



**Parks
Canada**

**Parcs
Canada**

PARKS CANADA AGENCY

**SPECIFICATIONS FOR
DREDGING FOR CONSTRUCTION ACCESS TO
RED PINE LAKE DAM**

Rev. 00 - Issued for Tender

August 2019

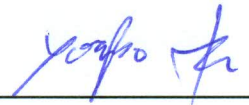
Prepared by KGS Group

Division 00 - Procurement and Contracting Requirements

00 00 01	Title Page
00 01 07	Seal Page
00 01 10	Table of Content
00 01 12	List of Drawings

Division 01 - General Requirements

01 11 00	Summary of Work
01 14 00	Work Restrictions
01 22 01	Measurement and Payment
01 31 19	Project Meet
01 32 16.07	Construction Progress Scheduling
01 33 00	Submittal Procedures
01 35 29	Health and Safety Requirements
01 35 44	Environmental Protection Procedures for Marine Work
01 45 00	Quality Control
01 52 00	Construction Facilities
01 56 00	Temporary Barriers and Enclosures
01 71 00	Examination and Preparation
01 74 11	Cleaning
01 74 21	Waste Management and Disposal
01 77 00	Closeout Procedures
01 78 00	Closeout Submittals



Above Sections reviewed by
Yongbo Fu, P.Eng.
Project Manager

August 2019

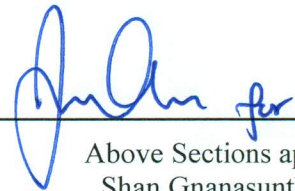
Dredging for Construction Access to Red Pine Lake Dam

Page 2

Division 35 – Waterway and Marine Construction

35 20 23

• Dredging



Above Sections approved by
Shan Gnanasunthar, P.Eng.
Geotechnical Engineer

End of Section

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Pages</u>
<u>Division 00 - Procurement and Contracting Requirements</u>		
00 00 01	Title Page	
00 01 07	Seal Page	
00 01 10	Table of Content	
00 01 12	List of Drawings	
<u>Division 01 - General Requirements</u>		
01 11 00	Summary of Work	
01 14 00	Work Restrictions	
01 22 01	Measurement and Payment	
01 31 19	Project Meetings	
01 32 16.07	Construction Progress Schedule	
01 33 00	Submittal Procedures	
01 35 29	Health and Safety Requirements	
01 35 44	Environmental Protection Procedures for Marine Work	
01 45 00	Quality Control	
01 52 00	Construction Facilities	
01 56 00	Temporary Barriers and Enclosures	
01 74 11	Cleaning	
01 74 21	Waste Management and Disposal	
01 77 00	Closeout Procedures	
01 78 00	Closeout Submittals	
<u>Division 35 – Waterway and Marine Construction</u>		
35 20 23	Dredging	
Appendix A	Site Photos	
Appendix B	GPR Scan Red Pine Lake	
Appendix C	Description of Materials and Environmental Testing Results	
Appendix D	Basic Impact Analysis Mitigation Measures applicable to Dredging	
Appendix E	Mesures d'atténuation — dragage	

END OF SECTION

LIST OF DRAWINGS

<u>Drawings</u>	<u>Title</u>
16-1538-004-C001	Drawing List & Project Location
16-1538-004-C002	Dredging Route Plan & Test Pit Locations
16-1538-004-C003	Test Pit Logs
16-1538-004-C004	Dredging Plan & STA. 1+950m to 2+840m
16-1538-004-C005	Dredging Plan, Profile & Sections, STA. 1+950m to 2+170m
16-1538-004-C006	Dredging Plan, Profile & Sections, STA. 2+170m to 2+400m
16-1538-004-C007	Dredging Plan, Profile & Sections, STA. 2+400m to 2+620m
16-1538-004-C008	Dredging Plan, Profile & Sections, STA. 2+620m to 2+840m
16-1538-004-C009	Dredging Plan & STA. 4+600m to 5+117m
16-1538-004-C010	Dredging Plan, Profile & Sections, STA. 4+600m to 4+800m
16-1538-004-C011	Dredging Plan, Profile & Sections, STA. 4+800m to 5+020m
16-1538-004-C012	Dredging Plan, Profile & Sections, STA. 5+020m to 5+117m

END OF SECTION

Part 1 General

1.1 PRECEDENCE

- .1 For Federal Government Projects Division 1 sections take precedence over technical specifications in other Divisions.

1.2 RELATED REQUIREMENTS

- .1 Section 01 14 00: Work Restriction
- .2 Section 01 33 00: Submittal Procedures
- .3 Section 01 35 44: Environmental Protection Procedure for Marine Work
- .4 Section 01 45 00: Quality Control
- .5 Section 01 52 00: Construction Facilities
- .6 Section 01 56 00: Temporary Barriers and Enclosures
- .7 Section 01 74 11: Cleaning
- .8 Section 01 77 00: Close out Procedures

1.3 Abbreviations

- .1 ACI: American Concrete Institute
- .2 AISC: American Institute of Steel Construction
- .3 AISI: American Iron and Steel Institute
- .4 ANSI: American National Standards Institute
- .5 ASTM: American Society for Testing and Materials
- .6 CCDC: Canadian Construction Documents Committee
- .7 CGSB: Canadian General Standards Board
- .8 CSA: Canadian Standards Association
- .9 CHBDC: Canadian Highway Bridge Design Code
- .10 DFO: Department of Fisheries and Oceans
- .11 EMP: Environmental Management Plan
- .12 ESG: Environmental Standards and Guidelines
- .13 ISO: International Standards Organization
- .14 NBCC: National Building Code of Canada
- .15 NFC: National Fire Code of Canada
- .16 NFPA: National Fire Protection Association
- .17 NRCC: National Research Council Canada
- .18 NSF: National Safety Foundation

- .19 OMNRF: Ontario Department of Natural Resources and Forestry
- .20 OHSA: The Occupational Health and Safety Act
- .21 PSPC: Public Services and Procurement Canada
- .22 PCA: Parks Canada Agency (Owner)
- .23 SDS: Safety Data Sheet
- .24 SSPC: Steel Structures Painting Council
- .1 TSW: Trent-Severn Waterway
- .2 WSIB: Workplace Safety and Insurance Board
- .3 WHMIS: Workplace Hazardous Materials Information System

1.4 DEFINITIONS

- .1 Owner/Client: Parks Canada Agency (PCA).
- .2 Department Representative: Public Services and Procurement Canada (PSPC) or its representative.
- .3 Prime Consultant/Engineer: KGS Group.
- .4 Contractor – The successful proponent, i.e. the person(s) identified as Contractor on the first page of the Agreement/Contract and its (or their) successors and permitted assigns.

1.5 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises the dredging work starting at the shore of Royal Mile Drive property at Kennisis River to Red Pine Lake Dam site at downstream of Red Pine Lake. The pictures of the property of Royal Mile Drive is provided in Appendix A.
- .2 The purpose of the dredging work is to provide barge access to carry out construction activities for the Red Pine Lake Dam replacement scheduled to be completed spring through fall 2020. Considering some of the site work completed under this contract may be used by following dam construction contractor, Contractor shall obtain the approval from Departmental Representative prior to remove any such work.
- .3 The Construction Work includes but is not limited to the following:
 - .1 Mobilization and demobilization.
 - .2 A pre-survey may be required for the work, including locating and maintaining working points, and establishing lines and elevations. Perform all layout work, and carefully preserve benchmarks, reference points and stakes.
 - .3 Dredging to grade elevation 370.1m along Kennisis River and Red Pine Lake from the Royal Mile Drive property to Red Pine Lake new dam site
 - .4 Supply of all materials, labour, equipment, tools, tests, supervision, transport, storage, construction facilities, assembly, final tests and correction of defects, as well as commercial and administrative obligations and other general risks, all the responsibilities and obligations specified in the laws or indicated in the Contract for the execution, quality control, completion, performance and maintenance of all the permanent and temporary works in strict accordance with the Contract.

- .5 Provide for safe transportation and disposal of dredged materials. Transport and dispose of dredged material in areas:
 - .1 Dredging material of Kennisis River Upstream of Red Pine Lake: On property adjacent to leased property within 2 km (Between Station 1+950 and 2+800).
 - .2 Dredging material of Kennisis River Downstream of Red Pine Lake: at (cleared site adjacent to Dam at location determined by PCA/KGS (Between Station 4+615 and 5+117).
 - .3 Deadhead Trees and logs will not be removed from lake but relocated out of barge navigation channel in a distance of minimum 5 m from edge of the designed dredging path. The placement of the deadhead trees shall not create a hazard for boaters and be subject to approval by departmental representative.
 - .4 Boulders or fragments too large (volume larger than approximately 0.5 m³) shall either be removed from lake or relocated out of barge navigation channel in a distance of minimum 5 m from edge of the designed dredging path. The placement of the boulders shall not create a hazard for boaters and be subject to approval by departmental representative.
 - .5 Rock excavation may be required at approximate areas as shown in the contract drawings. Blasting will not be permitted.
 - .6 The project in water work is scheduled to be completed during the period of September to October 1, 2019. First, the Contractor should complete dredging between station 1+ 950 and 2 + 800 as this is a more sensitive area for fish spawning.
- .6 Install marker buoys along each edge of the designed dredging path for dam construction to use as shown in the dredging drawings. Obtain required permits from applicable authorities. The marker buoys shall be installed within 2 weeks of ice melt spring 2020.
- .7 Detailed post-survey to provide “as-built” cross sections of any dredging areas.

1.6 CONTRACT METHOD

- .1 Construct Work under combined lump sum and unit price contract.
- .2 Submit list of subcontractors.

1.7 EXAMINATION OF SITE

- .1 Visit the site before submitting tender. Examine site, adjacent premises, means of access and egress. Investigate and be fully informed of the nature and extent of the work required, difficulties in performing the work, facilities available for delivery and placing of materials. Submission of Tender will be deemed that Contractor is conversant with site conditions.
- .2 Be completely familiar with every detail and intent of these specifications and scope of work to be performed, and all regulatory requirements governing the Work.
- .3 The Contractor is advised that all elevations and dimensions shown on the plans are based on interpolation and subject to variation. The Contractor will be required to verify

all existing elevations and grades before preparing and before planning and undertaking any construction work. The Contractor will immediately report all discrepancies, in writing, to Department Representative.

- .4 The Departmental Representative will give no consideration whatsoever to any claim by the Contractor resulting from failure to have made all the necessary investigations prior to tendering.

1.8 WORK BY OTHERS

- .1 The Contractor shall for the purpose of the Ontario Occupational Health and Safety Act and Regulations for Construction Projects, and for the duration of the Work of the Contract:
 - .1 Assume the role of Constructor in accordance with the Authority Having Jurisdictions.

1.9 CONTRACTOR USE OF PREMISES

- .1 Limit use of premises to the work of this project, including storage in designated areas and site access.
- .2 Allow for Owner and Departmental Representatives access.
- .3 Coordinate use of premises under direction of the Departmental Representative.
- .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .5 Prevent injury or damage to all existing items or property which is not part of the work.
- .6 Considering some of the site completed under this contract may be used by following dam construction contractor, Contractor shall obtain the approval from Departmental Representative prior to repair or replace existing items or property which is not part of the work that are altered during construction operations.

1.10 OWNER OPERATION OF DAM

- .1 PCA will occupy premises during entire construction period for execution of normal dam operations.
- .2 Provide access for PCA Representatives to operate the dam.
- .3 Cooperate with Departmental Representative in scheduling operations to minimize conflict and to facilitate ongoing usage.

1.11 ALTERATIONS TO EXISTING SITE

- .1 Execute work with least possible interference or disturbance to property, operations and normal use of premises by PCA and the Departmental Representative.

1.12 COMMUNICATION PROTOCOL

- .1 Due to the nature of the work of ongoing water management and control issues, a communication protocol will need to be established between the Departmental Representative, the Contractor and PCA, prior to the commencement of work (i.e. during the startup meeting).

- .2 In general terms the Communication Protocol will address:
 - .1 Daily communication related to water management and control;
 - .2 Communication related to urgent safety concerns;
 - .3 Communication related to urgent environmental concerns;
 - .4 Communication related to scheduled and unscheduled PCA operation activities;
 - .5 Communication related to construction and contract issues;
 - .6 Communication with the general public.

1.13 RECORD DRAWINGS

- .1 As work progresses, maintain accurate records to show deviations from contract drawings. Submit one (1) set of record drawings just prior to the Departmental Representative's inspection of the work for issuance of the Final Certificate of Completion.

1.14 SIGNS

- .1 Provide common use signs related to traffic and navigation control, information, instruction, use of equipment, public safety devices, etc., in both official languages or by the use of commonly understood graphic symbols to the Departmental Representative's approval.
- .2 No Advertising will be permitted on this project.
- .3 PCA will provide a project sign which is to be installed by the contractor.

1.15 SCHEDULING

- .1 Within Five (5) days of award of the Contract, provide Department Representative with a copy of the construction schedule.
- .2 Ensure that it is understood that award of Contract or time of beginning, rate of progress, Certificate of Substantial Performance and Certificate of Completion as defined times of completion are of essence of this contract.
- .3 Commencement of work will not be permitted until a detailed schedule, has been reviewed by Department Representative, and revised and resubmitted by the Contractor.
 - .1 No progress payments will be made until the construction progress schedule is approved.
 - .2 Submit together with the progress schedule a cost breakdown for each lump sum and unit price payment items.
- .4 When requested, resubmit the schedule with all revisions made to show the progress of the work and to show any changes which are required to meet the approved completion dates, within ten (10) working days.
- .5 Do not make changes to the approved schedule, without Department Representative's approval.
- .6 The requirements of Section 01 33 00 apply to the construction progress schedule.
- .7 Notify Department Representative at least forty-eight (48) hours prior to work being carried out during "off-hour" periods.

- .8 Provide a schedule for the submission of, plans and procedures.
- .9 If progress of work should fall behind, take steps required to bring work back to schedule. Do not change schedule without Department Representative's approval.
 - .1 Weather related delays with their remedial measures will be discussed and negotiated.

1.16 EXISTING SERVICES

- .1 Notify Department Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Establish location and extent of service lines including all buried utilities in area of work before starting Work. Notify Department Representative of findings.
- .3 Submit schedule to and obtain approval from Department Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .4 Where unknown services are encountered, immediately advise Department Representative and Consultant and confirm findings in writing.
- .5 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .6 Record locations of maintained, re-routed and abandoned service lines, if applicable.
- .7 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.17 QUALITY CONTROL

- .1 Refer to Section 01 45 00 – Quality Control.

1.18 WATER MANAGEMENT AND CONTROL

- .1 The owner (PCA) will continue their responsibility of water management and control on the headwater throughout the duration of the construction period. PCA will instruct the Contractor on any water control issues.
- .2 For target water levels, refer to Section 01 14 00 – Work Restrictions.

1.19 REGULATORY REQUIREMENT

- .1 Fee Permits, Certificates: Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance certificates. Provide inspection certificates as evidence that work conforms to requirements of authority having jurisdiction. The submission of a tender will be construed as the Tenderer's declaration that they have discussed the approval requirements with the appropriate levels of government. The Contractor will not make any claim for additional compensation due to delays on commencing work due to compliance with the above.

1.20 TIME OF COMPLETION

- .1 Commence work in accordance with notification of acceptance of offer and complete the work within the dates outlined in the contract.

1.21 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders.
 - .5 Other Modifications to Contract.
 - .6 Field Test Reports.
 - .7 Copy of Approved Work Schedule.
 - .8 Site Specific Health and Safety Plan and Other Safety Related Documents.
- .2 Environmental Protection Plan Other documents as specified herein.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

- .1 The Contractor shall, before the start of work, familiarize himself with the access of the site and fully inform himself of the restrictions and limitations.
- .2 Design, construct and maintain temporary "access to" and "egress from" work areas in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of adjacent premises. Make arrangements with Department Representative to facilitate work as stated.
- .2 Where security is reduced by work provide temporary means to maintain security.
- .3 Contractor is responsible to provide sanitary facilities for use by Contractor's personnel and to keep facilities clean.
- .4 Closures: protect work temporarily until permanent enclosures are completed.

1.3 EXISTING SERVICES

- .1 Notify Department Representative of intended interruption of services and obtain required permission.
- .1 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions at minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.
- .2 Provide for pedestrian, boat, and vehicular traffic control.
- .3 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.4 SPECIAL REQUIREMENTS

- .1 Refer to basic impact analysis (BIA) for details of the restriction window and required mitigations.
- .2 The restriction period for in-water work is October 1 to May 31, in order to avoid harm to spawning, hatching and rearing of Lake Trout. During the restriction period, the Contractor is not permitted to engage in any activity that may cause disturbance of the watercourse bottom and dispersion of sediment. Examples of prohibited activities include in-water excavation, in-filling, rock/armour stone placement, in-water concrete/tremie pours, and transfer/movement of granular material or aggregate.
- .3 Where possible, site clearing/commencement of construction should be planned to occur outside of sensitive bird nesting times – May 1 to August 30th. If this is not feasible, then the site must be inspected by the contractor's biologist prior to clearing, to identify any potential for nests.

- .4 Water levels can vary beyond the control of Parks Canada. Based on historical data, for information only, the normal water levels are for September to October as follows:
 - .1 Average normal water level is approximate 371.08 m.
 - .2 Maximum normal water level is approximate 371.48 m.
 - .3 Minimum normal water level is approximate 370.91 m.
- .5 Carry out noise generating Work Monday to Friday from 07:00 to 20:00 hours.
- .6 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .7 Keep within limits of work and avenues of ingress and egress.
- .8 Coordinate all operations for Work so that environmental mitigation measures are followed. Refer to Section 01 35 44.
- .9 Blasting for demolition and rock excavation is prohibited.

1.5 ROAD RESTRICTIONS

- .1 Minimize construction traffic along access roads and maintain safe speed in accordance to local authorities and regulations.
- .2 Limit transportation activities in accordance with local by-laws
- .3 Where work involves disruption to site and rerouting of vehicular traffic, provide Department Representative with a Traffic Control Plan to the requirement of the local authorities and the standards set out in the Ontario Traffic Manual Book 7, Temporary Conditions.
- .4 Provide a minimum of three (3) weeks formal notification for alterations to the local road access to the local authorities, emergency services, Canada Post, School Boards, and residents.
- .5 Install road closure and construction advertising signs, two (2) weeks in advance of planned access changes.

1.6 REGIONAL ROAD LOAD RESTRICTIONS

- .1 Contractor will be responsible to obtain authorization from the Regional Municipality beforehand, and provide a copy of the authorization to the Department Representative.
- .2 Should authorization not be given, the Contractor is responsible to make alternative arrangements at no additional cost to the project.

