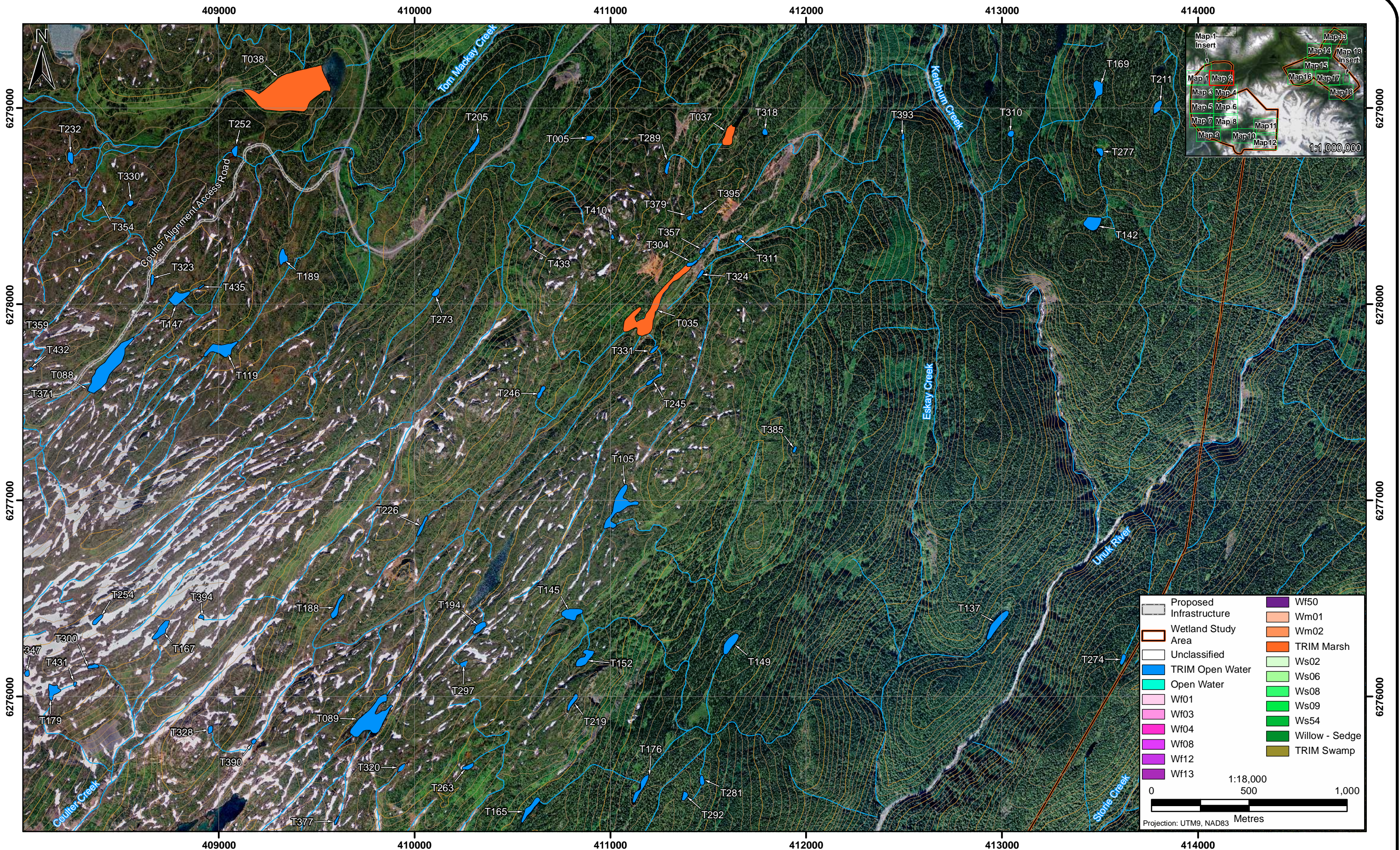
Table 4.2-2. Area of Wetland Classes in the KSM Wetland Study Area

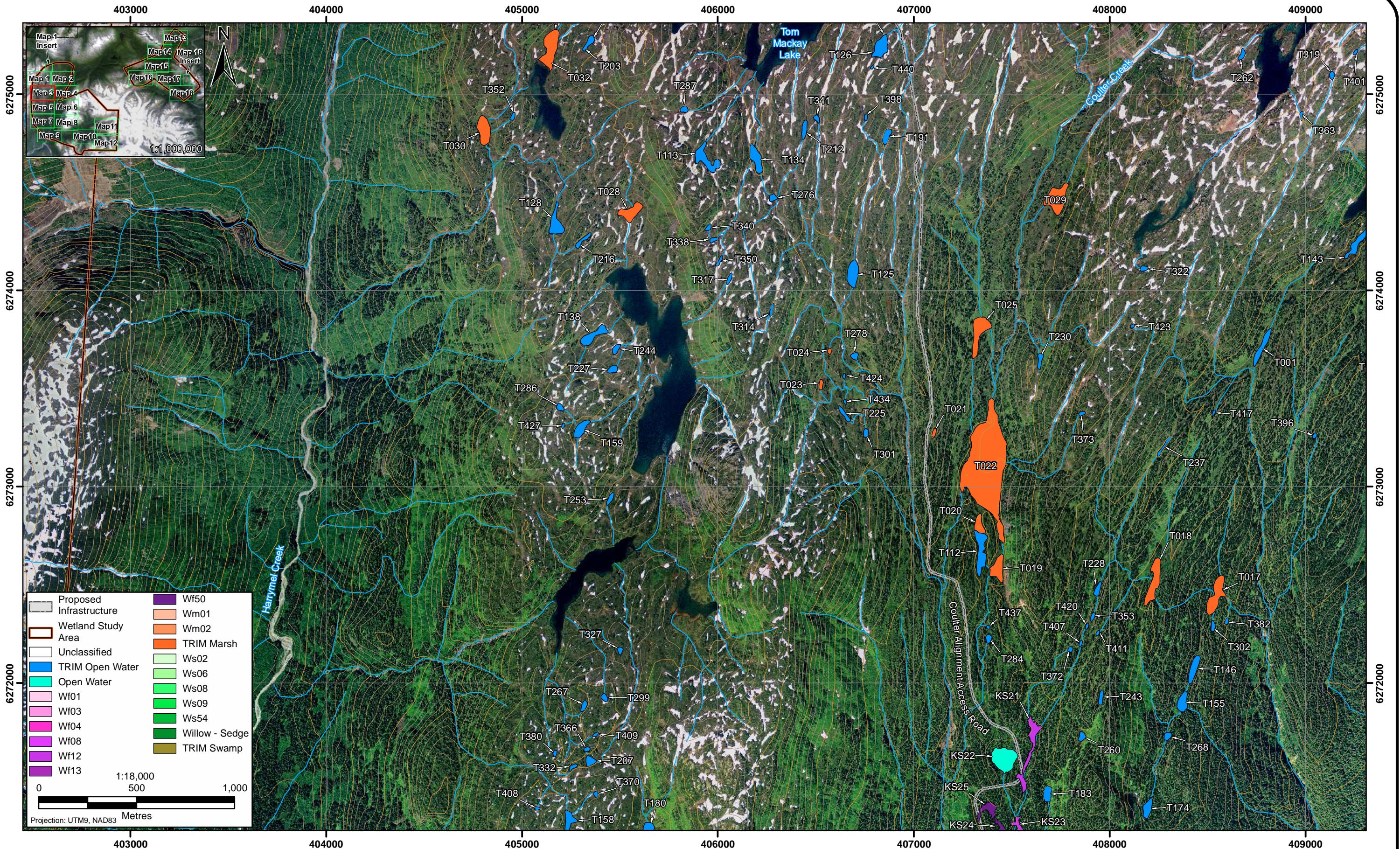
Wetland Class	Area (ha)
Fen	78.75
Marsh	24.91
Swamp	36.25
Shallow Open Water	5.97
TRIM Marsh	86.94
TRIM Open Water	95.85
TRIM Swamp	225.66
Total	554.33

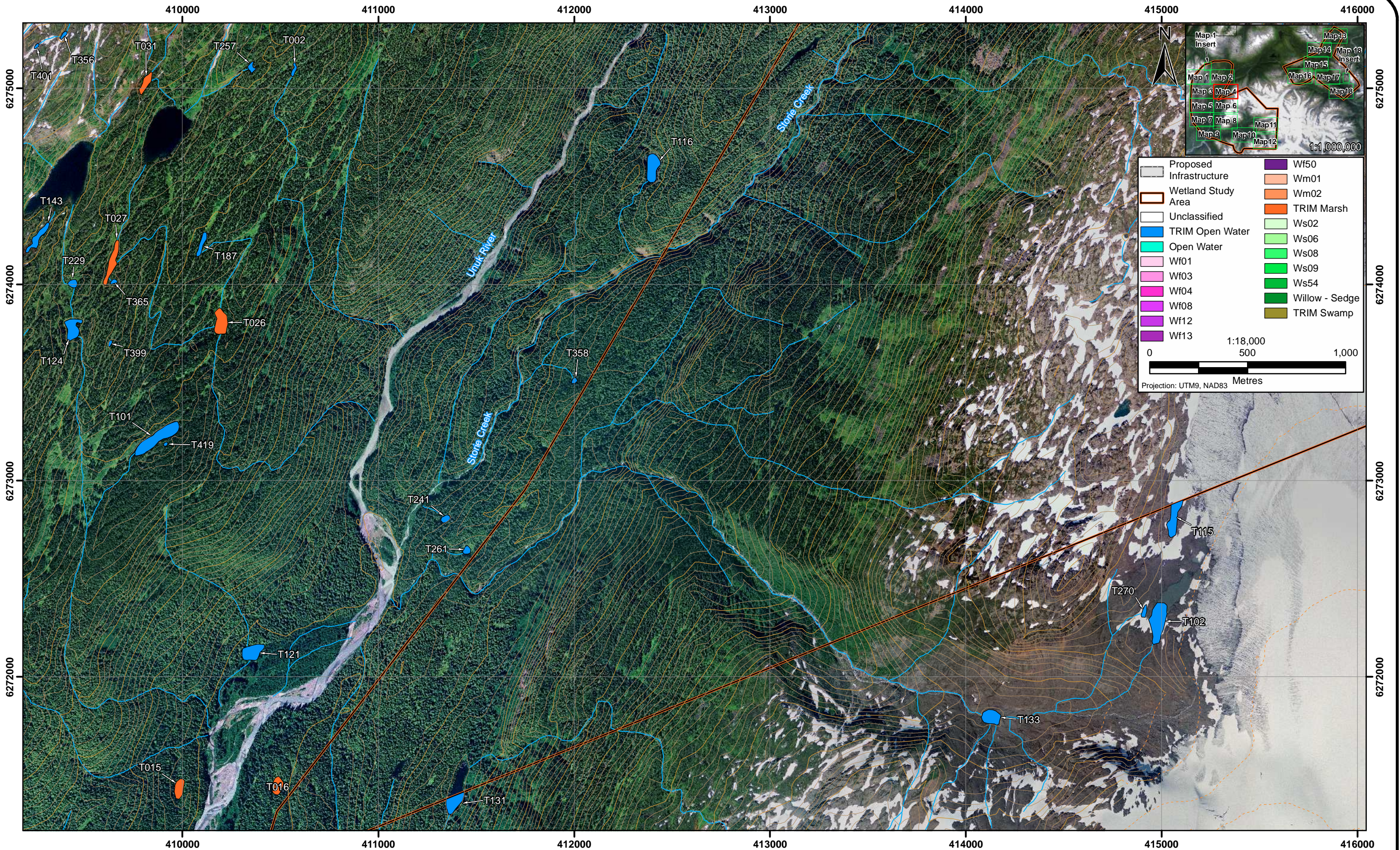
Table 4.2-3. Area of Wetland Associations in the KSM Wetland Study Area

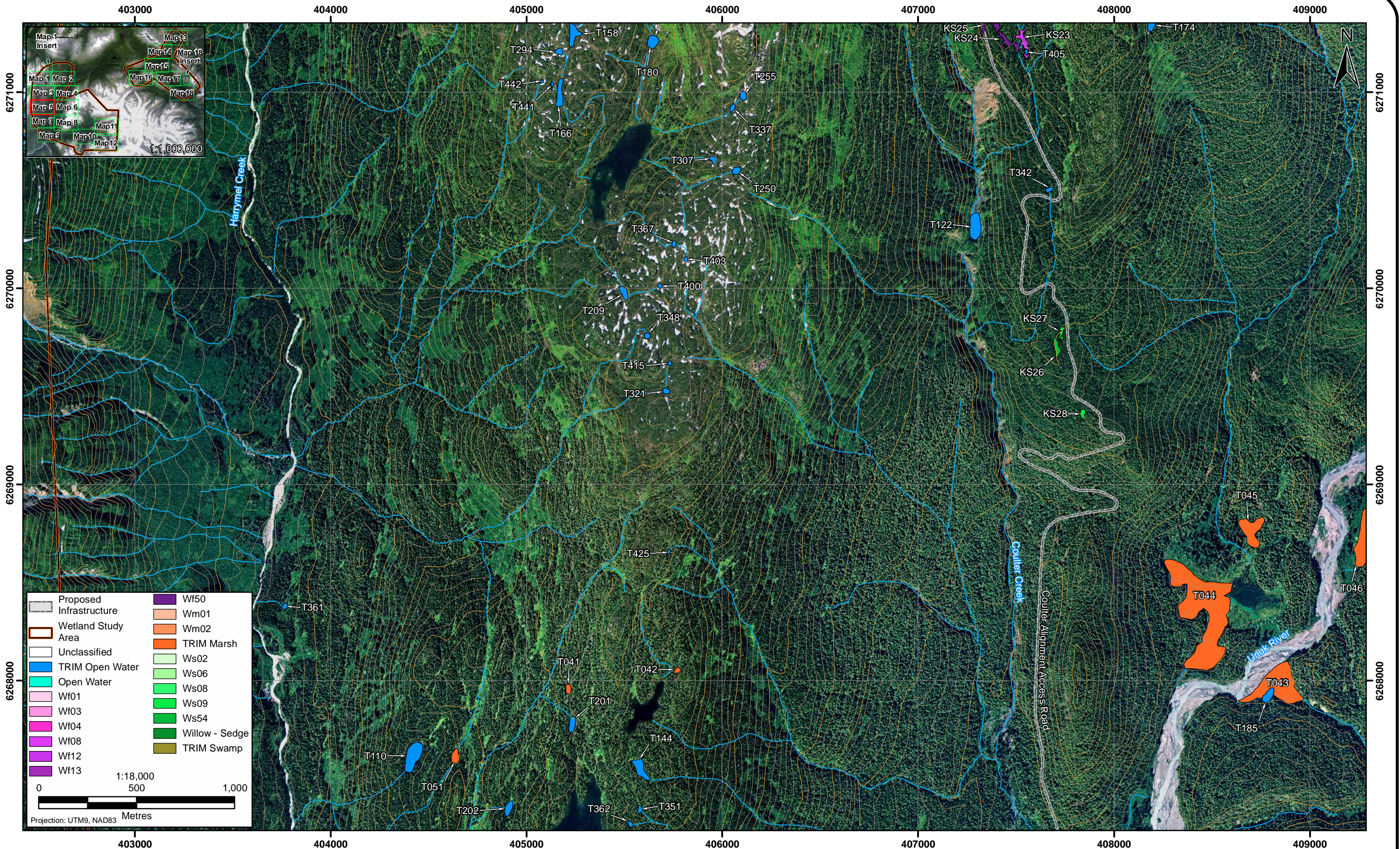
Wetland Class and Association	Wetland Area (ha) (Decile 1)	Wetland Area (ha) (Decile 2)	Wetland Area (ha) (Decile 3)
Fen			
Unclassified	0.23	-	-
Wf01	1.73	-	-
Wf03	21.87	1.35	-
Wf04	13.60	9.66	0.43
Wf08	0.86	-	-
Wf12	10.31	0.26	-
Wf13	10.57	-	-
Wf50	7.90	-	-
Marsh			
Wm01	4.05	-	-
Wm02	20.87	-	-
TRIM Marsh	86.94	-	-
Swamp			
Ws02	16.15	-	-
Ws06	14.95	0.77	-
Ws08	0.58	-	-
Ws09	1.69	-	-
Ws54	0.20	-	-
Willow - Sedge	1.90	-	-
TRIM Swamp	225.66	-	-
Shallow Open Water			
Open Water	2.38	3.11	0.29
Yellow Pond Lily	-	0.11	0.08
TRIM Open Water	95.85	-	-
Total	538.28	15.25	0.79





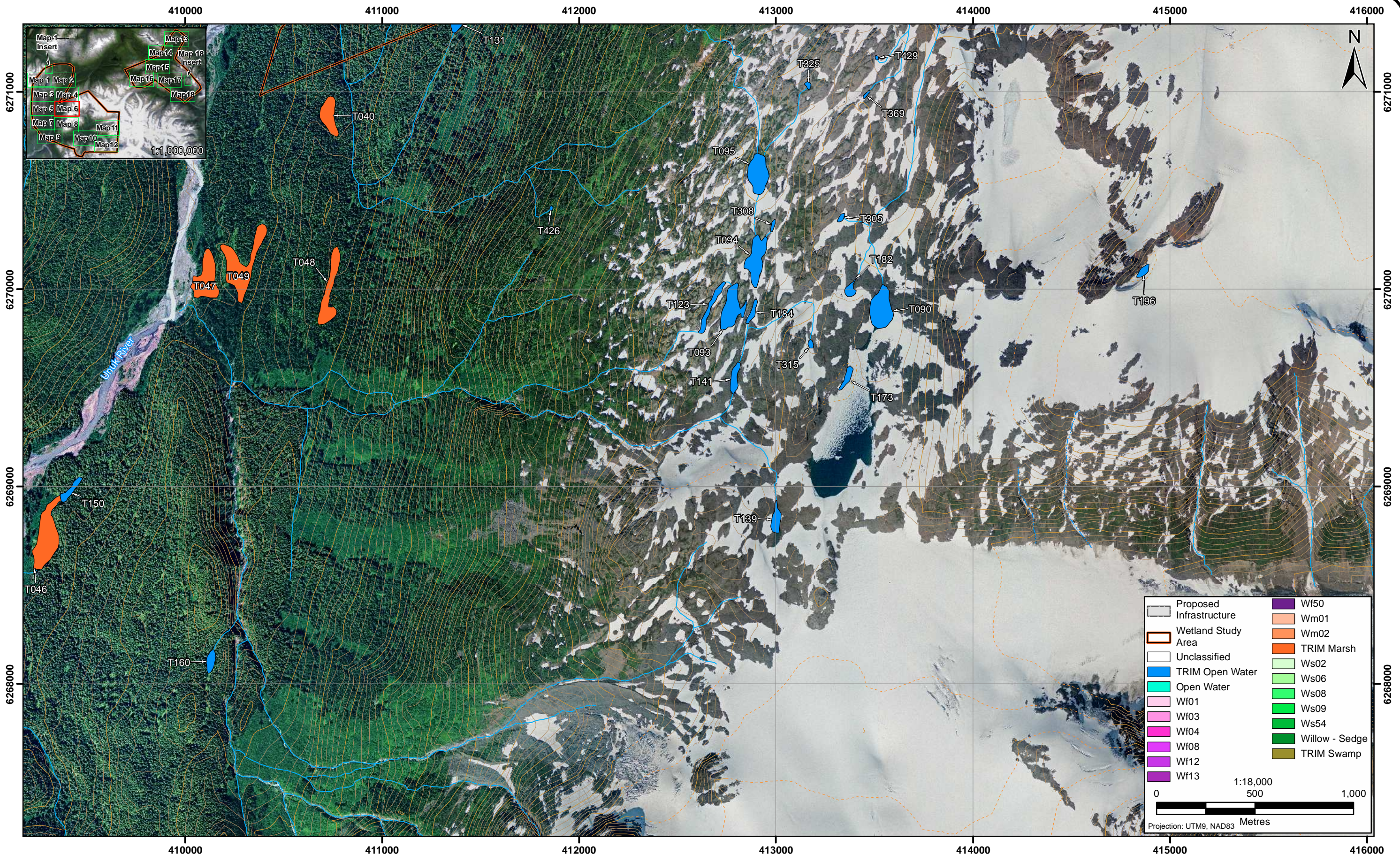


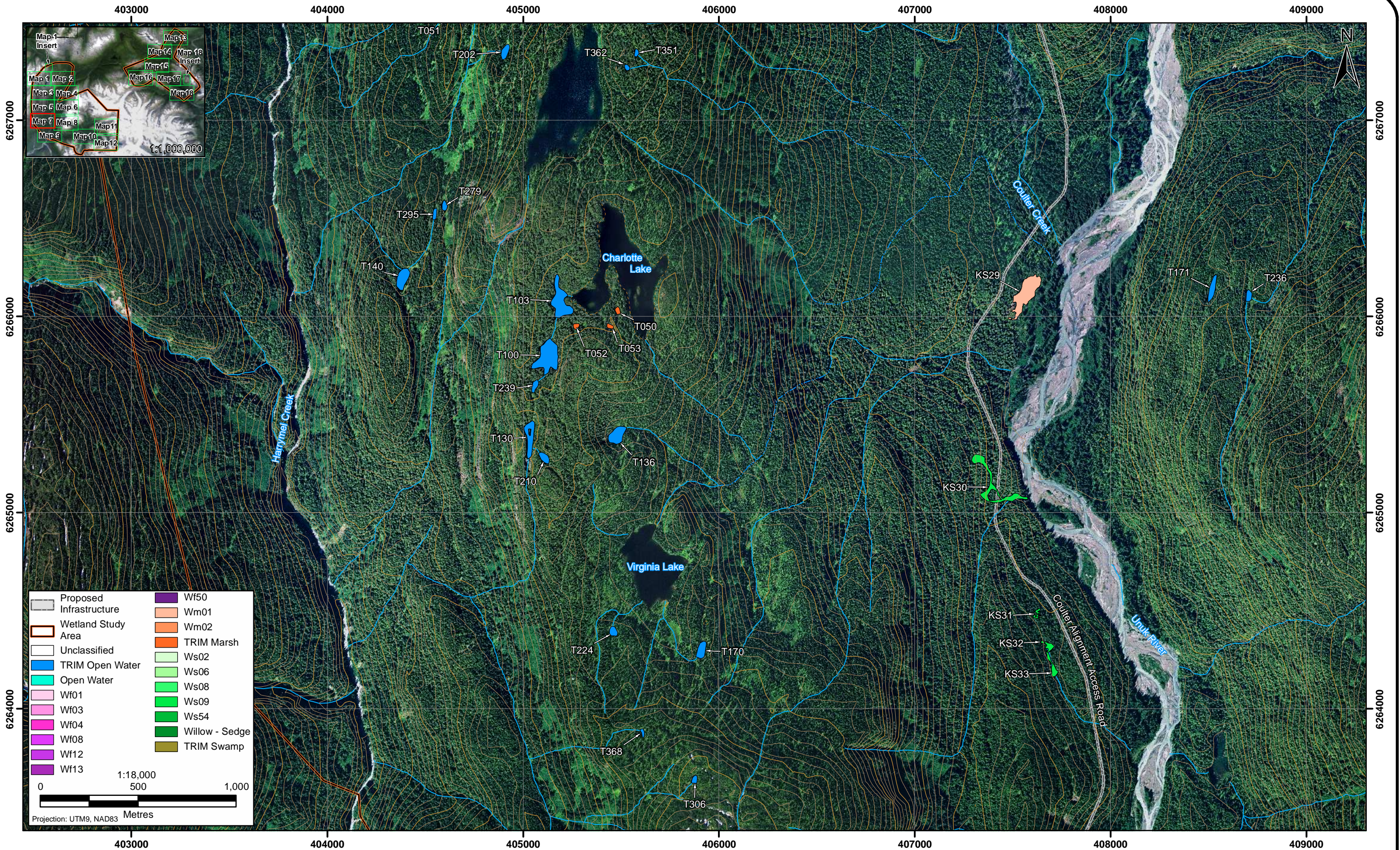


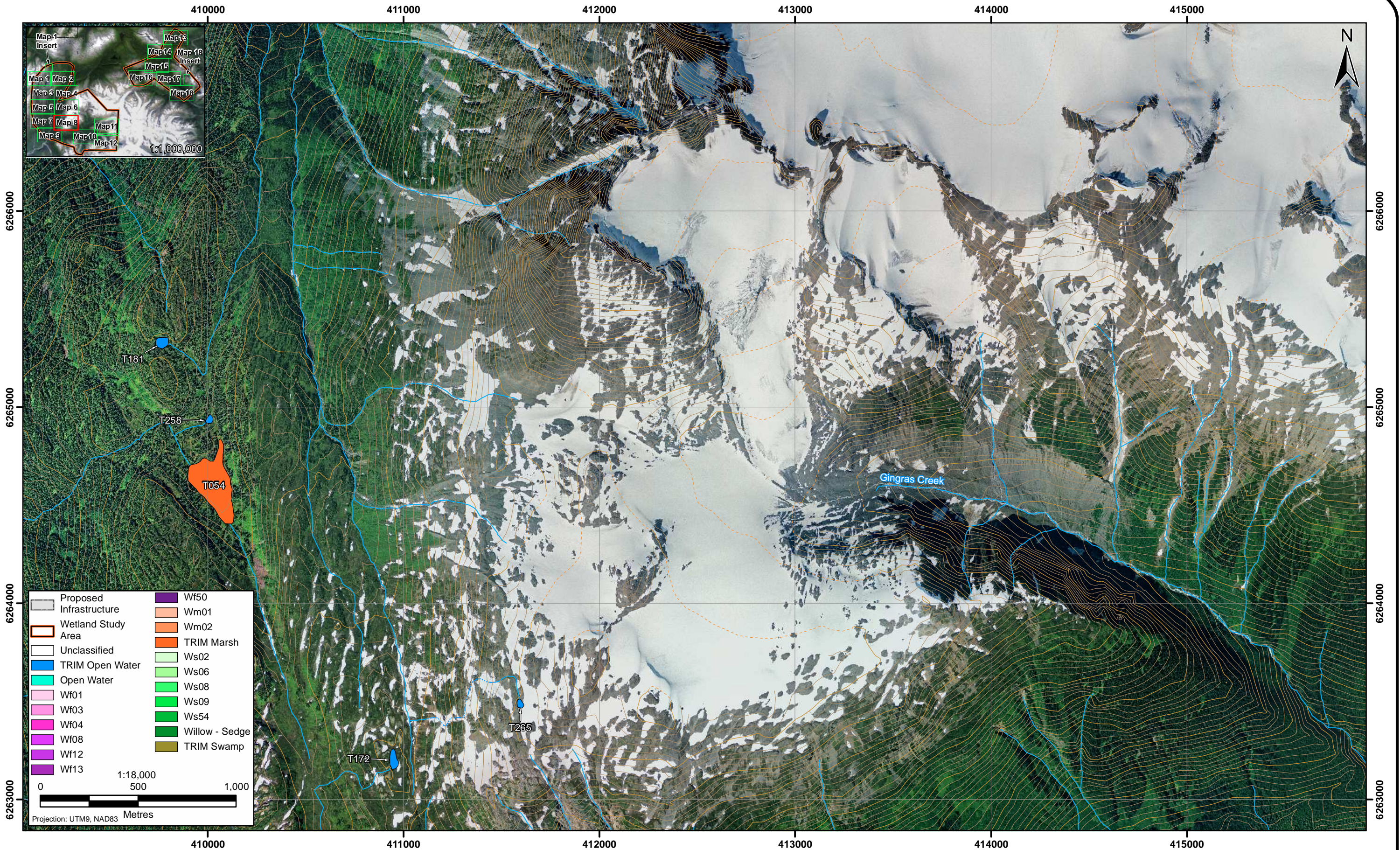


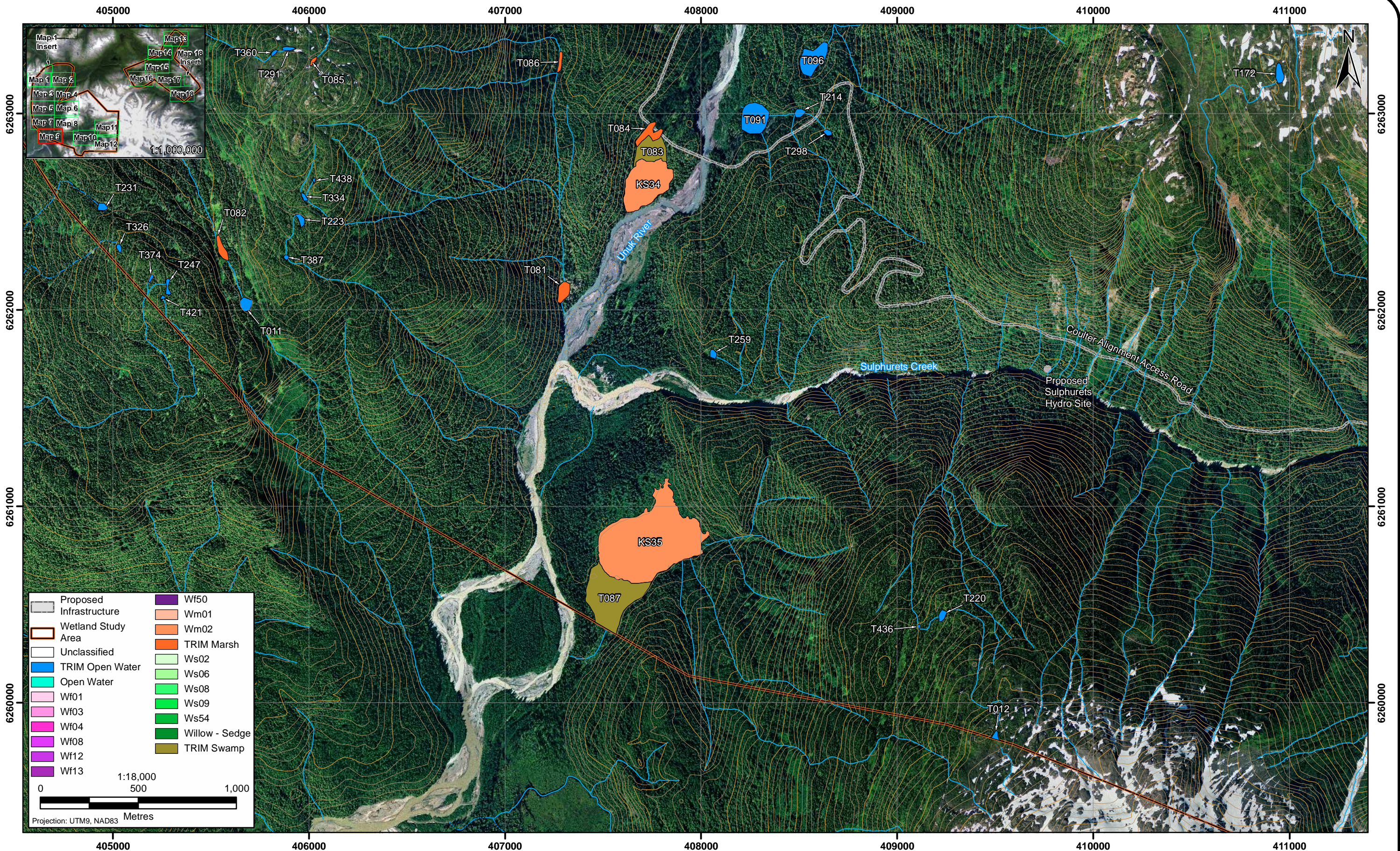
Proposed Infrastructure	Wf50
Wetland Study Area	Wm01
Unclassified	Wm02
TRIM Open Water	TRIM Marsh
Open Water	Ws02
Wf01	Ws06
Wf03	Ws08
Wf04	Ws09
Wf08	Ws54
Wf12	Willow - Sedge
Wf13	TRIM Swamp