1.7 ENVIRONMENTAL RESTRICTIONS

- .1 Section 01 35 44 – Environmental Protection Procedure for Marine Work lists environmental restrictions and time frames that need to be considered in the planning of the Work.
- .2 Adhere to PCA in-water timing windows; In-water work and work adjacent to open water is to be done accordance with Section 01 35 44 – Environmental Protection Procedure for Marine Work Tree cutting and clearing work during the migratory bird nesting season is to be done in accordance with Section 01 35 44 and Section 31 11 00.

1.8 WATER LEVELS

- .1 Daily water level variation graphs, together with historical high and low water levels can be obtained from PCA by request.
- .2 The Contractor is solely responsible for making their own interpretation of the data included herein, and any received from Department Representative.
- .3 The Contractor is solely responsible for planning and adjustment of construction activities according to the projected as well as actual water levels. Boat and barge access may be restricted during low water level period.
- .4 The Contractor is cautioned that, while PCA endeavors to manage the water levels within the indicated ranges, it cannot be held responsible for events, or the result of natural events such as the high water levels due to flooding or low water levels due to drought condition, that are not under its control.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 This section covers the measurement of work for payment purposes, and the scope of work included in the pay items in the Lump Sum Table and Unit Price Table.

1.2 APPLICATIONS FOR PROCESS PAYMENT

- .1 Make applications for payment on account as provided in Agreement as Work progresses.
- .2 Date applications for payment last day of payment period and ensure amount claimed is for value, proportional to amount of Contract, of Work performed and products delivered to place of work at that date.
- .3 Submit to Department Representative at least fourteen (14) days before first application for payment. Schedule of values of Contract Amount, so as to facilitate evaluation of applications for payment.
- .4 Time and Materials work shall not take place without written approval from the Departmental Representative and PCA. The Contractor shall notify the Departmental Representative prior to starting work.

1.3 SCHEDULE OF VALUES

- .1 Provide schedule of values supported by evidence as Consultant may reasonably direct and when accepted by Consultant, be used as basis for applications for payment.
- .2 Include statement based on schedule of values with each application for payment.
- .3 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Consultant may reasonably require to establish value and delivery of products.

1.4 PREPARING SCHEDULE OF LUMP SUM TABLE ITEMS

- .1 Make form of submittal parallel to Schedule of Values, with each line item identified same as line item in Schedule of Values. Include in unit prices only:
 - .1 Cost of material.
 - .2 Delivery and unloading at site.
 - .3 Installation, overhead and profit.
- .2 Ensure unit prices multiplied by quantities given equal material cost of that item in Schedule of Values.

1.5 LUMP SUM PRICE ITEMS

- .1 Lump Sum Price Item No.1 – “General Site Work” – All work that is not specifically designated in the Unit Price Tables as individual items but is indicated in the tender package in order to complete the Work in full, shall be paid under the Lump Sum Price item “General Site Work”. This item includes all costs associated to perform the work including but not limited to material,

equipment, personnel, travel and accommodations, overhead, etc. Items included but not limited to in the Lump Sum Price are:

- .1 Mobilization;
 - .2 Demobilization;
 - .3 Designing, installing and maintaining all temporary access routes required to access the work areas;
 - .4 Clearing and grubbing;
 - .5 Providing construction fence and perimeter security measures around work and staging areas;
 - .6 Construction facilities including portable office trailer;
 - .7 Maintaining the work/storage area for the duration of the work;
 - .8 Removal of the temporary access routes;
 - .9 Health and safety;
 - .10 Coordinating and working adjacent to overhead lines.
 - .11 Environmental Procedures, including control work to provide effective environmental, waterbody, and fish habitat protection;
 - .12 Surveying services;
 - .13 Engineering services.
- .2 Lump Sum Price Item No.1 will be only paid on the percentage of the dredging completion (refer to Lump Sum Price Item No.2). Lump Sum Price Item No.2 – “Dredging” – All work that is not specifically designated in the Unit Price Tables as individual items but is indicated in the tender package in order to complete the Work in full, shall be paid under the Lump Sum Price item “Dredging”. This item includes all costs associated to perform the work including but not limited to material, equipment, personnel, travel and accommodations, overhead, etc. Items included but not limited to in the Lump Sum Price are:
- .1 Dredging of common materials including sand, mud, loose or shale rock, gravels and any debris;
 - .2 Dredging of solid rock requiring drilling or hydraulic splitting to loosen;
 - .3 Dredging of large boulder having individual volumes of 0.5 cubic metres;
 - .4 Dredging of pieces of wood, logs, submerged logs and trees.

1.6 SUBSTANTIAL PERFORMANCE OF WORK

- .1 Prepare and submit to Departmental Representative a comprehensive list of items to be completed or corrected and apply for a review by Departmental Representative to establish Substantial Performance of Work or Substantial Performance of designated portion of Work when Work is substantially performed if permitted by lien legislation applicable to Place of Work designated portion thereof which Departmental Representative agrees to accept separately is substantially performed. Failure to include an item on list does not alter
- .2 Submit an application for final payment when work is completed.

- .3 Departmental Representative will, no later than ten (10) days after receipt of an application for final payment, review work to verify validity of application. Departmental Representative will give notification that application is valid or give reasons why it is not valid, no later than seven (7) days after reviewing work.
- .4 Departmental Representative will issue a Certificate of Completion and a Certificate of Measurement when application for final payment is found valid.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

- .1 Schedule and administer regular project meetings throughout the progress of the work at the call of Department Representative.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to Department Representative.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants, affected parties not in attendance, Department Representative, and Consultant.
- .8 Representative of Contractor, Subcontractor(s) and supplier(s) attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

- .1 Within ten 10 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Department Representative, Consultant, Contractor, major Subcontractors, and field inspectors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Health and Safety Plan
 - .3 Environmental Issues and Mitigation Measures
 - .4 Schedule of Work: in accordance with Section 01 32 16.07.
 - .5 Submittal Schedule in accordance with Section 01 33 00.
 - .6 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities and 01 56 00 - Temporary Barriers and Enclosures.
 - .7 Site security in accordance with Departmental Representative requirements. Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

- .8 Monthly progress claims, administrative procedures, photographs, hold backs.
- .9 Appointment of inspection and testing agencies or firms.
- .10 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

- .1 During course of Work and two weeks prior to project completion, schedule progress meetings biweekly.
- .2 Contractor, major Subcontractors involved in Work, and Department Representative are to be in attendance.
- .3 Notify parties minimum 3 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 2 days after meeting.
- .5 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Corrective measures and procedures to regain projected schedule.
 - .6 Revision to construction schedule.
 - .7 Progress schedule, during succeeding work period.
 - .8 Review submittal schedules: expedite as required.
 - .9 Maintenance of quality standards.
 - .10 Review proposed changes for affect on construction schedule and on completion date.
 - .11 Other business.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date placed horizontal bars. Generally, Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

- .1 Specified Contract completion date is October 30, 2019. However, the in water work shall be completed by October 1, 2019.
- .2 The construction window for dredging work is dependent on fish migration and spawning periods. Refer to Section 01 14 00 –Work Restrictions, for the restriction window to in water works. The Contractor is responsible for implementing required mitigations.
- .3 Where possible, site clearing/commencement of construction should be planned to occur outside of sensitive bird nesting times; see Section 01 14 00 –Work Restrictions. If this is not feasible, then the site must be inspected by a biologist prior to clearing, to identify any potential for nests.
- .4 The contractor shall make every effort to minimize time working in the streams or water body.

- .5 Accordingly, all necessary materials and equipment should be on site before proceeding with removal such that delays waiting for materials or equipment do not occur once in-stream activities have commenced.
- .6 Ensure Project Schedule is practical and remains within specified Contract duration.
- .7 Detail Project Schedule to include a breakdown of work activity.
- .8 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Certificate of Substantial Performance and Certificate of Completion as defined times of completion are of essence of this contract.
- .9 Submit Project Schedule to Departmental Representative for comment and update accordingly.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Submit to Departmental Representative within 5 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within five working days of receipt of acceptance of Master Plan.

1.4 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules within five working days.
- .3 Revise impractical schedule and resubmit within five working days. Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.5 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan and specified contract duration.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Permits.
 - .3 Mobilization
 - .4 Installation of environmental controls.
 - .5 Dredging
 - .6 Demobilization.
 - .7 Contract Closeout.

1.6 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation. Contractor to resubmit updated Project Schedule to Departmental Representative for review in case of delays due to severe weather conditions.
- .3 Updated Project Schedule is to be submitted with every request for Progress Payment.

1.7 PROJECT MEETINGS

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Not Used

1.2 REFERENCES

- .1 Not Used.

1.3 ADMINISTRATIVE

- .1 Submit to Department Representative and Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Review submittals prior to submission to Department Representative and Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .4 Notify Department Representative and Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .5 Verify field measurements and affected adjacent Work are co-ordinated.
- .6 Contractor's responsibility for errors and omissions in submission is not relieved by Department Representative's and Consultant's review of submittals.
- .7 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Department Representative and Consultant review.
- .8 Keep one reviewed copy of each submission on site.
- .9 Summary of submittal requirements as a minimum:
 - .1 Project Schedule, 01 32 16.07 Section 1.3
 - .2 Photographic Documentation, 01 33 00 Section 1.7
 - .3 Site Specific Health and Safety Plan, 01 35 29 Section 1.3
 - .4 Site Health and Safety Reports, 01 35 29 Section 1.3
 - .5 Incident and Accident Reports, 01 35 29 Section 1.3
 - .6 Notice of project, 01 35 29 Section 1.4
 - .7 Site Specific Environmental Management Plan, 01 35 43 Section 1.4 to 1.12
 - .8 WHMIS Material Safety Data Sheets, 01 35 29 Section 1.3
 - .9 Waste Reduction Workplan (WRW), 01 74 21 Section 1.1, 1.6
 - .10 WRW Reports, 01 74 21 Section 1.4
 - .11 Waste Source Separation Program (WSSP), 01 74 21 Section 1.7

- .12 Final Documents, 01 78 00 Section 1.3
- .13 Final Survey, 01 78 00 Section 1.8

1.4 PRODUCT DATA

- .1 Submissions are to include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .2 After Departmental Representative's review, distribute copies.
- .3 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .4 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
- .5 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material

attesting that product, system or material meets specification requirements.

- .2 Certificates must be dated after award of project contract complete with project name.
- .6 Submit electronic copies of manufacturers' instructions for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .7 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .8 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .9 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .10 Delete information not applicable to project.
- .11 Supplement standard information to provide details applicable to project.

1.5 SAMPLES

- .1 Not Used

1.6 MOCK-UPS

- .1 Not Used

1.7 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: 4 locations.
 - .1 Viewpoints and their location as determined by Departmental Representative.
- .4 Frequency of photographic documentation: monthly or as directed by Departmental Representative,
 - .1 Upon completion of: excavation, foundation, framing and services before concealment, of Work.

1.8 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, Canada Labour Code Part II, and Canada Occupational Safety and Health Regulations.
- .2 Develop written Site Specific Health and Safety Plan based on hazard assessment prior to commencing any site work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .3 Relief from or substitution from any portion or provisions of minimum Health and Safety Guidelines specified herein or reviewed site-specific Health and Safety Plan must be submitted to the Department Representative in writing. Department Representative will respond in writing either accepting or requesting improvements.

1.2 REFERENCES

- .1 Construction is in accordance with the latest edition of the applicable Ontario and National codes. The above governs except where other applicable codes or provided notes are more restrictive.
- .2 Canada Labour Code:
 - .1 Part 2, Canada Occupational Safety and Health Regulations
 - .2 SOR/2010-120, Maritime Occupational Health and Safety Regulations
- .3 Occupational Safety and Health Administration (OSHA): Deck Barge Safety
- .4 Province of Ontario
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.0.1, as amended, and
 - .1 Regulations for Construction Projects, O. Reg. 213/91 as amended.
 - .2 Regulations for Diving Operations, O. Reg. 629/94 as amended.
 - .2 Forest Fires Prevention Act of Ontario 1990, Chapter 24.
 - .3 Workplace Safety and Insurance Act, 1997.
 - .4 Municipal statutes and authorities.
- .5 Latest revision of the following Canadian Standards Association (CSA) standard:
 - .1 CSA S350, Code of Practice for Safety in Demolition of Structures.
- .6 Latest revision of the following National Building Code of Canada (NBC)
 - .1 NBC, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
- .7 Latest revision of the following National Fire Code of Canada (NFC):
 - .1 NFC, Division B. Part 2, Emergency Planning, subsection 2.8.2 Fire Safety Plan.
- .8 Treasury Board of Canada Secretariat (TBS):

- .1 Treasury Board, Fire Protection Standard April 1, 2010. www.tbs-sct.gc.ca/pol/doceng.aspx?id=17316§ion=text.
- .9 Health Canada/workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS)
- .10 Fire Commissioner of Canada (FCC):
 - .1 FC—301 Standard for Construction Operations, June 1982.
 - .2 FC—302 Standard for Welding and Cutting, June 1982.

Labour Program
Fire Protection Engineering Services
4900 Yonge Street 8th Floor
North York, Ontario M2N 6A8

Copies may be obtained from:

Human Resources and Social Development Canada
Labour Program
Fire Protection Engineering Services
Ottawa, Ontario K1A 0J2

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Use Parks Canada Safety Template.
- .3 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative weekly.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets.
- .7 Department Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Department Representative within 5 days after receipt of comments from Department Representative.
- .8 Department Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Department Representative.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

- .11 Complete and Submit Parks Canada Attestation and Proof of Compliance with Occupational Health and Safety.

1.4 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to commencement of Work.
- .2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location. Contractor shall provide a written acknowledgement of this responsibility with 1 week of contract award, or prior to beginning work, whichever is sooner.
- .3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project

1.5 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.6 WORK PERMIT

- .1 Obtain road permits related to project prior to commencement of Work.
- .2 Obtain all other permits related to the project, as required, such as well decommissioning, prior to commencement of the work.

1.7 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Department Representative prior to commencement of Work.

1.8 REGULATORY REQUIREMENTS

- .1 Comply with the Acts and Regulations of the Province of Ontario and Canada.
- .2 Comply with specified standards and regulations to ensure safe operations at site.

1.9 PROJECT/SITE CONDITIONS

- .1 The following are known or potential project related health, environmental and safety hazards at site which must be properly managed if encountered during course of work:
 - .1 Work within and adjacent to streams and water.
 - .2 Working within and adjacent to roadway.
 - .3 Rapidly changing flows and water levels below a dam.
 - .4 Hazards related to working in a remote and natural area including insect, vegetation and wildlife related hazards.
 - .5 Above list shall not be construed as being complete and inclusive of potential health, and safety hazards encountered during work. Include above items into hazard assessment process.
- .2 For work in isolated locations Contractor to comply with Occupational Health and Safety Act, S.25 (2)(h)-Duties of employers and other applicable regulations.
- .3 For working near, on or above a body of water Contractor to comply with Safe Boating Guide issued by Transport Canada, OHS Regulation 213/91 – Section 27, CAN/CGSB-

65.7 for use of life jackets and CAN/CGSB-65.11 for use of Personal Flotation Devices (PFDs)

- .4 Provide traffic control measures when working on, or adjacent to, roadways in accordance with the "Traffic Control Manual for Roadwork Operations", Department of Transportation and Works.
- .5 Erect safety barricades, lights and signage on site to effectively delineate work areas, protect pedestrian and vehicular traffic around and adjacent to work and to create a safe working environment.
- .6 Contractor to comply with Municipal Bylaws and Owner's bylaws for the use of ATV's and side-by side off-road vehicle on site.
- .7 For Forest Safety Worker's to show valid certificates on training in First Aid, Forest Safety, Forest Survival, Heat/Cold Stress and use of an auto-injector (EpiPen) and to comply with Occupational Health and Safety Act (OHSA).
- .8 For Thermal Exposure – Heat/Cold stress Contractor to comply with OHS Regulation 213/91 and other applicable regulations.

1.10 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Department Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.
- .3 Relief from or substitution for any portion or provision of minimum Health and Safety Standards specified herein or reviewed site-specific. Health and Safety Plan shall be submitted to Departmental Representative in writing.

1.11 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Contractor will be responsible and assume the role of Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.12 UNFORSEEN HAZARDS

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Department Representative verbally and in writing.
- .2 Follow procedures in place for Employee's Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.

1.13 HEALTH AND SAFETY COORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
 - .1 Have site-related working experience specific to activities associated with similar dam reconstruction projects.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work and report directly to Site Supervisor.

1.14 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Department Representative.
- .2 Provide documents as follows and post on site:
 - .1 Contractor's Health and Safety Policy.
 - .2 Contractor's Name.
 - .3 Notice of Project.
 - .4 Name, trade, and employer of Health and Safety Coordinator.
 - .5 Department of Labour orders and reports.
 - .6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
 - .7 Address and phone number of nearest Department of Labour office.
 - .8 Material Safety Data Sheets.
 - .9 Written Emergency Response Plan.
 - .10 Site Specific Health and Safety plan.
 - .11 Copy of valid certificate of first-aid personnel on duty.
 - .12 WSIB "In Case of Injury at Work" poster.
 - .13 Location of toilet and cleanup facilities.
 - .14 Any specific handling or procedures specific to the site.
- .3 Comply with Provincial general posting requirements.

1.15 CORRECTION OF NON-CONFORMANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Department Representative.
- .2 Provide Department Representative with written report of action taken to correct non-compliance of health and safety issues identified.

- .3 Department Representative may stop Work if non-compliance of health and safety regulations or a potential issue is not corrected.

1.16 BLASTING

- .1 Blasting or other use of explosives is not permitted. .

1.17 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to Health and Safety Coordinator to stop or start Work when, at Health and Safety Coordinator's discretion, it is necessary or advisable for reasons of health or safety. Department Representative or his/her designate may also stop Work for health and safety considerations

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 01 74 11 – Cleaning.
- .2 Section 01 74 21 –Waste Management and Disposal.

1.2 REFERENCES

- .1 Reference Standards and Guides:
 - .1 Canada Shipping Act, Transport Canada, 2001, amended 2013-12-01
 - .2 Canadian Environmental Assessment Act, 2012, amended 2013-11-25
 - .3 Canadian Environmental Protection Act, 1999, amended on 2014-03-28
 - .4 Fisheries Act, 1985, Fisheries and Oceans Canada, amended 2013-11-25
 - .5 Migratory Birds Convention Act, 1994, Environment Canada, amended 2010-12-10
 - .6 Navigation Protection Act, 1985. Transport Canada, amended 2014-04-01
 - .7 Species at Risk Act, 2002, amended 2013-03-08
 - .8 The Federal Policy on Wetland Conservation, 1991, Environment Canada
 - .9 Transportation of Dangerous Goods Act, 1992, Transport Canada, amended 2009-06-16
 - .10 Workplace Hazardous Materials Information System, Health Canada.