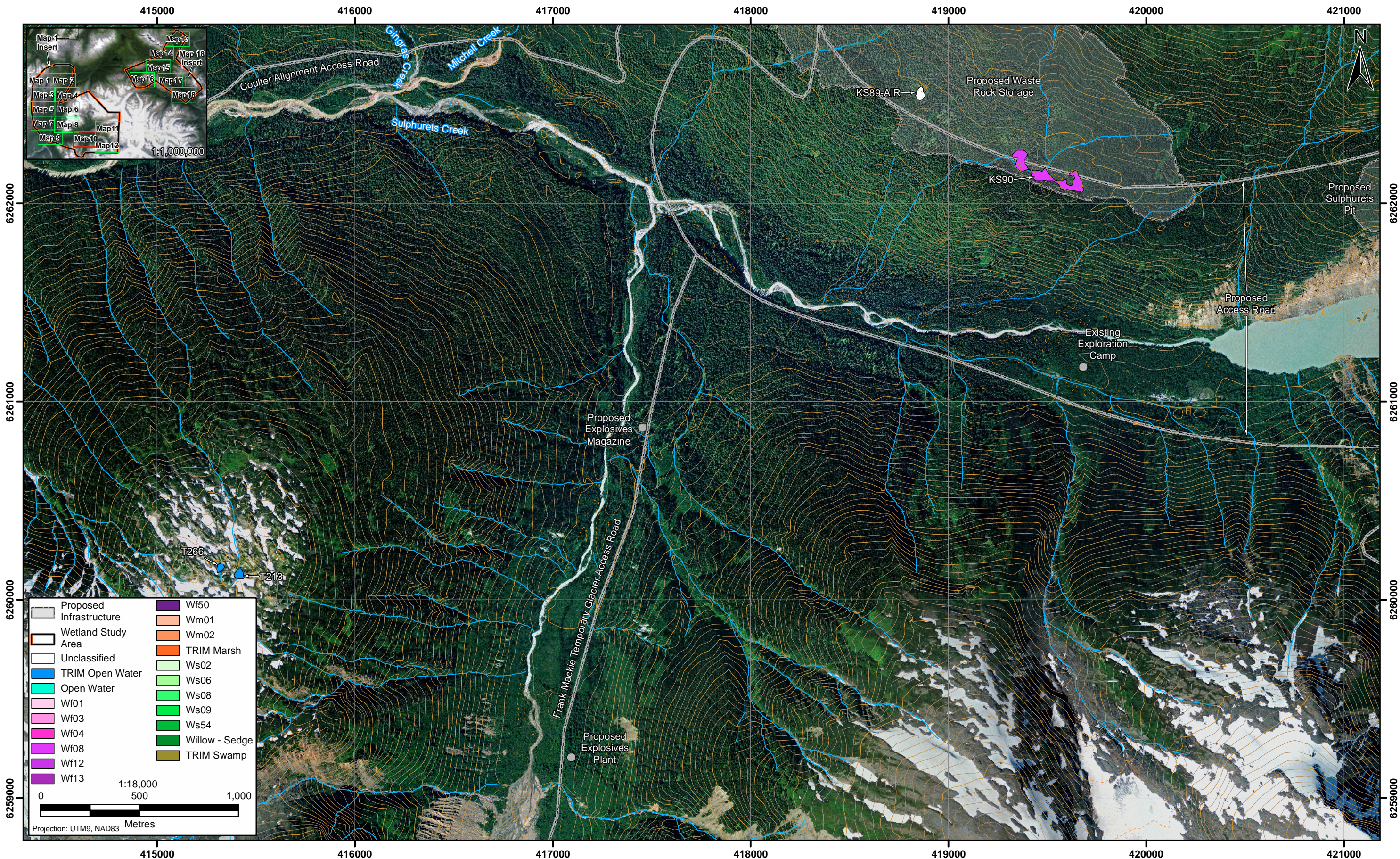
1:18,000
0 500 1,000
Metres
Projection: UTM9, NAD83





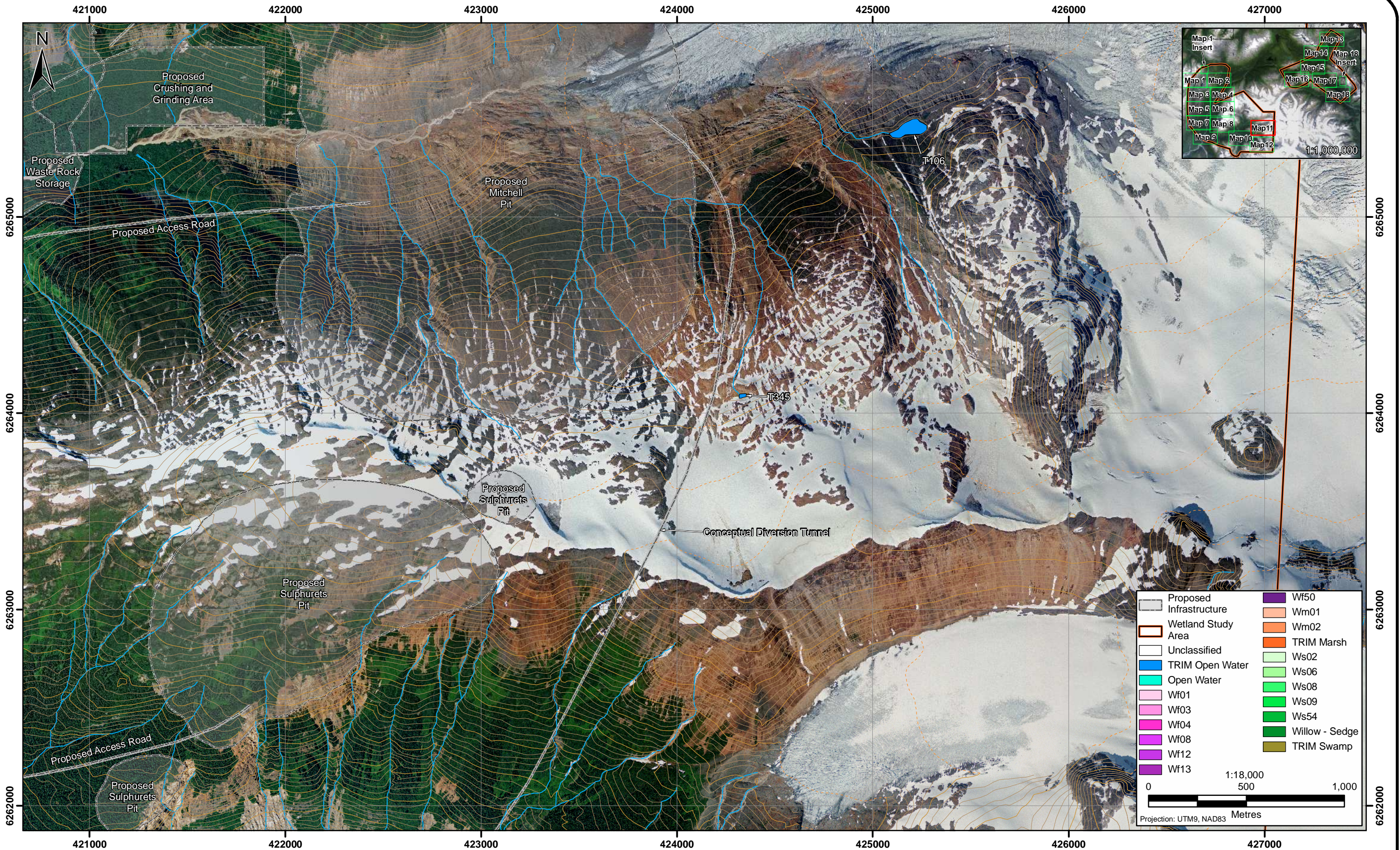


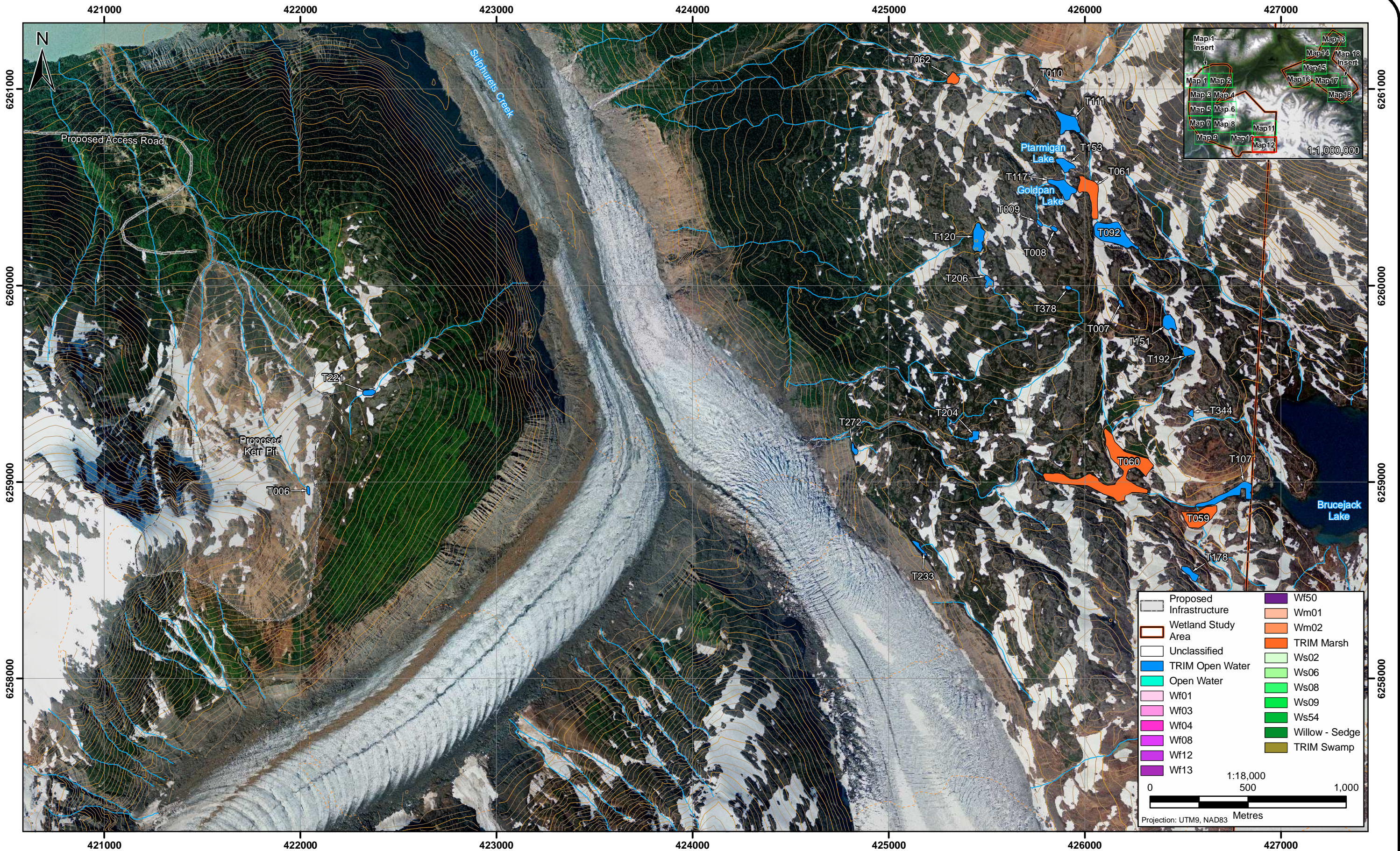


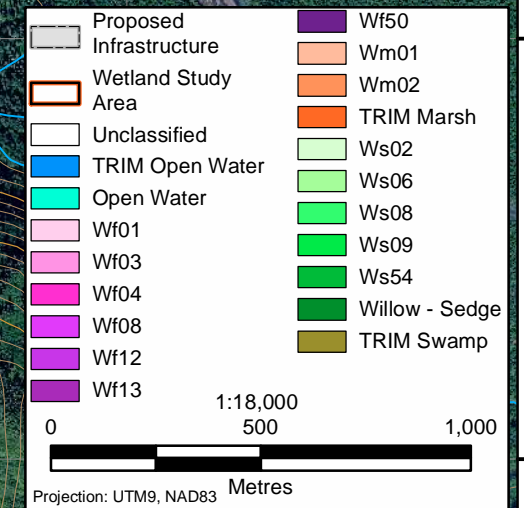
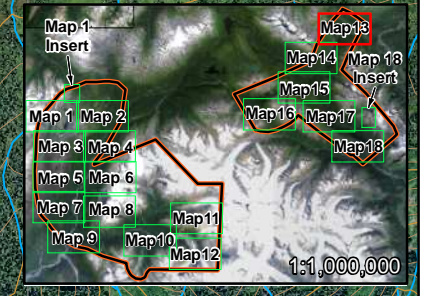
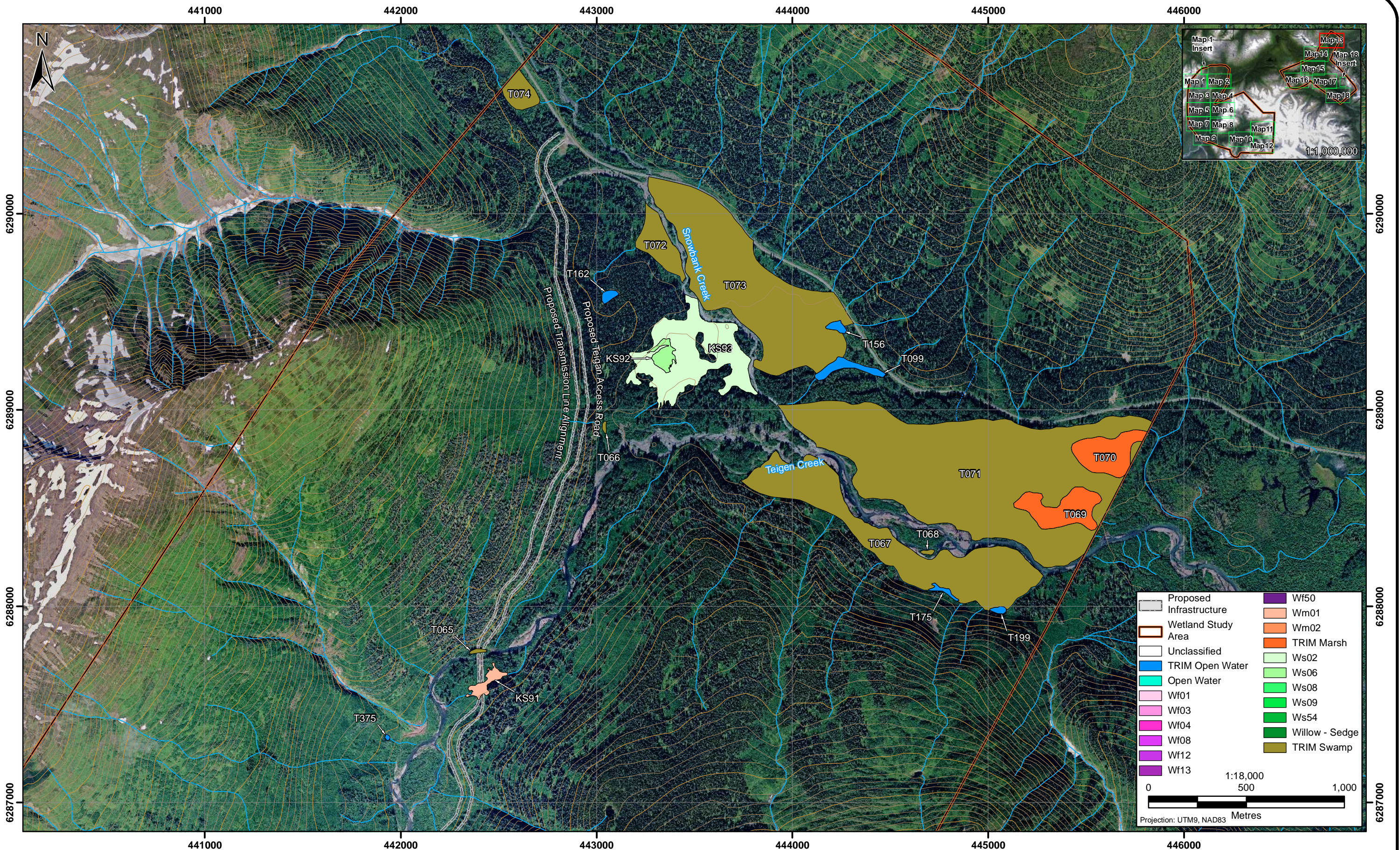


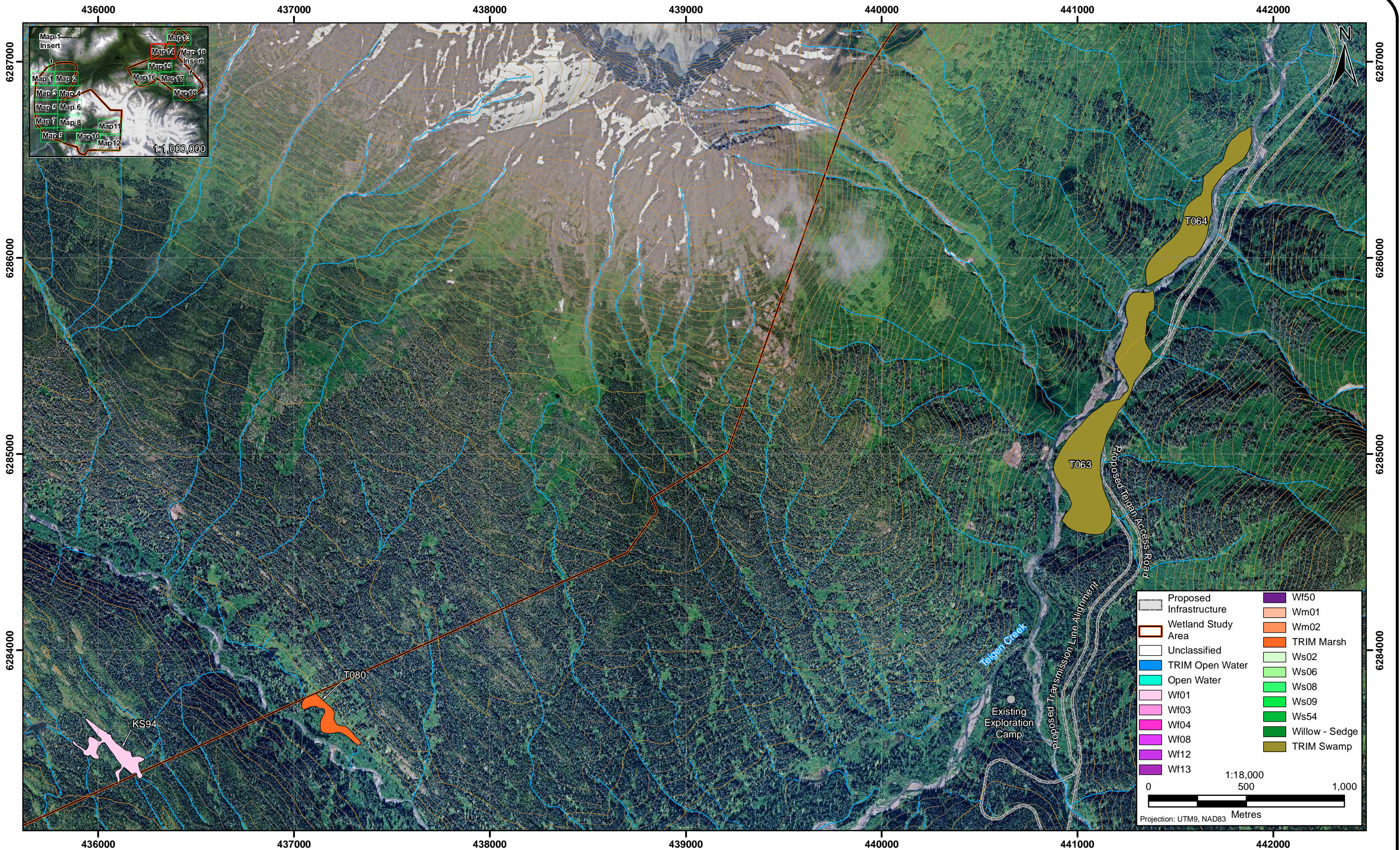
Proposed Infrastructure	Wf50
Wetland Study Area	Wm01
Unclassified	Wm02
TRIM Open Water	TRIM Marsh
Open Water	Ws02
Wf01	Ws06
Wf03	Ws08
Wf04	Ws09
Wf08	Ws54
Wf12	Willow - Sedge
Wf13	TRIM Swamp

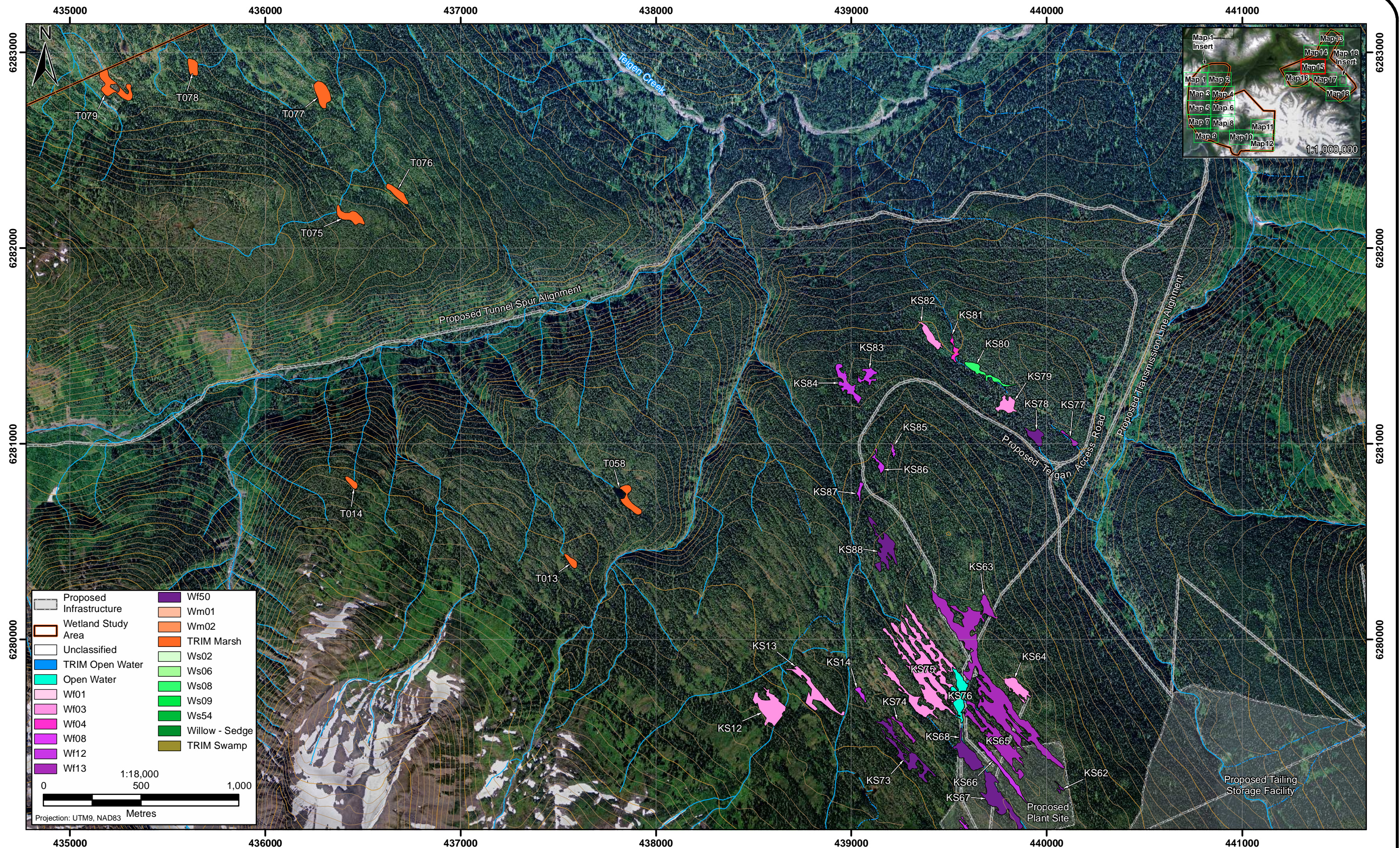
1:18,000
0 500 1,000
Metres
Projection: UTM9, NAD83







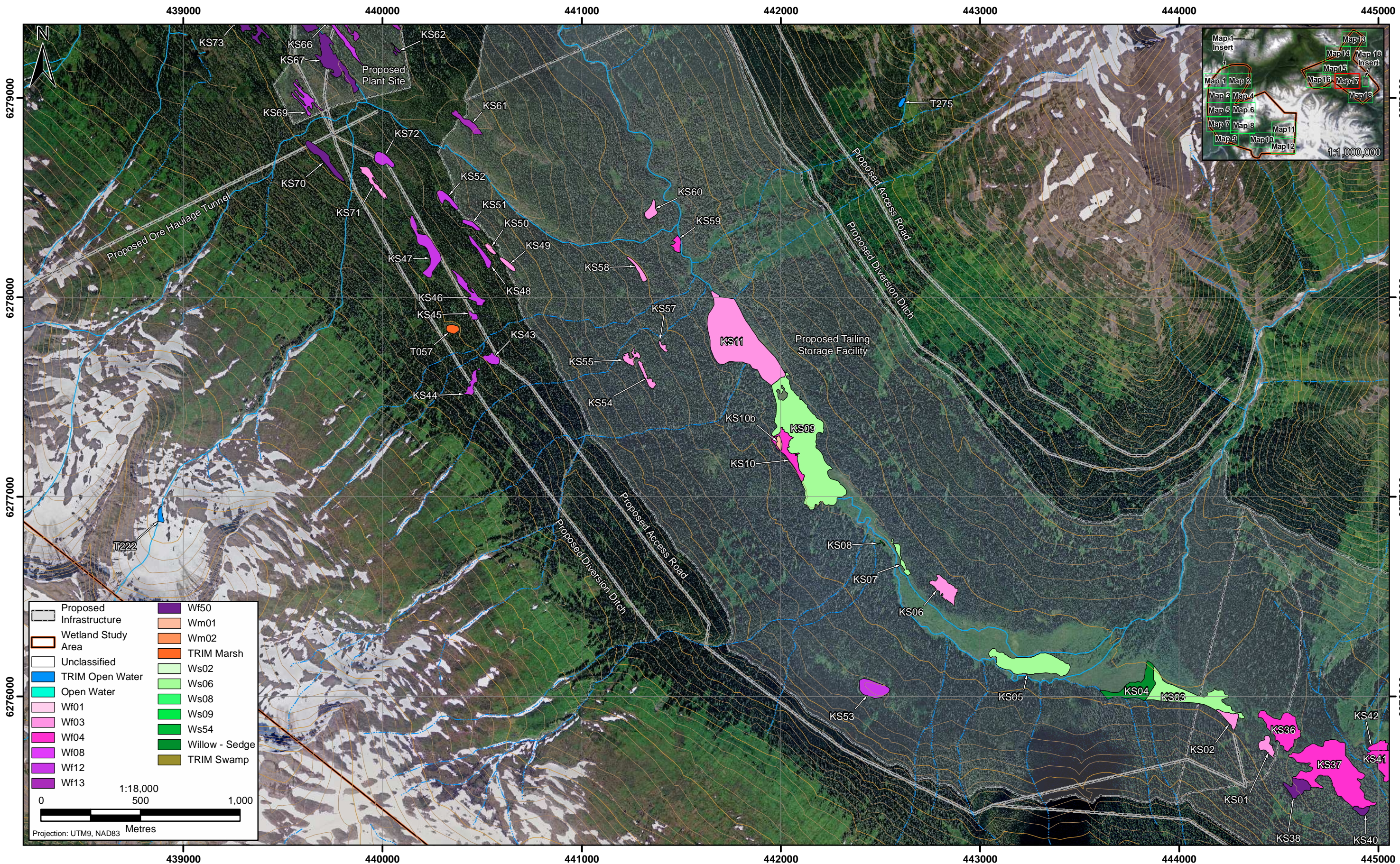


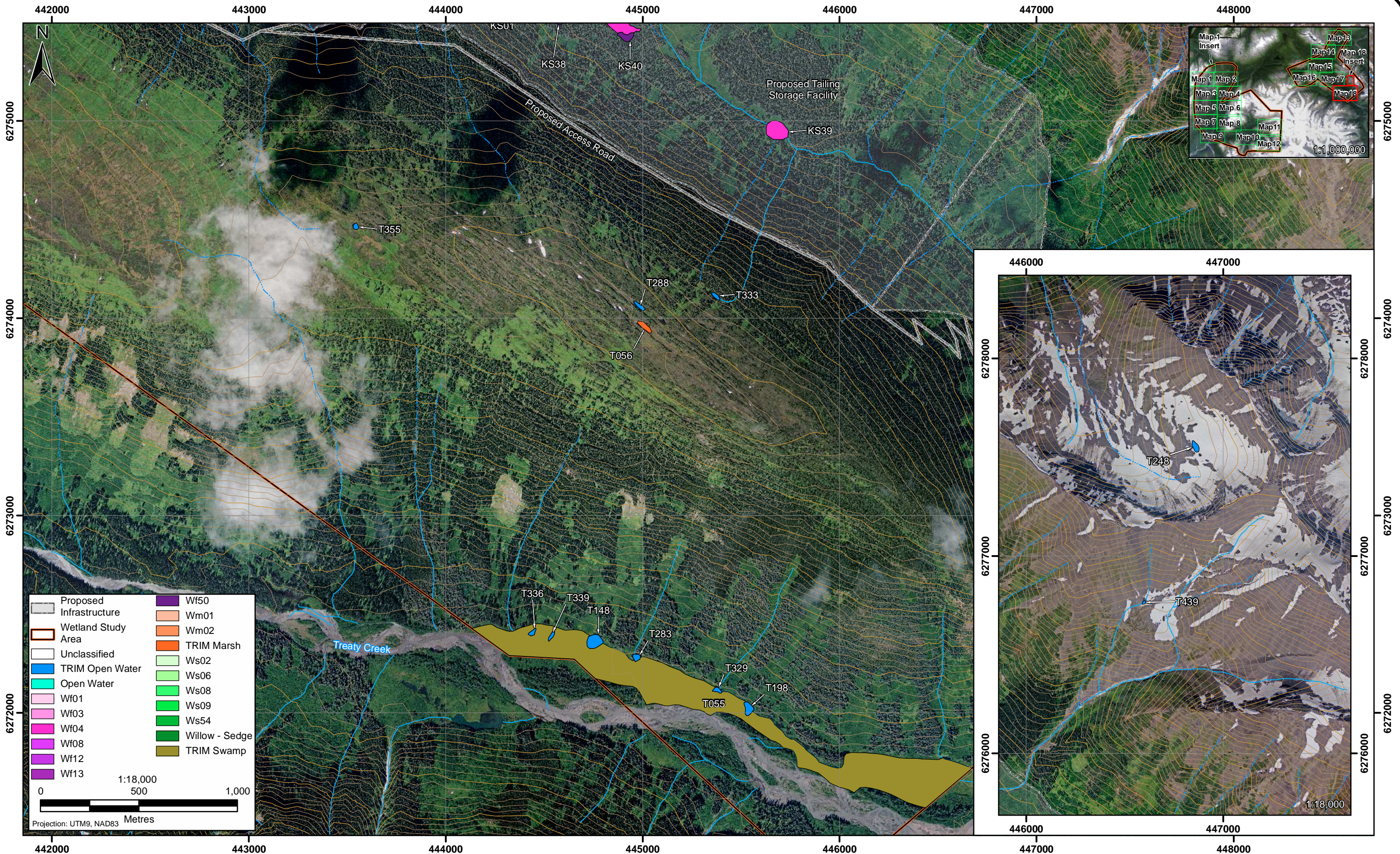




Proposed Infrastructure	Wf50
Wetland Study Area	Wm01
Unclassified	Wm02
TRIM Open Water	TRIM Marsh
Open Water	Ws02
Wf01	Ws06
Wf03	Ws08
Wf04	Ws09
Wf08	Ws54
Wf12	Willow - Sedge
Wf13	TRIM Swamp

1:18,000
 0 500 1,000
 Metres
 Projection: UTM9, NAD83





4.3 WETLAND HYDROLOGY

The hydrology monitoring results are presented for each wetland, for both 2008 and 2009 monitoring years in the following section. The results from monitoring static water level data are presented as lateral and longitudinal transects. All data for the static measurements were referenced to a common surveyed control point in each wetland. The continuous data are presented as daily average timeseries and are referenced to the ground surface at each well.

4.3.1 Wetland UR1

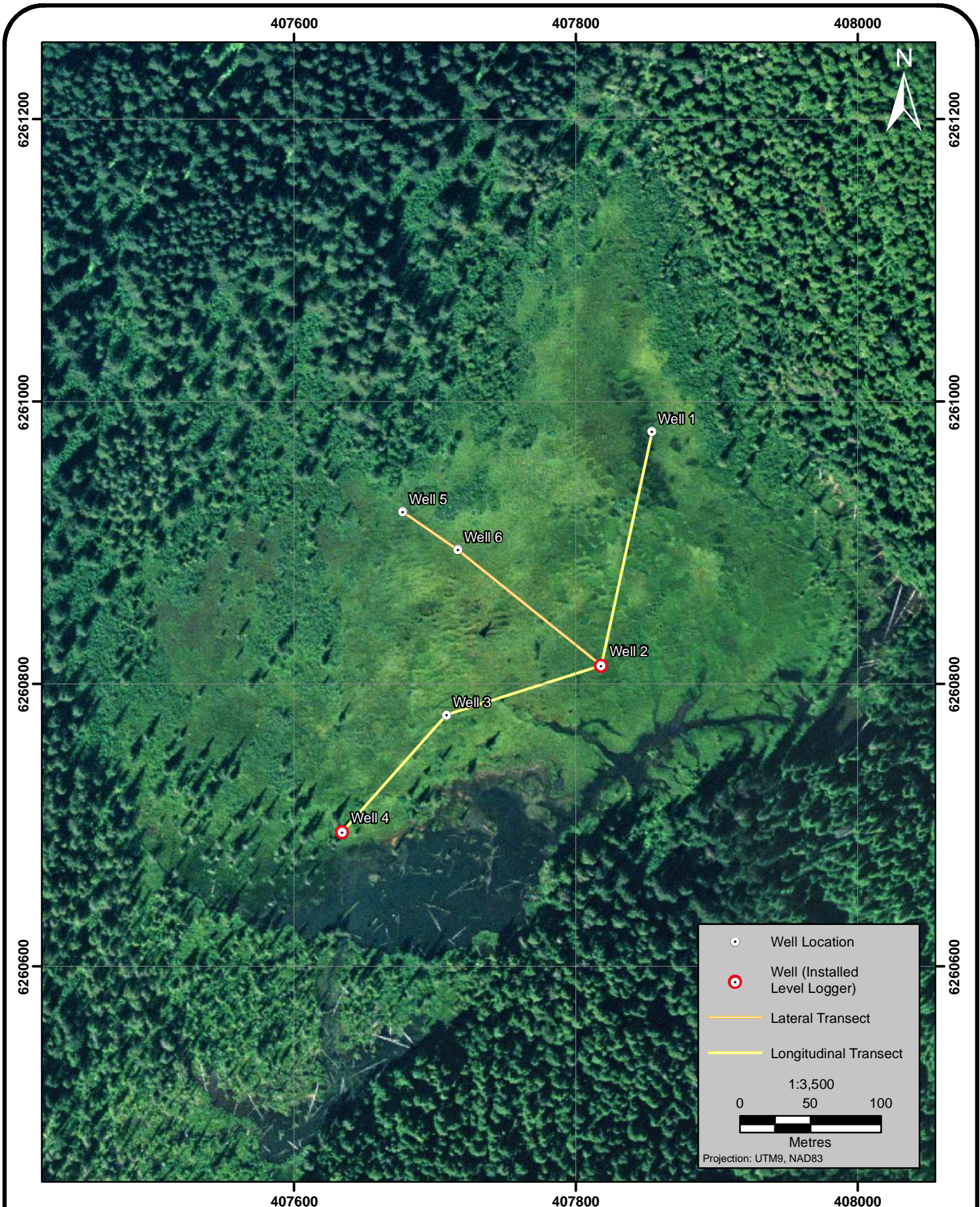
Wetland UR1 is located to the south of the confluence of Sulphurets Creek and the Unuk River. The southern edge of the wetland is defined by a large pond of water with steep slopes on the opposite side. The lateral cross-section of the wetland was measured on relatively flat ground, upslope from the large pond and comprised wells 2, 5, and 6, (Plate 4.3-1). The longitudinal cross-section comprised wells 1, 2, 3, and 4. Leveloggers were installed in Wells 2 and 4. A schematic of the well locations and levelogger installations is shown in Figure 4.3-1.

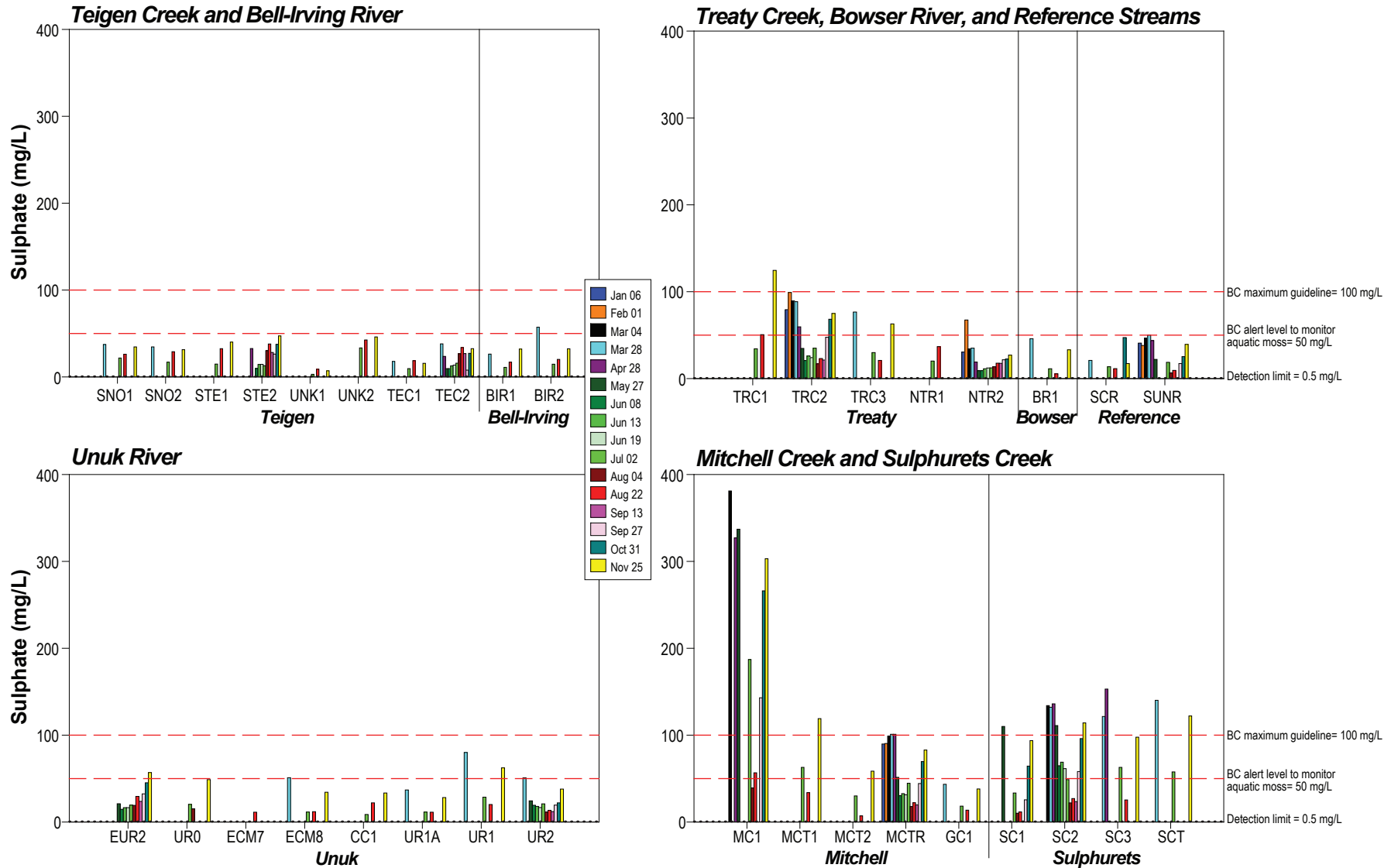


Plate 4.3-1. Wetland UR1 (view to the south). June 2008.

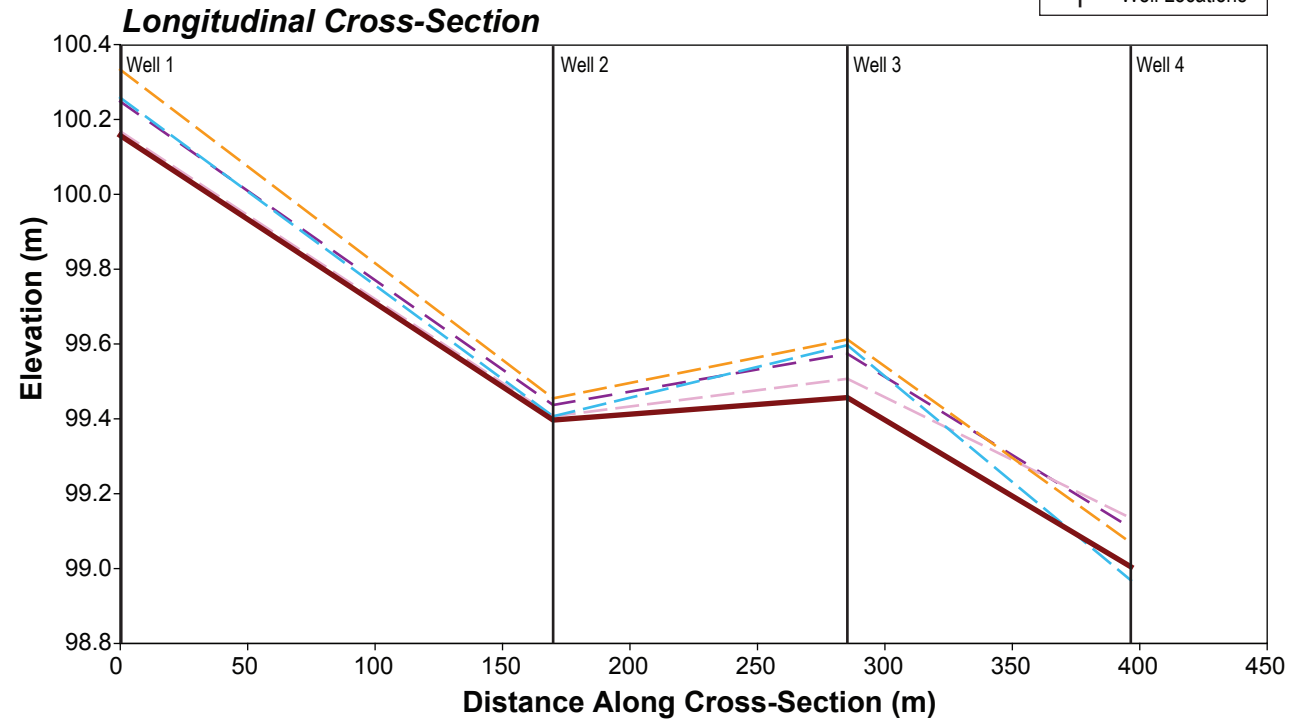
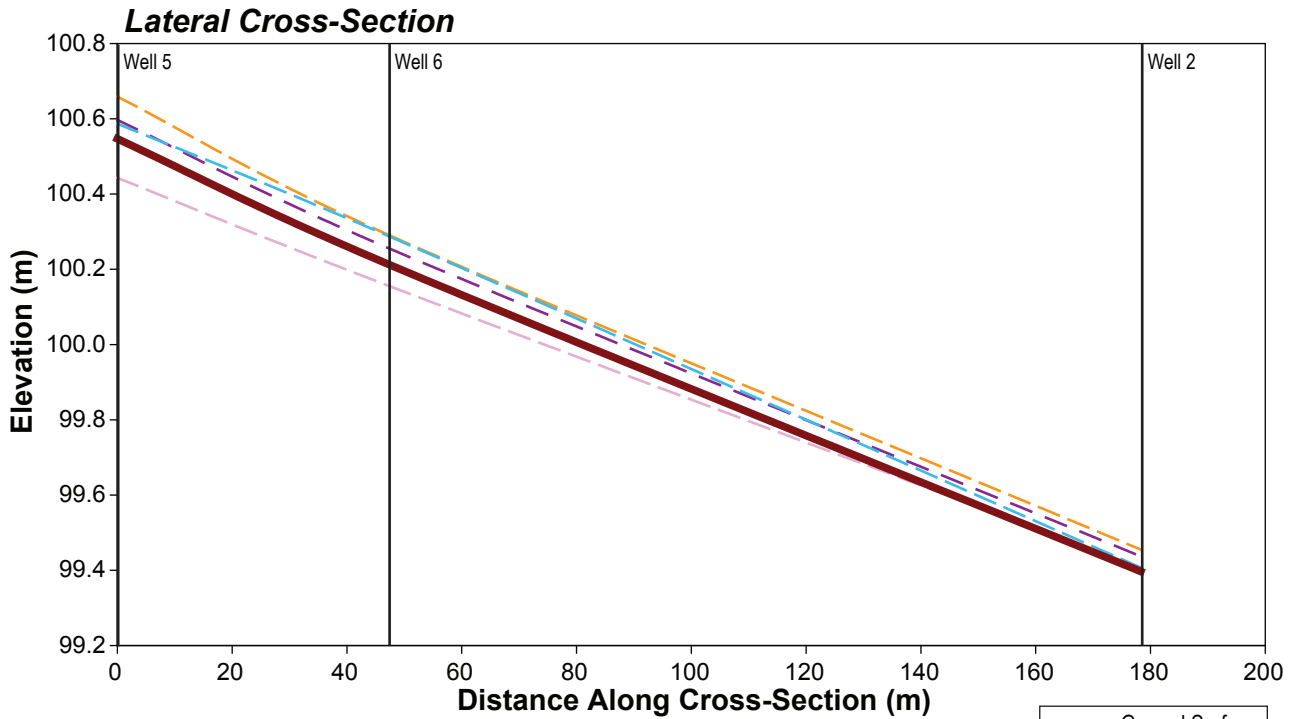
4.3.1.1 Static Monitoring

The 2008 static water level measurements of the wells in wetland UR1 showed small increases in water levels from June to September, followed by a small decrease in late September (Figure 4.3-2). In 2008, there was little variability between measurements taken at each well from one period to the next compared to 2009 (Figure 4.3-3). In 2009, water levels were high in June following snowmelt. Water levels dropped in the summer likely due to warm temperatures and high evapotranspiration in July. Water levels increased in September and October due to fall rain episodes (Figure 4.3-3). In wetland UR1, it was not clear whether the direction of flow followed the lateral or longitudinal transects more closely.





Notes: No CCME guideline exists.
 Dotted line represents analytical detection limit.
 Dashed line indicates BC Water Quality Guidelines for the Protection of Aquatic Life, where available.



UR1 Static Water Levels, 2009

FIGURE 4.3-3

4.3.1.2 Continuous Monitoring

In 2008, continuous monitoring in Well 4 began on June 8, following the installation of a level logger. A levellogger was also installed in Well 2 and began operating on July 28. In both wells, there was little fluctuation in wetland water levels, which suggests a low sensitivity to precipitation events (Figure 4.3-4). For example, the average daily water levels in Well 2 varied by 0.11 and 0.14 m during the 2008 and 2009 monitoring years, respectively (Figure 4.3-4). A similar degree of variability occurred in Well 4. However, suspect data in the form of anomalously high water table values were recorded in this well from September 16, 2009 until the end of the monitoring period. Beaver damming activities in the large pond, located nearby and lower relative to Well 4, caused the unusually high water levels (Figure 4.3-4).

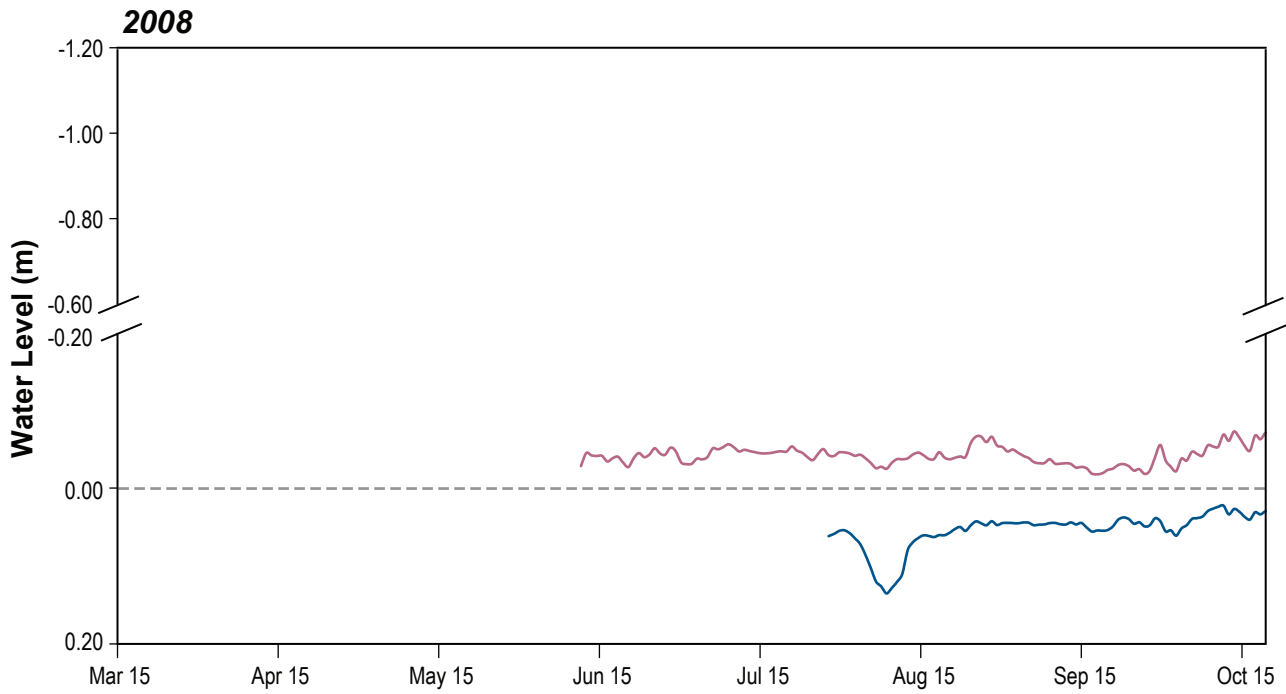
Except for the anomalous data recorded at Well 4 in the fall of 2009, water levels in both wells were near the ground surface for the majority of the monitoring periods. In 2008, the water table was above ground for the entire monitoring season at Well 4. In 2009, water levels in Well 4 were just below the surface of the ground in March, but the snowmelt period (April 4 to May 15) caused water levels to rise above the ground surface, where they stayed for the remainder of the season. Similar to Well 4, 2009 water levels in Well 2 increased by 0.08 m during the snowmelt period, and were briefly above the ground surface (Figure 4.3-4).

4.3.2 Wetland STE1

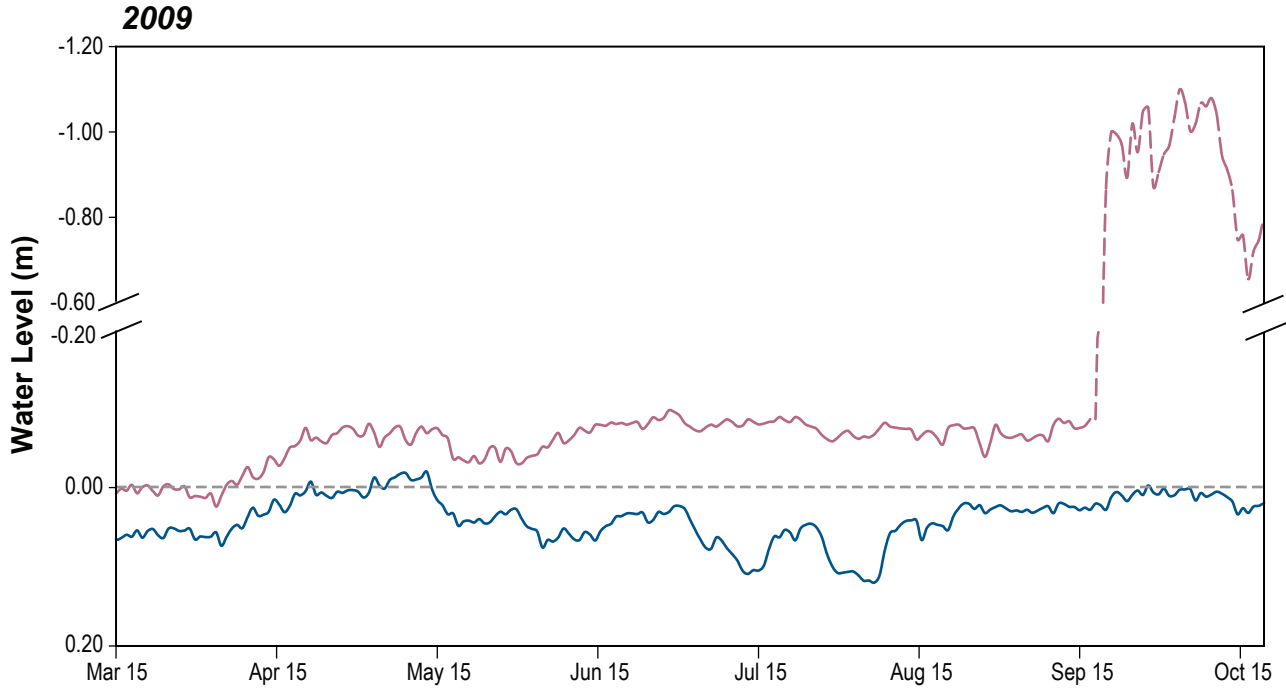
Wetland STE1 is located in South Teigen Creek in the area of the proposed TMF. The wetland is hydrologically connected to South Teigen Creek, which meanders down the centre of the wetland complex. The stream course has an average width of approximately 4 m. A survey of the main channel was conducted and was included in the lateral cross-section, which comprised wells 1, 2, and 3. The longitudinal cross-section of the wetland comprised wells 4, 2, 5, 6, and 7 (Plate 4.3-2). Levelloggers were installed in wells 4 and 7. A detailed layout of the monitoring wells installed within the wetland is shown in Figure 4.3-5.



Plate 4.3-2. Wetland STE1 (view to the west). June 2008. The stream channel riparian vegetation is seen toward the background.



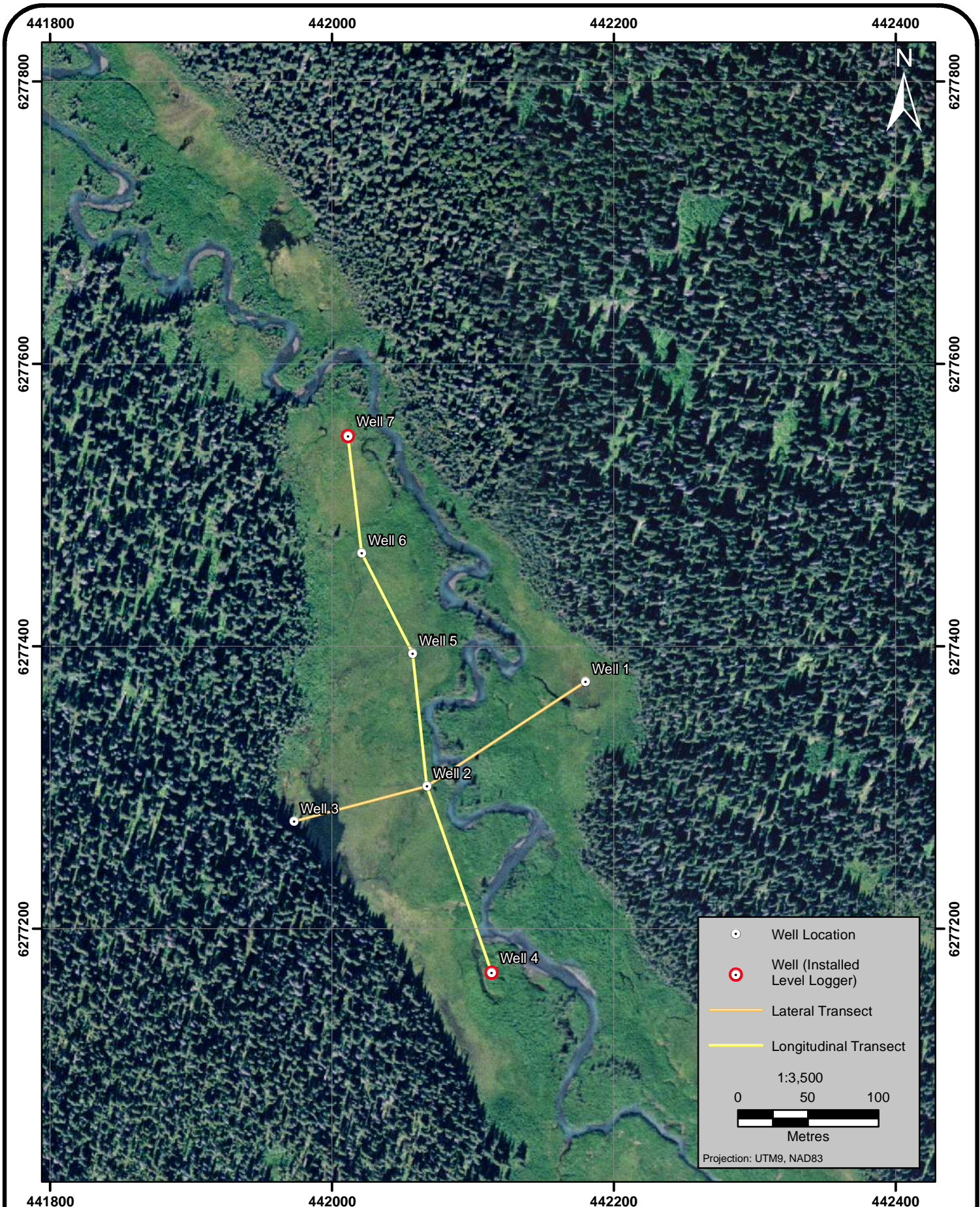
Note: Water levels are relative to the ground surface at the well (metres below ground surface)



Note: Water levels are relative to the ground surface at each well (metres below ground surface)
The dashed line indicating water level for Well 4 indicates unusual data likely resulting from beaver damming.

UR1 Continuous Water Levels, 2008 and 2009

FIGURE 4.3-4



4.3.2.1 *Static Monitoring*

Static water levels in wetland STE1 were lowest when the wells were installed in June 2008, after snowmelt had occurred (Figure 4.3-6). Rainy periods were prevalent in July and August, which explains higher static water levels recorded during these months, except for Well 4. In 2009, late snowmelt caused high water levels in June. However, static water levels decreased into the summer months (Figure 4.3-7). Differences in water levels were generally consistent between wells from one static measurement date to the next, especially for the lateral transect.

4.3.2.2 *Continuous Monitoring*

The levelloggers were installed after the snowmelt had occurred at STE1 in 2008. At both wells, the water level was below ground surface for the 2008 and 2009 monitoring periods (Figure 4.3-8). For both years, the water level was closer to the ground surface at Well 7, and varied less, compared to that at Well 4. In 2008 for example, the water level at Well 7 rose to 0.02 m below ground surface, and dropped to a maximum of 0.11 m below ground surface. Water levels at Well 4 varied from 0.26 to 0.81 m below ground surface in 2008. Well 4 is situated on higher ground and is surrounded by different soils compared to Well 7 which explains why water levels fluctuated more in Well 4. Likely for the same reasons, water levels in Well 4 showed a greater response to the 2009 spring snowmelt, when the water table spiked on June 8th (Figure 4.3-8). Apart from the snowmelt event, water levels remained below the level of the levellogger for the 2009 monitoring season.

4.3.3 **Wetland NTR1**

Wetland NTR1 is located at the headwaters of North Treaty Creek. The wetland is located approximately 3 km southeast of the STE1 wetland, and is close to the drainage divide between the South Teigen and North Treaty creeks. Ponds are located to the west of the wetland, followed by a heavily treed area (Plate 4.3-3 and Figure 4.3-9). The lateral cross-section survey was performed along the short axis of the wetland, and comprised wells 1, 2, and 3 (note that Well 3 was located on high ground). Four wells (2, 4, 5, and 6) were installed along a longitudinal cross-section (parallel to the assumed direction of flow) (Plate 4.3-3). No levelloggers were installed within the monitoring wells of this wetland.

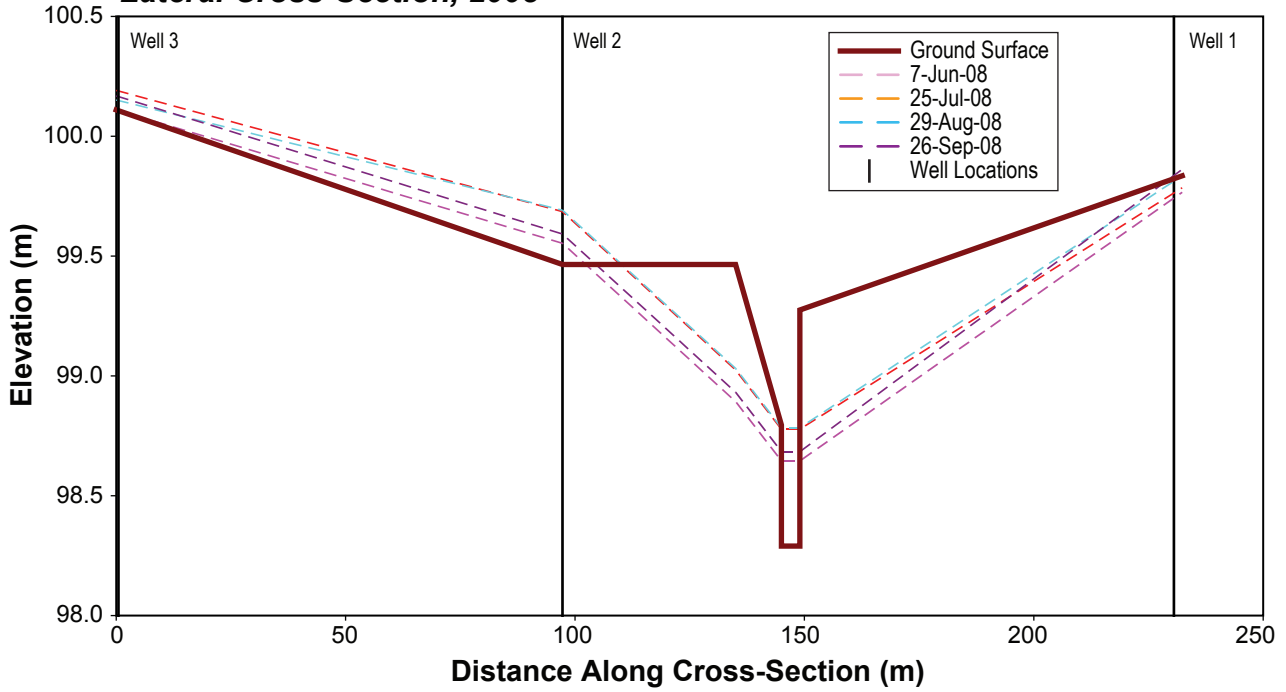
4.3.3.1 *Static Monitoring*

The static monitoring results in NTR1 show that there was slightly more variability in water levels from one date to the next within the longitudinal cross-section compared to the lateral cross-section, in both 2008 (Figure 4.3-10) and 2009 (Figure 4.3-11). Along the lateral transect, the water table remained close to the ground surface throughout both monitoring periods, with the exception of the June 2008 water level in Well 2. Along the longitudinal transect there was more variability in water level from one date to the next in 2008 compared to 2009.

4.4 **WETLAND FUNCTION**

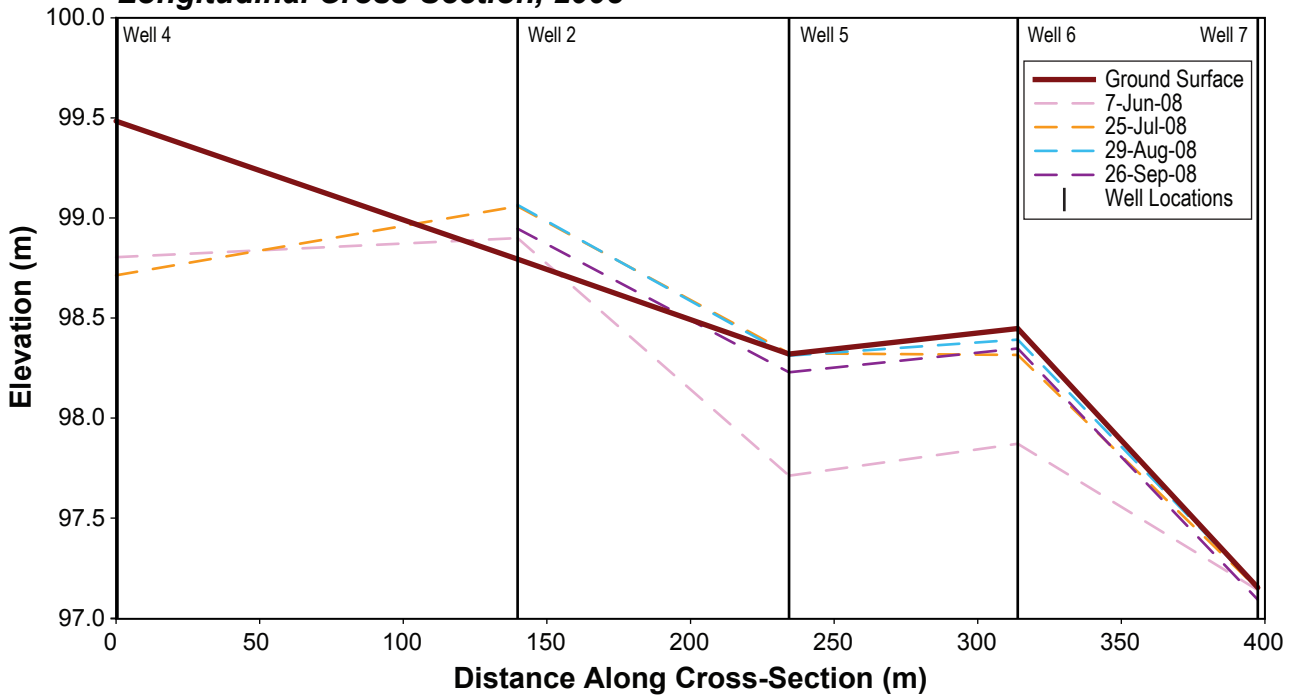
Wetland function is a process or series of processes a wetland carries out such as its ability to regulate water levels to attenuate flow, filter water to improve water quality, and provide aquatic and terrestrial habitat for aquatic and semi-aquatic species. Wetland function is separated into four primary categories (hydrology, biochemical, ecological, and habitat) (Environment Canada 2003). The following is a description of the primary wetland functions identified in the study area.