1.3 DEFINITIONS

- .1 Archaeological resources: all tangible evidence of human activity that is of historical, cultural or scientific interest. Examples include features, structures, archaeological objects or remains at or from an archaeological site, or an object recorded as an isolated archaeological find.
- .2 Buffer zone: a vegetated land that protects watercourses from adjacent land uses. It refers to the land adjacent to watercourses, such as streams, rivers, lakes, ponds, oceans, and wetlands, including the floodplain and the transitional lands between the watercourse and the drier upland areas.
- .3 Deleterious substance: (a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or (b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.
- .4 Fish habitat: spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes.

- .5 Hazardous material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .6 Invasive or alien species: refers to a species or subspecies introduced outside its normal distribution whose establishment and spread threaten ecosystems, habitats or species with economic or environmental harm.
- .7 Navigable water: a canal and any other body of water created or altered as a result of the construction of any work.
- .8 Surface watercourse: refers to the bed and shore of a river, stream, lake, creek, pond, marsh, estuary or salt-water body that contains water for at least part of each year.
- .9 Wetlands: land where the water table is at, near or above the surface or which is saturated for a long enough period to promote such features as wet-altered soils and water tolerant vegetation. Wetlands include organic wetlands or "peatlands," and mineral wetlands or mineral soil areas that are influenced by excess water but produce little or no peat.

1.4 TRANSPORTATION

- .1 Transport hazardous materials and hazardous waste in compliance with the Transportation of Dangerous Goods Act.
- .2 Do not overload scows when hauling dredged material. Secure contents against spillage.
- .3 Scows transporting dredged material will have tight seals to prevent leakage during loading and transporting dredge material.
- .4 Prior to commencement of work, advise and seek approval from the Departmental Representative of the existing roads and temporary routes / roads (including the construction of any temporary causeways or access roads for the purposes of dredging) proposed to be used to access work areas and to haul material to and from the site, including roads to the dredge material disposal site.
- .5 In general, any tools, equipment, vehicles, temporary structures or parts thereof used or placing a work in navigable water are not to remain in place after the completion of the project. However, considering some of the work under this contract may be used by following dam construction contractor, Contractor shall obtain the approval from Departmental Representative prior to remove any such work.
- .6 Vessels are to be permitted safe access through the worksite at all times, and assisted as necessary.
- .7 All materials and equipment used in construction must be marked in accordance with the Collision Regulations of the Canada Shipping Act, 2001 when located on the waterway.

1.5 OPERATION OF MACHINERY

- .1 Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.

- .2 Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the water body.
- .3 Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.

1.6 DISPOSAL OF DREDGED MATERIAL

- .1 The Contractor shall dispose of dredged material by depositing in the specified disposal area:
 - .1 Dredging material of Kennisis River Upstream of Red Pine Lake: On property adjacent to leased property within 2 km (Between Station 1+950 and 2+800).
 - .2 Dredging material of Kennisis River Downstream of Red Pine Lake: at (cleared site adjacent to Dam at location determined by PCA/KGS (Between Station 4+615 and 5+117).
 - .3 Deadhead Trees and logs will not be removed from lake but relocated out of barge navigation channel in a distance of minimum 5 m from edge of the designed dredging path. The placement of the deadhead trees shall not create a hazard for boaters and be subject to approval by departmental representative.
 - .4 Boulders or fragments too large (volume larger than approximately 0.5 m³) shall either be removed from lake or relocated out of barge navigation channel in a distance of minimum 5 m from edge of the designed dredging path. The placement of the boulders shall not create a hazard for boaters and be subject to approval by departmental representative.
- .2 Items such as rubber tires, bottles, cans and other debris or litter must be removed from the disposal site following regrading. Failure to remove such debris may constitute a littering offence under applicable regulations.
- .3 A Disposal Material Disposal Plan (DMDP) required by Environment Canada as part of permit conditions, is to be prepared by the Contractor and submitted to the Departmental Representative for review by Environment Canada within 10 days of award. Requirements will include but not limited to: equipment details, schedule and reporting requirements including provision of electronic positioning equipment of the tug to daily verify the position of the disposal events.

1.7 CONTAINMENT AND SPILL MANAGEMENT

- .1 Comply with Federal (CEPA Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations) and Provincial regulations, codes, standards and guidelines for the storage of fuel and allied petroleum products on site.
- .2 Do not dump petroleum products or any other deleterious substances on ground or in the water.
- .3 Be diligent and take all necessary precautions to avoid spills and contaminate the soil and water (both surface and subsurface) when handling petroleum products on site and during fueling and servicing of vehicles and equipment.

- .4 Maintain vehicles and equipment in good working order to prevent leaks on site.
- .5 In Spill Management and Reporting:
 - .1 All construction staff should be trained and familiar with the Spills and Emergency Management plan, including roles and responsibilities, locations and contents of spill kits, and use of equipment. A check list approach should be developed for staff to sign-off and confirm training.
 - .2 Upon identification of a spill, immediate containment is required. All areas affected by the spill shall be remediated.
 - .3 Spill response equipment shall be located and maintained on-site and utilized in accordance with applicable the spill containment procedures. Multiple spills kits (number to match the scale of the project and to isolate a contaminated area) shall be placed in covered, accessible structures around the construction site.
- .6 Typical spill response equipment (spill kit) shall include as a minimum: absorbent spill pads, berms, cover drains and personal protective equipment (materials for both in-water and on land spill) to be used to contain the spill as appropriate. Replace or repair material after use.
- .7 Contractor to ensure adequate additional resources available.
- .8 Wastes that are generated from remedial operations that are considered to be hazardous wastes under Ontario Regulation 347 of the Environmental Protection Act must be contained in sealed containers and temporarily stored on the project site until they are collected for disposal by a licensed waste hauler.
- .9 All other non-hazardous waste generated by a concrete pour operation shall be disposed according to Ontario Regulation 558/00. R.R.O. 1990 (General – Waste Management).
- .10 Environmental permits shall be obtained by the Contractor for any off-site disposal.
- .11 Any spill into water, or in a dewatered area must be reported immediately to PCA's Environmental Authority, the Departmental Representative and the Ontario Ministry of Environment and Climate Change's Spills Action Centre (SAC) (Telephone No. 1-800-268-6060).
- .12 Any spill on land must be reported immediately to PCA's Environmental Authority and the Departmental Representative. Any spill on land meeting the criteria set out in Ontario's Environmental Protection Act, O. Reg. 675/98 must be reported immediately to the Ontario Ministry of Environment and Climate Change's Spills Action Centre (SAC)
- .13 Materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals are not to enter the watercourse.
- .14 Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance.

1.8 HAZARDOUS MATERIAL HANDLING

- .1 Store and handle hazardous materials in accordance with applicable federal and provincial regulations, codes, standards and guidelines. Store in location that will prevent spillage into the environment.

- .2 Label containers to WHMIS requirements and keep MSDS data sheets on site for all hazardous materials.
- .3 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when stored.
- .4 Store and handle flammable and combustible materials in accordance with National Fire Code.

1.9 DISPOSAL OF WASTES

- .1 Do not dispose of hazardous waste, volatile materials (such as mineral spirits, paints, thinners etc.) and petroleum products into waterways, storm or sanitary sewers or in waste landfill sites.
- .2 Dispose of hazardous waste in accordance with applicable federal and provincial, regulations, codes, standards and guidelines.

1.10 WATER QUALITY

- .1 Conduct dredging of a watercourse in such a manner to limit turbidity and reduce sediment suspension in the water to an absolute minimum at all times.
 - .1 Maintain appropriate production speed and momentum of the excavation equipment. Make adjustments as required and as approved by Departmental Representative.
 - .2 Strategically position excavator equipment and haul vehicles to avoid over the water swings of dredged material whenever possible.
 - .3 Restrict the amount of material dredged to the area and depth required for navigation.
- .2 Fine-grained dredge material is to be transported from in situ, directly to scows. No bottom stockpiling, dragging or sidecasting material during dredging will be allowed.
- .3 Do not wash down equipment within a 30 metre buffer zone of a wetland, watercourse or other identified environmentally sensitive area.
- .4 Where required, install effective sediment control measures before starting work to prevent the entry or re-suspension of sediment in the water body. Inspect sediment control measures regularly to ensure they are functioning properly, and make all necessary repairs if any damage occurs. Upon completion of use, remove these control measures in a way that prevents the escape of settled sediment.
- .5 Develop and implement an Erosion and Sediment Control Plan for the site that minimizes risk of sedimentation of the water body during all phases of the work. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the water body or settling basin and runoff water is clear. The plan should, where applicable, include:
 - .1 Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
 - .2 Measures for managing water flowing onto the site, as well as water being pumped / diverted from the site such that sediment is filtered out prior to the

water entering a water body. For example, pumping / diversion of water to a vegetated area, construction of a settling basin or other filtration system.

- .3 Site isolation measures (e.g., silt boom or silt curtain) may only be required for locally containing suspended sediment. Refer to Appendix C for soil conditions. Regular inspection and maintenance of erosion and sediment control measures and structures during the course of the work.
- .4 Repairs to erosion and sediment control measures and structures if damage occurs.
- .5 Removal of non-biodegradable erosion and sediment control materials once site is stabilized.

1.11 BIRD AND BIRD HABITAT

- .1 Become knowledgeable with and abide by the Migratory Birds Convention Act (MBCA) in regards to the protection of migratory birds, their eggs, nests and their young encountered on site and in the vicinity.
- .2 Minimize disturbance to all birds on site and adjacent areas during the entire course of the Work.
- .3 Do not approach concentrations of seabirds, waterfowl and shorebirds when anchoring equipment, accessing wharves or ferrying supplies.
- .4 During night time work, shield lights and point them downwards.
- .5 Do not use beaches, dunes and other natural previously undisturbed areas of the site to conduct work unless specifically approved by the Departmental Representative.
- .6 Should nests of migratory birds in wetlands be encountered during work, immediately notify Departmental Representative for directives to be followed.
 - .1 Do not disturb nest site and neighbouring vegetation until nesting is completed.
 - .2 Minimize work immediately adjacent to such areas until nesting is completed.
 - .3 Protect these areas by following recommendations of Canadian Wildlife Service.

1.12 FISH PROTECTION

- .1 Avoid wet, windy and rainy periods that may increase erosion and sedimentation.
- .2 Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows.
- .3 Cleaning and washing of equipment shall be performed immediately upon their arrival at the site and before use in or over the body of water.
- .4 Conduct cleaning and washing operations as follows:
 - .1 Scrape and remove heavy accumulation of mud and dispose appropriately.
 - .2 Wash all surfaces of equipment by use of a pressurized fresh water supply.
 - .3 Immediately follow with application of a heavy sprayed coating of undiluted vinegar or other environmentally approved cleaning agent to thoroughly remove all plant matter, animals and sediments.
 - .4 Check and remove all plant, animal and sediment matter from the all bilges and filters.

- .5 Drain standing water from equipment and let fully dry before use.
- .6 Upon removal from the water, drain standing water from equipment and let fully dry before removal off the site.
- .7 Do not perform cleaning and washdown within a 30 metre buffer zone of a wetland, watercourse or other identified environmentally sensitive area.
- .5 Record of Assurance Logbook:
 - .1 Write data in a hard cover bound logbook to include the following:
 - .1 Date and location where equipment was previously used in a watercourse or wetland;
 - .2 Type of work performed.
 - .3 Dates of wash down for each piece of equipment;
 - .4 Cleaning method and cleaning agent(s) used.
 - .6 Keep Record of Assurance Logbook updated from project to project. Upon request, submit logbook to Departmental Representative for review.
 - .7 Abide by requirements and recommendations from Fisheries and Oceans Canada – Fisheries Protection Program in cleaning and wash down of equipment.
 - .8 Work activities must comply with all / any conditions of the Fisheries Act Letter of Advice issued by Fisheries and Oceans Canada.

1.13 AIR QUALITY

- .1 Keep airborne dust and dirt resulting from the work on site to an absolute minimum.
- .2 Dust suppression by the application of water must be employed, when required. Apply dust control measures to roads, parking lots and work areas. The Departmental Representative shall determine locations where water is to be applied, the amount of water to be applied, and the times at which it shall be applied. Waste oil must not be used for dust control under any circumstances.
- .3 Spray surfaces with water or other environmentally approved product. Use purposely suited equipment or machinery and apply in sufficient quantity and frequency to provide effective result and continued dust control during the entire course of the work.
- .4 Do not use oil or any other petroleum products for dust control.

1.14 ARCHAEOLOGICAL

- .1 All construction personnel are responsible for reporting any unusual materials unearthed during construction to the construction supervisor. If the find is believed to be an archaeological resource, the construction supervisor will immediately stop work in the vicinity of the find and notify his / her immediate supervisor.
- .2 If an archaeological and / or historically significant item is discovered during dredging or excavation, work in the area will be stopped immediately and the Departmental Representative will be contacted as well as the provincial Archaeological Services unit.
- .3 Work can only resume in the vicinity of the find when authorized by the PCA Project Manager and Construction Supervisor.

- .4 In the event of the discovery of human remains or evidence of burials, the excavation work will immediately cease and nearest law enforcement agency will be contacted immediately by the PCA Project Manager and/or the Construction Supervisor.

1.15 FIRES

- .1 Fires and burning of rubbish on site is not permitted.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Inspection, administrative and enforcement requirement.

1.2 INSPECTION

- .1 Allow Department Representative and Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Department Representative and Consultant will order part of Work to be inspected if Work is suspected to be not in accordance with Contract Documents. If, upon the inspection such work is found not in accordance with Contract Documents, correct such Work and pay cost of inspection and correction.

1.3 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection Agencies may be engaged by Department Representative for purpose of inspecting portions of Work. Cost of such services will be borne by PCA.
- .2 If defects are revealed during inspection, appointed agency will request additional inspection to ascertain full degree of defect. Correct defect as advised by Department Representative at no cost to Department Representative. Pay costs for re-inspection.

1.4 ACCESS TO WORK

- .1 Allow inspection agencies access to Work. Co-operate to provide reasonable facilities for such access.

1.5 REPORTS

- .1 Submit electronic copy of inspection to Department Representative.
- .2 Provide copies to subcontractor of work being inspected.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 56 00 – Temporary Barriers and Enclosures.

1.2 REFERENCES

- .1 Latest version of the following Canadian Standards Association (CSA International) standards:
 - .1 CSA-A23.1/A23.2 Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-0121, Douglas Fir Plywood.
 - .3 CAN/CSA-S269.2, Access Scaffolding for Construction Purposes.
 - .4 CAN/CSA-S269.3, Concrete Formwork.
 - .5 CAN/CSA-Z321, Signs and Symbols for the Occupational Environment.
 - .6 CAN/CSA-Z797, Code of Practice for Access Scaffold.
- .2 Ontario Provincial Standard Specification, OPSS 805, Construction Specification for Temporary Erosion and Sediment Control Measures.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be gravelled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use. Considering work may be used by following dam construction contractor, Contractor shall obtain approval from Departmental Representative confirmation on what elements are to remain prior to removal.

1.5 SCAFFOLDING

- .1 Not used

1.6 HOISTING

- .1 Provide, operate and maintain hoists/cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists/cranes to be operated by qualified operator.

1.7 SITE STORAGE/LOADING

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with equipment, debris piles, and removable bins outside of pre-approved staging area determined in advance of Work. .
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.8 CONSTRUCTION PARKING

- .1 Provide and maintain adequate access to project site.
- .2 The site area is limited and the Contractor must arrange and pay for any additional storage or work areas that are needed to complete the work.
- .3 Clean areas where used by Contractor's equipment.
- .4 Provide snow removal during progress of work as required for access to project site.

1.9 SECURITY

- .1 Provide and pay for suitable measures and methods to guard site and contents of site after working hours and during holidays, and for duration of project completion.

1.10 LIVING FACILITIES

- .1 Living facilities and meals to be arranged by the Contractor.

1.11 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Contractor to make his own arrangements for on-site storage areas.
- .2 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .3 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.12 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.13 CONSTRUCTION SIGNAGE

- .1 Only Project Identification and Consultant/ Contractor signboards and notices for safety or instruction are permitted on site.
- .2 Signs and notices for safety and instruction to CAN/CSA-Z321.
- .3 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Department Representative.

1.14 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Maintain and protect traffic on affected roads including the barge launch area during construction period except as otherwise specifically directed by Department Representative. Roads include Royal Mile Drive and West Shore Road.
- .2 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .3 Protect travelling public from damage to person and property.
- .4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
 - .1 Also in accordance with Section 01 14 00.
- .5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor is responsible for repair of damage to roads caused by construction operations. Consider spring load restrictions in planning deliveries to site.
 - .1 Also in accordance with Section 01 14 00.
- .6 Provide necessary, signs, barricades, and distinctive markings for safe movement of traffic.
- .7 Dust control: adequate to ensure safe operation at all times.
- .8 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.
- .9 Provide snow removal during period of Work if required.

1.15 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily to waste disposal staging area.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways and restore roadways to original conditions or better.
- .3 Store materials resulting from demolition activities that are salvageable and removed from work site daily to waste disposal staging area.
- .4 Stack stored new or salvaged material not in construction facilities.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Obtain approval from Departmental Representative prior to remove erosion and sedimentation controls and to restore and to stabilize areas disturbed during removal.

END OF SECTION

Part 1 General**1.1 RELATED DOCUMENTS**

- .1 Not Used.

1.2 REFERENCES

- .1 Construction to be in accordance with the latest edition of the applicable Ontario and National codes. The above to govern except where other applicable codes or provided notes are more restrictive.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.59-[97], Alkyd Exterior Gloss Enamel.
 - .2 CAN/CGSB 1.189-[00], Exterior Alkyd Primer for Wood.
 - .3 CAN/CGSB-S269.2, Access Scaffolding for Construction Purposes.
- .3 Canadian Standards Association (CSA International):
- .4 CSA-O121, Douglas Fir Plywood Ontario Ministry of Natural Resources (OMNR)
 - .1 Reptile and Amphibian Exclusion Fencing: Best Practices, Version 1.0. Species at Risk Branch Technical Note. [2013]
- .5 Province of Ontario
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990 as amended
 - .2 O. Reg. 213/91 as amended: Construction Projects
 - .3 O. Reg. 419/05: Air Pollution – Local Air Quality
- .6 Ontario Provincial Standard Specification OPSS 539, Construction Specification for Temporary Protection Systems
- .7 Ontario Department of Transportation, Book 7 of the Ontario Traffic Manual – Temporary Conditions.

1.3 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.4 HOARDING

- .1 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.5 GUARD RAILS AND BARRICADES

- .1 Provide as required by governing authorities.

1.6 ACCESS TO SITE

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.7 PUBLIC TRAFFIC FLOW

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.8 FIRE ROUTES

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.10 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products**2.1 NOT USED**

- .1 Not Used.