Lateral Cross-Section, 2008



Notes: Well 3 is 0 m distance
CP2 is 100 m elevation
Vertical exaggeration is 52x

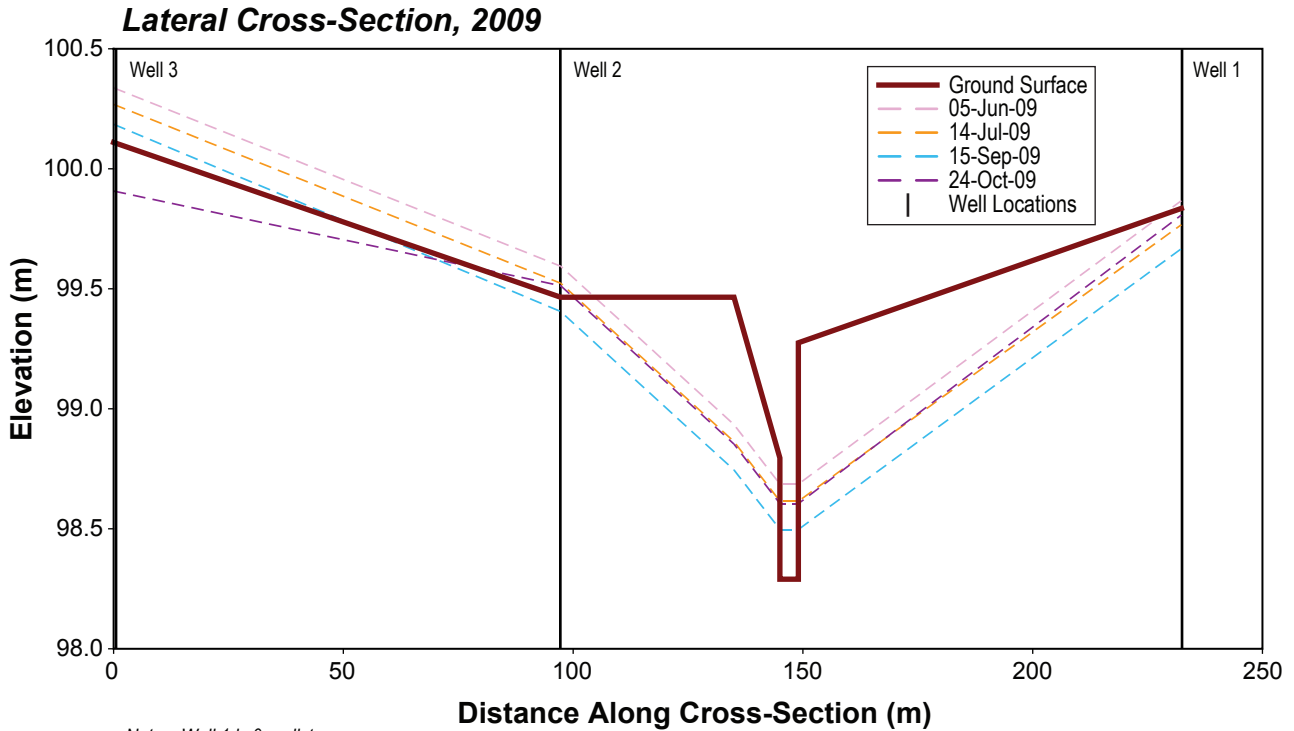
Longitudinal Cross-Section, 2008



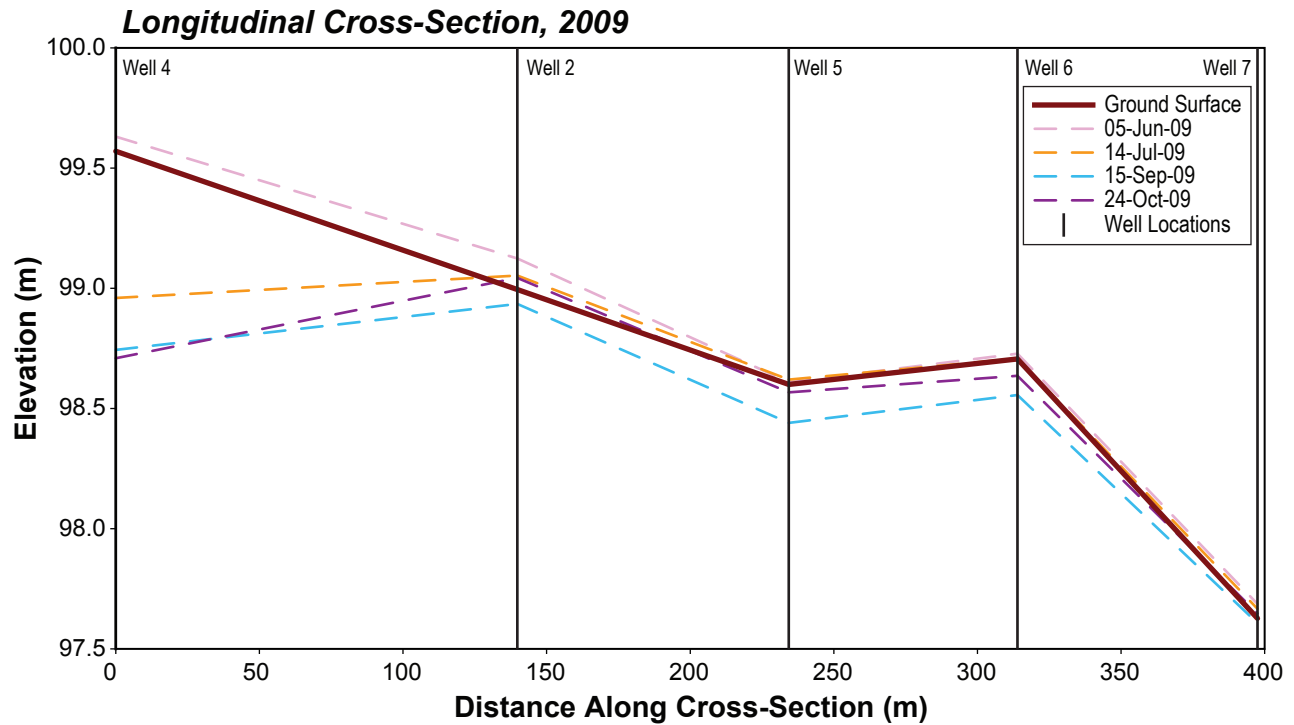
Notes: Well 4 is 0 m distance
CP2 is 100 m elevation
Vertical exaggeration is 81x

STE1 Static Water Levels, 2008

FIGURE 4.3-6



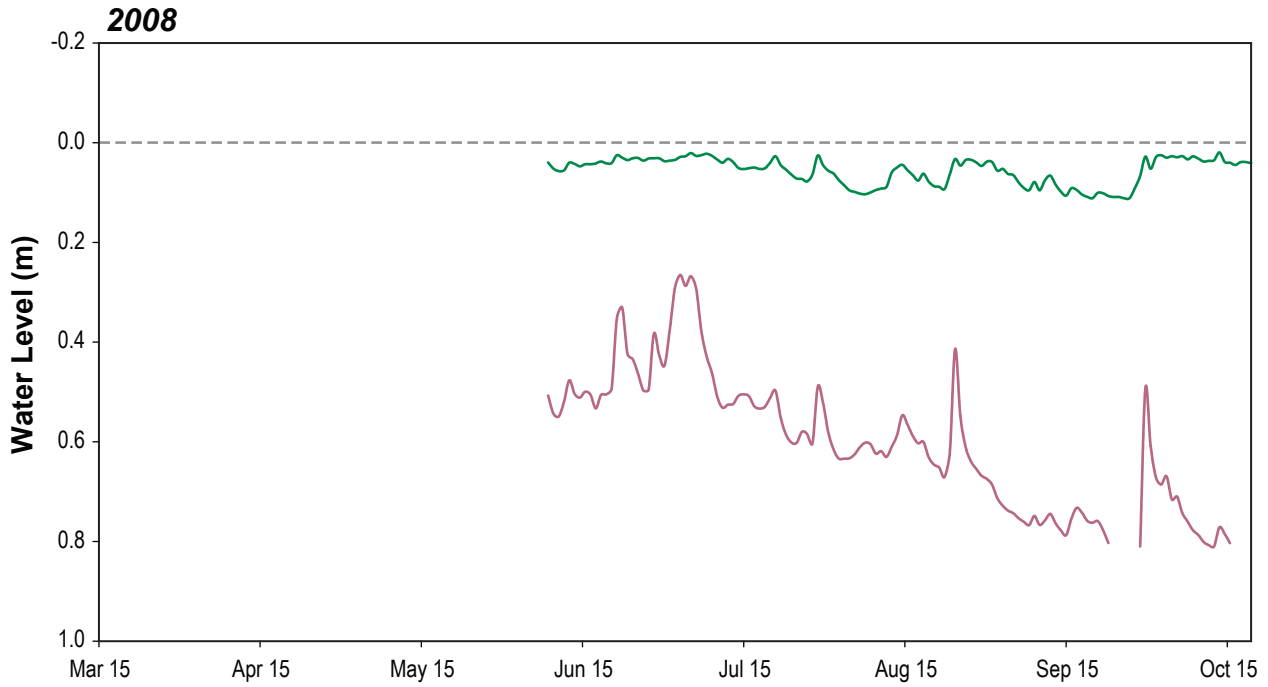
Notes: Well 1 is 0 m distance
 CP2 is 100 m elevation
 Vertical exaggeration is 14x



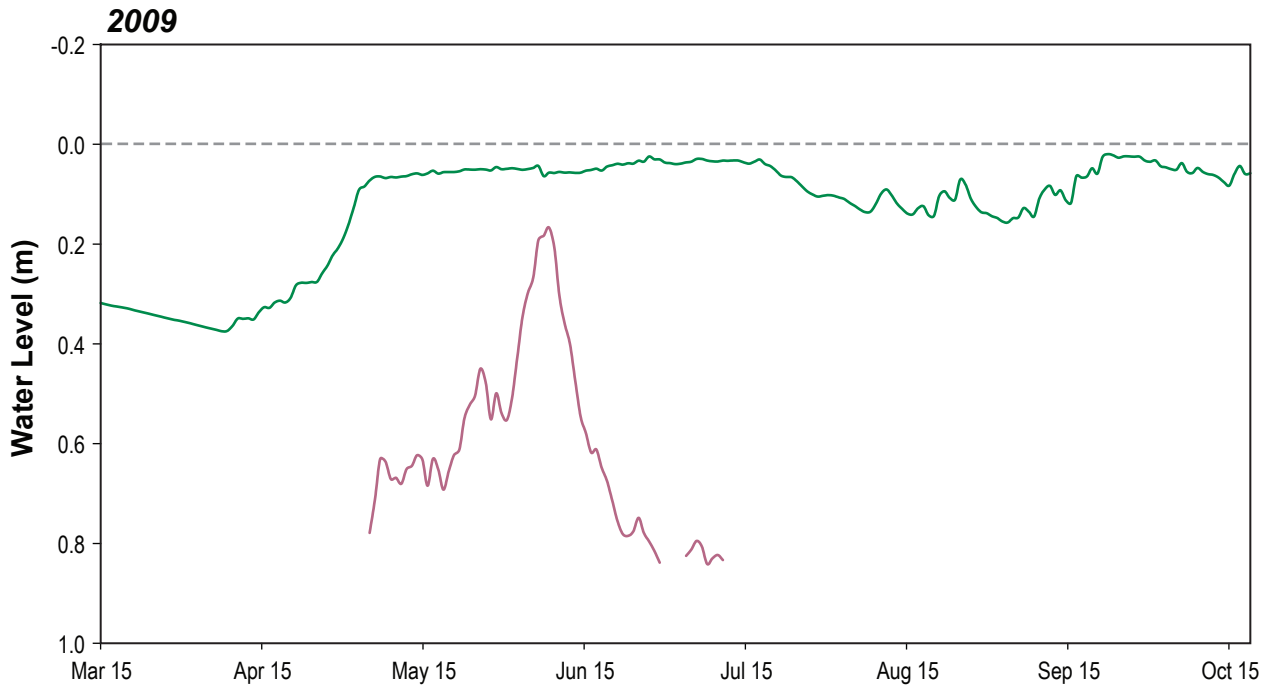
Notes: Well 4 is 0 m distance
 CP2 is 100 m elevation
 Vertical exaggeration is 24x

STE1 Static Water Levels, 2009

FIGURE 4.3-7



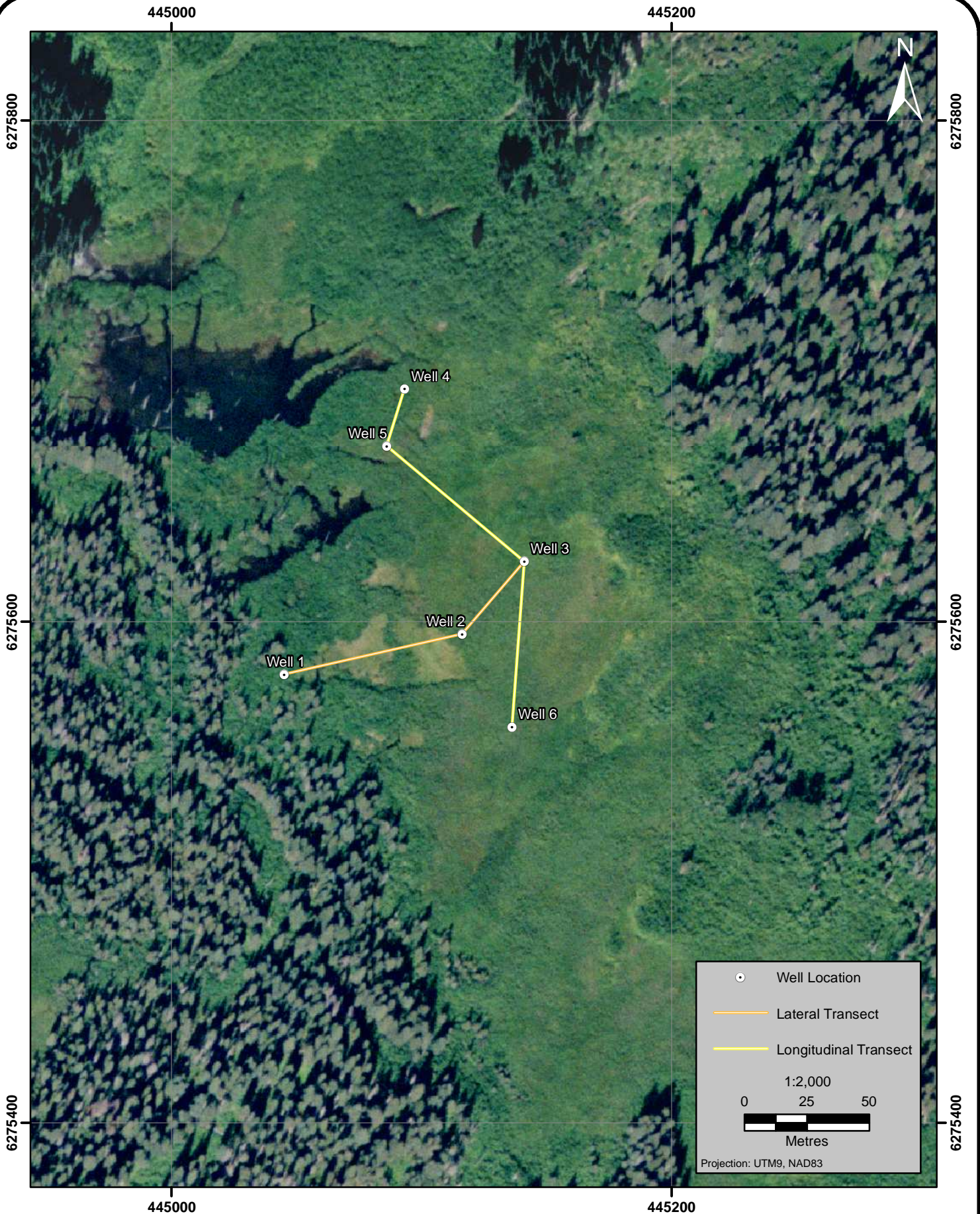
Note: Water levels are relative to the ground surface at each well (metres below ground surface)



Note: Water levels are relative to the ground surface at each well (metres below ground surface)

STE1 Continuous Water Levels, 2008 and 2009

FIGURE 4.3-8



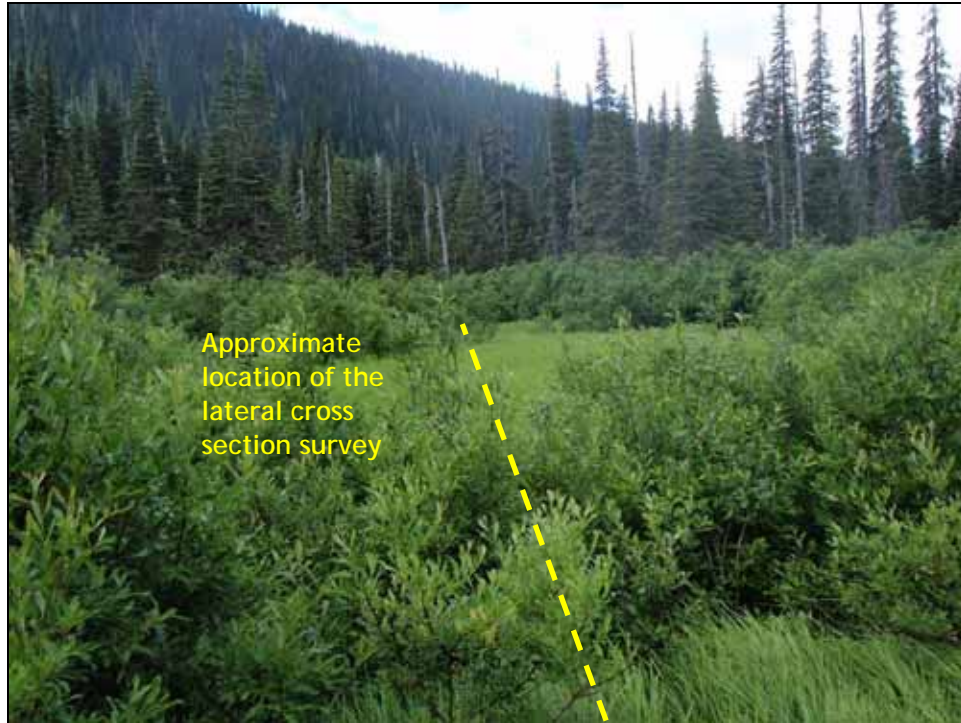


Plate 4.3-3. Wetland NTR1 (view to the west). July 2009. The wetland contained many small stream channels with riparian vegetation, which increased the difficulty of conducting surveys.

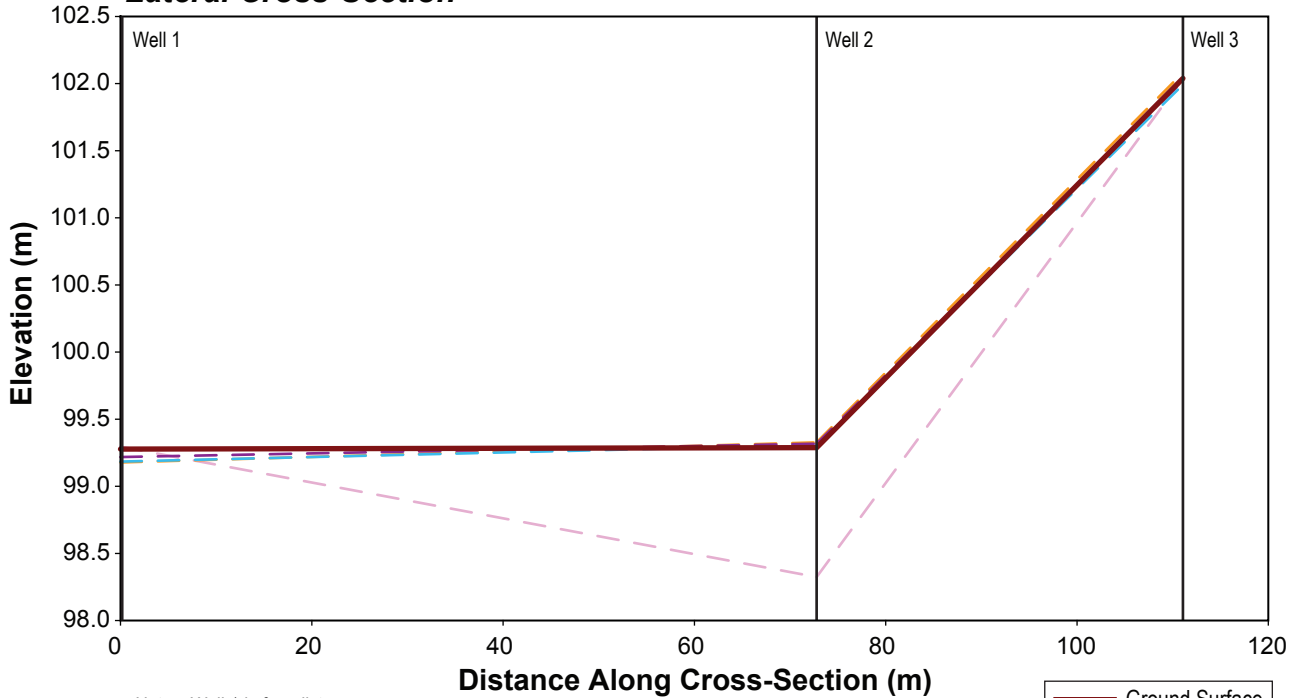
4.4.1 Hydrologic Function

Hydrologic function is defined as a wetlands contribution to ground and surface water resources. The hydrologic function of wetlands in the KSM study area is varied because of the variety of wetland classes and landscape position. Physical features of wetlands and geographical properties such as wetland class, landscape position, and hydrodynamic index both influence and are influenced by wetland hydrologic function.

Shallow wells were installed in three wetlands within the KSM Project area. At wetlands UR1 and STE1, static water levels were collected on eight dates and continuous water level monitoring occurred in two of the wells at each wetland during the 2008 and 2009 monitoring seasons. At wetland NTR1, water levels were collected on seven dates and no continuous water level monitoring was conducted. The installed shallow wells provided a means of quantifying relative changes in water levels through time, along lateral and longitudinal cross-sections of the wetlands. Generally, observations showed that water levels were high during the spring snowmelt period, which occurred in April or early May. Depending on climatic conditions, water levels decreased during the warm summer months, after the snowpack had been depleted. During the wettest months of the year for the project area, which occurs between September and October, water levels increased.

Exceptions to the above patterns were observed, and these are attributed to local effects on well water levels. For example, wells located on higher ground within a given wetland, such as Well 4 at STE1, reacted more quickly to precipitation or snowmelt events. Wells that were located on lower ground within a given wetland, such as Well 7 at STE1 and Well 2 at UR1, received greater groundwater contributions and water level changes in them were more moderated. Generally for all wetlands, more variability in static measurements was observed along transects that were parallel with the assumed direction of flow. The direction of flow, however, was not obvious for all wetlands (e.g., UR1).

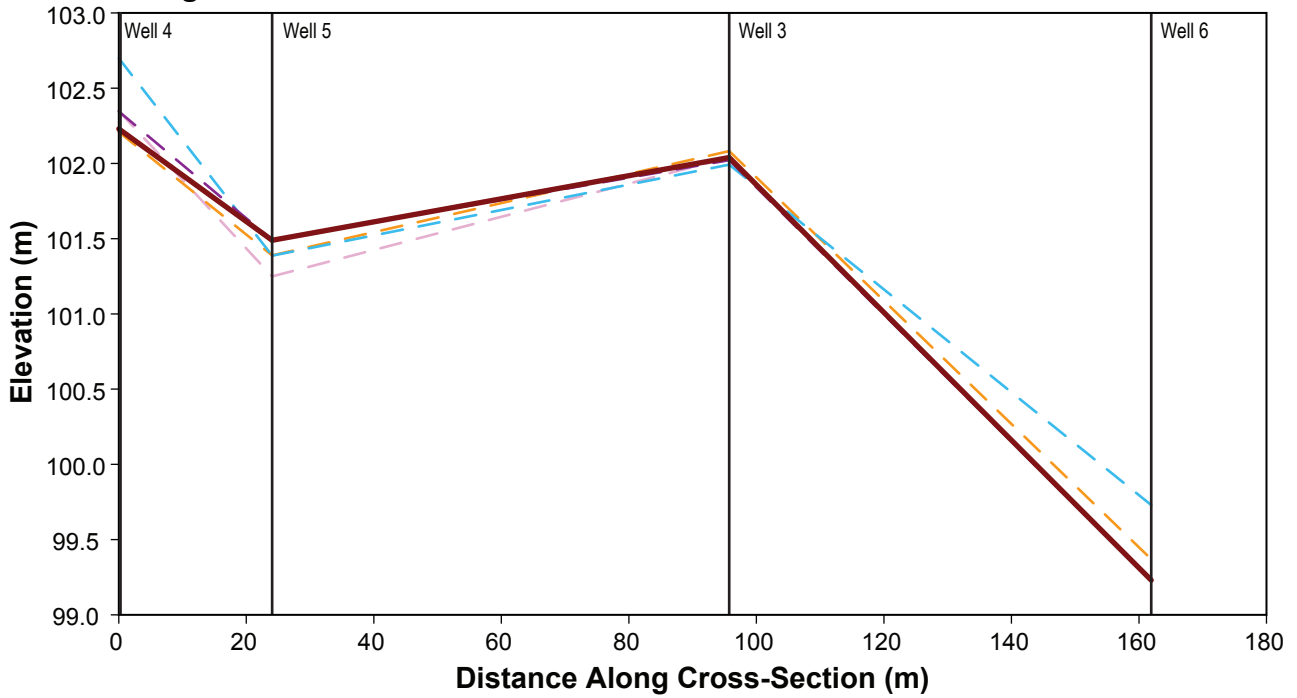
Lateral Cross-Section



Notes: Well 1 is 0 m distance
CP2 is 100 m elevation
Vertical exaggeration is 14x

- Ground Surface
- 10-Jun-08
- 26-Jul-08
- 1-Sep-08
- 26-Sep-08
- Well Locations

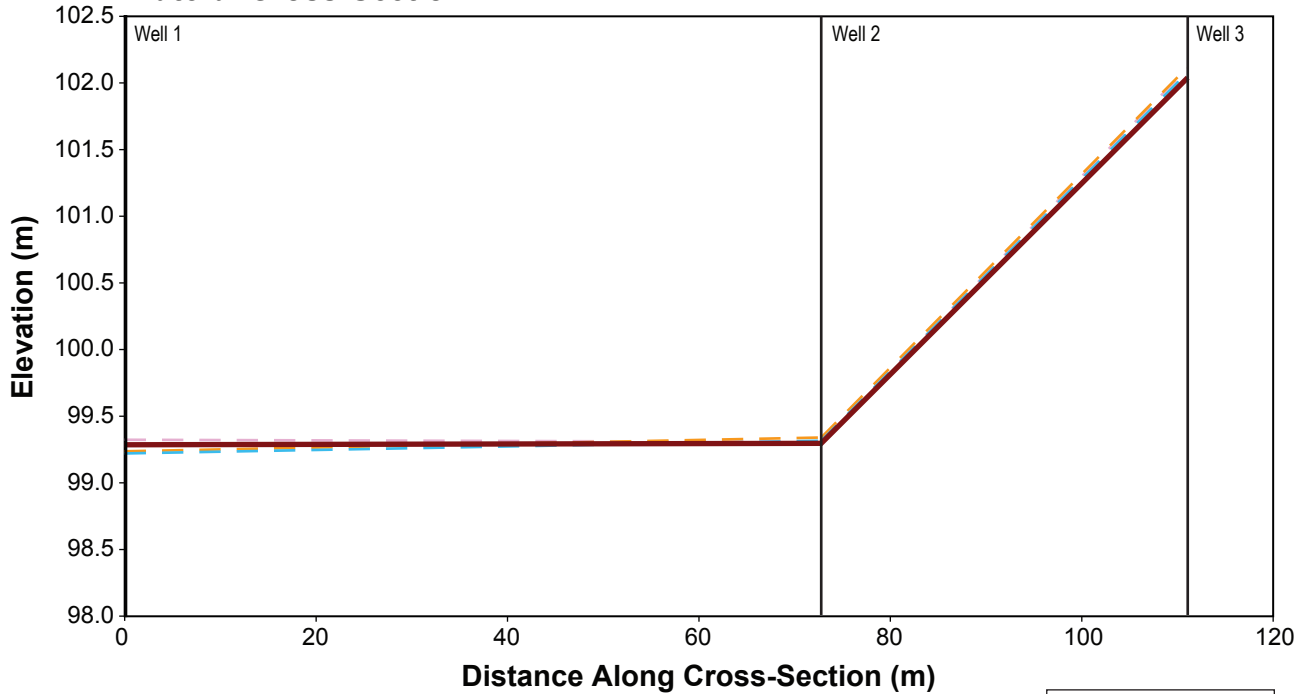
Longitudinal Cross-Section



Notes: Well 4 is 0 m distance
CP2 is 100 m elevation
Vertical exaggeration is 24x

NTR1 Static Water Levels, 2008

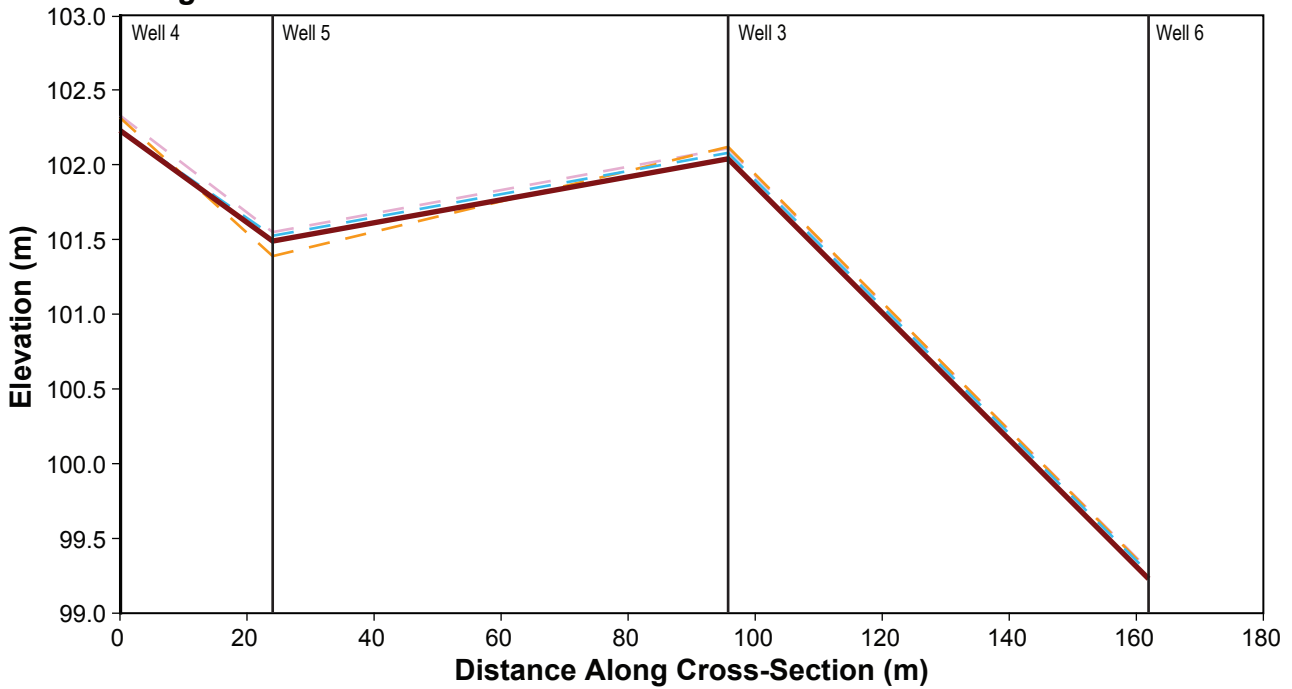
Lateral Cross-Section



Notes: Well 3 is 0 m distance
CP2 is 100 m elevation
Vertical exaggeration is 14x

- Ground Surface
- 5-Jun-09
- 14-Jul-09
- 15-Sep-09
- Well Locations

Longitudinal Cross-Section



Notes: Well 1 is 0 m distance
CP2 is 100 m elevation
Vertical exaggeration is 24x

NTR1 Static Water Levels, 2009

The majority of the wetlands were small shallow open water wetlands identified as TRIM open water. Although these sites are mapped as lakes, small (<2 ha) open water features are typically associated with wetlands, particularly in the alpine and subalpine BEC zones of the study area. The primary hydrology of these wetlands is storage. Water is held in these shallow open water wetlands and is therefore available to adjacent ecosystems and wildlife during the drier summer months (Plate 4.4-1). Although these wetlands were the most abundant as a percentage of total mapped wetlands, TRIM swamp wetlands accounted for 38% of all wetlands by area. Swamp wetlands, particularly riparian flat swamps and inland swamps, have an important flood prevention function (Environment Canada 2008). They store water and release it slowly into surface water features over time (Plate 4.4-2).



Plate 4.4-1. Small Subalpine Pool.



Plate 4.4-2. Water Infiltrating into a Stream from Adjacent Swamp Complex.

Another important determinant of wetland hydrologic function is the size of individual wetlands. Smaller wetlands have a greater perimeter to volume ratio than larger wetlands and therefore better support groundwater recharge (Weller, 1994). Approximately 72% of all wetlands mapped were smaller than 0.5 ha (Table 4.4-1) and 11% of the area of all wetlands is represented by wetlands less than 0.5 ha. Although 72% of all mapped wetlands were less than 0.5 ha, wetlands greater than 5 ha accounted for approximately 60% of total wetland area.