Part 3 Execution**3.1 NOT USED**

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 74 21 - Waste Management and Disposal

1.2 REFERENCES

- .1 Construction to be in accordance with the latest edition of the applicable Ontario and National codes. The above to govern except where other applicable codes or provided notes are more restrictive.
- .2 United States Environmental Protection Agency (USEPA)
 - .1 EPA 833-F-11-006 - Stormwater Best Management Practices: Concrete Washout [2012]

1.3 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Department Representative. Do not burn waste materials on site, unless approved by Department Representative.
- .3 Clear snow and ice from access to work area, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7 Dispose of waste materials and debris off site.
- .8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .10 Provide adequate ventilation during use of volatile or noxious substances.
- .11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.4 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Department Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Remove dirt and other disfiguration from exterior surfaces.
- .8 Sweep and wash clean paved areas.
- .9 Clean equipment and fixtures to sanitary condition.
- .10 Clean drainage systems.
- .11 Remove snow and ice from access to dam.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

- .1 Not Used.

2.2 EQUIPMENT

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 WASTE MANAGEMENT GOALS

- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PCA's waste management goal and Contractor's proposed Waste Reduction Workplan for Construction, Renovation and /or Demolition (CRD) waste to be project generated.
- .2 Carefully deconstruct and source separate materials/equipment and divert waste destined for landfill to maximum extent possible.
- .3 Reuse, recycle, compost, burn or sell material for reuse except where indicated otherwise. On site sales are not permitted.
- .4 Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste produced by CRD activities.
- .5 Protect environment and prevent environmental pollution damage.

1.2 RELATED SECTIONS

- .1 Section 01 35 29: Health and safety requirements.
- .2 Section 01 35 44: Environmental procedures.
- .3 Section 01 74 11: Cleaning.

1.3 REFERENCES

- .1 Construction to be in accordance with the latest edition of the applicable Ontario and National codes. The above to govern except where other applicable codes or provided notes are more restrictive.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
- .2 Prepare and submit following prior to project start-up:
 - .1 One copy and one electronic copy of completed Waste Audit (WA).
 - .2 One copy and one electronic copy of completed Waste Reduction Workplan.
- .3 Written monthly summary report detailing cumulative amounts of waste materials reused, recycled and landfilled, and brief status of ongoing waste management activities.
- .4 Registration of activities on the Ontario Hazardous Waste Information Network (HWIN), if applicable

1.5 WASTE AUDIT (WA)

- .1 Source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.
 - .1 Provide facilities for collection, handling and storage of source separate wastes.

- .2 Source separate the following waste:
 - .1 Cement and concrete.
 - .2 Corrugated cardboard.
 - .3 Wood.
 - .4 Steel.

1.6 WASTE REDUCTION WORKPLAN (WRW)

- .1 Prepare and submit WRW (Schedule B) at least 10 days prior to project start-up.
- .2 WRW identifies strategies to optimize diversion through reduction, reuse, and recycling of materials and comply with applicable regulations. Updated Project Schedule is to be submitted with every request for Progress Payment.
- .3 WRW should include but not limited to:
 - .1 Applicable regulations.
 - .2 Specific goals for waste reduction, identify existing barriers and develop strategies to overcome them.
 - .3 List of approved Disposal Facilities
 - .4 List of approved Haulers
 - .5 Destination of materials identified.
 - .6 Deconstruction/disassembly techniques and schedules.
 - .7 Methods to collect, separate, and reduce generated wastes.
 - .8 Location of waste bins on-site.
 - .9 Security of on-site stock piles and waste bins.
 - .10 Protection of personnel, sub-contractors.
 - .11 Clear labelling of storage areas.
 - .12 Details on materials handling and removal procedures.
 - .13 Recycler and reclaimer requirements.
 - .14 Quantities of materials to be salvaged for reuse or recycled and materials sent to landfill.
 - .15 Requirements for monitoring on-site wastes management activities.
- .4 Monitor and report on waste reduction by documenting total volume (in tonnes) and cost of actual waste removed from project.

1.7 WASTE SOURCE SEPARATION PROGRAM (WSSP)

- .1 As part of Waste Reduction Workplan, prepare a WSSP prior to project start-up.
- .2 WSSP will detail methodology and planned on-site activities for separation of reusable and recyclable materials from waste intended for landfill.
- .3 Provide list and drawings of locations that will be made available for sorting, collection, handling and storage of anticipated quantities of reusable and recyclable materials.

- .4 Provide sufficient on-site facilities and containers for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .5 Locate containers to facilitate deposit of materials without hindering daily operations.
- .6 Locate separated materials in areas which minimizes material damage.
- .7 Clearly and securely label containers to identify types/conditions of materials accepted and assist in separating materials accordingly.
- .8 Monitor on-site waste management activities by conducting periodic site inspections to verify: state of signage, contamination levels, bin locations and condition, personnel participation, use of waste tracking forms and collection of waybills, receipts and invoices.
- .9 On-site sale of salvaged materials is not permitted.

1.8 USE OF SITE AND FACILITIES

- .1 Execute Work with minimal interference and disturbance to normal use of premises.
- .2 Maintain security measures established by facility and provide temporary security measures approved by Departmental Representative.
- .3 Dumping of dredging material of Kennisis River Upstream of Red Pine Lake: On property adjacent to leased property within 2 km.
- .4 Dumping of dredging material of Kennisis River Downstream of Red Pine Lake: At cleared site adjacent to Dam at location determined by PCA/KGS.
- .5 If Contractor decides not to remove Deadhead Trees from the lake, the Deadhead Trees shall be relocated out of barge navigation channel (Minimum a distance of 5.0 m from edge of designed dredging path). The placement of the deadhead tress shall not create a hazard for boaters and be subject to approval by departmental representative.
- .6 If Contractor decides not to remove boulders of substantial size (Larger than approximately 0.5 m³) from the lake, the boulders shall be relocated out of barge navigation channel (Minimum a distance of 5.0 m from edge of designed dredging path). The placement of the boulders shall not create a hazard for boaters and be subject to approval by departmental representative.

1.9 WASTE PROCESSING SITES

- .1 Province of Ontario:
 - .1 Ministry of Environment and Energy, 135 St. Clair Avenue West, Toronto ON M4V 1P5. Telephone: 1-800-565-4923 or 416-323-4321 Fax: 416-323-4682
 - .2 Recycling Council of Ontario, 215 Spadina Ave. #225, Toronto ON M5T 2C7. Telephone: 416-657-2797, Fax: 416-960-8053, Email: rco@rco.on.ca, Website: <http://www.rco.on.ca/>
- .2 Contractor responsible for accessing a licensed/approved landfill site for both hazardous and nonhazardous materials. Submit location of the licensed landfill site to Departmental Representative for review.

1.10 QUALITY ASSURANCE

- .1 After award of Contract, a mandatory site examination will be held for this Project for Contractor responsible for renovation demolition/deconstruction waste management.
 - .1 Date, time and location will be arranged with Departmental Representative.
- .2 Waste Management Meeting: Waste Management Coordinator is to provide an update on status of waste diversion and management activities at each meeting. Written monthly Waste Diversion Report summary to be provided by Waste Management Coordinator.
- .3 Submit proof that all waste is being disposed of at a licensed landfill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site.

1.11 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed and salvaged materials from movement or damage.
- .6 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .7 Separate and store materials produced during project in designated areas.
- .8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities:
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
 - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.12 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste volatile materials mineral spirits oil paint thinner into waterways, storm, or sanitary sewers.
- .3 Concrete waste water having a pH ≥ 12.5 must be disposed of in accordance with Section 02 81 0: Hazardous Materials.
- .4 Keep records of construction waste including:

- .1 Number and size of bins.
- .2 Waste type of each bin.
- .3 Total tonnage generated.
- .4 Tonnage reused or recycled.
- .5 Reused or recycled waste destination.
- .5 Remove materials on-site as Work progresses.
- .6 Prepare project summary to verify destination and quantities on a material-by-material basis.

1.13 SCHEDULING

- .1 Coordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 APPLICATION

- .1 Do Work in compliance with WRW and WSSP.
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.

3.3 DIVERSION OF MATERIALS

- .1 Separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.
 - .1 Mark containers or stockpile areas.
 - .2 Provide instruction on disposal practices.
- .2 On-site sale of salvaged recovered reusable recyclable materials is not permitted.

**3.4 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY
FOR THE ENVIRONMENT**

.1 Schedule G - Government Chief Responsibility for the Environment:

Province: Ontario

Address:

- .1 Ministry of the Environment and Climate Change, 135 St. Clair
Avenue West, Toronto, ON M4V 1P5;
- .2 Environment Canada, Toronto ON.

General Inquiries: 416-323-4321, 800-565-4923, 416-734-4494

Fax: 416-323-4682

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 74 11 – Cleaning.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Department Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Department Representative inspection.
 - .2 Department Representative's Inspection:
 - .1 Department Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates in English and French that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested and fully operational.
 - .4 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Department Representative.
 - .2 When Work incomplete according to Department Representative, complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance: when Department Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
 - .7 Final Payment:
 - .1 When Department Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

- .2 When Work deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.
- .8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.3 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
 - .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Warranties and bonds.

1.2 RELATED REQUIREMENTS

- .1 Section 01 45 00 – Quality Control.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare instructions and data using personnel experienced in maintenance and operations of described products.
- .3 Copy will be returned after final inspection, with Departmental Representative's comments.
- .4 Revise content of documents as required prior to final submittal.
- .5 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of manuals and documentation in English.
- .6 Pay costs of transportation.

1.4 FORMAT

- .1 Organize data in the form of a manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in “dwg” format on CD.

1.5 CONTENTS – PROJECT RECORD DOCUMENTS

- .1 Table of Contents: provide title of project;
 - .1 Date of submission; names
 - .2 Addresses and telephone numbers of Departmental Representative and Contractor with name of responsible parties.

- .3 Schedule of products and systems, indexed to content of volume.
- .2 Drawings: supplement product data to illustrate relations of component parts, to show control and flow diagrams.

1.6 AS -BUILT DOCUMENTS

- .1 Maintain, at site for Department Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Department Representative.
- .6 Turn one set, paper copy and electronic copy, of AS-BUILT drawings and specifications over to Departmental Representative on completion of Work.
- .7 If project is completed without significant deviations from Contract drawings and specifications, submit to Departmental Representative one set of drawings and specifications marked "AS-BUILT".

1.7 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .2 Provide digital photos, if requested, for site records.

1.8 FINAL SURVEY

- .1 Submit final site survey drawings certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.9 WARRANTIES AND BONDS

- .1 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 This section specifies requirements for excavating underwater materials in areas and to dimensions and coordinates indicated in the drawings, and for transporting and disposing of excavated materials to specified locations.
- .2 Work includes but is not limited to the following:
 - .1 Dredging to the line and elevation according to the contract drawings and specifications.
 - .2 Excavation and disposal of surplus material.
- .3 Related Sections
 - .1 Section 01 35 44 – Environmental Protection Procedures for Marine Work

1.2 REFERENCE STANDARDS

- .1 Perform work accordance with Ontario Provincial Standard Specifications and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 PCA Environmental Standards and Guidelines Document Ontario Waterways, July 2017 (ESG).
- .3 Occupational Health and Safety Act (OHSA).
- .4 Canadian Environmental Quality Guidelines (CCME).

1.3 DEFINITIONS

- .1 Dredging: excavating, transporting and disposing of underwater materials as specified.
- .2 Excavation classes: two classes of excavation will be recognized; rock excavation and common excavation:
 - .1 Rock Excavation: Material from solid masses of igneous, sedimentary or metamorphic rock which, prior to removal, was integral with parent mass. Frozen material is not classified as rock
 - .2 Common Excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .3 Unclassified Excavation: excavation of deposits of whatever character encountered in Work.
- .4 Debris: pieces of wood, wood chips, bark, logs, submerged logs, tree branches, scrap vehicle tires, concrete, steel cable, steel chain, wire rope, scrap steel, etc.
- .5 Grade: plane or planes above which all material is to be dredged.
- .6 Estimated Quantity: volume in cubic meters of material calculated to be above dredge grade and within side slopes, unless otherwise specified.

- .7 Side Slope: inclined surface or plane from grade at side limit of dredging area to intersect original ground line outside of side limit and to be expressed as a ratio of horizontal to vertical.
- .8 Cleared Area: a dredge area that has been accepted by the Departmental Representative as complying with plans and specifications and all material removed to grade.
- .9 CEPA: Canadian Environmental Protection Act.
- .10 Dredging Area: a rectangle or polygon, defined by coordinates in which dredging is to take place.

1.4 LOCATION

- .1 Contract drawings indicate those areas which required dredging at the time of the most recent surveys.

1.5 SCHEDULE OF WORK

- .1 Submit to Departmental Representative, within 5 working days after award of Contract, a schedule of work including time periods during which each operation involved in the work will be undertaken. Also submit an estimated monthly dredging production of material in cubic meters for each operation. At the time of submission of the schedule meet with the Departmental Representative to review the schedule.
- .2 Adhere to the schedule and take immediate action to correct any slippage by effectively altering existing dredging operations or mobilizing other equipment. The Departmental Representative is to be notified of the corrective action to be taken.

1.6 REQUIREMENTS OF REGULATORY AGENCIES

- .1 Perform work in accordance with the National Building Code of Canada (NBC) and any other municipal, provincial and/or national codes relating to the project including the provisions of the Canadian Environmental Protection Act (CEPA). In any case of conflict or discrepancy, the more stringent requirements will apply. PCA will provide DFO approval.
- .2 Meet or exceed requirements of specified standards, codes and referenced documents.
- .3 Mark floating equipment with lights in accordance with Regulations for the Prevention of Collisions, as required by Transport Canada.
- .4 Contractor will be required to obtain prior approval from applicable regulatory agencies for any dredging outside specified dredging limits.
- .5 Perform work in accordance with the requirements as listed under the following authorizations:
 - .1 Canadian Environmental Protection Act (CEPA)

1.7 FLOATING PLANT

- .1 Dredges or other floating plants which are to be employed on this work, must meet the requirements as specified in General Instructions.

1.8 DATUMS

- .1 Horizontal and Vertical Datum: The survey data uses the NAD83 CSRS (2010) horizontal datum, and CGVD2013 vertical datum.

1.9 INSPECTION OF SITE

- .1 The Contractor must visit the site of the work before tendering and make himself thoroughly familiar with the extent and nature of the work and all conditions affecting the work.

1.10 SITE INFORMATION

- .1 Results of the most recent survey are included on the drawings. This pre-tender data is made available for tendering purposes only. It should be noted that this information may differ from present site conditions.
- .2 It is anticipated that the following materials will be encountered within the dredging limits, but are not limited to:
 - .1 Common materials - are not included under definitions of rock excavation
 - .2 Rock
 - .3 Debris
- .3 The Contractor shall take the necessary steps to become fully familiar with potential inclement weather and lake conditions in this area.
- .4 The Contractor will be responsible for making his own interpretation of soil conditions.

1.11 DREDGING EQUIPMENT

- .1 Provide suitable lighting on the dredge for free movement of Departmental Representative to inspect work in progress during night dredging operations. Lighting to illuminate all walkways, ladders etc. to safely permit inspection of dredging operation.
- .2 The physical description of materials and environmental testing results are provided in Appendix C is based on small samples and is not necessarily indicative of the overall soil conditions.
- .3 On request, prove to the satisfaction of the Departmental Representative that the dredging equipment and plant are adequate to finish the work to quality, time and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.
- .4 Contractor shall be responsible for ensuring that equipment can access and function at the disposal site.

1.12 SURVEY REQUIREMENTS

- .1 The Contractor shall provide, at his expense, a survey vessel, equipment and crew to set up and maintain survey control for the location of the dredge and dredge limits and to survey areas immediately after dredging to verify that grade depth has been attained. A copy of the Contractor's positioning and survey records shall be provided to the Departmental Representative.

1.13 SEQUENCE OF ACCEPTABLE WORK

- .1 Surveys on the proposed dredging route have been conducted by PCA using Ground Penetrating Radar (GPR). The GPR Report is provided in Appendix C. The results are shown on dredging drawings plotting average of instantaneous depths. However, interpretation of the GPR data is qualitative. Contractor may carry out test pit/borehole to verify the true nature of the interpreted stratigraphy, river bed elevations and bedrock elevations.
- .2 No area shall be dredged prior to Departmental Representative and Contractor's mutual acceptance of the pre-dredge survey for that area.
- .3 Dredge tolerance would be as follows: Maximum permitted tolerances to achieve design depth in accordance with the dimensions provided on the drawings as follows:
 - .1 HORIZONTAL: - 0.0 m / + 1.0 m
 - .2 VERTICAL: - 0.0m / + 0.25 m
- .4 The contractor shall satisfy themselves with the pre-dredge survey included in Appendix B.
- .5 Post-dredge survey shall be undertaken by the Contractor upon completion of dredging of all areas identified in pre-dredge survey prior to demobilize the site. Submit results as indicated in item 1.14. The survey may use the same type of equipment as used in the pre-dredge survey. It will be subject to weather conditions and the availability of functional survey equipment. The survey will confirm if dredging is completed as specified. The Contractor shall re-dredge as necessary to remove all material within the dredge areas which is found to be above the dredging grade elevations or less than horizontal dredging limits.
- .6 All additional surveys require to clear the dredge area will be undertaken by the Departmental Representative at Contractor's cost.
- .7 All surveys shall be performed to Canadian Hydrographic Service Standards.
- .8 Dead trees shall not be removed from lake but shall be relocated away from navigation route (approximately 10 m away from navigation route).
- .9 Blasting or other use of explosive is not permitted.
- .10 Drawings and specifications are complimentary. When work is shown or mentioned on the drawings but it is not indicated in the specification, or when work is indicated in the specifications but is not shown or mentioned on the drawings, it shall be nevertheless be included in the contract.
- .11 In the event of discrepancies or conflicts in the interpreting the plans (drawings) and specifications, Specifications take precedence over drawings bound with specifications.

1.14 MEASUREMENT FOR PAYMENT

- .1 Dredging and removals will be measured in accordance with Section 01 22 01.
- .2 The dredge areas are defined by coordinates and dimensions, as shown on the drawings.
- .3 No payment will be made for the Contractor's survey vessel, equipment and crew or diving services.
- .4 No payment will be made for over-dredging.

- .5 All operations in connection with the field positioning of dredging equipment will be considered incidental to the work and will not be measured separately for payment.
- .6 Payment for dredging shall include the disposal of dredge material, at the designated disposal areas near site determined by PCA (See drawings for the locations). Disposal of dredge material must be in accordance with the Dredge Material Disposal Plan (DMDP) to be prepared by the Contractor.
- .7 Refer to Environmental Protection Procedures for Marine Work - Section 01 35 44 for related information.
- .8 There will be no additional payment for temporary structures used in dredging operations.
- .9 There will be no additional payment for delays caused by vessel traffic.
- .10 There will be no additional payment for down time, mechanical or weather-related.
- .11 Once designated areas have been dredged and cleared, all subsequent infilling shall be deemed as additional to the contract if removal is required.
- .12 Removal of material infilling during dredging will not be measured separately for payment.
- .13 There will be no additional payment for land disposal of debris not suitable for the offshore disposal at site.
- .14 There will be no additional payment for berthing or mooring facilities for the dredge plant or any other floating equipment.
- .15 The entire area as shown on the plan, shall be fully covered during dredging.
- .16 There will be no additional payment for delays or changes in dredging methods required as a result of water quality monitoring results.

1.15 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Quality Control: in accordance with Section 01 45 00 – Quality Control:
 - .1 Submit condition survey of existing conditions as described in Item 1.7 Existing Conditions of this Section.
 - .2 Submit to the Departmental Representative written notice at least seven (7) days prior to excavation work, to ensure cross sections are taken.
 - .3 Submit to the Departmental Representative written notice when bottom of excavation is reached.
- .3 Preconstruction Submittals:
 - .1 Submit construction equipment list for major equipment to be used prior to start of Work.

1.16 QUALITY ASSURANCE

- .1 Keep design, temporary works, construction plans, details and supporting data on site.
- .2 Health and Safety Requirements:

- .1 Conform to construction occupational health and safety in accordance with Section 01 35 29 - HEALTH AND SAFETY REQUIREMENTS.

1.17 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and/or recycling in accordance with Section 01 74 21 – WASTE MANAGEMENT AND DISPOSAL.
- .2 Divert excess materials from landfill to local recycling facility for reuse as directed by the Departmental Representative.

1.18 EXISTING CONDITIONS

- .1 Examine all geotechnical reports available from the Departmental Representative.
- .2 Buried services:
 - .1 Before commencing work establish location of buried services on and adjacent to site.
 - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: The Departmental Representative will pay the costs of relocating services.
 - .3 Remove obsolete buried services as determined by relevant authority and approved by the Departmental Representative.
 - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .5 Prior to beginning of excavation Work, notify the Departmental Representative to establish location and state of use of buried utilities and structures. Authorities having jurisdiction or the Departmental Representative shall clearly mark such locations to prevent disturbance during Work.
 - .6 Confirm locations of buried utilities by obtaining Ontario One Call Clearances and / or private locaters.
 - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .8 Where utility lines or structures exist in area of excavation, obtain direction of the Departmental Representative before removing or re-routing. Costs for such Work will be paid by the Contractor.
 - .9 Record location of maintained, re-routed and abandoned underground lines.
 - .10 Confirm locations of recent excavations adjacent to area of excavation.
- .3 Existing buildings and surface features:
 - .1 Conduct with the Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by the Work.
 - .2 Protect existing buildings and surface features from damage while Work is in progress.
 - .3 Where required for excavation, cut roots or branches or proceed to vegetation removal as directed by the Departmental Representative in accordance with Section 31 11 00 – Clearing and Grubbing.

Part 2 **Products**

Not applicable.

Part 3 **Execution**

3.1 GENERAL

- .1 The Contractor shall do the following in executing the work:
 - .1 Mark floating equipment with lights in accordance with International Rules of Road and maintain a radio watch on board.
 - .2 Place and maintain buoys, ranges, markers and lights required to define work. The Departmental Representative will provide the coordinate values for all dredge limits on the drawings.
 - .3 Maintain and lay out work from benchmarks and control points as shown on Drawings and noted in the Specifications. Any additional control points required to control dredging operations are the responsibility of the Contractor. The Contractor is to maintain these control points for the duration of the project and at the Contractor's cost.
 - .4 Any damage to private property will be made good by the Contractor to the satisfaction of the Departmental Representative at no cost to the owner.
 - .5 All survey equipment provided on the dredge by the Contractor is to be made accessible to the Departmental Representative for his use.
 - .6 Establish accurately and maintain water level gauges in order that proper depth of dredging can be determined. Locate gauges so as to be clearly visible at all times.
 - .7 Dredge areas to grade depths below Chart Datum where indicated on the drawing.
 - .8 Dredge all side slopes to three horizontal to one vertical unless otherwise noted.
 - .9 Remove all materials above specified grade depth and side slopes, within limits indicated. Material removed from below grade depth or outside specified area or side slope is not part of work and will not be measured.
 - .10 Remove shoaling which occurs as a result of the work at no expense to Departmental Representative.
 - .11 The Contractor is responsible for the removal of infilling in dredge areas which occurs prior to acceptance by the Departmental Representative.
 - .12 It will be the Contractor's responsibility to gain access to the dredge area. The construction of causeways, roads, etc., will be at the Contractor's expense and will be removed at the completion of the project. Any derricks, power lines, etc., which will require removal will be done so at the Contractor's expense and will be replaced to satisfaction of the Departmental representative. Contractor to advise Departmental representative of his proposed method to carry out dredging and disposal of the material.
 - .13 Immediately notify the Departmental Representative upon encountering any object which might be classified as an obstruction. By-pass the object, after clearly marking its location by coordinates and continue work.

- .14 Provide dump scows capable of maintaining dredge materials within hoppers until delivery to disposal site. The Departmental Representative has the right to order removal of dump scows from the site where leakage from the dump scows is deemed to be excessive.
- .15 Arrange and pay for berthing and mooring facilities for dredge plant and other floating equipment.

3.2 DISPOSAL OF DREDGE MATERIAL

- .1 The Contractor shall dispose of dredged material by depositing in the disposal area as identified in Section 01 35 44 and in such a manner as approved by Departmental Representative.
- .2 The Contractor shall dispose of dredge material by depositing within the designated disposal area as shown in the drawings.
- .3 Do not permit any dredged material to spill or flow into the waterways during the disposal of dredge material activities.
- .4 Contractor is to transport dredged material to the disposal site(s) using appropriate equipment.
- .5 Maintain roadways and transfer area in a clean manner throughout the duration of the contract.
- .6 See drawings for details. Limits of disposal area to be verified on site prior the start of the work. Restrict disposal activities to those areas indicated.

3.3 COOPERATION AND ASSISTANCE TO DEPARTMENTAL REPRESENTATIVE

- .1 Cooperate with Departmental Representative on inspection work and provide assistance requested.
- .2 On request of Departmental Representative, furnish use of such boats, equipment, labour and materials forming ordinary and usual part of dredging plant as may be reasonably necessary to inspect and monitor work. Provide approved duty boat to transport inspectors to and from dredge, at beginning and end of each inspection shift. Inspection shifts will be 8 hours in duration. The duty boat must be of adequate size and power to operate safely in conditions encountered. It must be fitted with a sufficient number of approved life jackets and hard hats for inspection staff.
- .3 Provide Departmental Representative or inspector with copies of, or access to, daily records of dredging activity, including areas dredged, type of material, place measure of material dredged (daily and accumulated), hours of dredging, hours and reasons for downtime, and other information regarding dredging and disposal as requested by the Departmental Representative.

END OF SECTION

APPENDIX A
ROYAL MILL DRIVE PHOTOS

APPENDIX A

SITE PHOTOS

Photo 1 - Royal Mill Drive



Photo 2 – Close up Look of The Two Trees To Be Removed



Photo 3 – Royal Mill Drive



Photo 4 – Royal Mill Drive



APPENDIX B
GPR SCAN RED PINE LAKE



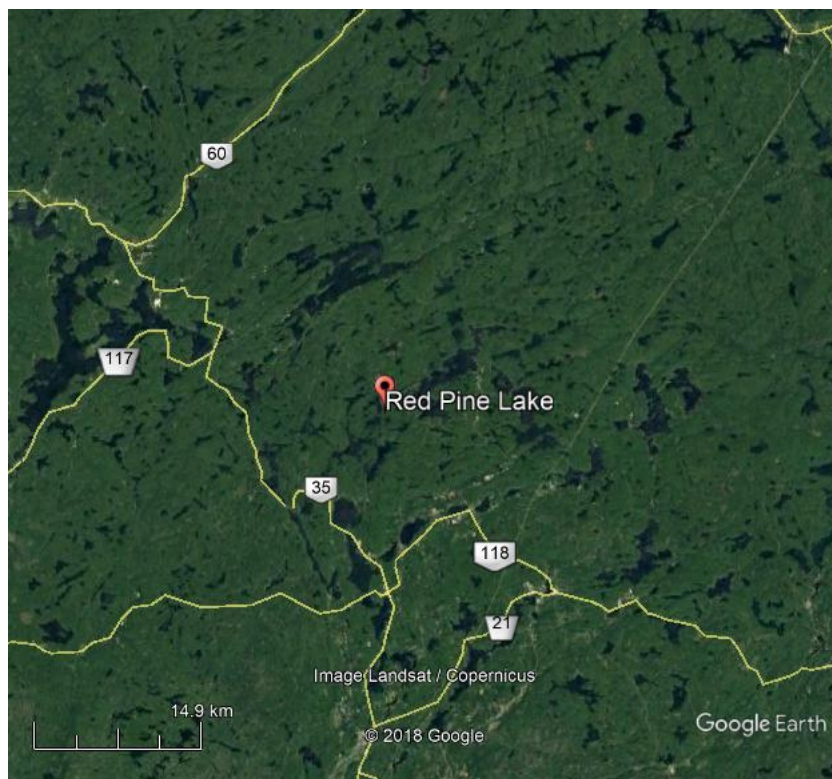
GEOPHYSICS GPR INTERNATIONAL INC.

GROUND PENETRATING RADAR SURVEY FOR SUB-BOTTOM PROFILING, RED PINE LAKE, ONTARIO

Presented to:

KGS
GROUP
CONSULTING
ENGINEERS

402-4310 Sherwoodtowne Blvd
Mississauga, ON
L4Z 4C4



Geophysics GPR International Inc.

6741 Columbus Road, Unit 14

Mississauga (Ontario) L5T 2G9

Tel. : +1 905.696.0656

info@geophysicsgpr.com

July 2019

GPR-19-1463

TABLE OF CONTENT

1 INTRODUCTION.....	1
2 METHODOLOGY.....	2
2.1 Survey Dates.....	2
2.2 Personnel.....	2
2.3 Positioning, Topography and Units of Measurement.....	2
2.4 Ground Penetrating Radar (Georadar).....	2
3 RESULTS & CONCLUSIONS.....	4

Illustration Index

Appendices:

Appendix A: Seismic Methodology Fact Sheets

Appendix B: Drawing GPR-19-1463 Geophysical Profiles and Drawings



1 INTRODUCTION

Geophysics GPR International Inc. (GPR) was requested by the KGS Group to carry out a marine geophysical survey as a component of a geotechnical investigation for proposed dredging routes within Red Pine Lake, Algonquin Highlands, Ontario.

The goal of this investigation was to map potential areas of shallow bedrock along proposed access routes to the Red Pine Lake Dam.

Georadar methodologies were employed to map the areas of shallow bedrock. Seismic methods are the preferred methodology for accurately mapping depth to compete bedrock. Georadar was chosen for the efficiency of data collection and potential for accurate, high resolution results.

The following report describes the survey design, the principles of the applied methods, the methodology for interpreting the data and finally a culmination of the results in the form of interpreted profiles and plan view maps.

Throughout this report, geophysical parameters (georadar reflections) are used to infer the nature of the subsurface materials. Drill hole or test pit data should be used to support the interpretations provided.



2 METHODOLOGY

2.1 Survey Dates

The dates GPR personnel were on-site and methodologies employed are outlined in Table 1.

Table 1: Survey dates 2019

Methodology	Dates On-Site
Georadar	June 19 th , 2019

2.2 Personnel

The dates GPR personnel were on site are outlined in Table 2.

Table 2: Names and roles

Employee	Role	Dates On-Site
Tomas Westerblom	Senior Technician	June 19 th , 2019
Peter Westerblom	Boat Operator	June 19 th , 2019

2.3 Positioning, Topography and Units of Measurement

Positioning was controlled by GPS with differential corrections (DGPS). The overall accuracy of the positioning is estimated to be on the order of +/-0.5 to 1.0m.

Elevation data was referenced to the water level of 371.54m provided by the client.

The proposed dredging elevation of 370.1m +/- 0.3m was provided by the client.

All geophysical measurements were collected in SI units.

The coordinate system, where applicable for data presentation is NAD83 UTM zone 17N.

2.4 Ground Penetrating Radar (Georadar)

Basic Theory

Ground Penetrating Radar (or Georadar) utilizes radar technology to obtain a near-continuous profile of the subsurface. The basic principle is to emit an electromagnetic impulse into the ground. This pulse will travel through the sub-surface and reflect off the boundaries of materials with differing dielectric constants (contrasts of EM impedances). The reflected pulse returns to the surface and is recorded by a receiver. Examples of radar reflecting boundaries included air/water (water table); water/earth (bathymetry); earth/metal, PVC, or concrete (pipe locating); and differing earth materials (stratigraphic profiles, including bedrock profiles).

The depth of investigation is controlled by the frequency and power of the antenna limited by attenuation and diffraction of the radar signal. Lower frequency antennas provide greater depth penetration at the expense of resolution. The radar signal is attenuated by conductive ground materials (e.g. clays, dissolved salts etc.). The radar signal is diffracted by irregular shaped material (e.g. boulders, debris etc.) that prevents the clear return of the reflected pulse.

Survey Design

Data was collected using the SIR-4000, accompanied by a 350MHz antenna. The georadar was



mounted a dinghy, which was then towed beside a small boat. The data were recorded continuously while manoeuvring along the water way.

Interpretation Method

Processing of the radar images involved basic horizontal normalization, filtering and gain adjustments.

The vertical scale on all radar images is a two-way time scale representing the time taken for a radar pulse to transmit to a reflector and back to the receiver. In order to convert the time scale to a depth scale a signal velocity must be applied. The velocity with which the pulse travels through the given material is determined by the dielectric constant. This dielectric will vary with the type of material.

Calculating a velocity can be done in many ways but the most reliable method is with a test pit or borehole where the real rock contact can be exposed. Based on in-situ measurements or borehole data, the dielectric value can be approximated depending on the expected material type. An underestimate of the dielectric will result in an over estimate of the signal velocity and in turn an over estimate of the depths. For this site, a dielectric of 81 (velocity of 3cm/ns) was used for the water column. The bottom sediments used an assumed dielectric of 20 (velocity of 7 cm/ns). Test pit or borehole data can be used to further refine this estimated dielectric value.

Interpretation of the data is based primarily on the qualitative analysis of three characteristics of radar reflections: continuity, amplitude and shape. The interpreter then identifies reflectors and textures within the radar records that represent subsurface contacts, objects or zones. The true nature of the interpreted features can only be assumed without corroborating evidence.

Figure 1 presents an example image of the georadar data at the northeast end of the survey area from the northeast bound lane.

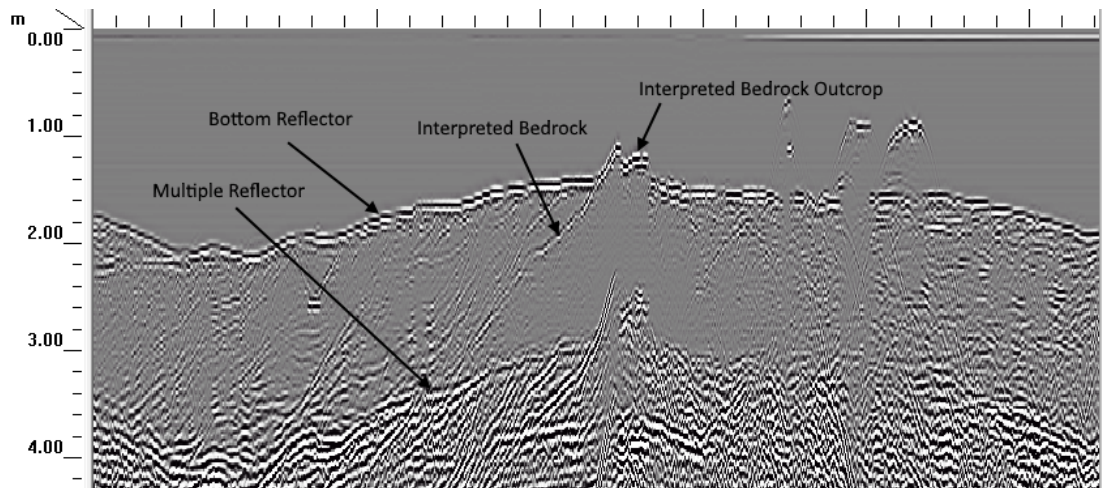


Figure 1: Example Georadar image

3 RESULTS & CONCLUSIONS

The results of the geophysical survey are presented in Drawings GPR-19-1463 A1 through A1 and in profile view along the proposed routes.

The profile drawings present northern, central and southern alignments within the proposed routes. The data along the alignments have been sampled from the contoured data sets. The alignments were drawn in close proximity to the radar track plots.

A total of approximately 12.8 km of georadar data were collected.

Bedrock was not visible along the entire profile length. The maximum depth of radar signal penetration was on the order of 4-5 m below water surface. In some areas the sub-bottom reflectors are masked by “multiples”. Multiples occur from repeated reflections from the bottom and sub-bottom contacts.

Bathymetry (bottom elevation) has been interpreted from the georadar data. Bottom elevations between the georadar tracklines are interpolated based on the contouring algorithm. Bathymetric data collected with ground radar is not to hydrographic standards and is not valid for navigation purposes.

The signal penetration of the georadar was good to very good. The signal-penetration of the radar is very site specific with sands/gravels generally have very good results and clays having generally poor results. The signal penetration in silty materials can fall between the two. The advantages of georadar, when there is good signal penetration, is that data collection is very efficient and the results can be very accurate.

Interpretation of the georadar data is qualitative. The accuracy of the interpretation is difficult to fully assess. The largest source of uncertainty is in the determining if the interpreted reflector is from the top of the bedrock, within the bedrock or a sedimentary layer. The secondary source of error is in the use of an estimated or assumed dielectric value for the bottom sediments. The dielectric will vary with the material (sand vs clay), degree of compaction and water content. The estimated error in the dielectric value is typically on the order of +/- 15%. Test pit/borehole data is the best way to verify the true nature of the interpreted contacts and calibration of the dielectric value.

Test pits or boreholes are recommend to be collected at several locations along the alignments where interpreted shallow bedrock is indicated. Table 2 provides a list of suggested test locations. The test locations are spread out along the alignments. If a preferred route is chosen, the proposed test pit locations can be focused on the preferred line.