Table 4.4-1. Distribution of Wetland Size

	<0.1 ha	0.1 - 0.25 ha	0.25 - 0.5 ha	0.5 - 2 ha	2 - 5 ha	5 - 10 ha	10 - 20 ha	>20 ha
Count	165	140	83	111	16	14	3	4
% Count	30.78	26.12	15.49	20.71	2.99	2.61	0.56	0.75
Area	9.99	21.84	30.99	110.71	46.50	100.53	51.72	182.04
% Area	1.8	3.94	5.59	19.97	8.39	18.14	9.33	32.84

4.4.2 Ecological Function

Wetland ecology is defined as the relationship between a wetland and surrounding ecosystems. Aspects of the wetland ecosystem function include rare or unique wetlands, wetland complexes, and biological productivity.

Wetlands were observed in six BEC subzones in the study area (Table 4.4-2). Particular attention was given to the search for red- and blue- listed wetland associations in these BEC zones of the Skeena Stikine Forest District. Of the 10 wetland associations identified, during the search, as red- or blue-listed in these sub-zones and forest district none were observed in these BEC subzones in the study area.

Table 4.4-2. Potentially Occurring Red- and Blue-listed Ecosystems

Subzones in the Study Area	BAFA unp	CMA unp	CWH wm	ESSF wv	ICH vc	MH un
Red and Blue Listed Wetland Associations	None	None	Wm50 Wf51 Wf52 Fl01 CWH wm 09	None	Wb13 Wf51 Wb04 Fl01 Fl02	None

An aspect of ecological function is the wetland complex, a combination of multiple wetland classes and associations. Wetland complexes accounted for 42 of the 94 wetland sites surveyed and 11 % of the total wetland area. It is also quite likely that large TRIM wetlands that were not visited are also wetland complexes, such as the wetland in the proposed tailings management facility (PTMF). The largest wetlands are TRIM swamps and likely represent a number of communities including non-wetland riparian forest and numerous flood associations.

4.4.3 Biochemical Function

The wetland biochemistry function is defined as a wetland's contribution to the quality of surface and groundwater of an area. Water, sediment, and vegetation components of a wetland influence its biological function. Accurately describing biochemical function is not possible given site specific interactions between wetland components (water, soil and vegetation), landscape position, and environmental factors such as salinity, precipitation, and climate (Almas and Singh, 2001; and Brunham, 2009). Aspects of the biochemical function of aquatic ecosystems were studied in the aquatic biology, and surface water and groundwater quality study reports. The pH and conductivity of wetlands were measured to aid in wetland classification (MacKenzie and Moran 2004) and provide baseline data on these aspects of biochemical function. The data confirm expectations; fens have the lowest average pH followed by swamps and then marshes (Table 4.4-3).

Table 4.4-3. Wetland pH and Conductivity

Wetland Class	Average of pH	Max of pH	Min of pH	Average Conductivity (µs)	Max Conductivity (µs)	Min Conductivity (µs)
Fen	5.4	6.8	4.6	43.1	180.0	10.0
Marsh	6.1	7.1	5.5	82.5	120.0	30.0
Shallow Open Water	6.7	6.7	6.7	10.0	10.0	10.0
Swamp	6.0	6.6	5.5	78.9	160.0	30.0

Identifying the primary biochemical function of wetlands in the study area is not possible given the different wetland classes, associations, and landscape position of wetlands in the study area. However, swamp wetlands accounted for the majority of wetlands by area and a variety of biochemical functions have been identified for this wetland class (Environment Canada 2008). Swamp wetlands have a potentially high ability to improve the physical, chemical, and biological water quality of an area due to a combination of physical processes, high interaction between water and the rhizosphere, soil matrix, and a multitude of micro-sites which result in a heterogeneity of oxidation (Environment Canada 2008).

4.4.4 Habitat Function

Wetland habitat function includes both terrestrial and aquatic habitat components and is defined as a wetland's contribution to the wildlife habitat within a given region. Wetlands in the study area maintain local and regional biodiversity by providing a wide range of aquatic and terrestrial habitat types, as confirmed by the variety of wildlife observed during the wetland field survey (Table 4.4-4). Wildlife observations included a number of mammalian, avian, and herptofauna species, although approximately 50% of all wildlife observations were moose (*Alces alces*).

No COSEWIC/SARA listed species were directly observed during wetland field studies. However, a number of herptofauna were observed during wetland field surveys (Plate 4.4-2) and Western Toads were observed during herptofauna surveys (Rescan 2010b).

Table 4.4-4. Wetland Survey: Incidental Wildlife Observations

Plot	Genus	Species	Feature
KS1	<i>Ursa</i>	<i>sp</i>	Scat
KS1	<i>Alces</i>	<i>alces</i>	Trail
KS2	<i>Alces</i>	<i>alces</i>	Bed
KS2	<i>Alces</i>	<i>alces</i>	Hair
KS11	<i>Alces</i>	<i>alces</i>	Individual
KS12	<i>Ursa</i>	<i>sp</i>	Scat
KS12	<i>Alces</i>	<i>alces</i>	Trail
KS13	<i>Alces</i>	<i>alces</i>	Trail
KS16	<i>Ursa</i>	<i>sp</i>	Scat
KS16	Grouse		Individual
KS18	<i>Alces</i>	<i>alces</i>	Trail
KS19	Ducks		Individual
KS19	<i>Alces</i>	<i>alces</i>	Trail and Browse
KS20	Frog		Individual
KS23	<i>Rana</i>	<i>sp</i>	Individual and Egg mass
KS27	<i>Castor</i>	<i>canadensis</i>	Dam/lodge
KS29	<i>Alces</i>	<i>alces</i>	Trail
KS29	<i>Castor</i>	<i>canadensis</i>	lodge
KS35	<i>Castor</i>	<i>canadensis</i>	lodge
KS90	<i>Rana</i>	<i>sp</i>	Individual



Plate 4.4-2. Columbia spotted frog Observed at Wetland Site KS20.

5. Conclusion

A total of 111 wetland ecosystem surveys were completed in the KSM study area in September 2008 and July 2009; 94 wetland communities were mapped, classified, and entered into a wetland GIS. A further 442 TRIM wetlands were also incorporated into the wetland GIS. Wetlands were classified to federal wetland class and provincial site association following Warner and Rubec (1997) and Mackenzie and Moran (2004). Wetland classification identified 21 wetland associations including an unclassified fen, TRIM marsh, TRIM swamp, and TRIM open water.

Most wetland communities were identified in the Shallow Open Water class because this class included TRIM open water features smaller than 2 ha in area. It is possible that some of these features are not wetlands. However, they would provide some functions similar to open water wetlands. The Swamp wetland class covered the largest area because the study area contains a number of TRIM Swamps. These tended to be large features; the largest being approximately 75 ha. Wetlands accounted for approximately 554 ha, approximately 1% of the study area and were observed in six BEC zones.

Wetlands in the study area were identified to generally have one of two hydrology functions 1) storage and 2) flood regulation. Small open water wetlands, particularly in the alpine and subalpine BEC zones, store water. They hold water in shallow pools making it available to adjacent ecosystems and wildlife during the drier summer months. TRIM swamp wetlands accounted for 38% of all wetlands by area. Swamp wetlands, particularly riparian flat swamps and inland swamps, have an important flood prevention function.

The wetland ecological function is a wetlands relationship with other ecosystems in an area and was identified principally as rare or unique wetlands and wetland complexes within the study area. A total of 10 red and blue-listed wetland associations in the BAFA unp, CMA unp, CWH wm, ESSF vc, ICH vc, and MH un of the Skeena Stikine Forest District are identified as potentially occurring in the area by the BC CDC; however, none were observed during field studies. Wetland complexes accounted for 42 of the 94 wetland sites surveyed and 11% of the total wetland area. The largest wetlands are TRIM swamps, such as the complex observed in the TMF, they represent a number of communities including non-wetland riparian forest, flood associations, and swamps.

Wetlands in the study area were identified to support a variety of biochemical functions because a variety of wetland classes and associations were observed. Swamp wetlands accounted for the majority of wetlands by area. Swamps primary biochemical function is improving water quality because they support a combination of physical processes, high interaction between water and the rhizosphere, soil matrix, and a multitude of micro-sites which result in a heterogeneity of oxidation (Environment Canada 2008).

Wetlands in the study area maintain local and regional biodiversity by providing a wide range of aquatic and terrestrial habitat. Wildlife observations included a number of mammalian, avian, and herptofauna, although approximately 50% of all wildlife observations were moose (*Alces alces*). No COSEWIC/SARA listed species were directly observed during wetland field studies.

Within the study area wetlands cover a small component of the landscape. They are the connection between wetter aquatic habitats and drier upland habitats. They carry out a number of processes specific to wetlands such as regulating flood waters, improving water quality, and offering semi-aquatic wildlife habitat. The information collected in this baseline study informs aspects of the environmental assessment such that effects to wetlands as a result of the Project would be avoided or mitigated.

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Appendix 1

Wetland Ecosystem Field Data

Appendix 1. Wetland Ecosystem Field Data

ID	Plot	Date	Location	Easting	Northing	Elevation	Photo Numbers	Slope (%)	Aspect +	Meso Slope Position	Drainage Mineral Soils	Organic Soil Moisture	Mineral Soil Texture	Organic Soil Texture	Surface Organic Thickness	pH	Conductivity (ms)	Hydrodynamic Index	Soil Moisture Regime	Soil Nutrient Regime	Von Post	Polygon Area (m ²)	Wetland Class_1	Assn_ Code_1	Decile Percent	Association Name	Assn_ Area_1	Wetland Class_2	Assn_ Code_2	Decile Percent 2	Assn_ Area_2	Wetland Class3	Assn_ Code_3	Decile Percent 3	Assn_ Area_3	Notes	Source	ZONE	SUBZONE	BGC_LABEL	
212	TRIM101	27-Jan-10	-	409872	6273216	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13639.67	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	13640	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
213	TRIM102	27-Jan-10	-	414983	6272283	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12928.23	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	12928	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
214	TRIM103	27-Jan-10	-	405191	6266077	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11427.93	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	11428	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
215	TRIM104	27-Jan-10	-	407689	6276197	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11368.34	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	11368	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
216	TRIM105	27-Jan-10	-	411045	6276968	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10757.99	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	10758	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv
217	TRIM106	27-Jan-10	-	425190	6265448	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10579.62	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	10580	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
218	TRIM107	27-Jan-10	-	426741	6258936	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10260.49	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	10260	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
219	TRIM108	27-Jan-10	-	433546	6276888	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9012.90	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	9013	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv
220	TRIM109	27-Jan-10	-	432488	6278525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9003.77	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	9004	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv
221	TRIM110	27-Jan-10	-	404421	6267615	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8987.69	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	8988	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
222	TRIM111	27-Jan-10	-	425914	6260828	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8551.20	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	8551	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
223	TRIM112	27-Jan-10	-	407344	6272670	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8423.15	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	8423	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
224	TRIM113	27-Jan-10	-	405941	6274671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7863.74	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	7864	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
225	TRIM114	27-Jan-10	-	407285	6275853	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7682.50	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	7682	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
226	TRIM115	27-Jan-10	-	415063	6272805	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7522.75	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	7523	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
227	TRIM116	27-Jan-10	-	412400	6274597	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7422.12	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	7422	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
228	TRIM117	27-Jan-10	-	425893	6260497	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7288.81	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	7289	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
229	TRIM118	27-Jan-10	-	407437	6276298	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7139.29	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	7139	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
230	TRIM119	27-Jan-10	-	409015	6277771	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6930.57	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6931	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
231	TRIM120	27-Jan-10	-	425458	6260243	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6911.41	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6911	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
232	TRIM121	27-Jan-10	-	410357	6272126	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6903.49	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6903	-	-	-	-	-	-	-	-	-	-	TRIM	CWH	wm	CWHwm
233	TRIM122	27-Jan-10	-	407293	6270315	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6635.98	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6636	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
234	TRIM123	27-Jan-10	-	412669	6269908	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6607.59	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6608	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
235	TRIM124	27-Jan-10	-	409440	6273774	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6224.41	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6224	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
236	TRIM125	27-Jan-10	-	406691	6274086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6206.41	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6206	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
237	TRIM126	27-Jan-10	-	406834	6275241	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6126.38	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6126	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
238	TRIM127	27-Jan-10	-	434132	6276057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6072.35	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6072	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv
239	TRIM128	27-Jan-10	-	405173	6274342	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6071.19	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6071	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
240	TRIM129	27-Jan-10	-	433691	6277157	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6041.69	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	6042	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv
241	TRIM130	27-Jan-10	-	405034	6265383	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5892.70	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5893	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
242	TRIM131	27-Jan-10	-	411387	6271359	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5862.61	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5863	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
243	TRIM132	27-Jan-10	-	407645	6276781	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5820.71	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5821	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
244	TRIM133	27-Jan-10	-	414131	6271794	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5793.73	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5794	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
245	TRIM134	27-Jan-10	-	406196	6274673	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5618.57	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5619	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
246	TRIM135	27-Jan-10	-	433649	6275950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5589.01	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5589	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv
247	TRIM136	27-Jan-10	-	405480	6265395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5566.06	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5566	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
248	TRIM137	27-Jan-10	-	412976	6276371	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5555.83	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5556	-	-	-	-	-	-	-	-	-	-	TRIM	CWH	wm	CWHwm
249	TRIM138	27-Jan-10	-	405365	6273771	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5481.83	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5482	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
250	TRIM139	27-Jan-10	-	413002	6268832	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5284.30	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5284	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
251	TRIM140	27-Jan-10	-	404386	6266193	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5094.05	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	5094	-	-	-	-	-	-	-	-	-	-	TRIM	CWH	wm	CWHwm
252	TRIM141	27-Jan-10	-	412792	6269550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4913.60	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	4914	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp
253	TRIM142	27-Jan-10	-	413463	6278414	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4859.95	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	4860	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv
254	TRIM143	27-Jan-10	-	409263	6274239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4705.95	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	4706	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
255	TRIM144	27-Jan-10	-	405583	626755																																				

Appendix 1. Wetland Ecosystem Field Data

ID	Plot	Date	Location	Easting	Northing	Elevation	Photo Numbers	Slope (%)	Aspect +	Meso Slope Position	Drainage Mineral Soils	Organic Soil Moisture	Mineral Soil Texture	Organic Soil Texture	Surface Organic Thickness	pH	Conductivity (ms)	Hydrodynamic Index	Soil Moisture Regime	Soil Nutrient Regime	Von Post	Polygon Area (m ²)	Wetland Class_1	Assn_ Code_1	Decile Percent 1	Association Name	Assn_ Area_1	Wetland Class_2	Assn_ Code_2	Decile Percent 2	Assn_ Area_2	Wetland Class_3	Assn_ Code_3	Decile Percent 3	Assn_ Area_3	Notes	Source	ZONE	SUBZONE	BGC_LABEL							
309	TRIM198	27-Jan-10	-	445539	6272022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2250.00	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv	
310	TRIM199	27-Jan-10	-	445056	6287980	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2242.50	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2243	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	ICH	vc	ICHvc	
311	TRIM200	27-Jan-10	-	406748	6277383	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2241.83	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
312	TRIM201	27-Jan-10	-	405233	6267778	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2234.49	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2234	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
313	TRIM202	27-Jan-10	-	404909	6267349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2229.26	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
314	TRIM203	27-Jan-10	-	405343	6275265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2085.75	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
315	TRIM204	27-Jan-10	-	425437	6259232	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2079.24	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2079	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
316	TRIM205	27-Jan-10	-	410308	6278814	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2064.06	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2064	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv	
317	TRIM206	27-Jan-10	-	425511	6260018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2048.83	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2049	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
318	TRIM207	27-Jan-10	-	405348	6271602	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2040.45	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
319	TRIM208	27-Jan-10	-	407055	6277590	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2033.59	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
320	TRIM209	27-Jan-10	-	405498	6269977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2028.99	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
321	TRIM210	27-Jan-10	-	405109	6265280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2018.43	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
322	TRIM211	27-Jan-10	-	413795	6279006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000.93	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	2001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv	
323	TRIM212	27-Jan-10	-	406443	6274821	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1912.27	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1912	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
324	TRIM213	27-Jan-10	-	415416	6260130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1890.83	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1891	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
325	TRIM214	27-Jan-10	-	408503	6263002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1834.21	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1834	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CWH	wm	CWHwm	
326	TRIM215	27-Jan-10	-	406384	6272220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1813.12	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1813	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
327	TRIM216	27-Jan-10	-	405309	6274255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1771.14	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1771	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
328	TRIM217	27-Jan-10	-	405938	6275995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767.38	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
329	TRIM218	27-Jan-10	-	407748	6278510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1763.03	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1763	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
330	TRIM219	27-Jan-10	-	410806	6275974	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1739.91	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1740	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv	
331	TRIM220	27-Jan-10	-	409231	6260444	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1702.62	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1703	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
332	TRIM221	27-Jan-10	-	422350	6259456	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1694.90	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1695	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
333	TRIM222	27-Jan-10	-	438885	6276906	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1693.16	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1693	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	BAFA	unp	BAFAunp	
334	TRIM223	27-Jan-10	-	405959	6262460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1682.99	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1683	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
335	TRIM224	27-Jan-10	-	405460	6264394	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1660.69	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1661	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
336	TRIM225	27-Jan-10	-	406646	6273370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1611.94	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1612	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un
337	TRIM226	27-Jan-10	-	410039	6276866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1602.44	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1602	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	ESSF	wv	ESSFwv	
338	TRIM227	27-Jan-10	-	405463	6273599	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1594.78	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1595	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
339	TRIM228	27-Jan-10	-	407940	6272476	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1594.26	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
340	TRIM229	27-Jan-10	-	409441	6274004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1566.67	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1567	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
341	TRIM230	27-Jan-10	-	407646	6273645	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1548.85	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1549	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
342	TRIM231	27-Jan-10	-	404947	6262525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1546.86	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1547	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
343	TRIM232	27-Jan-10	-	408244	6278749	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1544.84	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1545	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
344	TRIM233	27-Jan-10	-	425156	6258668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1531.30	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1531	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
346	TRIM235	27-Jan-10	-	406599	6277205	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1469.20	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1469	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CMA	unp	CMA unp	
347	TRIM236	27-Jan-10	-	408706	6266104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1468.20	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1468	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	CWH	wm	CWHwm	
348	TRIM237	27-Jan-10	-	408279	6273206	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1461.48	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1461	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TRIM	MH	un	MH un	
349	TRIM238	27-Jan-10	-	407267	6278594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1441.86	TRIM Open Water	TRIM Open Water	100	TRIM Open Water	1																				

Appendix 2

Wetland Ecosystem Vegetation

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS001	<i>Rubus</i>	<i>arcticus</i>	2
KS001	<i>Salix</i>	<i>commutata</i>	3
KS001	<i>Carex</i>	<i>aquatilis</i>	55
KS001	<i>Eriophorum</i>	<i>angustifolium</i>	10
KS001	<i>Comarum</i>	<i>palustre</i>	2
KS001	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS001	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS001	<i>Caltha</i>	<i>leptosepala</i>	2
KS001	<i>Equisetum</i>	<i>arvense</i>	0.5
KS001	<i>Grass</i>	<i>sp</i>	0.5
KS001	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS001	<i>Senecio</i>	<i>triangularis</i>	0.5
KS001	<i>Veratrum</i>	<i>viride</i>	0.5
KS001	<i>Viola</i>	<i>sp</i>	0.5
KS001	<i>Sphagnum</i>	<i>sp</i>	50
KS001	<i>Erigeron</i>	<i>philadelphicus</i>	0.5
KS002	<i>Salix</i>	<i>commutata</i>	20
KS002	<i>Salix</i>	<i>barclayi</i>	20
KS002	<i>Salix</i>	<i>barrattiana</i>	20
KS002	<i>Picea</i>	<i>sp</i>	2
KS002	<i>Carex</i>	<i>aquatilis</i>	60
KS002	<i>Deschampsia</i>	<i>caespitosa</i>	2
KS002	<i>Eriophorum</i>	<i>angustifolium</i>	20
KS002	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS002	<i>Equisetum</i>	<i>arvense</i>	0.5
KS002	<i>Sanguisorba</i>	<i>canadensis</i>	4
KS002	<i>Comarum</i>	<i>palustre</i>	5
KS002	<i>Calamagrostis</i>	<i>canadensis</i>	1
KS002	<i>Senecio</i>	<i>triangularis</i>	0.5
KS002	<i>Viola</i>	<i>sp</i>	0.5
KS002	<i>Athyrium</i>	<i>filix-femina</i>	0.5
KS002	<i>Caltha</i>	<i>leptosepala</i>	0.5
KS002	<i>Pleurozium</i>	<i>schreberi</i>	10
KS002	<i>Sphagnum</i>	<i>sp</i>	50
KS002	<i>Aulacomnium</i>	<i>palustre</i>	10
KS003	<i>Salix</i>	<i>sitchensis</i>	30
KS003	<i>Salix</i>	<i>stolonifera</i>	30
KS003	<i>Salix</i>	<i>barrattiana</i>	20
KS003	<i>Equisetum</i>	<i>arvense</i>	15
KS003	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS003	<i>Drepanocladus</i>	<i>uncinatus</i>	60
KS004	<i>Salix</i>	<i>barrattiana</i>	10
KS004	<i>Salix</i>	<i>commutata</i>	10
KS004	<i>Salix</i>	<i>stolonifera</i>	10
KS004	<i>Salix</i>	<i>sitchensis</i>	10
KS004	<i>Salix</i>	<i>barclayi</i>	30
KS004	<i>Equisetum</i>	<i>arvense</i>	5
KS004	<i>Carex</i>	<i>aquatilis</i>	20
KS004	<i>Drepanocladus</i>	<i>uncinatus</i>	20
KS005	<i>Salix</i>	<i>barclayi</i>	20
KS005	<i>Salix</i>	<i>barrattiana</i>	10

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS005	<i>Salix</i>	<i>sitchensis</i>	30
KS005	<i>Equisetum</i>	<i>arvense</i>	1
KS005	<i>Leptarrhena</i>	<i>pyrolifolia</i>	1
KS005	<i>Carex</i>	<i>sitchensis</i>	40
KS005	<i>Mnium</i>	<i>sp</i>	5
KS005	<i>Marchantia</i>	<i>polymorpha</i>	1
KS005	<i>Moss</i>	<i>sp</i>	2
KS005	<i>Sphagnum</i>	<i>sp</i>	15
KS005	<i>Aulacomnium</i>	<i>palustre</i>	2
KS006	<i>Salix</i>	<i>barclayi</i>	15
KS006	<i>Carex</i>	<i>sitchensis</i>	25
KS006	<i>Eriophorum</i>	<i>angustifolium</i>	25
KS006	<i>Senecio</i>	<i>triangularis</i>	1
KS006	<i>Viola</i>	<i>sp</i>	0.5
KS006	<i>Rubus</i>	<i>arcticus</i>	0.5
KS006	<i>Sanguisorba</i>	<i>canadensis</i>	1
KS006	<i>Grass</i>	<i>sp</i>	0.5
KS006	<i>Carex</i>	<i>utriculata</i>	5
KS006	<i>Carex</i>	<i>sp</i>	5
KS006	<i>Sphagnum</i>	<i>sp</i>	30
KS006	<i>Aulacomnium</i>	<i>palustre</i>	20
KS007	<i>Salix</i>	<i>barclayi</i>	50
KS007	<i>Salix</i>	<i>commutata</i>	5
KS007	<i>Salix</i>	<i>sitchensis</i>	5
KS007	<i>Carex</i>	<i>sitchensis</i>	70
KS007	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS007	<i>Viola</i>	<i>sp</i>	1
KS007	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS007	<i>Equisetum</i>	<i>arvense</i>	1
KS007	<i>Senecio</i>	<i>triangularis</i>	1
KS007	<i>Sphagnum</i>	<i>sp</i>	30
KS007	<i>Moss</i>	<i>sp</i>	20
KS008	<i>Salix</i>	<i>sitchensis</i>	60
KS008	<i>Equisetum</i>	<i>arvense</i>	40
KS008	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS008	<i>Epilobium</i>	<i>angustifolium</i>	0.5
KS008	<i>Senecio</i>	<i>triangularis</i>	0.5
KS008	<i>Carex</i>	<i>sp</i>	2
KS008	<i>Mnium</i>	<i>sp</i>	5
KS008	<i>Drepanocladus</i>	<i>uncinatus</i>	10
KS008	<i>Moss</i>	<i>sp</i>	15
KS009	<i>Salix</i>	<i>sitchensis</i>	30
KS009	<i>Salix</i>	<i>barclayi</i>	30
KS009	<i>Carex</i>	<i>sitchensis</i>	79
KS009	<i>Poa</i>	<i>sp</i>	0.5
KS009	<i>Equisetum</i>	<i>arvense</i>	0.5
KS009	<i>Aulacomnium</i>	<i>palustre</i>	5
KS009	<i>Sphagnum</i>	<i>sp</i>	10
KS009	<i>Liverwort</i>	<i>sp</i>	5
KS010	<i>Salix</i>	<i>barclayi</i>	15
KS010	<i>Salix</i>	<i>sitchensis</i>	15

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS010	<i>Carex</i>	<i>aquatilis</i>	30
KS010	<i>Carex</i>	<i>sitchensis</i>	60
KS010	<i>Sphagnum</i>	<i>sp</i>	50
KS010	<i>Mnium</i>	<i>sp</i>	5
KS011	<i>Salix</i>	<i>barclayi</i>	20
KS011	<i>Carex</i>	<i>aquatilis</i>	40
KS011	<i>Carex</i>	<i>sitchensis</i>	40
KS011	<i>Eriophorum</i>	<i>angustifolium</i>	10
KS011	<i>Sanguisorba</i>	<i>canadensis</i>	1
KS011	<i>Comarum</i>	<i>palustre</i>	1
KS011	<i>Poa</i>	<i>sp</i>	0.5
KS011	<i>Rubus</i>	<i>arcticus</i>	1
KS011	<i>Viola</i>	<i>sp</i>	0.5
KS011	<i>Leptarrhena</i>	<i>pyrolifolia</i>	1
KS011	<i>Grass</i>	<i>sp</i>	1
KS011	<i>Sphagnum</i>	<i>sp</i>	40
KS011	<i>Aulacomnium</i>	<i>palustre</i>	20
KS012	<i>Salix</i>	<i>barclayi</i>	6
KS012	<i>Salix</i>	<i>commutata</i>	4
KS012	<i>Leptarrhena</i>	<i>pyrolifolia</i>	3
KS012	<i>Eriophorum</i>	<i>angustifolium</i>	20
KS012	<i>Carex</i>	<i>aquatilis</i>	30
KS012	<i>Equisetum</i>	<i>arvense</i>	5
KS012	<i>Viola</i>	<i>sp</i>	1
KS012	<i>Senecio</i>	<i>triangularis</i>	1
KS012	<i>Caltha</i>	<i>leptosepala</i>	5
KS012	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS012	<i>Veratrum</i>	<i>viride</i>	1
KS012	<i>Comarum</i>	<i>palustre</i>	1
KS012	<i>Valeriana</i>	<i>sitchensis</i>	0.5
KS012	<i>Erigeron</i>	<i>sp</i>	0.5
KS012	<i>Sphagnum</i>	<i>sp</i>	30
KS012	<i>Carex</i>	<i>sitchensis</i>	20
KS012	<i>Moss</i>	<i>sp</i>	30
KS013	<i>Salix</i>	<i>barclayi</i>	6
KS013	<i>Salix</i>	<i>barclayi</i>	6
KS013	<i>Salix</i>	<i>barclayi</i>	6
KS013	<i>Salix</i>	<i>barclayi</i>	6
KS013	<i>Eriophorum</i>	<i>angustifolium</i>	10
KS013	<i>Viola</i>	<i>sp</i>	1
KS013	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS013	<i>Sanguisorba</i>	<i>canadensis</i>	1
KS013	<i>Carex</i>	<i>aquatilis</i>	30
KS013	<i>Valeriana</i>	<i>sitchensis</i>	2
KS013	<i>Veratrum</i>	<i>viride</i>	2
KS013	<i>Erigeron</i>	<i>sp</i>	0.5
KS013	<i>Grass</i>	<i>sp</i>	2
KS013	<i>Senecio</i>	<i>triangularis</i>	1
KS013	<i>Equisetum</i>	<i>arvense</i>	1
KS013	<i>Caltha</i>	<i>leptosepala</i>	5
KS013	<i>Lycopodium</i>	<i>sp</i>	0.5

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS013	<i>Aulacomnium</i>	<i>palustre</i>	20
KS013	<i>Sphagnum</i>	<i>sp</i>	20
KS013	<i>Juncus</i>	<i>sp</i>	0.5
KS013	<i>Carex</i>	<i>sitchensis</i>	20
KS013	<i>Rubus</i>	<i>arcticus</i>	2
KS014	<i>Salix</i>	<i>barclayi</i>	1
KS014	<i>Eriophorum</i>	<i>angustifolium</i>	60
KS014	<i>Caltha</i>	<i>leptosepala</i>	15
KS014	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS014	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS014	<i>Nuphar</i>	<i>variegatum</i>	40
KS014	<i>Carex</i>	<i>sp</i>	10
KS014	<i>Equisetum</i>	<i>arvense</i>	1
KS014	<i>Erigeron</i>	<i>sp</i>	1
KS014	<i>Aulacomnium</i>	<i>palustre</i>	15
KS015	<i>Salix</i>	<i>sp</i>	5
KS015	<i>Salix</i>	<i>commutata</i>	15
KS015	<i>Salix</i>	<i>barclayi</i>	20
KS015	<i>Sanguisorba</i>	<i>canadensis</i>	1
KS015	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS015	<i>Carex</i>	<i>sitchensis</i>	40
KS015	<i>Eriophorum</i>	<i>angustifolium</i>	15
KS015	<i>Equisetum</i>	<i>arvense</i>	2
KS015	<i>Viola</i>	<i>sp</i>	0.5
KS015	<i>Carex</i>	<i>aquatilis</i>	30
KS015	<i>Trientalis</i>	<i>arctica</i>	1
KS015	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS015	<i>Senecio</i>	<i>triangularis</i>	0.5
KS015	<i>Parnassia</i>	<i>fimbriata</i>	0.5
KS015	<i>Caltha</i>	<i>leptosepala</i>	1
KS015	<i>Mnium</i>	<i>sp</i>	5
KS015	<i>Aulacomnium</i>	<i>palustre</i>	10
KS015	<i>Moss</i>	<i>sp</i>	5
KS016	<i>Salix</i>	<i>commutata</i>	20
KS016	<i>Salix</i>	<i>barclayi</i>	20
KS016	<i>Abies</i>	<i>lasiocarpa</i>	2
KS016	<i>Eriophorum</i>	<i>angustifolium</i>	50
KS016	<i>Equisetum</i>	<i>arvense</i>	5
KS016	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS016	<i>Viola</i>	<i>sp</i>	1
KS016	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS016	<i>Valeriana</i>	<i>sitchensis</i>	0.5
KS016	<i>Sanguisorba</i>	<i>canadensis</i>	0.5
KS016	<i>Carex</i>	<i>aquatilis</i>	20
KS016	<i>Trientalis</i>	<i>arctica</i>	1
KS016	<i>Senecio</i>	<i>triangularis</i>	0.5
KS016	<i>Sphagnum</i>	<i>sp</i>	10
KS016	<i>Moss</i>	<i>sp</i>	15
KS017	<i>Salix</i>	<i>commutata</i>	10
KS017	<i>Salix</i>	<i>barclayi</i>	20
KS017	<i>Salix</i>	<i>sp</i>	10