Table 2: Suggested Test pit/borehole locations

Profile	Chainage	Easting	Northing
Main Route - North	2+216	681640	5008388
Main Route – South	2+788	681292	5008093
Main Route - Centre	2+270	681626	5008346
Main Route - Centre	2+796	681282	5008103
South Route - Centre	3+075	681261	5007760
South Route - Centre	2+622	681616	5007989
South Route - North	3+025	681294	5007761
South Route – South	2+703	681598	5007916
Main Route - Centre	4+655	679825	5008947
Main Route - Centre	4+921	679616	5009000
Main Route - North	4+792	679728	5009049
Main Route - South	5+032	679510	5008969

It should also be noted that very large boulders were observed along the alignments. In particular along the southern channel route.

Collecting seismic data is an option for obtaining bedrock depths along the final route. Seismic data will have a significantly higher confidence level in identification of competent bedrock than the georadar. The overall cost would be higher than the georadar survey, but potentially lower than an intrusive drilling program.

Interpretation of the radar data was performed by Ilia Gusakov, GIT. This report has been prepared by Ben McClement, P.Eng.


Ben McClement, P.Eng.



APPENDIX A

Radar Fact Sheet





GSSI SIR-4000 – High Performance GPR Data Acquisition System

System

Antennas: Compatible with all GSSI antennas
 Number of Channels: Records data from 1 single-frequency antenna or 1 dual-frequency antenna
 Data Storage: 32 GB Flash, 1 GB RAM
 Display: Enhanced 10.4" LED display with internal high brightness, Active matrix 1024 x 768 resolution and 32-bit color
 GPS: Data logged internally
 Display Modes: Linescan, Linescan plus O-scope, Wiggle trace Full 3D, 256 color bins are used to represent the amplitude and polarity of the signal
 Environmental Rating: IP65

Data Acquisition

Data Format: RADAN® (dzt)
 Output Data Format: 32-bit
 Scan Interval: User-selectable, up to 400 scans/sec
 Samples per Scan: 256, 512, 1024, 2048, 4096, 8192, 16384
 Operating Modes: Continuous (time) or survey wheel (distance triggered) or point mode
 Time Range: 0-20,000 nanoseconds full scale, user-selectable Gain: manual adjustment from -42 to +126 dB Number of segments in gain curve is user-selectable from 1 to 8
 Standard Real-Time Filters: Infinite Impulse Response (IIR) - Low and High Pass, vertical and horizontal - Finite Impulse Response (FIR): Low and High Pass, vertical and horizontal
 Advanced Real-Time Filters: Migration, Surface Position Tracking, Signal Noise Floor Tracking, Adaptive Background Removal
 Automatic System Setups: Storage of an unlimited number of system setup files for different survey conditions and/or antenna deployment configurations

Operating

Operating Temperature -20°C to 40°C external (-4°F to 104°F)
 Battery Inspired Energy Ni2040ED, 3 hour runtime (battery life dependent on level of display brightness)
 Transmit Rate Up to 800 KHz (International) US/Canada and CE rates depend on antenna model

Input/Output

Available Ports: Antenna inputs analog and digital (one at a time), DC power input, Serial RS232 (GPS port), Accessory connector, HDMI video output, Ethernet to PC, USB 2.0 port, mini USB
 Ethernet RJ45 100BT Ethernet USB Host USB host with external keyboard support, USB flash drive support and USB HUB support

Mechanical

Dimensions 14x10x2.75 in (36x25x7 cm)
 Weight 10 lbs (4.53 kg) including battery
 Relative Humidity <95% non-condensing
 Storage Temperature -40°C to 60°C (-40°F to 140°F)



Dielectric Values For Common Materials

Material	Dielectric	Velocity (mm/ns)
Air	1	300
Water (fresh)	81	33
Water (sea)	81	33
Polar snow	1.4 to 3	194 to 252
Polar ice	3 to 3.15	168
Temperate ice	3.2	167
Pure ice	3.2	167
Freshwater Lake ice	4	150
Sea Ice	2.5 to 8	78 to 157
Permafrost	1 to 8	106 to 300
Coastal sand (dry)	10	95
Sand (dry)	3 to 6	120 to 170
Sand (wet)	20 to 30	55 to 70
Silt (wet)	10	95
Clay (wet)	8 to 15	86 to 110
Clay soil (dry)	3 to 3.15	173
Marsh	12	86 to 110
Agricultural land	15	77
Pastoral land	13	83
“Average” soil	16	75
Granite	5 to 8	106 to 120
Limestone	7 to 9	100 to 113
Dolomite	6.8 to 8	106 to 115
Basalt (wet)	8 to 15	106 to 115
Shale (wet)	7 to 9	113
Sandstone (wet)	6.8 to 8	112
Coal	4 to 5	134 to 150
Quartz	4.3	145
Concrete	5 to 8	106 to 120
Asphalt	3 to 5	134 to 173
PVC	3	173

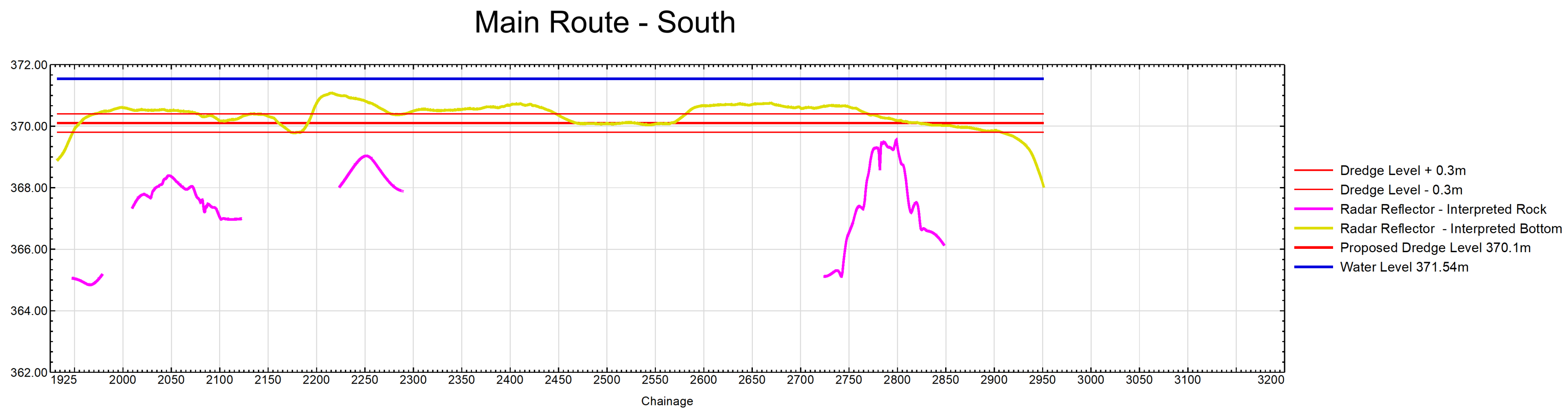
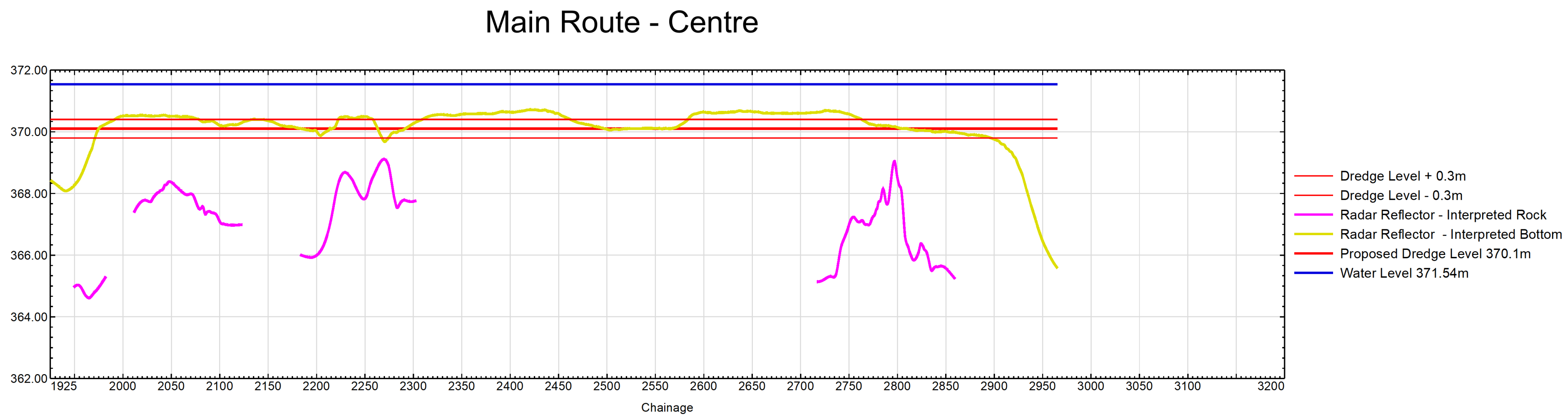
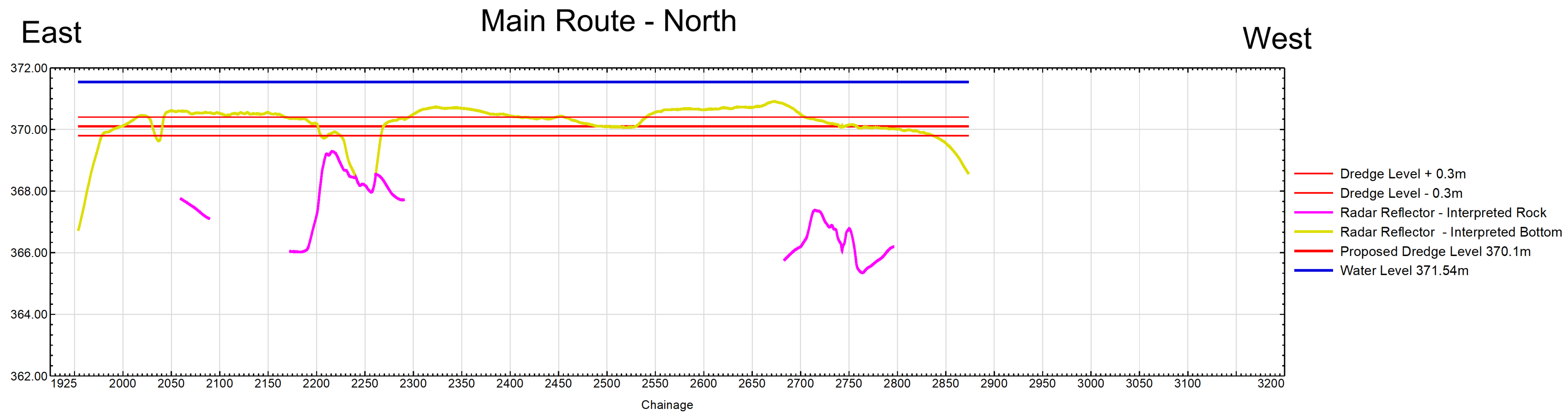
From Reynolds, John M. 1997, An Introduction to Applied And Environmental Geophysics, John Wiley & Sons, New York



APPENDIX B

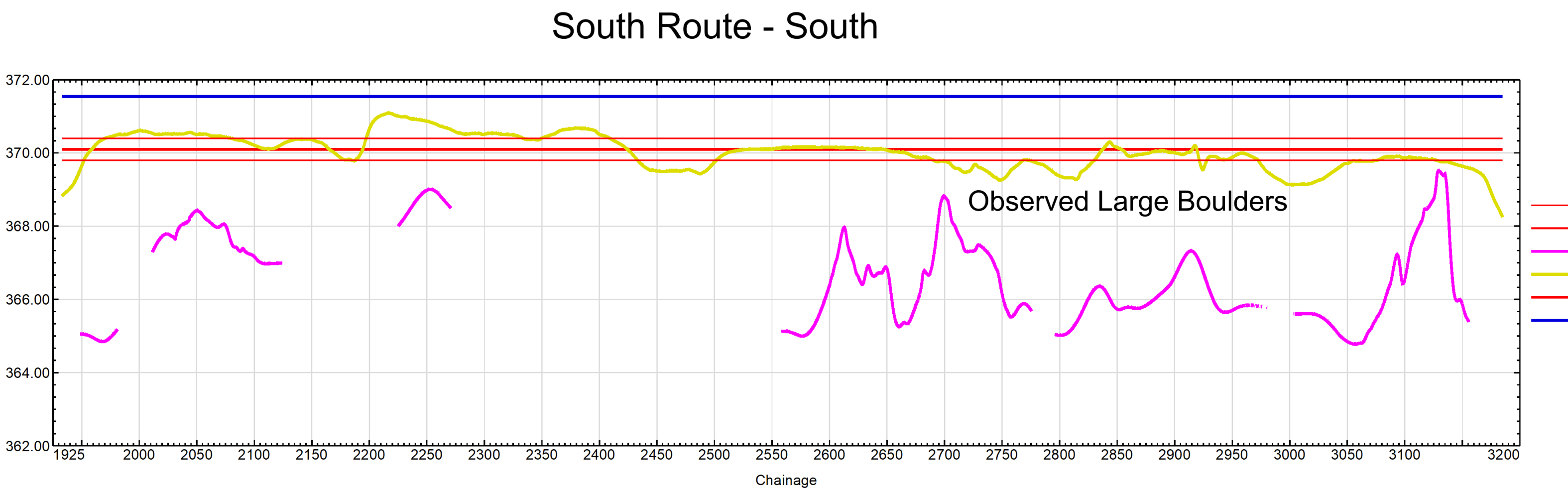
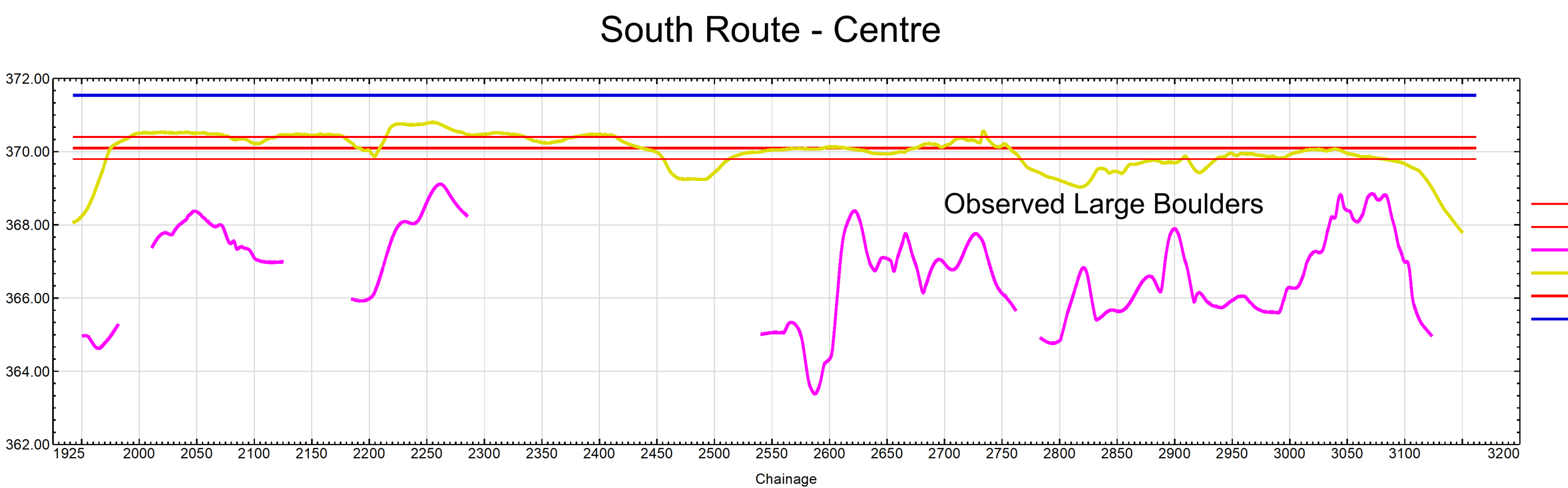
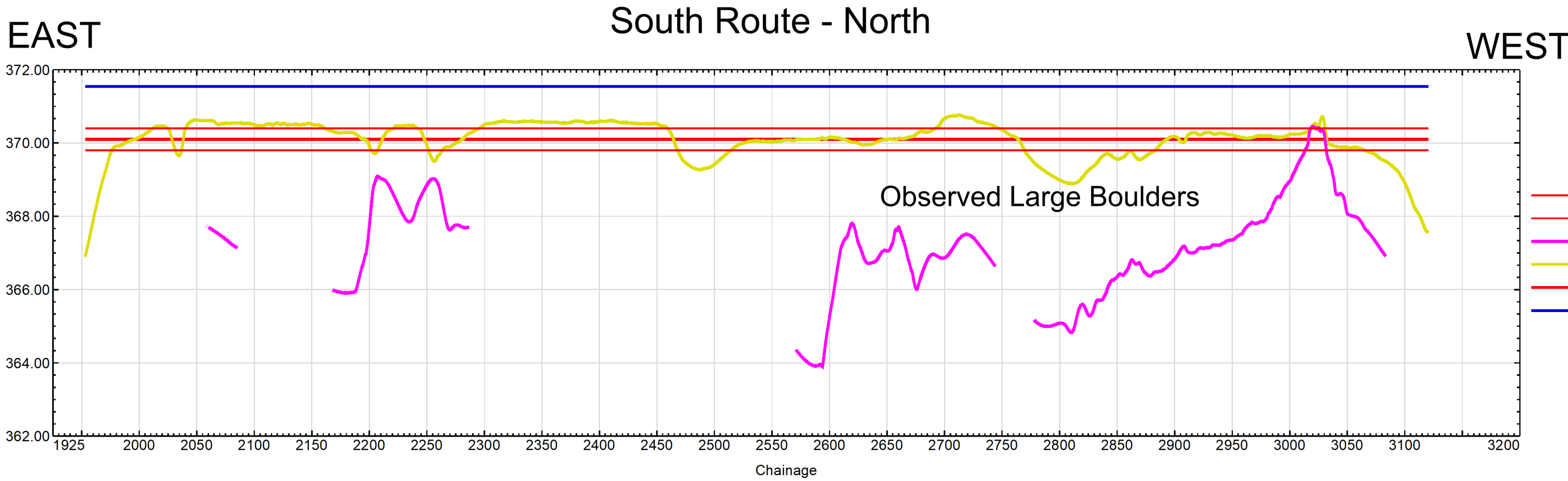
Drawings GPR-19-1463