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS017	<i>Eriophorum</i>	<i>angustifolium</i>	50
KS017	<i>Caltha</i>	<i>leptosepala</i>	5
KS017	<i>Trientalis</i>	<i>arctica</i>	1
KS017	<i>Viola</i>	<i>sp</i>	0.5
KS017	<i>Calamagrostis</i>	<i>canadensis</i>	2
KS017	<i>Carex</i>	<i>utriculata</i>	10
KS017	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS017	<i>Equisetum</i>	<i>arvense</i>	2
KS017	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS017	<i>Juncus</i>	<i>sp</i>	2
KS017	<i>Comarum</i>	<i>palustre</i>	2
KS017	<i>Carex</i>	<i>sp</i>	2
KS017	<i>Sphagnum</i>	<i>sp</i>	40
KS017	<i>Aulacomnium</i>	<i>palustre</i>	10
KS017	<i>Moss</i>	<i>sp</i>	5
KS018	<i>Salix</i>	<i>barclayi</i>	20
KS018	<i>Salix</i>	<i>commutata</i>	20
KS018	<i>Eriophorum</i>	<i>angustifolium</i>	30
KS018	<i>Carex</i>	<i>sitchensis</i>	20
KS018	<i>Caltha</i>	<i>leptosepala</i>	15
KS018	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS018	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS018	<i>Comarum</i>	<i>palustre</i>	5
KS018	<i>Carex</i>	<i>limosa</i>	10
KS018	<i>Carex</i>	<i>sp</i>	5
KS018	<i>Erigeron</i>	<i>sp</i>	0.5
KS018	<i>Sphagnum</i>	<i>sp</i>	20
KS018	<i>Polytricum</i>	<i>sp</i>	1
KS018	<i>Moss</i>	<i>sp</i>	20
KS019	<i>Salix</i>	<i>barclayi</i>	5
KS019	<i>Carex</i>	<i>aquatilis</i>	60
KS019	<i>Equisetum</i>	<i>arvense</i>	5
KS019	<i>Carex</i>	<i>sitchensis</i>	20
KS019	<i>Epilobium</i>	<i>sp</i>	0.5
KS019	<i>Aulacomnium</i>	<i>palustre</i>	30
KS019	<i>Pleurozium</i>	<i>schreberi</i>	5
KS019	<i>Sphagnum</i>	<i>sp</i>	10
KS020	<i>Salix</i>	<i>barclayi</i>	5
KS020	<i>Carex</i>	<i>aquatilis</i>	55
KS020	<i>Veratrum</i>	<i>viride</i>	1
KS020	<i>Comarum</i>	<i>palustre</i>	5
KS020	<i>Eriophorum</i>	<i>angustifolium</i>	15
KS020	<i>Rubus</i>	<i>arcticus</i>	0.5
KS020	<i>Viola</i>	<i>sp</i>	0.5
KS020	<i>Valeriana</i>	<i>sitchensis</i>	0.5
KS020	<i>Erigeron</i>	<i>sp</i>	0.5
KS020	<i>Caltha</i>	<i>leptosepala</i>	1
KS020	<i>Carex</i>	<i>sitchensis</i>	15
KS020	<i>Senecio</i>	<i>triangularis</i>	1
KS020	<i>Sphagnum</i>	<i>sp</i>	40
KS020	<i>Moss</i>	<i>sp</i>	10

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Plot	Genus	Species	% Cover
KS021	<i>Salix</i>	<i>barclayi</i>	5
KS021	<i>Equisetum</i>	<i>arvense</i>	0.5
KS021	<i>Eriophorum</i>	<i>angustifolium</i>	75
KS021	<i>Caltha</i>	<i>leptosepala</i>	0.5
KS023	<i>Salix</i>	<i>sp</i>	0.5
KS023	<i>Caltha</i>	<i>leptosepala</i>	5
KS023	<i>Eriophorum</i>	<i>angustifolium</i>	30
KS023	<i>Equisetum</i>	<i>arvense</i>	1
KS023	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS023	<i>Valeriana</i>	<i>dioica</i>	1
KS023	<i>Senecio</i>	<i>triangularis</i>	3
KS023	<i>Dryopteris</i>	<i>expansa</i>	2
KS023	<i>Veratrum</i>	<i>viride</i>	2
KS023	<i>Sphagnum</i>	<i>sp</i>	3
KS023	<i>Aulacomnium</i>	<i>palustre</i>	2
KS024	<i>Eriophorum</i>	<i>angustifolium</i>	70
KS024	<i>Equisetum</i>	<i>arvense</i>	0.5
KS024	<i>Sphagnum</i>	<i>sp</i>	50
KS025	<i>Eriophorum</i>	<i>angustifolium</i>	75
KS025	<i>Equisetum</i>	<i>arvense</i>	0.5
KS025	<i>Leptarrhena</i>	<i>pyrolifolia</i>	0.5
KS026	<i>Carex</i>	<i>aquatilis</i>	35
KS026	<i>Lysichiton</i>	<i>americanum</i>	10
KS026	<i>Dryopteris</i>	<i>expansa</i>	20
KS026	<i>Viola</i>	<i>adunca</i>	5
KS026	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS026	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS026	<i>Valeriana</i>	<i>sitchensis</i>	5
KS026	<i>Sphagnum</i>	<i>sp</i>	10
KS026	<i>Aulacomnium</i>	<i>palustre</i>	20
KS027	<i>Oplopanax</i>	<i>horridus</i>	2
KS027	<i>Lysichiton</i>	<i>americanum</i>	30
KS027	<i>Dryopteris</i>	<i>expansa</i>	40
KS027	<i>Viola</i>	<i>glabella</i>	1
KS027	<i>Viola</i>	<i>adunca</i>	0.5
KS027	<i>Streptopus</i>	<i>amplexifolius</i>	2
KS027	<i>Streptopus</i>	<i>streptopoides</i>	1
KS027	<i>Senecio</i>	<i>triangularis</i>	0.5
KS027	<i>Aulacomnium</i>	<i>palustre</i>	50
KS028	<i>Lysichiton</i>	<i>americanum</i>	20
KS028	<i>Dryopteris</i>	<i>expansa</i>	60
KS028	<i>Streptopus</i>	<i>amplexifolius</i>	5
KS028	<i>Senecio</i>	<i>triangularis</i>	1
KS028	<i>Viola</i>	<i>glabella</i>	2
KS028	<i>Tiarella</i>	<i>trifoliata</i>	0.5
KS028	<i>Viola</i>	<i>adunca</i>	1
KS028	<i>Equisetum</i>	<i>arvense</i>	1
KS028	<i>Aulacomnium</i>	<i>palustre</i>	40
KS028	<i>Mnium</i>	<i>sp</i>	40
KS029	<i>Carex</i>	<i>aquatilis</i>	30
KS029	<i>Equisetum</i>	<i>fluviatile</i>	30

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Plot	Genus	Species	% Cover
KS029	<i>Equisetum</i>	<i>arvense</i>	5
KS029	<i>Lysichiton</i>	<i>americanum</i>	1
KS029	<i>Scirpus</i>	<i>microcarpus</i>	0.5
KS030	<i>Tsuga</i>	<i>heterophylla</i>	2
KS030	<i>Picea</i>	<i>sp</i>	8
KS030	<i>Ribes</i>	<i>hadsonianum</i>	2
KS030	<i>Oplopanax</i>	<i>horridus</i>	5
KS030	<i>Cornus</i>	<i>stolonifera</i>	2
KS030	<i>Lysichiton</i>	<i>americanum</i>	15
KS030	<i>Dryopteris</i>	<i>expansa</i>	10
KS030	<i>Streptopus</i>	<i>amplexifolius</i>	1
KS030	<i>Coeloglossum</i>	<i>viride</i>	1
KS030	<i>Gymnocarpium</i>	<i>dryopteris</i>	1
KS030	<i>Viola</i>	<i>palustris</i>	1
KS030	<i>Comarum</i>	<i>palustre</i>	1
KS030	<i>Equisetum</i>	<i>arvense</i>	0.5
KS030	<i>Cornus</i>	<i>canadensis</i>	1
KS030	<i>Mnium</i>	<i>sp</i>	15
KS030	<i>Sphagnum</i>	<i>sp</i>	25
KS031	<i>Tsuga</i>	<i>heterophylla</i>	5
KS031	<i>Picea</i>	<i>sp</i>	2
KS031	<i>Oplopanax</i>	<i>horridus</i>	2
KS031	<i>Menziesia</i>	<i>ferruginea</i>	1
KS031	<i>Rubus</i>	<i>spectabilis</i>	1
KS031	<i>Vaccinium</i>	<i>ovalifolium</i>	4
KS031	<i>Tsuga</i>	<i>heterophylla</i>	2
KS031	<i>Lysichiton</i>	<i>americanum</i>	20
KS031	<i>Dryopteris</i>	<i>expansa</i>	10
KS031	<i>Gymnocarpium</i>	<i>dryopteris</i>	1
KS031	<i>Viola</i>	<i>palustris</i>	1
KS031	<i>Streptopus</i>	<i>amplexifolius</i>	2
KS031	<i>Streptopus</i>	<i>streptopoides</i>	0.5
KS031	<i>Tiarella</i>	<i>trifoliata</i>	2
KS031	<i>Cornus</i>	<i>canadensis</i>	2
KS031	<i>Mnium</i>	<i>sp</i>	5
KS031	<i>Aulacomnium</i>	<i>palustre</i>	2
KS031	<i>Sphagnum</i>	<i>sp</i>	5
KS032	<i>Tsuga</i>	<i>heterophylla</i>	5
KS032	<i>Ribes</i>	<i>hudsonianum</i>	2
KS032	<i>Oplopanax</i>	<i>horridus</i>	3
KS032	<i>Lysichiton</i>	<i>americanum</i>	20
KS032	<i>Dryopteris</i>	<i>expansa</i>	40
KS032	<i>Viola</i>	<i>palustris</i>	5
KS032	<i>Streptopus</i>	<i>amplexifolius</i>	10
KS032	<i>Mnium</i>	<i>sp</i>	20
KS032	<i>Aulacomnium</i>	<i>palustre</i>	5
KS033	<i>Tsuga</i>	<i>heterophylla</i>	5
KS033	<i>Oplopanax</i>	<i>horridus</i>	5
KS033	<i>Lysichiton</i>	<i>americanum</i>	20
KS033	<i>Dryopteris</i>	<i>expansa</i>	50
KS033	<i>Viola</i>	<i>palustris</i>	2

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS033	<i>Streptopus</i>	<i>amplexifolius</i>	5
KS033	<i>Mnium</i>	<i>sp</i>	10
KS033	<i>Aulacomnium</i>	<i>palustre</i>	2
KS034	<i>Picea</i>	<i>sp</i>	3
KS034	<i>Tsuga</i>	<i>heterophylla</i>	2
KS034	<i>Salix</i>	<i>sitchensis</i>	0.5
KS034	<i>Equisetum</i>	<i>fluviatile</i>	10
KS034	<i>Comarum</i>	<i>palustre</i>	10
KS034	<i>Menyanthes</i>	<i>trifoliata</i>	20
KS034	<i>Epilobium</i>	<i>angustifolium</i>	10
KS034	<i>Galium</i>	<i>triflorum</i>	1
KS034	<i>Angelica</i>	<i>genuflexa</i>	0.5
KS034	<i>Carex</i>	<i>sp</i>	10
KS034	<i>Carex</i>	<i>aquatilis</i>	10
KS034	<i>Poa</i>	<i>arctica</i>	10
KS034	<i>Scirpus</i>	<i>microcarpus</i>	1
KS034	<i>Brachythecium</i>	<i>sp</i>	40
KS035	<i>Salix</i>	<i>sitchensis</i>	15
KS035	<i>Salix</i>	<i>pyrifolia</i>	0.5
KS035	<i>Alnus</i>	<i>crispa</i>	0.5
KS035	<i>Equisetum</i>	<i>fluviatile</i>	10
KS035	<i>Menyanthes</i>	<i>trifoliata</i>	10
KS035	<i>Comarum</i>	<i>palustre</i>	30
KS035	<i>Carex</i>	<i>aquatilis</i>	50
KS035	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS035	<i>Lysichiton</i>	<i>americanum</i>	0.5
KS035	<i>Angelica</i>	<i>genuflexa</i>	0.5
KS035	<i>Scirpus</i>	<i>microcarpus</i>	0.5
KS036	<i>Salix</i>	<i>arbusculoides</i>	20
KS036	<i>Salix</i>	<i>commutata</i>	10
KS036	<i>Carex</i>	<i>aquatilis</i>	50
KS036	<i>Equisetum</i>	<i>arvense</i>	0.5
KS036	<i>Aulacomnium</i>	<i>palustre</i>	35
KS036	<i>Mnium</i>	<i>sp</i>	5
KS037	<i>Salix</i>	<i>barclayi</i>	15
KS037	<i>Salix</i>	<i>arbusculoides</i>	25
KS037	<i>Carex</i>	<i>aquatilis</i>	50
KS038	<i>Eriophorum</i>	<i>angustifolium</i>	30
KS038	<i>Carex</i>	<i>aquatilis</i>	0.5
KS038	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS038	<i>Comarum</i>	<i>palustre</i>	0.5
KS038	<i>Scouleria</i>	<i>aquatica</i>	90
KS039	<i>Salix</i>	<i>barclayi</i>	50
KS039	<i>Salix</i>	<i>arbusculoides</i>	25
KS039	<i>Carex</i>	<i>aquatilis</i>	30
KS039	<i>Senecio</i>	<i>triangularis</i>	2
KS039	<i>Urtica</i>	<i>dioica</i>	0.5
KS039	<i>Heracleum</i>	<i>lanatum</i>	0.5
KS039	<i>Equisetum</i>	<i>arvense</i>	0.5
KS039	<i>Aulacomnium</i>	<i>palustre</i>	20
KS040	<i>Salix</i>	<i>barclayi</i>	5

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS040	<i>Carex</i>	<i>aquatilis</i>	25
KS040	<i>Eriophorum</i>	<i>angustifolium</i>	25
KS040	<i>Equisetum</i>	<i>arvense</i>	0.5
KS040	<i>Viola</i>	<i>palustris</i>	1
KS040	<i>Comarum</i>	<i>palustre</i>	1
KS040	<i>Aulacommium</i>	<i>palustre</i>	85
KS040	<i>Mnium</i>	<i>sp</i>	5
KS040	<i>Scouleria</i>	<i>aquatica</i>	85
KS041	<i>Salix</i>	<i>barclayi</i>	80
KS041	<i>Cicuta</i>	<i>douglasii</i>	0.5
KS041	<i>Carex</i>	<i>aquatilis</i>	15
KS041	<i>Senecio</i>	<i>triangularis</i>	2
KS041	<i>Epilobium</i>	<i>ciliatum</i>	2
KS041	<i>Equisetum</i>	<i>arvense</i>	0.5
KS041	<i>Viola</i>	<i>palustris</i>	0.5
KS041	<i>Aulacommium</i>	<i>palustre</i>	-
KS042	<i>Abies</i>	<i>lasiocarpa</i>	1
KS042	<i>Salix</i>	<i>barclayi</i>	20
KS042	<i>Senecio</i>	<i>triangularis</i>	10
KS042	<i>Epilobium</i>	<i>ciliatum</i>	2
KS042	<i>Carex</i>	<i>aquatilis</i>	20
KS042	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS042	<i>Veratrum</i>	<i>viride</i>	0.5
KS042	<i>Mitella</i>	<i>pentandra</i>	0.5
KS042	<i>Equisetum</i>	<i>arvense</i>	2
KS042	<i>Trientalis</i>	<i>arcticus</i>	0.5
KS042	<i>Carex</i>	<i>utriculata</i>	10
KS042	<i>Heracleum</i>	<i>lanatum</i>	0.5
KS042	<i>Aulacommium</i>	<i>palustre</i>	20
KS042	<i>Drepanocladus</i>	<i>sp</i>	2
KS043	<i>Eriophorum</i>	<i>angustifolium</i>	45
KS043	<i>Caltha</i>	<i>leptosepala</i>	5
KS043	<i>Sphagnum</i>	<i>sp</i>	80
KS044	<i>Eriophorum</i>	<i>angustifolium</i>	20
KS044	<i>Caltha</i>	<i>leptosepala</i>	10
KS044	<i>Equisetum</i>	<i>arvense</i>	1
KS044	<i>Veratrum</i>	<i>viride</i>	0.5
KS044	<i>Sphagnum</i>	<i>sp</i>	90
KS045	<i>Eriophorum</i>	<i>angustifolium</i>	30
KS045	<i>Caltha</i>	<i>leptosepala</i>	5
KS045	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS045	<i>Equisetum</i>	<i>arvense</i>	1
KS045	<i>Angelica</i>	<i>genuflexa</i>	2
KS045	<i>Senecio</i>	<i>triangularis</i>	0.5
KS045	<i>Sphagnum</i>	<i>sp</i>	80
KS046	<i>Abies</i>	<i>lasiocarpa</i>	3
KS046	<i>Tsuga</i>	<i>heterophylla</i>	2
KS046	<i>Eriophorum</i>	<i>angustifolium</i>	30
KS046	<i>Equisetum</i>	<i>arvense</i>	1
KS046	<i>Caltha</i>	<i>leptosepala</i>	5
KS046	<i>Senecio</i>	<i>triangularis</i>	1

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS046	<i>Veratrum</i>	<i>viride</i>	0.5
KS046	<i>Sanguisorba</i>	<i>canadensis</i>	0.5
KS046	<i>Viola</i>	<i>palustris</i>	0.5
KS046	<i>Carex</i>	<i>nigricans</i>	10
KS046	<i>Scouleria</i>	<i>aquatica</i>	10
KS046	<i>Sphagnum</i>	<i>sp</i>	70
KS047	<i>Abies</i>	<i>lasiocarpa</i>	1
KS047	<i>Veratrum</i>	<i>viride</i>	0.5
KS047	<i>Viola</i>	<i>palustris</i>	0.5
KS047	<i>Eriophorum</i>	<i>angustifolium</i>	30
KS047	<i>Caltha</i>	<i>leptosepala</i>	5
KS047	<i>Dryopteris</i>	<i>expansa</i>	0.1
KS047	<i>Sphagnum</i>	<i>sp</i>	10
KS048	<i>Alnus</i>	<i>crispa</i>	3
KS048	<i>Salix</i>	<i>bebbiana</i>	2
KS048	<i>Eriophorum</i>	<i>angustifolium</i>	25
KS048	<i>Caltha</i>	<i>leptosepala</i>	10
KS048	<i>Viola</i>	<i>palustris</i>	1
KS048	<i>Veratrum</i>	<i>viride</i>	2
KS048	<i>Carex</i>	<i>nigricans</i>	0.5
KS048	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS048	<i>Leptarrhena</i>	<i>pyrolifolia</i>	0.5
KS048	<i>Dryopteris</i>	<i>expansa</i>	2
KS048	<i>Senecio</i>	<i>triangularis</i>	1
KS048	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS048	<i>Equisetum</i>	<i>arvense</i>	0.5
KS048	<i>Sphagnum</i>	<i>sp</i>	5
KS048	<i>Drepanocladus</i>	<i>sp</i>	20
KS049	<i>Salix</i>	<i>bebbiana</i>	5
KS049	<i>Carex</i>	<i>aquatilis</i>	30
KS049	<i>Eriophorum</i>	<i>angustifolium</i>	10
KS049	<i>Equisetum</i>	<i>arvense</i>	0.5
KS049	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS049	<i>Viola</i>	<i>palustris</i>	0.5
KS049	<i>Sanguisorba</i>	<i>canadensis</i>	0.5
KS049	<i>Leptarrhena</i>	<i>pyrolifolia</i>	0.5
KS049	<i>Carex</i>	<i>nigricans</i>	0.5
KS049	<i>Sphagnum</i>	<i>sp</i>	50
KS049	<i>Drepanocladus</i>	<i>sp</i>	5
KS049	<i>Aulacomnium</i>	<i>palustre</i>	10
KS050	<i>Salix</i>	<i>bebbiana</i>	0.5
KS050	<i>Carex</i>	<i>aquatilis</i>	25
KS050	<i>Eriophorum</i>	<i>angustifolium</i>	15
KS050	<i>Equisetum</i>	<i>arvense</i>	0.5
KS050	<i>Comarum</i>	<i>palustre</i>	0.5
KS050	<i>Caltha</i>	<i>leptosepala</i>	0.5
KS050	<i>Leptarrhena</i>	<i>pyrolifolia</i>	0.5
KS050	<i>Aulacomnium</i>	<i>palustre</i>	0.5
KS051	<i>Salix</i>	<i>bebbiana</i>	2
KS051	<i>Eriophorum</i>	<i>angustifolium</i>	30
KS051	<i>Carex</i>	<i>aquatilis</i>	20

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS051	<i>Equisetum</i>	<i>arvense</i>	0.5
KS051	<i>Caltha</i>	<i>leptosepala</i>	2
KS051	<i>Leptarrhena</i>	<i>pyrolifolia</i>	0.5
KS051	<i>Viola</i>	<i>palustris</i>	0.5
KS051	<i>Sphagnum</i>	<i>sp</i>	75
KS051	<i>Aulacomnium</i>	<i>palustre</i>	5
KS052	<i>Salix</i>	<i>bebbiana</i>	5
KS052	<i>Carex</i>	<i>aquatilis</i>	20
KS052	<i>Eriophorum</i>	<i>angustifolium</i>	20
KS052	<i>Sanguisorba</i>	<i>canadensis</i>	0.5
KS052	<i>Caltha</i>	<i>leptosepala</i>	2
KS052	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS052	<i>Equisetum</i>	<i>arvense</i>	0.5
KS052	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS052	<i>Sphagnum</i>	<i>sp</i>	60
KS053	<i>Salix</i>	<i>drummondiana</i>	20
KS053	<i>Salix</i>	<i>barclayi</i>	10
KS053	<i>Eriophorum</i>	<i>angustifolium</i>	10
KS053	<i>Carex</i>	<i>aquatilis</i>	25
KS053	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS053	<i>Equisetum</i>	<i>arvense</i>	0.5
KS053	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS053	<i>Viola</i>	<i>palustris</i>	0.5
KS053	<i>Carex</i>	<i>sp</i>	5
KS053	<i>Trientalis</i>	<i>europaea</i>	0.5
KS053	<i>Mnium</i>	<i>sp</i>	10
KS053	<i>Aulacomnium</i>	<i>palustre</i>	10
KS053	<i>Drepanocladus</i>	<i>sp</i>	20
KS054	<i>Salix</i>	<i>barclayi</i>	10
KS054	<i>Alnus</i>	<i>crispa</i>	5
KS054	<i>Carex</i>	<i>aquatilis</i>	25
KS054	<i>Carex</i>	<i>sp</i>	5
KS054	<i>Eriophorum</i>	<i>angustifolium</i>	5
KS054	<i>Equisetum</i>	<i>arvense</i>	1
KS054	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS054	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS054	<i>Dryopteris</i>	<i>expansa</i>	0.5
KS054	<i>Senecio</i>	<i>triangularis</i>	0.5
KS054	<i>Sphagnum</i>	<i>sp</i>	90
KS054	<i>Aulacomnium</i>	<i>palustre</i>	10
KS055	<i>Kalmia</i>	<i>microphylla</i>	0.5
KS055	<i>Carex</i>	<i>aquatilis</i>	20
KS055	<i>Leptarrhena</i>	<i>pyrolifolia</i>	10
KS055	<i>Equisetum</i>	<i>arvense</i>	0.5
KS055	<i>Eriophorum</i>	<i>angustifolium</i>	5
KS055	<i>Carex</i>	<i>sp</i>	2
KS055	<i>Sphagnum</i>	<i>sp</i>	90
KS055	<i>Aulacomnium</i>	<i>palustre</i>	5
KS056	<i>Tsuga</i>	<i>heterophylla</i>	50
KS056	<i>Abies</i>	<i>lasiocarpa</i>	25
KS056	<i>Vaccinium</i>	<i>ovalifolium</i>	5

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Plot	Genus	Species	% Cover
KS056	<i>Equisetum</i>	<i>arvense</i>	2
KS056	<i>Veratrum</i>	<i>viride</i>	2
KS056	<i>Gymnocarpium</i>	<i>dryopteris</i>	1
KS056	<i>Petasites</i>	<i>frigidus</i>	0.5
KS056	<i>Sphagnum</i>	<i>sp</i>	90
KS057	<i>Abies</i>	<i>lasiocarpa</i>	2
KS057	<i>Tsuga</i>	<i>heterophylla</i>	3
KS057	<i>Alnus</i>	<i>crispa</i>	10
KS057	<i>Vaccinium</i>	<i>ovalifolium</i>	0.5
KS057	<i>Equisetum</i>	<i>arvense</i>	1
KS057	<i>Carex</i>	<i>aquatilis</i>	15
KS057	<i>Caltha</i>	<i>leptosepala</i>	2
KS057	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS057	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS057	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS057	<i>Sphagnum</i>	<i>sp</i>	90
KS058	<i>Salix</i>	<i>barclayi</i>	5
KS058	<i>Salix</i>	<i>barrattiana</i>	10
KS058	<i>Carex</i>	<i>aquatilis</i>	20
KS058	<i>Eriophorum</i>	<i>angustifolium</i>	20
KS058	<i>Equisetum</i>	<i>arvense</i>	1
KS058	<i>Leptarrhena</i>	<i>pyrolifolia</i>	3
KS058	<i>Trientalis</i>	<i>arctica</i>	0.5
KS058	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS058	<i>Viola</i>	<i>palustris</i>	0.5
KS058	<i>Sphagnum</i>	<i>sp</i>	60
KS058	<i>Drepanocladus</i>	<i>sp</i>	30
KS059	<i>Salix</i>	<i>barclayi</i>	15
KS059	<i>Salix</i>	<i>barrattiana</i>	75
KS059	<i>Rubus</i>	<i>spectabilis</i>	0.5
KS059	<i>Carex</i>	<i>aquatilis</i>	30
KS059	<i>Trientalis</i>	<i>arctica</i>	0.5
KS059	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS059	<i>Equisetum</i>	<i>arvense</i>	0.5
KS059	<i>Angelica</i>	<i>genuflexa</i>	0.5
KS059	<i>Leptarrhena</i>	<i>pyrolifolia</i>	0.5
KS059	<i>Sphagnum</i>	<i>sp</i>	85
KS060	<i>Salix</i>	<i>barrattiana</i>	15
KS060	<i>Salix</i>	<i>barclayi</i>	10
KS060	<i>Eriophorum</i>	<i>angustifolium</i>	25
KS060	<i>Carex</i>	<i>aquatilis</i>	10
KS060	<i>Equisetum</i>	<i>arvense</i>	5
KS060	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS060	<i>Sanguisorba</i>	<i>canadensis</i>	5
KS060	<i>Carex</i>	<i>podocarpa</i>	5
KS060	<i>Viola</i>	<i>palustris</i>	0.5
KS060	<i>Sphagnum</i>	<i>sp</i>	5
KS060	<i>Aulacomnium</i>	<i>palustre</i>	45
KS061	<i>Salix</i>	<i>barclayi</i>	5
KS061	<i>Salix</i>	<i>barrattiana</i>	10
KS061	<i>Eriophorum</i>	<i>angustifolium</i>	30

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Plot	Genus	Species	% Cover
KS061	<i>Carex</i>	<i>sp</i>	25
KS061	<i>Sanguisorba</i>	<i>canadensis</i>	0.5
KS061	<i>Viola</i>	<i>palustris</i>	0.5
KS061	<i>Leptarrhena</i>	<i>pyrolifolia</i>	0.5
KS061	<i>Equisetum</i>	<i>arvense</i>	0.5
KS061	<i>Trientalis</i>	<i>arctica</i>	0.5
KS061	<i>Coeloglossum</i>	<i>viride</i>	1
KS061	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS061	<i>Aulacomnium</i>	<i>palustre</i>	5
KS062	<i>Vaccinium</i>	<i>ovalifolium</i>	5
KS062	<i>Eriophorum</i>	<i>angustifolium</i>	25
KS062	<i>Veratrum</i>	<i>viride</i>	2
KS062	<i>Caltha</i>	<i>leptosepala</i>	2
KS062	<i>Coeloglossum</i>	<i>viride</i>	1
KS062	<i>Carex</i>	<i>sp</i>	5
KS062	<i>Equisetum</i>	<i>arvense</i>	0.5
KS062	<i>Castilleja</i>	<i>parviflora</i>	0.5
KS062	<i>Aulacomnium</i>	<i>palustre</i>	10
KS063	<i>Salix</i>	<i>barclayi</i>	5
KS063	<i>Eriophorum</i>	<i>angustifolium</i>	15
KS063	<i>Carex</i>	<i>sp</i>	10
KS063	<i>Caltha</i>	<i>leptosepala</i>	5
KS063	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS063	<i>Viola</i>	<i>palustris</i>	1
KS063	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS063	<i>Carex</i>	<i>aquatilis</i>	15
KS063	<i>Sphagnum</i>	<i>sp</i>	40
KS064	<i>Kalmia</i>	<i>microphylla</i>	0.5
KS064	<i>Salix</i>	<i>barclayi</i>	2
KS064	<i>Vaccinium</i>	<i>ovalifolium</i>	0.5
KS064	<i>Eriophorum</i>	<i>angustifolium</i>	25
KS064	<i>Caltha</i>	<i>leptosepala</i>	5
KS064	<i>Carex</i>	<i>aquatilis</i>	35
KS064	<i>Leptarrhena</i>	<i>pyrolifolia</i>	3
KS064	<i>Equisetum</i>	<i>arvense</i>	0.5
KS064	<i>Viola</i>	<i>palustris</i>	1
KS064	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS064	<i>Veratrum</i>	<i>viride</i>	0.5
KS064	<i>Valeriana</i>	<i>sitchensis</i>	0.5
KS064	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS064	<i>Castilleja</i>	<i>parviflora</i>	0.5
KS064	<i>Sphagnum</i>	<i>sp</i>	40
KS065	<i>Eriophorum</i>	<i>angustifolium</i>	5
KS065	<i>Caltha</i>	<i>leptosepala</i>	5
KS065	<i>Carex</i>	<i>sp</i>	10
KS065	<i>Viola</i>	<i>palustris</i>	3
KS065	<i>Sanguisorba</i>	<i>canadensis</i>	3
KS065	<i>Senecio</i>	<i>triangularis</i>	2
KS065	<i>Fragaria</i>	<i>vesca</i>	2
KS065	<i>Sphagnum</i>	<i>sp</i>	20
KS066	<i>Salix</i>	<i>arbussculoides</i>	2

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS066	<i>Eriophorum</i>	<i>angustifolium</i>	20
KS066	<i>Caltha</i>	<i>leptosepala</i>	5
KS066	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS066	<i>Carex</i>	<i>sp</i>	20
KS066	<i>Equisetum</i>	<i>arvense</i>	1
KS066	<i>Viola</i>	<i>palustris</i>	1
KS066	<i>Leptarrhena</i>	<i>pyrolifolia</i>	1
KS066	<i>Sphagnum</i>	<i>sp</i>	15
KS066	<i>Aulacomnium</i>	<i>palustre</i>	5
KS067	<i>Salix</i>	<i>arbusculoides</i>	5
KS067	<i>Eriophorum</i>	<i>angustifolium</i>	15
KS067	<i>Carex</i>	<i>sp</i>	20
KS067	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS067	<i>Caltha</i>	<i>leptosepala</i>	0.5
KS067	<i>Viola</i>	<i>palustris</i>	0.5
KS067	<i>Coeloglossum</i>	<i>viride</i>	1
KS067	<i>Veratrum</i>	<i>viride</i>	1
KS067	<i>Valeriana</i>	<i>sitchensis</i>	0.5
KS067	<i>Equisetum</i>	<i>arvense</i>	0.5
KS067	<i>Carex</i>	<i>aquatilis</i>	3
KS067	<i>Fauria</i>	<i>crista-galli</i>	2
KS067	<i>Sphagnum</i>	<i>sp</i>	1
KS068	<i>Salix</i>	<i>planifolia</i>	5
KS068	<i>Carex</i>	<i>aquatilis</i>	25
KS068	<i>Fauria</i>	<i>crista-galli</i>	10
KS068	<i>Caltha</i>	<i>leptosepala</i>	5
KS068	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS068	<i>Veratrum</i>	<i>viride</i>	0.5
KS068	<i>Leptarrhena</i>	<i>pyrolifolia</i>	0.5
KS068	<i>Senecio</i>	<i>triangularis</i>	0.5
KS068	<i>Viola</i>	<i>palustris</i>	0.5
KS068	<i>Ranunculus</i>	<i>eschschooltzii</i>	0.5
KS068	<i>Sphagnum</i>	<i>sp</i>	90
KS069	<i>Carex</i>	<i>aquatilis</i>	10
KS069	<i>Eriophorum</i>	<i>angustifolium</i>	20
KS069	<i>Caltha</i>	<i>leptosepala</i>	5
KS069	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS069	<i>Viola</i>	<i>palustris</i>	0.5
KS069	<i>Carex</i>	<i>sp</i>	3
KS069	<i>Leptarrhena</i>	<i>pyrolifolia</i>	1
KS069	<i>Sphagnum</i>	<i>sp</i>	10
KS070	<i>Eriophorum</i>	<i>angustifolium</i>	25
KS070	<i>Leptarrhena</i>	<i>pyrolifolia</i>	3
KS070	<i>Fauria</i>	<i>crista-galli</i>	5
KS070	<i>Viola</i>	<i>palustris</i>	1
KS070	<i>Carex</i>	<i>aquatilis</i>	5
KS070	<i>Veratrum</i>	<i>viride</i>	2
KS070	<i>Coeloglossum</i>	<i>viride</i>	1
KS070	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS070	<i>Dryopteris</i>	<i>expansa</i>	1
KS070	<i>Carex</i>	<i>sp</i>	10

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS070	<i>Sphagnum</i>	<i>sp</i>	10
KS071	<i>Vaccinium</i>	<i>membranaceum</i>	1
KS071	<i>Carex</i>	<i>aquatilis</i>	25
KS071	<i>Viola</i>	<i>palustris</i>	3
KS071	<i>Veratrum</i>	<i>viride</i>	1
KS071	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS071	<i>Eriophorum</i>	<i>angustifolium</i>	2
KS071	<i>Carex</i>	<i>sp</i>	2
KS071	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS071	<i>Sphagnum</i>	<i>sp</i>	15
KS071	<i>Aulacomnium</i>	<i>palustre</i>	2
KS072	<i>Abies</i>	<i>lasiocarpa</i>	0.5
KS072	<i>Salix</i>	<i>barclayi</i>	5
KS072	<i>Eriophorum</i>	<i>angustifolium</i>	20
KS072	<i>Equisetum</i>	<i>arvense</i>	15
KS072	<i>Carex</i>	<i>aquatilis</i>	0.5
KS072	<i>Sanguisorba</i>	<i>canadensis</i>	0.5
KS072	<i>Senecio</i>	<i>triangularis</i>	0.5
KS072	<i>Caltha</i>	<i>leptosepala</i>	0.5
KS072	<i>Leptarrhena</i>	<i>pyrolifolia</i>	0.5
KS072	<i>Drepanocladus</i>	<i>sp</i>	40
KS072	<i>Sphagnum</i>	<i>sp</i>	5
KS073	<i>Kalmia</i>	<i>microphylla</i>	1
KS073	<i>Vaccinium</i>	<i>membranaceum</i>	1
KS073	<i>Carex</i>	<i>aquatilis</i>	20
KS073	<i>Sanguisorba</i>	<i>canadensis</i>	10
KS073	<i>Veratrum</i>	<i>viride</i>	5
KS073	<i>Fauria</i>	<i>crista-galli</i>	10
KS073	<i>Eriophorum</i>	<i>angustifolium</i>	1
KS073	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS073	<i>Viola</i>	<i>palustris</i>	1
KS073	<i>Caltha</i>	<i>leptosepala</i>	0.5
KS073	<i>Carex</i>	<i>sp</i>	20
KS073	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS073	<i>Lycopodium</i>	<i>alpinum</i>	0.5
KS073	<i>Sphagnum</i>	<i>sp</i>	80
KS073	<i>Moss</i>	<i>sp</i>	5
KS074	<i>Eriophorum</i>	<i>angustifolium</i>	20
KS074	<i>Carex</i>	<i>sp</i>	25
KS074	<i>Carex</i>	<i>aquatilis</i>	10
KS074	<i>Caltha</i>	<i>leptosepala</i>	0.5
KS074	<i>Equisetum</i>	<i>arvense</i>	0.5
KS074	<i>Sphagnum</i>	<i>sp</i>	50
KS075	<i>Kalmia</i>	<i>microphylla</i>	0.5
KS075	<i>Carex</i>	<i>aquatilis</i>	20
KS075	<i>Eriophorum</i>	<i>angustifolium</i>	10
KS075	<i>Caltha</i>	<i>leptosepala</i>	0.5
KS075	<i>Carex</i>	<i>sp</i>	15
KS075	<i>Comarum</i>	<i>palustre</i>	0.5
KS075	<i>Sphagnum</i>	<i>sp</i>	30
KS076	<i>Nuphar</i>	<i>variegatum</i>	-

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS077	<i>Alnus</i>	<i>crispa</i>	5
KS077	<i>Salix</i>	<i>commutata</i>	10
KS077	<i>Eriophorum</i>	<i>angustifolium</i>	25
KS077	<i>Equisetum</i>	<i>arvense</i>	5
KS077	<i>Carex</i>	<i>sp</i>	25
KS077	<i>Caltha</i>	<i>leptosepala</i>	1
KS077	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS077	<i>Leptarrhena</i>	<i>pyrolifolia</i>	0.5
KS077	<i>Trientalis</i>	<i>europaea</i>	0.5
KS077	<i>Viola</i>	<i>palustris</i>	0.5
KS077	<i>Sphagnum</i>	<i>sp</i>	50
KS078	<i>Kalmia</i>	<i>microphylla</i>	3
KS078	<i>Eriophorum</i>	<i>angustifolium</i>	2
KS078	<i>Carex</i>	<i>sp</i>	10
KS078	<i>Carex</i>	<i>aquatilis</i>	10
KS078	<i>Sphagnum</i>	<i>sp</i>	5
KS079	<i>Salix</i>	<i>barrattiana</i>	15
KS079	<i>Salix</i>	<i>planifolia</i>	10
KS079	<i>Alnus</i>	<i>crispa</i>	1
KS079	<i>Carex</i>	<i>aquatilis</i>	25
KS079	<i>Eriophorum</i>	<i>angustifolium</i>	2
KS079	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS079	<i>Coeloglossum</i>	<i>viride</i>	1
KS079	<i>Carex</i>	<i>sp</i>	10
KS079	<i>Valeriana</i>	<i>sitchensis</i>	1
KS079	<i>Equisetum</i>	<i>arvense</i>	0.5
KS079	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS079	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS079	<i>Epilobium</i>	<i>angustifolium</i>	0.5
KS079	<i>Sphagnum</i>	<i>sp</i>	15
KS079	<i>Drepanocladus</i>	<i>sp</i>	65
KS080	<i>Abies</i>	<i>lasiocarpa</i>	10
KS080	<i>Salix</i>	<i>barrattiana</i>	10
KS080	<i>Alnus</i>	<i>crispa</i>	2
KS080	<i>Vaccinium</i>	<i>ovalifolium</i>	1
KS080	<i>Salix</i>	<i>planifolia</i>	2
KS080	<i>Oplopanax</i>	<i>horridus</i>	0.5
KS080	<i>Equisetum</i>	<i>arvense</i>	30
KS080	<i>Veratrum</i>	<i>viride</i>	2
KS080	<i>Dryopteris</i>	<i>expansa</i>	10
KS080	<i>Caltha</i>	<i>leptosepala</i>	5
KS080	<i>Viola</i>	<i>glabella</i>	3
KS080	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS080	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS080	<i>Valeriana</i>	<i>dioica</i>	2
KS080	<i>Mnium</i>	<i>sp</i>	15
KS080	<i>Aulacomnium</i>	<i>palustre</i>	75
KS081	<i>Abies</i>	<i>lasiocarpa</i>	5
KS081	<i>Tsuga</i>	<i>heterophylla</i>	2
KS081	<i>Alnus</i>	<i>crispa</i>	10
KS081	<i>Salix</i>	<i>planifolia</i>	10

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS081	<i>Salix</i>	<i>commutata</i>	15
KS081	<i>Carex</i>	<i>aquatilis</i>	20
KS081	<i>Sanguisorba</i>	<i>canadensis</i>	2
KS081	<i>Equisetum</i>	<i>arvense</i>	2
KS081	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS081	<i>Carex</i>	<i>sp</i>	10
KS081	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS081	<i>Eriophorum</i>	<i>angustifolium</i>	1
KS081	<i>Viola</i>	<i>palustris</i>	0.5
KS081	<i>Valeriana</i>	<i>sitchensis</i>	0.5
KS081	<i>Platanthera</i>	<i>dilatata</i>	0.5
KS081	<i>Drepanocladus</i>	<i>sp</i>	40
KS081	<i>Mnium</i>	<i>sp</i>	5
KS081	<i>Sphagnum</i>	<i>sp</i>	40
KS082	<i>Tsuga</i>	<i>heterophylla</i>	1
KS082	<i>Salix</i>	<i>barclayi</i>	10
KS082	<i>Alnus</i>	<i>crispa</i>	5
KS082	<i>Carex</i>	<i>aquatilis</i>	25
KS082	<i>Eriophorum</i>	<i>angustifolium</i>	5
KS082	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS082	<i>Platanthera</i>	<i>dilatata</i>	2
KS082	<i>Trientalis</i>	<i>europaea</i>	1
KS082	<i>Caltha</i>	<i>leptosepala</i>	0.5
KS082	<i>Equisetum</i>	<i>arvense</i>	0.5
KS082	<i>Sanguisorba</i>	<i>canadensis</i>	1
KS082	<i>Carex</i>	<i>sp</i>	5
KS082	<i>Aulacomnium</i>	<i>palustre</i>	50
KS083	<i>Tsuga</i>	<i>heterophylla</i>	4
KS083	<i>Abies</i>	<i>lasiocarpa</i>	1
KS083	<i>Vaccinium</i>	<i>ovalifolium</i>	2
KS083	<i>Eriophorum</i>	<i>angustifolium</i>	10
KS083	<i>Equisetum</i>	<i>arvense</i>	1
KS083	<i>Carex</i>	<i>aquatilis</i>	15
KS083	<i>Comarum</i>	<i>palustre</i>	1
KS083	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS083	<i>Caltha</i>	<i>leptosepala</i>	2
KS083	<i>Veratrum</i>	<i>viride</i>	1
KS083	<i>Leptarrhena</i>	<i>pyrolifolia</i>	1
KS083	<i>Epilobium</i>	<i>angustifolium</i>	0.5
KS083	<i>Trientalis</i>	<i>europaea</i>	0.5
KS083	<i>Sanguisorba</i>	<i>canadensis</i>	1
KS083	<i>Epilobium</i>	<i>angustifolium</i>	0.5
KS083	<i>Sphagnum</i>	<i>sp</i>	50
KS084	<i>Salix</i>	<i>barrattiana</i>	30
KS084	<i>Salix</i>	<i>planifolia</i>	5
KS084	<i>Eriophorum</i>	<i>angustifolium</i>	10
KS084	<i>Carex</i>	<i>aquatilis</i>	15
KS084	<i>Dryopteris</i>	<i>expansa</i>	2
KS084	<i>Equisetum</i>	<i>arvense</i>	0.5
KS084	<i>Senecio</i>	<i>triangularis</i>	5
KS084	<i>Caltha</i>	<i>leptosepala</i>	5

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS084	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS084	<i>Sanguisorba</i>	<i>canadensis</i>	15
KS084	<i>Valeriana</i>	<i>sitchensis</i>	2
KS084	<i>Veratrum</i>	<i>viride</i>	0.5
KS084	<i>Coeloglossum</i>	<i>viride</i>	1
KS084	<i>Viola</i>	<i>palustris</i>	0.5
KS084	<i>Aulacommium</i>	<i>palustre</i>	35
KS084	<i>Drepanocladus</i>	<i>sp</i>	20
KS084	<i>Pellia</i>	<i>neesiana</i>	0.5
KS085	<i>Abies</i>	<i>lasiocarpa</i>	3
KS085	<i>Tsuga</i>	<i>heterophylla</i>	2
KS085	<i>Salix</i>	<i>commutata</i>	3
KS085	<i>Vaccinium</i>	<i>ovalifolium</i>	2
KS085	<i>Salix</i>	<i>arctica</i>	0.5
KS085	<i>Eriophorum</i>	<i>angustifolium</i>	40
KS085	<i>Ranunculus</i>	<i>occidentalis</i>	1
KS085	<i>Equisetum</i>	<i>arvense</i>	5
KS085	<i>Viola</i>	<i>palustris</i>	2
KS085	<i>Caltha</i>	<i>leptosepala</i>	3
KS085	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS085	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS085	<i>Streptopus</i>	<i>amplexifolius</i>	5
KS085	<i>Dryopteris</i>	<i>expansa</i>	1
KS085	<i>Senecio</i>	<i>triangularis</i>	0.5
KS085	<i>Petasites</i>	<i>frigidus</i>	1
KS085	<i>Valeriana</i>	<i>sitchensis</i>	1
KS085	<i>Aulacommium</i>	<i>palustre</i>	5
KS085	<i>Mnium</i>	<i>sp</i>	3
KS085	<i>Scouleria</i>	<i>aquatica</i>	2
KS085	<i>Veratrum</i>	<i>viride</i>	2
KS085	<i>Mitella</i>	<i>pentandra</i>	0.5
KS086	<i>Salix</i>	<i>barrattiana</i>	30
KS086	<i>Eriophorum</i>	<i>angustifolium</i>	30
KS086	<i>Equisetum</i>	<i>arvense</i>	2
KS086	<i>Leptarrhena</i>	<i>pyrolifolia</i>	10
KS086	<i>Caltha</i>	<i>leptosepala</i>	2
KS086	<i>Petasites</i>	<i>frigidus</i>	0.5
KS086	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS086	<i>Viola</i>	<i>palustris</i>	0.5
KS086	<i>Aulacommium</i>	<i>palustre</i>	1
KS087	<i>Abies</i>	<i>lasiocarpa</i>	3
KS087	<i>Tsuga</i>	<i>heterophylla</i>	2
KS087	<i>Salix</i>	<i>barrattiana</i>	5
KS087	<i>Salix</i>	<i>barclayi</i>	10
KS087	<i>Eriophorum</i>	<i>angustifolium</i>	20
KS087	<i>Equisetum</i>	<i>arvense</i>	10
KS087	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS087	<i>Caltha</i>	<i>leptosepala</i>	5
KS087	<i>Viola</i>	<i>palustris</i>	0.5
KS087	<i>Sphagnum</i>	<i>sp</i>	20
KS087	<i>Aulacommium</i>	<i>palustre</i>	15

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS088	<i>Kalmia</i>	<i>microphylla</i>	1
KS088	<i>Eriophorum</i>	<i>angustifolium</i>	10
KS088	<i>Carex</i>	<i>aquatilis</i>	25
KS088	<i>Leptarrhena</i>	<i>pyrolifolia</i>	5
KS088	<i>Carex</i>	<i>sp</i>	5
KS088	<i>Fauria</i>	<i>crista-galli</i>	0.5
KS088	<i>Sphagnum</i>	<i>sp</i>	75
KS090	<i>Picea</i>	<i>sp</i>	2
KS090	<i>Salix</i>	<i>barrattiana</i>	5
KS090	<i>Salix</i>	<i>arbussculoides</i>	5
KS090	<i>Eriophorum</i>	<i>angustifolium</i>	10
KS090	<i>Carex</i>	<i>aquatilis</i>	15
KS090	<i>Carex</i>	<i>sp</i>	15
KS090	<i>Comarum</i>	<i>palustre</i>	5
KS090	<i>Menyanthes</i>	<i>trifoliata</i>	5
KS090	<i>Leptarrhena</i>	<i>pyrolifolia</i>	1
KS090	<i>Coeloglossum</i>	<i>viride</i>	1
KS090	<i>Trientalis</i>	<i>europaea</i>	1
KS090	<i>Sanguisorba</i>	<i>canadensis</i>	1
KS090	<i>Scirpus</i>	<i>microcarpus</i>	13
KS090	<i>Cornus</i>	<i>canadensis</i>	1
KS090	<i>Drepanocladus</i>	<i>sp</i>	40
KS090	<i>Sphagnum</i>	<i>sp</i>	40
KS091	<i>Alnus</i>	<i>crispa</i>	1
KS091	<i>Salix</i>	<i>drummondiana</i>	2
KS091	<i>Rubus</i>	<i>sp</i>	0.5
KS091	<i>Poa</i>	<i>arctica</i>	15
KS091	<i>Heracleum</i>	<i>lanatum</i>	5
KS091	<i>Carex</i>	<i>aquatilis</i>	50
KS091	<i>Carex</i>	<i>sitchensis</i>	20
KS091	<i>Equisetum</i>	<i>arvense</i>	0.5
KS091	<i>Senecio</i>	<i>triangularis</i>	0.5
KS092	<i>Salix</i>	<i>sitchensis</i>	5
KS092	<i>Alnus</i>	<i>tenuifolia</i>	10
KS092	<i>Carex</i>	<i>sitchensis</i>	75
KS092	<i>Poa</i>	<i>arctica</i>	0.5
KS093	<i>Alnus</i>	<i>tenuifolia</i>	75
KS093	<i>Sambucus</i>	<i>racemosa</i>	10
KS093	<i>Salix</i>	<i>lucida</i>	15
KS093	<i>Equisetum</i>	<i>arvense</i>	40
KS093	<i>Poa</i>	<i>arctica</i>	1
KS093	<i>Dryopteris</i>	<i>expansa</i>	2
KS093	<i>Epilobium</i>	<i>sp</i>	0.5
KS093	<i>Carex</i>	<i>sitchensis</i>	20
KS094	<i>Salix</i>	<i>barclayi</i>	10
KS094	<i>Salix</i>	<i>planifolia</i>	5
KS094	<i>Salix</i>	<i>barrattiana</i>	2
KS094	<i>Carex</i>	<i>aquatilis</i>	25
KS094	<i>Eriophorum</i>	<i>angustifolium</i>	2
KS094	<i>Platanthera</i>	<i>dilatata</i>	1
KS094	<i>Sanguisorba</i>	<i>canadensis</i>	3

Appendix 2. Wetland Ecosystem Vegetation

Plot	Genus	Species	% Cover
KS094	<i>Leptarrhena</i>	<i>pyrolifolia</i>	2
KS094	<i>Rubus</i>	<i>arctica</i>	3
KS094	<i>Senecio</i>	<i>triangularis</i>	1
KS094	<i>Carex</i>	<i>sp</i>	10
KS094	<i>Coeloglossum</i>	<i>viride</i>	0.5
KS094	<i>Trientalis</i>	<i>europaea</i>	2
KS094	<i>Veratrum</i>	<i>viride</i>	0.5
KS094	<i>Sphagnum</i>	<i>sp</i>	75
KS094	<i>Aulacomnium</i>	<i>palustre</i>	5
KS094	<i>Drepanocladus</i>	<i>sp</i>	10

Appendix 3

Wetland Hydrology Static Monitoring Data

Appendix 3. Wetland Hydrology Static Monitoring Data

UR1 Water Levels (cm below ground surface)

Well Number	2008					2009				
	Standpipe Height	10-Jun	26-Jul	1-Sep	26-Sep	Standpipe Height	4-Jun	13-Jul	18-Sep	22-Oct
1	42.1	-7.1	-	-	-	42.1	-9.1	-1.1	-17.6	-10.1
2	31.0	0.0	0.5	1.4	1.0	31.0	-4.0	-1.0	-5.8	-1.0
3	34.0	-	-5.5	-9.8	-5.2	34.0	-11.7	-5.0	-15.5	-14.0
4	36.4	-6.4	-8.4	-6.4	-6.4	36.4	-10.4	-13.0	-6.4	3.6
5	35.0	8.1	3.0	-3.0	5.1	35.0	-5.0	10.4	-11.2	-4.0
6	25.3	3.7	-0.3	-5.3	0.6	25.3	-4.3	5.7	-7.8	-7.5

STE1 Water Levels (cm below ground surface)

Well Number	2008					2009				
	Standpipe Height	7-Jun	25-Jul	29-Aug	26-Sep	Standpipe Height	5-Jun	14-Jul	15-Sep	24-Oct
1	42.1	6.9	5.0	-46.0	-2.7	43.2	-3.2	6.8	16.8	2.8
2	31.0	-8.8	-22.0	-22.6	-12.7	41.0	-12.9	-5.8	6.0	-4.8
3	34.0	0.0	-8.1	-4.1	-5.8	78.7	-22.7	-15.8	-7.5	20.3
4	36.4	56.7	64.2	-63.3	-63.3	61.9	-6.1	61.0	82.6	86.1
5	35.0	50.7	-0.3	0.7	7.6	39.0	-1.0	-2.0	16.0	3.3
6	25.3	48.0	11.0	4.6	8.3	47.0	-2.2	-0.2	15.0	7.0
7	0.0	1.0	0.5	-	-	40.0	-6.0	-4.0	2.0	-2.0

NTR1 Water Levels (cm below ground surface)

Well Number	2008					2009			
	Standpipe Height	9-Jun	25-Jul	29-Aug	26-Sep	Standpipe Height	5-Jun	14-Jul	15-Sep
1	32.1	-1.8	9.9	9.3	5.9	33.0	-3.8	4.9	6.5
2	35.9	96.4	-3.9	-2.0	-2.9	35.0	-1.0	-4.4	-2.0
3	47.3	0.0	-4.3	4.7	1.7	52.0	-7.0	-8.0	-4.0
4	47.0	-12.0	2.0	-47.0	-11.6	44.0	-10.0	-8.5	0.0
5	41.0	24.0	10.0	10.2	-0.2	41.0	-6.0	10.1	-3.5
6	50.0	0.0	-14.0	-50.0	0.6	53.0	-6.0	-5.2	-4.0

Appendix 4

Wetland Hydrology Continuous Monitoring Data

Appendix 4. Wetland Hydrology Continuous Monitoring Data
Average Daily Water Levels: UR1 Well 2

Standpipe height	0.310	m
Logger (below top of standpipe)	1.220	m
Logger (below ground surface)	0.910	m

Note: all levels are reported in metres below ground surface

2008					
Date	Level (m)	Date	Level (m)	Date	
3/15/2008	-	6/11/2008	-	9/7/2008	0.047
3/16/2008	-	6/12/2008	-	9/8/2008	0.045
3/17/2008	-	6/13/2008	-	9/9/2008	0.045
3/18/2008	-	6/14/2008	-	9/10/2008	0.046
3/19/2008	-	6/15/2008	-	9/11/2008	0.047
3/20/2008	-	6/16/2008	-	9/12/2008	0.044
3/21/2008	-	6/17/2008	-	9/13/2008	0.046
3/22/2008	-	6/18/2008	-	9/14/2008	0.045
3/23/2008	-	6/19/2008	-	9/15/2008	0.051
3/24/2008	-	6/20/2008	-	9/16/2008	0.056
3/25/2008	-	6/21/2008	-	9/17/2008	0.054
3/26/2008	-	6/22/2008	-	9/18/2008	0.055
3/27/2008	-	6/23/2008	-	9/19/2008	0.054
3/28/2008	-	6/24/2008	-	9/20/2008	0.049
3/29/2008	-	6/25/2008	-	9/21/2008	0.041
3/30/2008	-	6/26/2008	-	9/22/2008	0.038
3/31/2008	-	6/27/2008	-	9/23/2008	0.040
4/1/2008	-	6/28/2008	-	9/24/2008	0.046
4/2/2008	-	6/29/2008	-	9/25/2008	0.044
4/3/2008	-	6/30/2008	-	9/26/2008	0.049
4/4/2008	-	7/1/2008	-	9/27/2008	0.048
4/5/2008	-	7/2/2008	-	9/28/2008	0.039
4/6/2008	-	7/3/2008	-	9/29/2008	0.042
4/7/2008	-	7/4/2008	-	9/30/2008	0.056
4/8/2008	-	7/5/2008	-	10/1/2008	0.054
4/9/2008	-	7/6/2008	-	10/2/2008	0.061
4/10/2008	-	7/7/2008	-	10/3/2008	0.052
4/11/2008	-	7/8/2008	-	10/4/2008	0.048
4/12/2008	-	7/9/2008	-	10/5/2008	0.040
4/13/2008	-	7/10/2008	-	10/6/2008	0.038
4/14/2008	-	7/11/2008	-	10/7/2008	0.036
4/15/2008	-	7/12/2008	-	10/8/2008	0.029
4/16/2008	-	7/13/2008	-	10/9/2008	0.027
4/17/2008	-	7/14/2008	-	10/10/2008	0.024
4/18/2008	-	7/15/2008	-	10/11/2008	0.022
4/19/2008	-	7/16/2008	-	10/12/2008	0.034
4/20/2008	-	7/17/2008	-	10/13/2008	0.027
4/21/2008	-	7/18/2008	-	10/14/2008	0.030
4/22/2008	-	7/19/2008	-	10/15/2008	0.037
4/23/2008	-	7/20/2008	-		
4/24/2008	-	7/21/2008	-		
4/25/2008	-	7/22/2008	-		
4/26/2008	-	7/23/2008	-		
4/27/2008	-	7/24/2008	-		
4/28/2008	-	7/25/2008	-		
4/29/2008	-	7/26/2008	-		
4/30/2008	-	7/27/2008	-		
5/1/2008	-	7/28/2008	0.061 ^a		
5/2/2008	-	7/29/2008	0.059		
5/3/2008	-	7/30/2008	0.055		
5/4/2008	-	7/31/2008	0.054		
5/5/2008	-	8/1/2008	0.058		
5/6/2008	-	8/2/2008	0.064		
5/7/2008	-	8/3/2008	0.072		
5/8/2008	-	8/4/2008	0.086		
5/9/2008	-	8/5/2008	0.102		
5/10/2008	-	8/6/2008	0.120		
5/11/2008	-	8/7/2008	0.126		
5/12/2008	-	8/8/2008	0.135		
5/13/2008	-	8/9/2008	0.128		
5/14/2008	-	8/10/2008	0.120		
5/15/2008	-	8/11/2008	0.110		
5/16/2008	-	8/12/2008	0.080		
5/17/2008	-	8/13/2008	0.069		
5/18/2008	-	8/14/2008	0.064		
5/19/2008	-	8/15/2008	0.061		
5/20/2008	-	8/16/2008	0.061		
5/21/2008	-	8/17/2008	0.063		
5/22/2008	-	8/18/2008	0.060		
5/23/2008	-	8/19/2008	0.061		
5/24/2008	-	8/20/2008	0.057		
5/25/2008	-	8/21/2008	0.052		
5/26/2008	-	8/22/2008	0.050		
5/27/2008	-	8/23/2008	0.055		
5/28/2008	-	8/24/2008	0.048		
5/29/2008	-	8/25/2008	0.043		
5/30/2008	-	8/26/2008	0.045		
5/31/2008	-	8/27/2008	0.048		
6/1/2008	-	8/28/2008	0.042		
6/2/2008	-	8/29/2008	0.047		
6/3/2008	-	8/30/2008	0.045		
6/4/2008	-	8/31/2008	0.045		
6/5/2008	-	9/1/2008	0.045		
6/6/2008	-	9/2/2008	0.045		
6/7/2008	-	9/3/2008	0.044		
6/8/2008	-	9/4/2008	0.044		
6/9/2008	-	9/5/2008	0.048		
6/10/2008	-	9/6/2008	0.047		

Notes

^a Levellogger installed

^b Water level was below the levellogger

2009					
Date	Level (m)	Date	Level (m)	Date	Level (m)
3/15/2009	0.065	6/11/2009	0.066	9/7/2009	0.026
3/16/2009	0.064	6/12/2009	0.056	9/8/2009	0.024
3/17/2009	0.060	6/13/2009	0.059	9/9/2009	0.032
3/18/2009	0.062	6/14/2009	0.067	9/10/2009	0.020
3/19/2009	0.054	6/15/2009	0.055	9/11/2009	0.021
3/20/2009	0.063	6/16/2009	0.049	9/12/2009	0.024
3/21/2009	0.055	6/17/2009	0.046	9/13/2009	0.025
3/22/2009	0.052	6/18/2009	0.037	9/14/2009	0.029
3/23/2009	0.060	6/19/2009	0.036	9/15/2009	0.026
3/24/2009	0.064	6/20/2009	0.033	9/16/2009	0.028
3/25/2009	0.052	6/21/2009	0.033	9/17/2009	0.020
3/26/2009	0.052	6/22/2009	0.033	9/18/2009	0.023
3/27/2009	0.055	6/23/2009	0.032	9/19/2009	0.028
3/28/2009	0.054	6/24/2009	0.044	9/20/2009	0.012
3/29/2009	0.052	6/25/2009	0.041	9/21/2009	0.006
3/30/2009	0.065	6/26/2009	0.031	9/22/2009	0.010
3/31/2009	0.062	6/27/2009	0.033	9/23/2009	0.017
4/1/2009	0.063	6/28/2009	0.031	9/24/2009	0.009
4/2/2009	0.062	6/29/2009	0.024	9/25/2009	0.004
4/3/2009	0.057	6/30/2009	0.023	9/26/2009	0.009
4/4/2009	0.073	7/1/2009	0.027	9/27/2009	-0.003
4/5/2009	0.062	7/2/2009	0.041	9/28/2009	0.006
4/6/2009	0.052	7/3/2009	0.054	9/29/2009	0.009
4/7/2009	0.047	7/4/2009	0.066	9/30/2009	0.001
4/8/2009	0.051	7/5/2009	0.076	10/1/2009	0.010
4/9/2009	0.037	7/6/2009	0.077	10/2/2009	0.010
4/10/2009	0.025	7/7/2009	0.063	10/3/2009	0.003
4/11/2009	0.036	7/8/2009	0.067	10/4/2009	0.002
4/12/2009	0.034	7/9/2009	0.077	10/5/2009	0.002
4/13/2009	0.031	7/10/2009	0.084	10/6/2009	0.016
4/14/2009	0.015	7/11/2009	0.092	10/7/2009	0.007
4/15/2009	0.022	7/12/2009	0.105	10/8/2009	0.011
4/16/2009	0.031	7/13/2009	0.109	10/9/2009	0.009
4/17/2009	0.023	7/14/2009	0.104	10/10/2009	0.005
4/18/2009	0.008	7/15/2009	0.105	10/11/2009	0.008
4/19/2009	0.010	7/16/2009	0.099	10/12/2009	0.012
4/20/2009	0.004	7/17/2009	0.078	10/13/2009	0.018
4/21/2009	-0.007	7/18/2009	0.062	10/14/2009	0.034
4/22/2009	0.009	7/19/2009	0.063	10/15/2009	0.026
4/23/2009	0.006	7/20/2009	0.054		
4/24/2009	0.010	7/21/2009	0.057		
4/25/2009	0.013	7/22/2009	0.067		
4/26/2009	0.006	7/23/2009	0.052		
4/27/2009	0.007	7/24/2009	0.047		
4/28/2009	0.003	7/25/2009	0.046		
4/29/2009	0.003	7/26/2009	0.050		
4/30/2009	0.005	7/27/2009	0.062		
5/1/2009	0.013	7/28/2009	0.084		
5/2/2009	0.007	7/29/2009	0.099		
5/3/2009	-0.012	7/30/2009	0.108		
5/4/2009	-0.003	7/31/2009	0.108		
5/5/2009	0.001	8/1/2009	0.106		
5/6/2009	-0.010	8/2/2009	0.106		
5/7/2009	-0.013	8/3/2009	0.111		
5/8/2009	-0.017	8/4/2009	0.118		
5/9/2009	-0.018	8/5/2009	0.117		
5/10/2009	-0.009	8/6/2009	0.120		
5/11/2009	-0.010	8/7/2009	0.111		
5/12/2009	-0.013	8/8/2009	0.079		
5/13/2009	-0.020	8/9/2009	0.058		
5/14/2009	0.002	8/10/2009	0.054		
5/15/2009	0.016	8/11/2009	0.047		
5/16/2009	0.023	8/12/2009	0.042		
5/17/2009	0.034	8/13/2009	0.041		
5/18/2009	0.033	8/14/2009	0.042		
5/19/2009	0.048	8/15/2009	0.066		
5/20/2009	0.043	8/16/2009	0.051		
5/21/2009	0.042	8/17/2009	0.045		
5/22/2009	0.044	8/18/2009	0.047		
5/23/2009	0.040	8/19/2009	0.049		
5/24/2009	0.045	8/20/2009	0.054		
5/25/2009	0.044	8/21/2009	0.037		
5/26/2009	0.036	8/22/2009	0.026		
5/27/2009	0.030	8/23/2009	0.020		
5/28/2009	0.034	8/24/2009	0.021		
5/29/2009	0.028	8/25/2009	0.027		
5/30/2009	0.027	8/26/2009	0.022		
5/31/2009	0.039	8/27/2009	0.032		
6/1/2009	0.049	8/28/2009	0.028		
6/2/2009	0.052	8/29/2009	0.025		
6/3/2009	0.056	8/30/2009	0.022		
6/4/2009	0.076	8/31/2009	0.026		
6/5/2009	0.066	9/1/2009	0.030		
6/6/2009	0.068	9/2/2009	0.029		
6/7/2009	0.063	9/3/2009	0.031		
6/8/2009	0.052	9/4/2009	0.028		
6/9/2009	0.058	9/5/2009	0.032		
6/10/2009	0.065	9/6/2009	0.029		

Notes

^a Levellogger installed

^b Water level was below the levellogger

Appendix 4. Wetland Hydrology Continuous Monitoring Data
Average Daily Water Levels: UR1 Well 2

Standpipe height	0.36	m
Logger (below top of standpipe)	1.48	m
Logger (below ground surface)	1.12	m