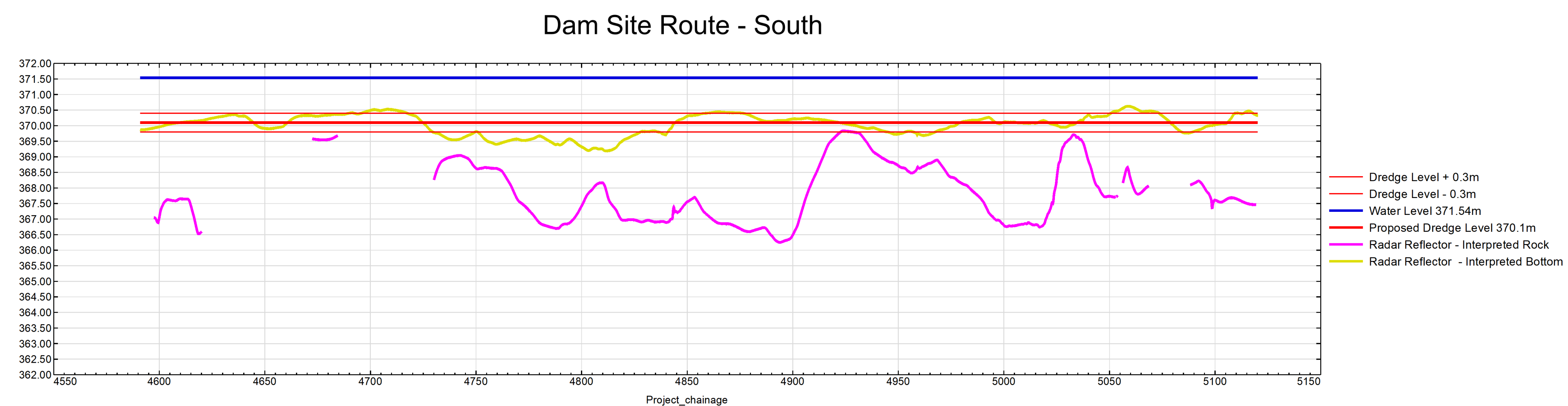
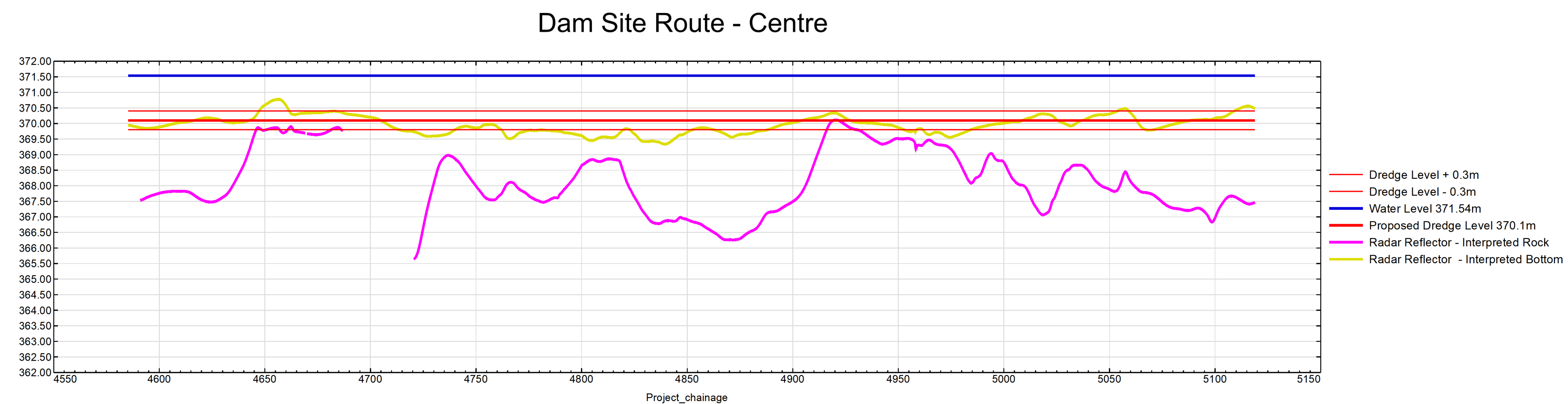
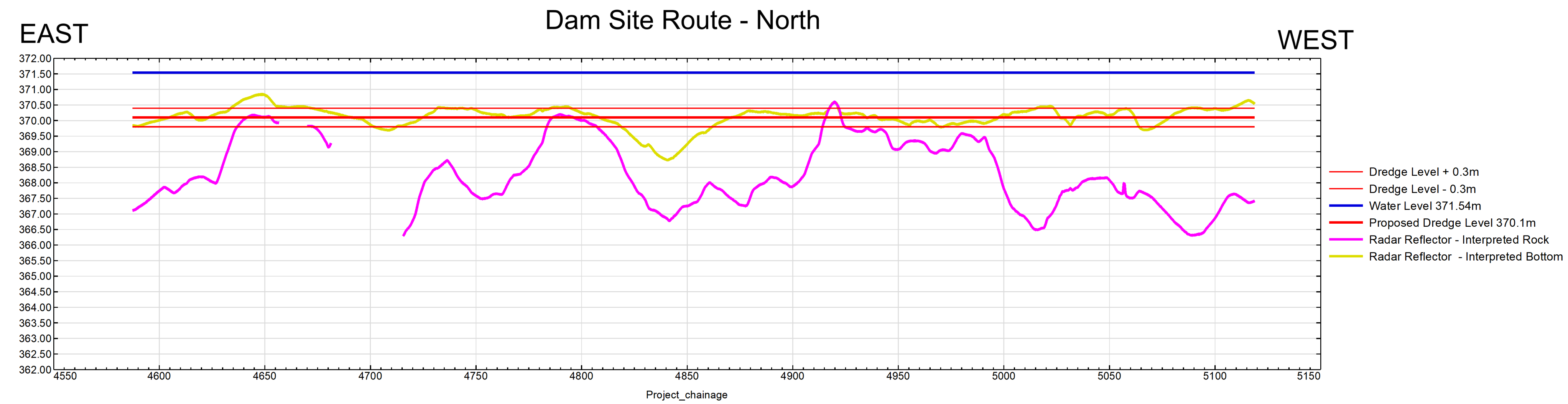
INTERPRETED GROUND RADAR PROFILES

(NOT VALID FOR NAVIGATION)
(NOT VALID FOR CONSTRUCTION)



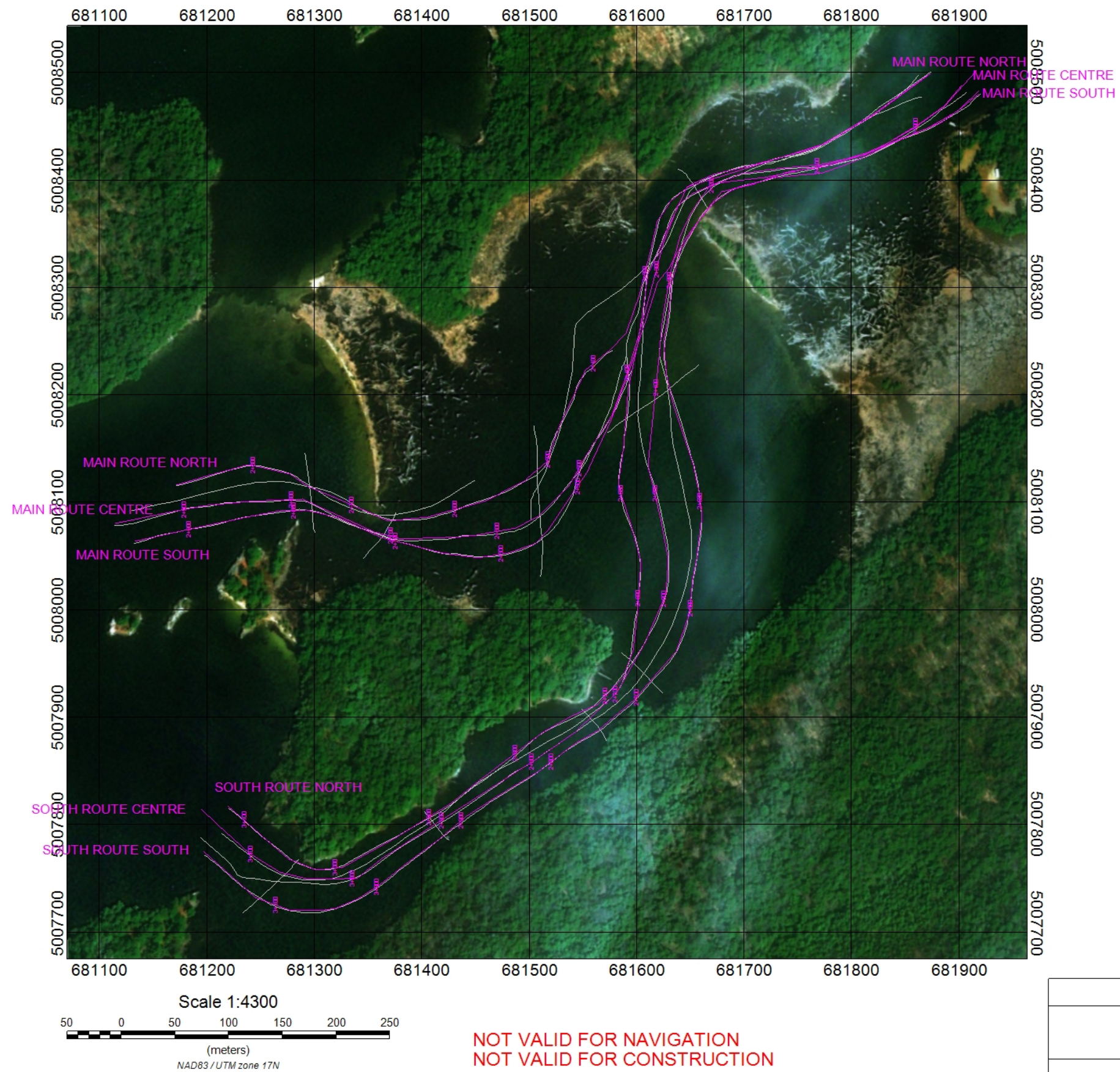
INTERPRETED GROUND RADAR PROFILES

(NOT VALID FOR NAVIGATION)
(NOT VALID FOR CONSTRUCTION)



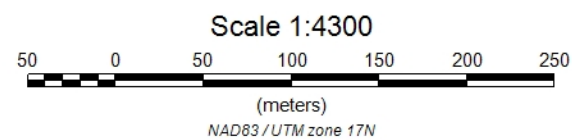
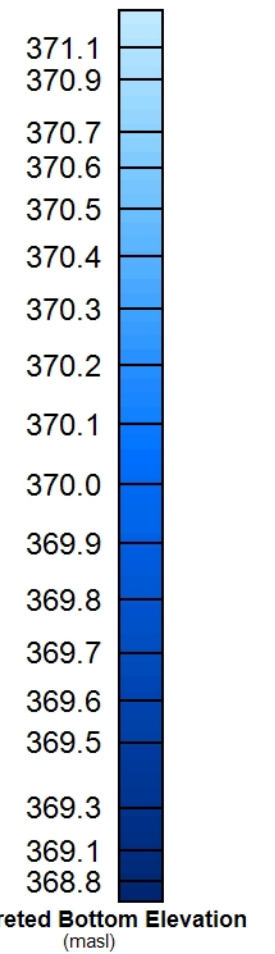
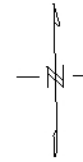
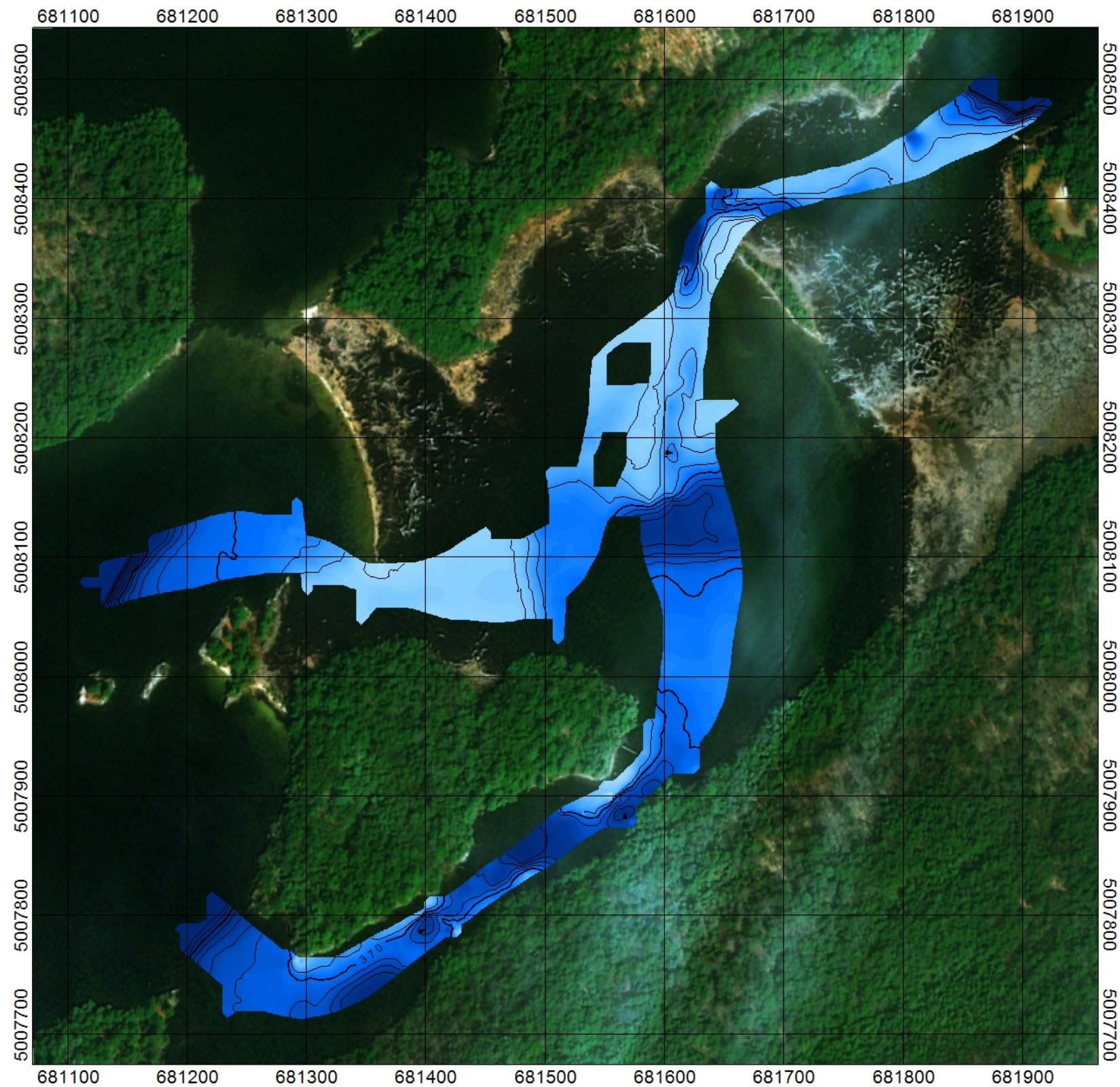
INTERPRETED GROUND RADAR PROFILES

(NOT VALID FOR NAVIGATION)
(NOT VALID FOR CONSTRUCTION)



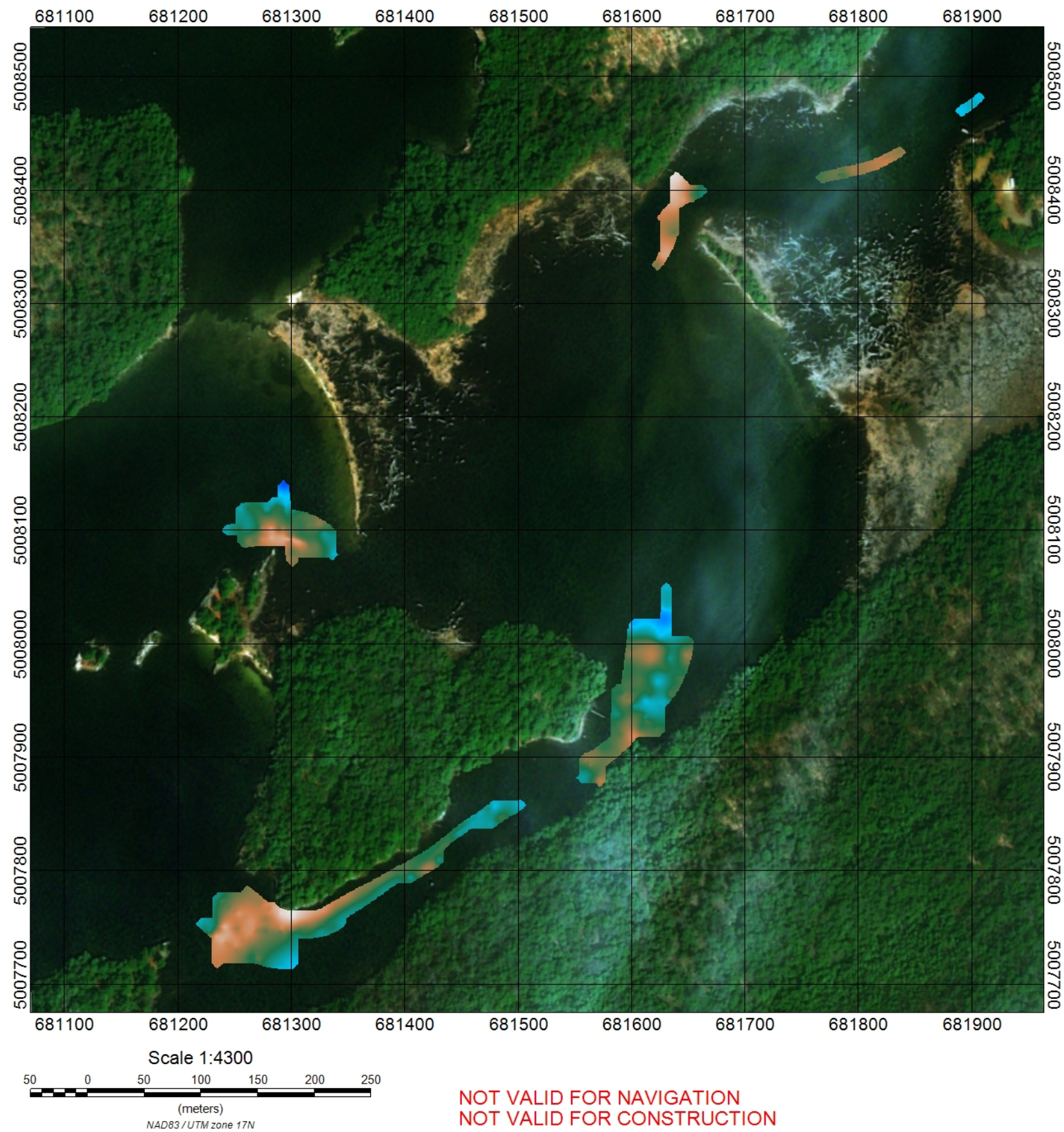
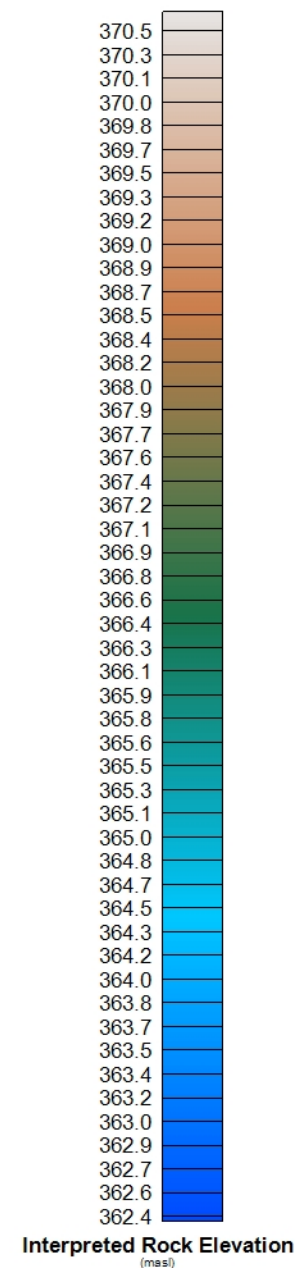
NOT VALID FOR NAVIGATION
NOT VALID FOR CONSTRUCTION

KGS
Red Pine Lake Haliburton Highlands, Ontario Ground Radar Survey
Main and South Routes Georadar Track plot (grey) & Plotted Profiles (magenta) GPR 19-1463 June 2019
Geophysics GPR International Inc.