Note: all levels are reported in metres below ground surface

2008					
Date	Level (m)	Date	Level (m)	Date	Level (m)
3/15/2008	-	6/11/2008	-0.028 ^b	9/7/2008	-0.032
3/16/2008	-	6/12/2008	-0.045	9/8/2008	-0.037
3/17/2008	-	6/13/2008	-0.042	9/9/2008	-0.031
3/18/2008	-	6/14/2008	-0.041	9/10/2008	-0.031
3/19/2008	-	6/15/2008	-0.041	9/11/2008	-0.032
3/20/2008	-	6/16/2008	-0.034	9/12/2008	-0.031
3/21/2008	-	6/17/2008	-0.038	9/13/2008	-0.026
3/22/2008	-	6/18/2008	-0.040	9/14/2008	-0.027
3/23/2008	-	6/19/2008	-0.033	9/15/2008	-0.025
3/24/2008	-	6/20/2008	-0.027	9/16/2008	-0.019
3/25/2008	-	6/21/2008	-0.038	9/17/2008	-0.018
3/26/2008	-	6/22/2008	-0.045	9/18/2008	-0.019
3/27/2008	-	6/23/2008	-0.040	9/19/2008	-0.023
3/28/2008	-	6/24/2008	-0.043	9/20/2008	-0.025
3/29/2008	-	6/25/2008	-0.051	9/21/2008	-0.030
3/30/2008	-	6/26/2008	-0.045	9/22/2008	-0.031
3/31/2008	-	6/27/2008	-0.043	9/23/2008	-0.028
4/1/2008	-	6/28/2008	-0.052	9/24/2008	-0.022
4/2/2008	-	6/29/2008	-0.047	9/25/2008	-0.024
4/3/2008	-	6/30/2008	-0.033	9/26/2008	-0.018
4/4/2008	-	7/1/2008	-0.031	9/27/2008	-0.022
4/5/2008	-	7/2/2008	-0.031	9/28/2008	-0.040
4/6/2008	-	7/3/2008	-0.038	9/29/2008	-0.055
4/7/2008	-	7/4/2008	-0.037	9/30/2008	-0.036
4/8/2008	-	7/5/2008	-0.040	10/1/2008	-0.028
4/9/2008	-	7/6/2008	-0.051	10/2/2008	-0.021
4/10/2008	-	7/7/2008	-0.050	10/3/2008	-0.038
4/11/2008	-	7/8/2008	-0.053	10/4/2008	-0.035
4/12/2008	-	7/9/2008	-0.056	10/5/2008	-0.047
4/13/2008	-	7/10/2008	-0.052	10/6/2008	-0.044
4/14/2008	-	7/11/2008	-0.047	10/7/2008	-0.042
4/15/2008	-	7/12/2008	-0.049	10/8/2008	-0.055
4/16/2008	-	7/13/2008	-0.047	10/9/2008	-0.053
4/17/2008	-	7/14/2008	-0.046	10/10/2008	-0.053
4/18/2008	-	7/15/2008	-0.045	10/11/2008	-0.069
4/19/2008	-	7/16/2008	-0.045	10/12/2008	-0.061
4/20/2008	-	7/17/2008	-0.045	10/13/2008	-0.073
4/21/2008	-	7/18/2008	-0.046	10/14/2008	-0.065
4/22/2008	-	7/19/2008	-0.047	10/15/2008	-0.054
4/23/2008	-	7/20/2008	-0.047		
4/24/2008	-	7/21/2008	-0.053		
4/25/2008	-	7/22/2008	-0.048		
4/26/2008	-	7/23/2008	-0.045		
4/27/2008	-	7/24/2008	-0.040		
4/28/2008	-	7/25/2008	-0.036		
4/29/2008	-	7/26/2008	-0.044		
4/30/2008	-	7/27/2008	-0.050		
5/1/2008	-	7/28/2008	-0.042183435		
5/2/2008	-	7/29/2008	-0.041		
5/3/2008	-	7/30/2008	-0.046		
5/4/2008	-	7/31/2008	-0.046		
5/5/2008	-	8/1/2008	-0.045		
5/6/2008	-	8/2/2008	-0.041		
5/7/2008	-	8/3/2008	-0.043		
5/8/2008	-	8/4/2008	-0.038		
5/9/2008	-	8/5/2008	-0.032		
5/10/2008	-	8/6/2008	-0.025		
5/11/2008	-	8/7/2008	-0.028		
5/12/2008	-	8/8/2008	-0.025		
5/13/2008	-	8/9/2008	-0.032		
5/14/2008	-	8/10/2008	-0.037		
5/15/2008	-	8/11/2008	-0.037		
5/16/2008	-	8/12/2008	-0.038		
5/17/2008	-	8/13/2008	-0.043		
5/18/2008	-	8/14/2008	-0.046		
5/19/2008	-	8/15/2008	-0.042		
5/20/2008	-	8/16/2008	-0.038		
5/21/2008	-	8/17/2008	-0.037		
5/22/2008	-	8/18/2008	-0.046		
5/23/2008	-	8/19/2008	-0.039		
5/24/2008	-	8/20/2008	-0.037		
5/25/2008	-	8/21/2008	-0.039		
5/26/2008	-	8/22/2008	-0.041		
5/27/2008	-	8/23/2008	-0.040		
5/28/2008	-	8/24/2008	-0.058		
5/29/2008	-	8/25/2008	-0.066		
5/30/2008	-	8/26/2008	-0.066		
5/31/2008	-	8/27/2008	-0.059		
6/1/2008	-	8/28/2008	-0.066		
6/2/2008	-	8/29/2008	-0.055		
6/3/2008	-	8/30/2008	-0.053		
6/4/2008	-	8/31/2008	-0.047		
6/5/2008	-	9/1/2008	-0.049		
6/6/2008	-	9/2/2008	-0.045		
6/7/2008	-	9/3/2008	-0.042		
6/8/2008	-	9/4/2008	-0.039		
6/9/2008	-	9/5/2008	-0.033		
6/10/2008	-	9/6/2008	-0.032		

Notes

^a Levellogger installed

^b Water level was below the levellogger

2009					
Date	Level (m)	Date	Level (m)	Date	Level (m)
3/15/2009	0.008	6/11/2009	-0.066	9/7/2009	-0.066
3/16/2009	0.007	6/12/2009	-0.075	9/8/2009	-0.066
3/17/2009	0.001	6/13/2009	-0.072	9/9/2009	-0.059
3/18/2009	0.004	6/14/2009	-0.069	9/10/2009	-0.079
3/19/2009	-0.004	6/15/2009	-0.079	9/11/2009	-0.087
3/20/2009	0.007	6/16/2009	-0.079	9/12/2009	-0.082
3/21/2009	0.000	6/17/2009	-0.078	9/13/2009	-0.084
3/22/2009	-0.003	6/18/2009	-0.082	9/14/2009	-0.075
3/23/2009	0.005	6/19/2009	-0.080	9/15/2009	-0.075
3/24/2009	0.010	6/20/2009	-0.081	9/16/2009	-0.078
3/25/2009	-0.002	6/21/2009	-0.079	9/17/2009	-0.086
3/26/2009	-0.004	6/22/2009	-0.082	9/18/2009	-0.382
3/27/2009	0.002	6/23/2009	-0.083	9/19/2009	-0.868
3/28/2009	0.002	6/24/2009	-0.074	9/20/2009	-1.000
3/29/2009	-0.002	6/25/2009	-0.080	9/21/2009	-0.994
3/30/2009	0.012	6/26/2009	-0.089	9/22/2009	-0.970
3/31/2009	0.011	6/27/2009	-0.085	9/23/2009	-0.893
4/1/2009	0.012	6/28/2009	-0.088	9/24/2009	-1.019
4/2/2009	0.013	6/29/2009	-0.098	9/25/2009	-0.953
4/3/2009	0.007	6/30/2009	-0.095	9/26/2009	-1.048
4/4/2009	0.024	7/1/2009	-0.091	9/27/2009	-1.057
4/5/2009	0.010	7/2/2009	-0.081	9/28/2009	-0.873
4/6/2009	-0.003	7/3/2009	-0.077	9/29/2009	-0.906
4/7/2009	-0.008	7/4/2009	-0.072	9/30/2009	-0.948
4/8/2009	-0.003	7/5/2009	-0.071	10/1/2009	-0.968
4/9/2009	-0.015	7/6/2009	-0.076	10/2/2009	-1.035
4/10/2009	-0.026	7/7/2009	-0.079	10/3/2009	-1.099
4/11/2009	-0.013	7/8/2009	-0.077	10/4/2009	-1.070
4/12/2009	-0.011	7/9/2009	-0.081	10/5/2009	-1.002
4/13/2009	-0.019	7/10/2009	-0.086	10/6/2009	-1.019
4/14/2009	-0.038	7/11/2009	-0.083	10/7/2009	-1.068
4/15/2009	-0.035	7/12/2009	-0.077	10/8/2009	-1.060
4/16/2009	-0.027	7/13/2009	-0.078	10/9/2009	-1.079
4/17/2009	-0.037	7/14/2009	-0.086	10/10/2009	-1.041
4/18/2009	-0.051	7/15/2009	-0.083	10/11/2009	-0.945
4/19/2009	-0.052	7/16/2009	-0.080	10/12/2009	-0.912
4/20/2009	-0.060	7/17/2009	-0.081	10/13/2009	-0.863
4/21/2009	-0.075	7/18/2009	-0.083	10/14/2009	-0.748
4/22/2009	-0.060	7/19/2009	-0.084	10/15/2009	-0.758
4/23/2009	-0.063	7/20/2009	-0.089		
4/24/2009	-0.058	7/21/2009	-0.085		
4/25/2009	-0.056	7/22/2009	-0.082		
4/26/2009	-0.066	7/23/2009	-0.089		
4/27/2009	-0.069	7/24/2009	-0.086		
4/28/2009	-0.076	7/25/2009	-0.079		
4/29/2009	-0.078	7/26/2009	-0.077		
4/30/2009	-0.074	7/27/2009	-0.074		
5/1/2009	-0.065	7/28/2009	-0.066		
5/2/2009	-0.066	7/29/2009	-0.061		
5/3/2009	-0.080	7/30/2009	-0.058		
5/4/2009	-0.070	7/31/2009	-0.063		
5/5/2009	-0.051	8/1/2009	-0.069		
5/6/2009	-0.063	8/2/2009	-0.072		
5/7/2009	-0.068	8/3/2009	-0.065		
5/8/2009	-0.076	8/4/2009	-0.062		
5/9/2009	-0.077	8/5/2009	-0.064		
5/10/2009	-0.060	8/6/2009	-0.063		
5/11/2009	-0.054	8/7/2009	-0.067		
5/12/2009	-0.069	8/8/2009	-0.075		
5/13/2009	-0.077	8/9/2009	-0.082		
5/14/2009	-0.069	8/10/2009	-0.077		
5/15/2009	-0.073	8/11/2009	-0.076		
5/16/2009	-0.075	8/12/2009	-0.074		
5/17/2009	-0.066	8/13/2009	-0.074		
5/18/2009	-0.062	8/14/2009	-0.073		
5/19/2009	-0.036	8/15/2009	-0.061		
5/20/2009	-0.038	8/16/2009	-0.066		
5/21/2009	-0.034	8/17/2009	-0.071		
5/22/2009	-0.032	8/18/2009	-0.069		
5/23/2009	-0.040	8/19/2009	-0.062		
5/24/2009	-0.030	8/20/2009	-0.054		
5/25/2009	-0.036	8/21/2009	-0.075		
5/26/2009	-0.050	8/22/2009	-0.078		
5/27/2009	-0.050	8/23/2009	-0.079		
5/28/2009	-0.032	8/24/2009	-0.075		
5/29/2009	-0.049	8/25/2009	-0.075		
5/30/2009	-0.046	8/26/2009	-0.075		
5/31/2009	-0.031	8/27/2009	-0.055		
6/1/2009	-0.030	8/28/2009	-0.039		
6/2/2009	-0.037	8/29/2009	-0.056		
6/3/2009	-0.040	8/30/2009	-0.079		
6/4/2009	-0.042	8/31/2009	-0.069		
6/5/2009	-0.051	9/1/2009	-0.064		
6/6/2009	-0.051	9/2/2009	-0.063		
6/7/2009	-0.061	9/3/2009	-0.065		
6/8/2009	-0.069	9/4/2009	-0.067		
6/9/2009	-0.056	9/5/2009	-0.059		
6/10/2009	-0.060	9/6/2009	-0.062		

Notes

^a Levellogger installed

^b Water level was below the levellogger

Appendix 4. Wetland Hydrology Continuous Monitoring Data
Average Daily Water Levels: UR1 Well 2

Standpipe height	0.63	m
Logger (below top of standpipe)	1.45	m
Logger (below ground surface)	0.81	m

Note: all levels are reported in metres below ground surface

2008					
Date	Level (m)	Date	Level (m)	Date	Level (m)
3/15/2008	-	6/11/2008	0.519	9/7/2008	0.767
3/16/2008	-	6/12/2008	0.477	9/8/2008	0.749
3/17/2008	-	6/13/2008	0.504	9/9/2008	0.767
3/18/2008	-	6/14/2008	0.511	9/10/2008	0.758
3/19/2008	-	6/15/2008	0.500	9/11/2008	0.745
3/20/2008	-	6/16/2008	0.505	9/12/2008	0.763
3/21/2008	-	6/17/2008	0.533	9/13/2008	0.777
3/22/2008	-	6/18/2008	0.506	9/14/2008	0.787
3/23/2008	-	6/19/2008	0.505	9/15/2008	0.754
3/24/2008	-	6/20/2008	0.493	9/16/2008	0.733
3/25/2008	-	6/21/2008	0.352	9/17/2008	0.742
3/26/2008	-	6/22/2008	0.330	9/18/2008	0.759
3/27/2008	-	6/23/2008	0.424	9/19/2008	0.762
3/28/2008	-	6/24/2008	0.434	9/20/2008	0.759
3/29/2008	-	6/25/2008	0.463	9/21/2008	0.778
3/30/2008	-	6/26/2008	0.497	9/22/2008	0.803
3/31/2008	-	6/27/2008	0.495	9/23/2008	b
4/1/2008	-	6/28/2008	0.383	9/24/2008	b
4/2/2008	-	6/29/2008	0.426	9/25/2008	b
4/3/2008	-	6/30/2008	0.447	9/26/2008	b
4/4/2008	-	7/1/2008	0.376	9/27/2008	b
4/5/2008	-	7/2/2008	0.290	9/28/2008	0.810
4/6/2008	-	7/3/2008	0.265	9/29/2008	0.493
4/7/2008	-	7/4/2008	0.287	9/30/2008	0.608
4/8/2008	-	7/5/2008	0.268	10/1/2008	0.672
4/9/2008	-	7/6/2008	0.293	10/2/2008	0.686
4/10/2008	-	7/7/2008	0.379	10/3/2008	0.669
4/11/2008	-	7/8/2008	0.429	10/4/2008	0.716
4/12/2008	-	7/9/2008	0.463	10/5/2008	0.710
4/13/2008	-	7/10/2008	0.510	10/6/2008	0.743
4/14/2008	-	7/11/2008	0.532	10/7/2008	0.760
4/15/2008	-	7/12/2008	0.526	10/8/2008	0.777
4/16/2008	-	7/13/2008	0.524	10/9/2008	0.787
4/17/2008	-	7/14/2008	0.508	10/10/2008	0.801
4/18/2008	-	7/15/2008	0.505	10/11/2008	0.807
4/19/2008	-	7/16/2008	0.509	10/12/2008	0.810
4/20/2008	-	7/17/2008	0.528	10/13/2008	0.772
4/21/2008	-	7/18/2008	0.533	10/14/2008	0.785
4/22/2008	-	7/19/2008	0.530	10/15/2008	0.803
4/23/2008	-	7/20/2008	0.512		
4/24/2008	-	7/21/2008	0.498		
4/25/2008	-	7/22/2008	0.552		
4/26/2008	-	7/23/2008	0.585		
4/27/2008	-	7/24/2008	0.601		
4/28/2008	-	7/25/2008	0.602		
4/29/2008	-	7/26/2008	0.580		
4/30/2008	-	7/27/2008	0.584		
5/1/2008	-	7/28/2008	0.603		
5/2/2008	-	7/29/2008	0.490		
5/3/2008	-	7/30/2008	0.521		
5/4/2008	-	7/31/2008	0.581		
5/5/2008	-	8/1/2008	0.615		
5/6/2008	-	8/2/2008	0.634		
5/7/2008	-	8/3/2008	0.634		
5/8/2008	-	8/4/2008	0.633		
5/9/2008	-	8/5/2008	0.625		
5/10/2008	-	8/6/2008	0.611		
5/11/2008	-	8/7/2008	0.602		
5/12/2008	-	8/8/2008	0.605		
5/13/2008	-	8/9/2008	0.624		
5/14/2008	-	8/10/2008	0.619		
5/15/2008	-	8/11/2008	0.630		
5/16/2008	-	8/12/2008	0.610		
5/17/2008	-	8/13/2008	0.587		
5/18/2008	-	8/14/2008	0.547		
5/19/2008	-	8/15/2008	0.566		
5/20/2008	-	8/16/2008	0.588		
5/21/2008	-	8/17/2008	0.603		
5/22/2008	-	8/18/2008	0.600		
5/23/2008	-	8/19/2008	0.631		
5/24/2008	-	8/20/2008	0.646		
5/25/2008	-	8/21/2008	0.652		
5/26/2008	-	8/22/2008	0.671		
5/27/2008	-	8/23/2008	0.621		
5/28/2008	-	8/24/2008	0.414		
5/29/2008	-	8/25/2008	0.548		
5/30/2008	-	8/26/2008	0.611		
5/31/2008	-	8/27/2008	0.640		
6/1/2008	-	8/28/2008	0.654		
6/2/2008	-	8/29/2008	0.668		
6/3/2008	-	8/30/2008	0.674		
6/4/2008	-	8/31/2008	0.686		
6/5/2008	-	9/1/2008	0.713		
6/6/2008	-	9/2/2008	0.728		
6/7/2008	-	9/3/2008	0.738		
6/8/2008	0.507 ^a	9/4/2008	0.743		
6/9/2008	0.544	9/5/2008	0.753		
6/10/2008	0.549	9/6/2008	0.760		

Notes

^a Levellogger installed

^b Water level was below the levellogger

2009					
Date	Level (m)	Date	Level (m)	Date	Level (m)
3/15/2009	b	6/11/2009	0.330	9/7/2009	b
3/16/2009	b	6/12/2009	0.371	9/8/2009	b
3/17/2009	b	6/13/2009	0.445	9/9/2009	b
3/18/2009	b	6/14/2009	0.516	9/10/2009	b
3/19/2009	b	6/15/2009	0.549	9/11/2009	b
3/20/2009	b	6/16/2009	0.588	9/12/2009	b
3/21/2009	b	6/17/2009	0.582	9/13/2009	b
3/22/2009	b	6/18/2009	0.619	9/14/2009	b
3/23/2009	b	6/19/2009	0.644	9/15/2009	b
3/24/2009	b	6/20/2009	0.684	9/16/2009	b
3/25/2009	b	6/21/2009	0.725	9/17/2009	b
3/26/2009	b	6/22/2009	0.751	9/18/2009	b
3/27/2009	b	6/23/2009	0.755	9/19/2009	b
3/28/2009	b	6/24/2009	0.746	9/20/2009	b
3/29/2009	b	6/25/2009	0.719	9/21/2009	b
3/30/2009	b	6/26/2009	0.749	9/22/2009	0.765
3/31/2009	b	6/27/2009	0.766	9/23/2009	b
4/1/2009	b	6/28/2009	0.785	9/24/2009	b
4/2/2009	b	6/29/2009	0.808	9/25/2009	b
4/3/2009	b	6/30/2009	b	9/26/2009	b
4/4/2009	b	7/1/2009	b	9/27/2009	b
4/5/2009	b	7/2/2009	b	9/28/2009	b
4/6/2009	b	7/3/2009	b	9/29/2009	b
4/7/2009	b	7/4/2009	0.795	9/30/2009	b
4/8/2009	b	7/5/2009	0.782	10/1/2009	b
4/9/2009	b	7/6/2009	0.765	10/2/2009	b
4/10/2009	b	7/7/2009	0.776	10/3/2009	b
4/11/2009	b	7/8/2009	0.811	10/4/2009	b
4/12/2009	b	7/9/2009	0.800	10/5/2009	b
4/13/2009	b	7/10/2009	0.793	10/6/2009	b
4/14/2009	b	7/11/2009	0.803	10/7/2009	b
4/15/2009	b	7/12/2009	b	10/8/2009	b
4/16/2009	b	7/13/2009	b	10/9/2009	b
4/17/2009	b	7/14/2009	b	10/10/2009	b
4/18/2009	b	7/15/2009	b	10/11/2009	b
4/19/2009	b	7/16/2009	b	10/12/2009	b
4/20/2009	b	7/17/2009	b	10/13/2009	b
4/21/2009	b	7/18/2009	b	10/14/2009	b
4/22/2009	b	7/19/2009	b	10/15/2009	b
4/23/2009	b	7/20/2009	b		
4/24/2009	b	7/21/2009	b		
4/25/2009	b	7/22/2009	b		
4/26/2009	b	7/23/2009	b		
4/27/2009	b	7/24/2009	b		
4/28/2009	b	7/25/2009	b		
4/29/2009	b	7/26/2009	b		
4/30/2009	b	7/27/2009	b		
5/1/2009	b	7/28/2009	b		
5/2/2009	b	7/29/2009	b		
5/3/2009	b	7/30/2009	b		
5/4/2009	b	7/31/2009	b		
5/5/2009	0.749	8/1/2009	b		
5/6/2009	0.682	8/2/2009	b		
5/7/2009	0.601	8/3/2009	b		
5/8/2009	0.606	8/4/2009	b		
5/9/2009	0.641	8/5/2009	b		
5/10/2009	0.639	8/6/2009	b		
5/11/2009	0.650	8/7/2009	b		
5/12/2009	0.621	8/8/2009	b		
5/13/2009	0.614	8/9/2009	b		
5/14/2009	0.593	8/10/2009	b		
5/15/2009	0.602	8/11/2009	b		
5/16/2009	0.654	8/12/2009	b		
5/17/2009	0.600	8/13/2009	b		
5/18/2009	0.622	8/14/2009	b		
5/19/2009	0.662	8/15/2009	b		
5/20/2009	0.625	8/16/2009	b		
5/21/2009	0.593	8/17/2009	b		
5/22/2009	0.582	8/18/2009	b		
5/23/2009	0.518	8/19/2009	b		
5/24/2009	0.492	8/20/2009	b		
5/25/2009	0.474	8/21/2009	b		
5/26/2009	0.420	8/22/2009	b		
5/27/2009	0.447	8/23/2009	b		
5/28/2009	0.521	8/24/2009	b		
5/29/2009	0.469	8/25/2009	b		
5/30/2009	0.508	8/26/2009	b		
5/31/2009	0.523	8/27/2009	b		
6/1/2009	0.479	8/28/2009	b		
6/2/2009	0.397	8/29/2009	b		
6/3/2009	0.316	8/30/2009	b		
6/4/2009	0.268	8/31/2009	b		
6/5/2009	0.238	9/1/2009	b		
6/6/2009	0.162	9/2/2009	b		
6/7/2009	0.153	9/3/2009	b		
6/8/2009	0.137	9/4/2009	b		
6/9/2009	0.176	9/5/2009	b		
6/10/2009	0.274	9/6/2009	b		

Notes

^a Levellogger installed

^b Water level was below the levellogger

Appendix 4. Wetland Hydrology Continuous Monitoring Data

Average Daily Water Levels: UR1 Well 2

Standpipe height	0.400	m
Logger (below top of standpipe)	1.475	m
Logger (below ground surface)	1.075	m

Note: all levels are reported in metres below ground surface

2008					
Date	Level (m)	Date	Level (m)	Date	Level (m)
3/15/2008	-	6/11/2008	0.055	9/7/2008	0.095
3/16/2008	-	6/12/2008	0.040	9/8/2008	0.079
3/17/2008	-	6/13/2008	0.042	9/9/2008	0.095
3/18/2008	-	6/14/2008	0.047	9/10/2008	0.075
3/19/2008	-	6/15/2008	0.043	9/11/2008	0.066
3/20/2008	-	6/16/2008	0.043	9/12/2008	0.084
3/21/2008	-	6/17/2008	0.042	9/13/2008	0.098
3/22/2008	-	6/18/2008	0.038	9/14/2008	0.106
3/23/2008	-	6/19/2008	0.041	9/15/2008	0.091
3/24/2008	-	6/20/2008	0.041	9/16/2008	0.095
3/25/2008	-	6/21/2008	0.025	9/17/2008	0.104
3/26/2008	-	6/22/2008	0.030	9/18/2008	0.109
3/27/2008	-	6/23/2008	0.035	9/19/2008	0.111
3/28/2008	-	6/24/2008	0.031	9/20/2008	0.100
3/29/2008	-	6/25/2008	0.030	9/21/2008	0.101
3/30/2008	-	6/26/2008	0.036	9/22/2008	0.107
3/31/2008	-	6/27/2008	0.032	9/23/2008	0.109
4/1/2008	-	6/28/2008	0.031	9/24/2008	0.109
4/2/2008	-	6/29/2008	0.031	9/25/2008	0.111
4/3/2008	-	6/30/2008	0.037	9/26/2008	0.111
4/4/2008	-	7/1/2008	0.036	9/27/2008	0.091
4/5/2008	-	7/2/2008	0.034	9/28/2008	0.067
4/6/2008	-	7/3/2008	0.028	9/29/2008	0.028
4/7/2008	-	7/4/2008	0.027	9/30/2008	0.052
4/8/2008	-	7/5/2008	0.021	10/1/2008	0.029
4/9/2008	-	7/6/2008	0.026	10/2/2008	0.025
4/10/2008	-	7/7/2008	0.025	10/3/2008	0.030
4/11/2008	-	7/8/2008	0.022	10/4/2008	0.027
4/12/2008	-	7/9/2008	0.026	10/5/2008	0.029
4/13/2008	-	7/10/2008	0.034	10/6/2008	0.027
4/14/2008	-	7/11/2008	0.040	10/7/2008	0.033
4/15/2008	-	7/12/2008	0.032	10/8/2008	0.027
4/16/2008	-	7/13/2008	0.039	10/9/2008	0.032
4/17/2008	-	7/14/2008	0.051	10/10/2008	0.038
4/18/2008	-	7/15/2008	0.053	10/11/2008	0.036
4/19/2008	-	7/16/2008	0.051	10/12/2008	0.035
4/20/2008	-	7/17/2008	0.050	10/13/2008	0.020
4/21/2008	-	7/18/2008	0.053	10/14/2008	0.039
4/22/2008	-	7/19/2008	0.051	10/15/2008	0.040
4/23/2008	-	7/20/2008	0.040		
4/24/2008	-	7/21/2008	0.027		
4/25/2008	-	7/22/2008	0.045		
4/26/2008	-	7/23/2008	0.054		
4/27/2008	-	7/24/2008	0.064		
4/28/2008	-	7/25/2008	0.072		
4/29/2008	-	7/26/2008	0.073		
4/30/2008	-	7/27/2008	0.078		
5/1/2008	-	7/28/2008	0.064		
5/2/2008	-	7/29/2008	0.026		
5/3/2008	-	7/30/2008	0.045		
5/4/2008	-	7/31/2008	0.056		
5/5/2008	-	8/1/2008	0.062		
5/6/2008	-	8/2/2008	0.075		
5/7/2008	-	8/3/2008	0.085		
5/8/2008	-	8/4/2008	0.096		
5/9/2008	-	8/5/2008	0.099		
5/10/2008	-	8/6/2008	0.102		
5/11/2008	-	8/7/2008	0.103		
5/12/2008	-	8/8/2008	0.100		
5/13/2008	-	8/9/2008	0.095		
5/14/2008	-	8/10/2008	0.092		
5/15/2008	-	8/11/2008	0.089		
5/16/2008	-	8/12/2008	0.060		
5/17/2008	-	8/13/2008	0.050		
5/18/2008	-	8/14/2008	0.044		
5/19/2008	-	8/15/2008	0.055		
5/20/2008	-	8/16/2008	0.065		
5/21/2008	-	8/17/2008	0.076		
5/22/2008	-	8/18/2008	0.062		
5/23/2008	-	8/19/2008	0.078		
5/24/2008	-	8/20/2008	0.087		
5/25/2008	-	8/21/2008	0.089		
5/26/2008	-	8/22/2008	0.093		
5/27/2008	-	8/23/2008	0.063		
5/28/2008	-	8/24/2008	0.033		
5/29/2008	-	8/25/2008	0.046		
5/30/2008	-	8/26/2008	0.035		
5/31/2008	-	8/27/2008	0.034		
6/1/2008	-	8/28/2008	0.039		
6/2/2008	-	8/29/2008	0.046		
6/3/2008	-	8/30/2008	0.038		
6/4/2008	-	8/31/2008	0.039		
6/5/2008	-	9/1/2008	0.056		
6/6/2008	-	9/2/2008	0.052		
6/7/2008	-	9/3/2008	0.062		
6/8/2008	0.040 ^a	9/4/2008	0.065		
6/9/2008	0.052	9/5/2008	0.079		
6/10/2008	0.057	9/6/2008	0.091		

Notes

^a Levellogger installed

^b Water level was below the levellogger

2009					
Date	Level (m)	Date	Level (m)	Date	Level (m)
3/15/2009	0.288	6/11/2009	0.027	9/7/2009	0.105
3/16/2009	0.291	6/12/2009	0.026	9/8/2009	0.115
3/17/2009	0.293	6/13/2009	0.027	9/9/2009	0.078
3/18/2009	0.295	6/14/2009	0.027	9/10/2009	0.061
3/19/2009	0.297	6/15/2009	0.023	9/11/2009	0.053
3/20/2009	0.299	6/16/2009	0.022	9/12/2009	0.071
3/21/2009	0.302	6/17/2009	0.019	9/13/2009	0.062
3/22/2009	0.304	6/18/2009	0.023	9/14/2009	0.082
3/23/2009	0.307	6/19/2009	0.015	9/15/2009	0.087
3/24/2009	0.309	6/20/2009	0.012	9/16/2009	0.034
3/25/2009	0.312	6/21/2009	0.009	9/17/2009	0.037
3/26/2009	0.314	6/22/2009	0.011	9/18/2009	0.035
3/27/2009	0.317	6/23/2009	0.008	9/19/2009	0.018
3/28/2009	0.320	6/24/2009	0.009	9/20/2009	0.029
3/29/2009	0.322	6/25/2009	0.003	9/21/2009	-0.005
3/30/2009	0.324	6/26/2009	0.005	9/22/2009	-0.010
3/31/2009	0.326	6/27/2009	-0.006	9/23/2009	-0.008
4/1/2009	0.329	6/28/2009	0.000	9/24/2009	-0.003
4/2/2009	0.332	6/29/2009	0.000	9/25/2009	-0.006
4/3/2009	0.334	6/30/2009	0.007	9/26/2009	-0.006
4/4/2009	0.337	7/1/2009	0.008	9/27/2009	-0.005
4/5/2009	0.340	7/2/2009	0.010	9/28/2009	-0.005
4/6/2009	0.342	7/3/2009	0.009	9/29/2009	0.003
4/7/2009	0.345	7/4/2009	0.006	9/30/2009	0.005
4/8/2009	0.344	7/5/2009	0.005	10/1/2009	0.002
4/9/2009	0.334	7/6/2009	-0.001	10/2/2009	0.014
4/10/2009	0.319	7/7/2009	-0.001	10/3/2009	0.016
4/11/2009	0.320	7/8/2009	0.003	10/4/2009	0.020
4/12/2009	0.319	7/9/2009	0.004	10/5/2009	0.021
4/13/2009	0.321	7/10/2009	0.005	10/6/2009	0.008
4/14/2009	0.306	7/11/2009	0.002	10/7/2009	0.025
4/15/2009	0.297	7/12/2009	0.003	10/8/2009	0.028
4/16/2009	0.298	7/13/2009	0.002	10/9/2009	0.017
4/17/2009	0.287	7/14/2009	0.003	10/10/2009	0.025
4/18/2009	0.283	7/15/2009	0.006	10/11/2009	0.030
4/19/2009	0.287	7/16/2009	0.009	10/12/2009	0.032
4/20/2009	0.278	7/17/2009	0.004	10/13/2009	0.037
4/21/2009	0.253	7/18/2009	0.001	10/14/2009	0.046
4/22/2009	0.248	7/19/2009	0.010	10/15/2009	0.053
4/23/2009	0.248	7/20/2009	0.014		
4/24/2009	0.246	7/21/2009	0.022		
4/25/2009	0.246	7/22/2009	0.033		
4/26/2009	0.229	7/23/2009	0.035		
4/27/2009	0.213	7/24/2009	0.036		
4/28/2009	0.193	7/25/2009	0.044		
4/29/2009	0.178	7/26/2009	0.055		
4/30/2009	0.158	7/27/2009	0.065		
5/1/2009	0.130	7/28/2009	0.071		
5/2/2009	0.096	7/29/2009	0.075		
5/3/2009	0.061	7/30/2009	0.073		
5/4/2009	0.055	7/31/2009	0.072		
5/5/2009	0.043	8/1/2009	0.073		
5/6/2009	0.035	8/2/2009	0.077		
5/7/2009	0.034	8/3/2009	0.080		
5/8/2009	0.038	8/4/2009	0.087		
5/9/2009	0.035	8/5/2009	0.093		
5/10/2009	0.037	8/6/2009	0.101		
5/11/2009	0.035	8/7/2009	0.106		
5/12/2009	0.034	8/8/2009	0.105		
5/13/2009	0.030	8/9/2009	0.089		
5/14/2009	0.028	8/10/2009	0.069		
5/15/2009	0.031	8/11/2009	0.060		
5/16/2009	0.028	8/12/2009	0.072		
5/17/2009	0.023	8/13/2009	0.089		
5/18/2009	0.029	8/14/2009	0.099		
5/19/2009	0.026	8/15/2009	0.109		
5/20/2009	0.026	8/16/2009	0.111		
5/21/2009	0.026	8/17/2009	0.098		
5/22/2009	0.024	8/18/2009	0.094		
5/23/2009	0.020	8/19/2009	0.112		
5/24/2009	0.021	8/20/2009	0.114		
5/25/2009	0.021	8/21/2009	0.074		
5/26/2009	0.020	8/22/2009	0.064		
5/27/2009	0.021	8/23/2009	0.077		
5/28/2009	0.022	8/24/2009	0.081		
5/29/2009	0.016	8/25/2009	0.041		
5/30/2009	0.020	8/26/2009	0.051		
5/31/2009	0.019	8/27/2009	0.079		
6/1/2009	0.018	8/28/2009	0.096		
6/2/2009	0.019	8/29/2009	0.106		
6/3/2009	0.021	8/30/2009	0.108		
6/4/2009	0.020	8/31/2009	0.114		
6/5/2009	0.017	9/1/2009	0.118		
6/6/2009	0.014	9/2/2009	0.125		
6/7/2009	0.034	9/3/2009	0.127		
6/8/2009	0.027	9/4/2009	0.118		
6/9/2009	0.027	9/5/2009	0.117		
6/10/2009	0.025	9/6/2009	0.098		

Notes

^a Levellogger installed

^b Water level was below the levellogger