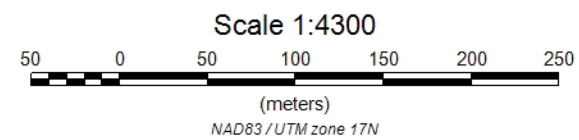
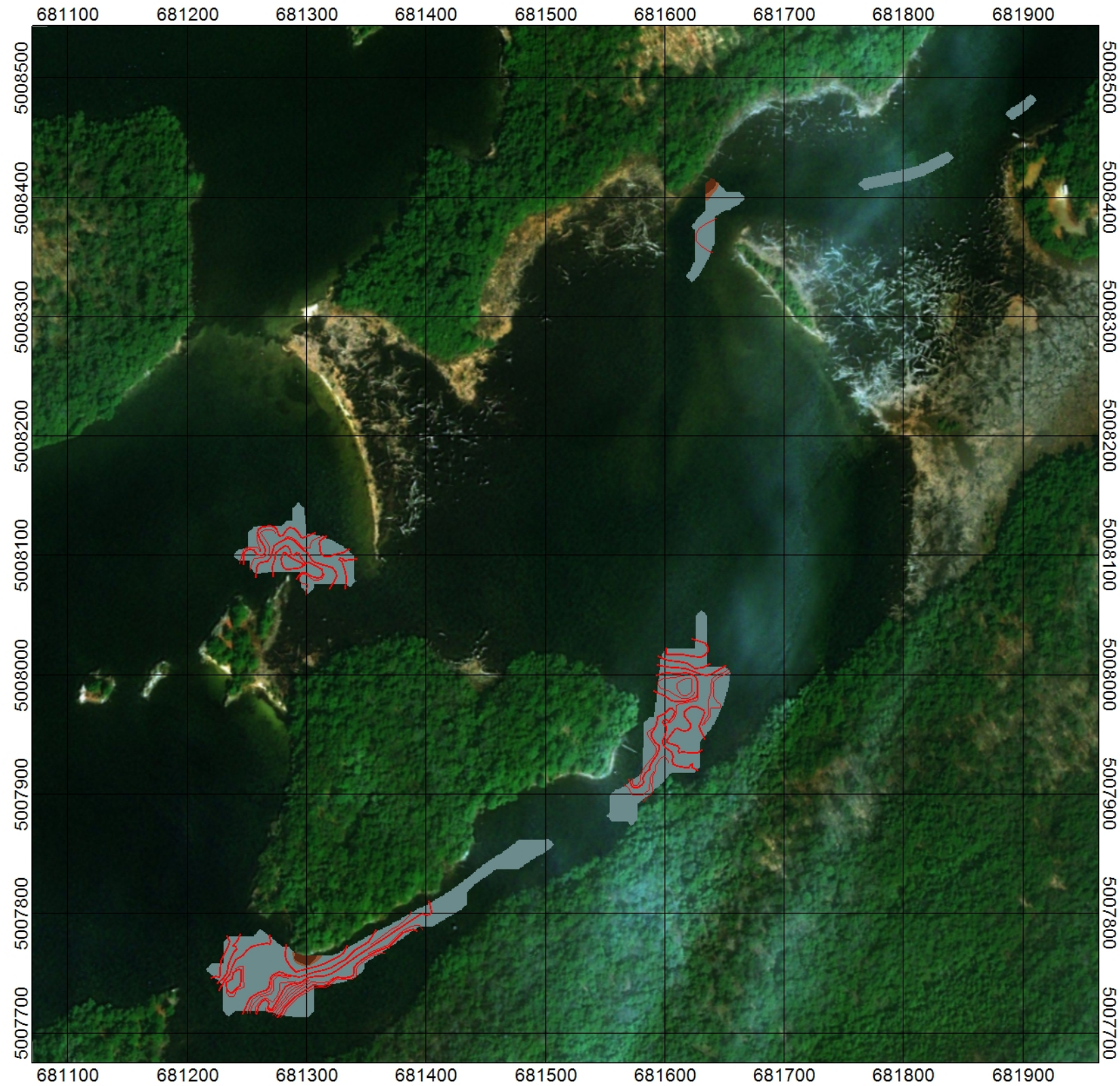
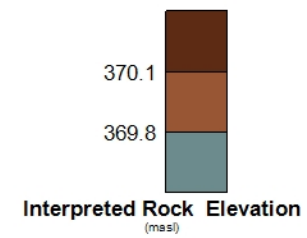
NOT VALID FOR NAVIGATION
NOT VALID FOR CONSTRUCTION

KGS
Red Pine Lake Haliburton Highlands, Ontario Ground Radar Survey
Main and South Rotues Bottom Elevation GPR 19-1463 June 2019
Geophysics GPR International Inc.



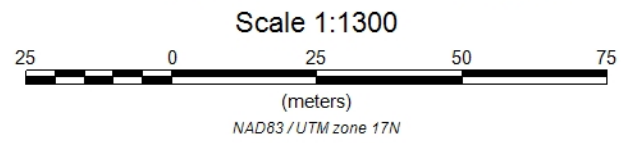
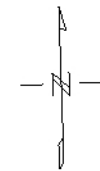
NOT VALID FOR NAVIGATION
NOT VALID FOR CONSTRUCTION

KGS
Red Pine Lake Haliburton Highlands, Ontario Ground Radar Survey
Main and South Rotues Interpreted Rock Elevation from Georadar GPR 19-1463 June 2019
<i>Geophysics GPR International Inc.</i>



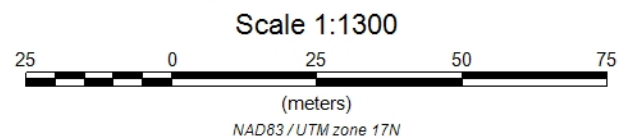
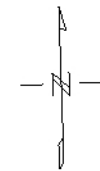
NOT VALID FOR NAVIGATION
NOT VALID FOR CONSTRUCTION

KGS
Red Pine Lake Haliburton Highlands, Ontario Ground Radar Survey
Main and South Rotues Interpreted Rock Elevation from Georadar GPR 19-1463 June 2019
<i>Geophysics GPR International Inc.</i>



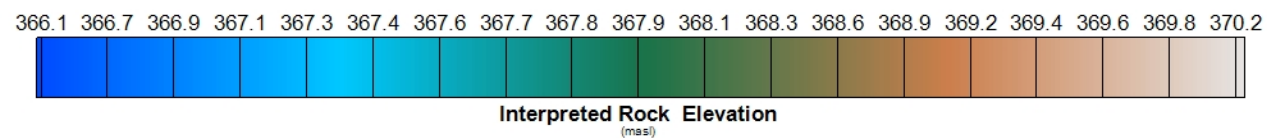
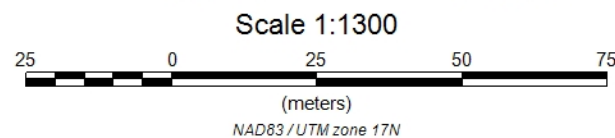
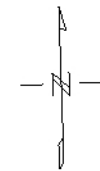
NOT VALID FOR NAVIGATION
NOT VALID FOR CONSTRUCTION

KGS
Red Pine Lake Haliburton Highlands, Ontario Ground Radar Survey
Georadar Track Plot (grey) & Plotted Profiles (magenta) GPR 19-1463 June 2019
Geophysics GPR International Inc.



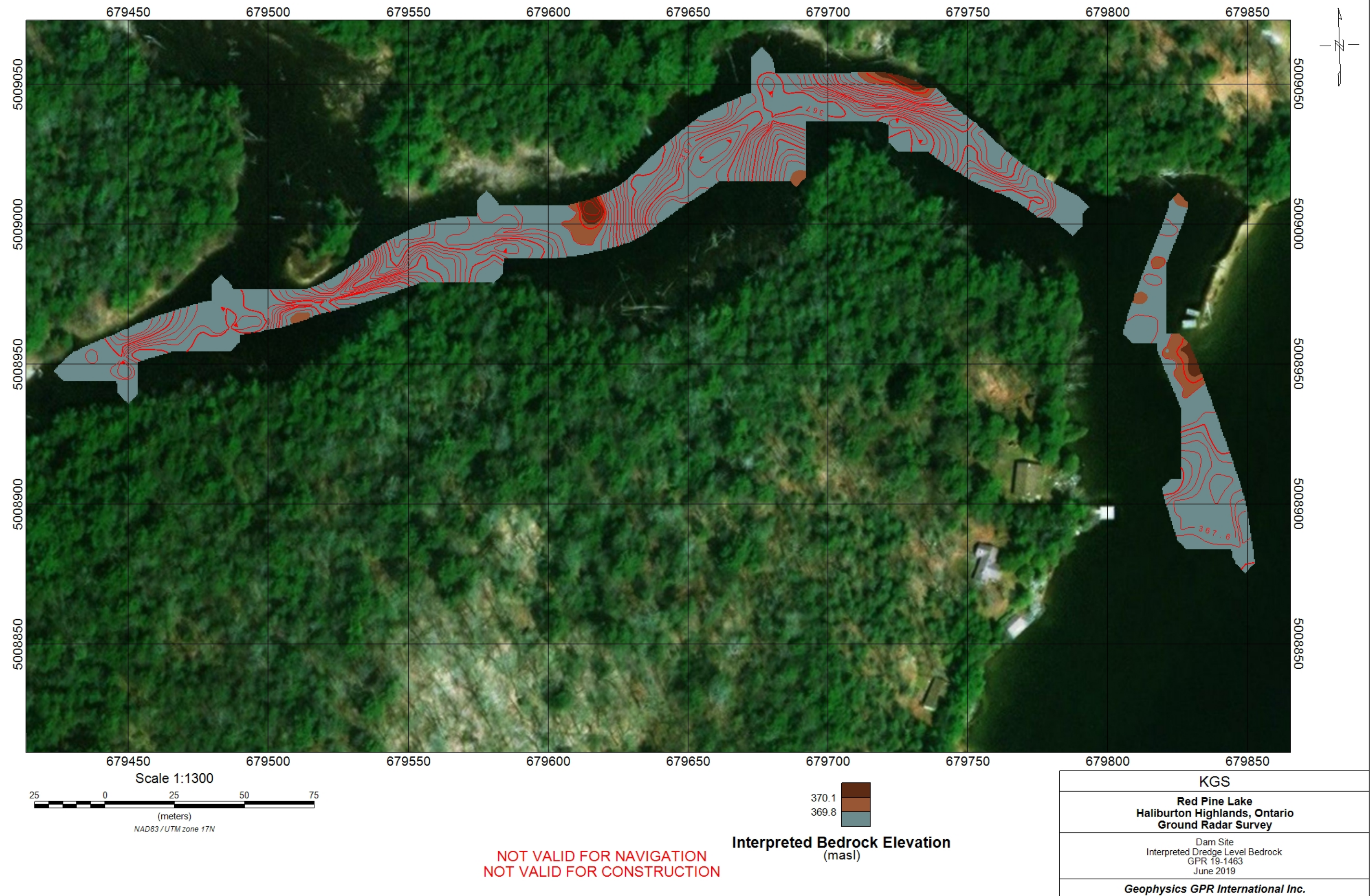
**Bottom Elevation
(masl)**
NOT VALID FOR NAVIGATION
NOT VALID FOR CONSTRUCTION

KGS
Red Pine Lake Haliburton Highlands, Ontario Ground Radar Survey
Dam Site Bottom Elevation from Georadar Data GPR 19-1463 June 2019
Geophysics GPR International Inc.



NOT VALID FOR NAVIGATION
NOT VALID FOR CONSTRUCTION

KGS
Red Pine Lake Haliburton Highlands, Ontario Ground Radar Survey
Interpreted Bedrock Elevation GPR 19-1463 June 2019
Geophysics GPR International Inc.



APPENDIX C
DESCRIPTION OF MATERIALS AND ENVIRONMENTAL TESTING RESULTS



July 18, 2019

Project No. 19115179(1000)

Shan Gnanasunthar

KGS Group

402-4310 Sherwoodtowne Blvd.

Mississauga, Ontario

L4Z 4C4

Dear Mr. Gnanasunthar

This letter reports the results of laboratory testing carried out on the sample received at our office in Mississauga. The results of the tests are summarized in the attached tables and figures.

The testing services reported herein have been performed in accordance with the indicated recognized standard, unless noted otherwise. This report is for the sole use of the designated client. This report constitutes a testing service only and does not represent any results interpretation or opinion regarding specification compliance or material suitability.

We trust that the results are sufficient for your current requirements. If you have any questions, please do not hesitate to call us.

Regards

Golder Associates Ltd.

A handwritten signature in black ink, appearing to read 'Marijana Manojlovic'.

Marijana Manojlovic

Laboratory Manager

MM/bp

n:\admin\lab\2019\master final letter for projects_new format.docx

Golder Associates Ltd.

2900 Argentia Road, Unit 15 Mississauga, Ontario, L5N 7X9 Canada

T: +1 905 567 4444 | F: +1 905 567 6561

Golder and the G logo are trademarks of Golder Associates Corporation

golder.com

FIGURE

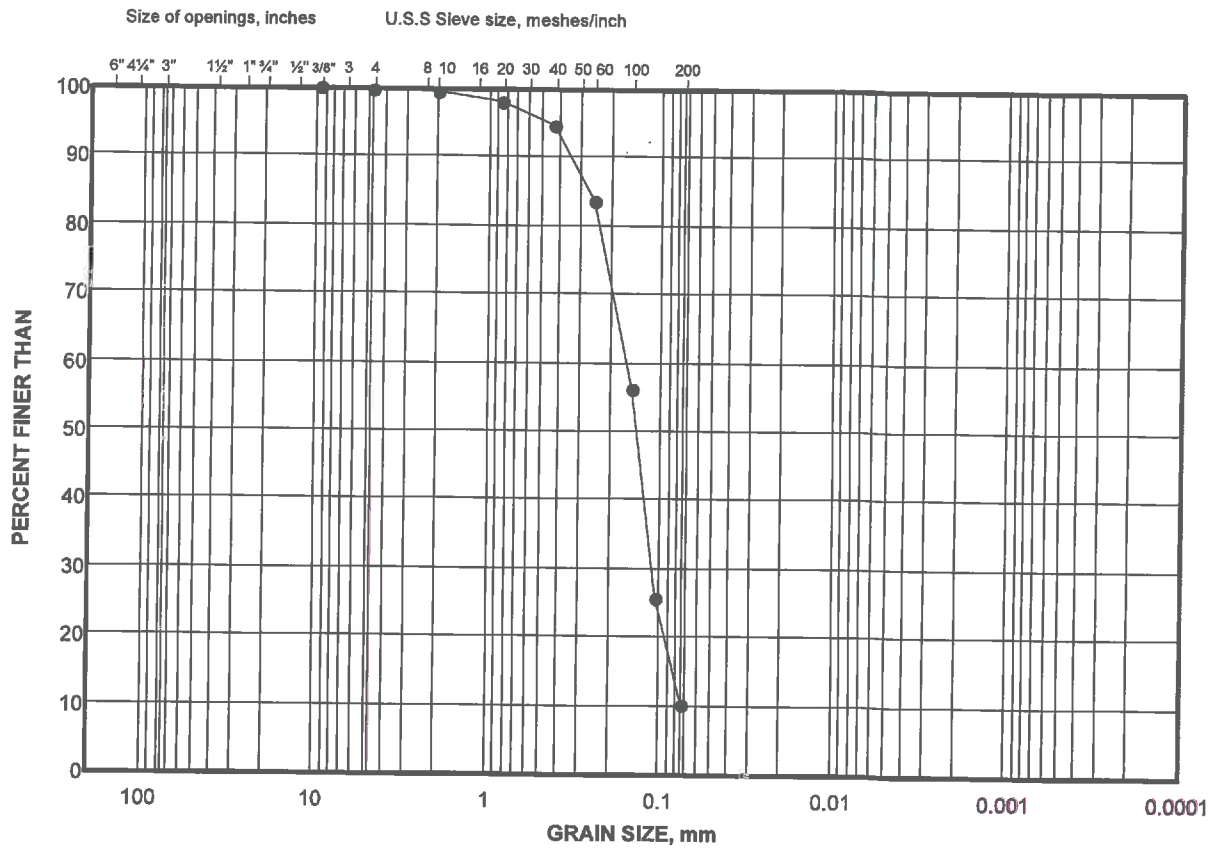


TP19-01

Date: 17-Jul-19

GRAIN SIZE DISTRIBUTION

FIGURE



ORGANIC CONTENT (BURNING METHOD)

BOREHOLE NUMBER		-	-
SAMPLE NUMBER		TP19-01	TP19-06
DEPTH, m		-	-
CRUCIBLE NUMBER		14	15
WEIGHT OF CRUCIBLE, g	W1	25.58	29.13
WEIGHT OF CRUCIBLE & AIR DRY SAMPLE, g	W2	82.11	81.94
WIGHT OF AIR DRY SAMPLE (ORIGINAL), g	W2-W1	56.53	52.81
WEIGHT AFTER BURNING SOIL & CRUCIBLE, g	W3	81.91	81.73
WEIGHT OF ORGANICS, g	W2-W3	0.2	0.21
PERCENT OF ORGANICS, %	$((W2-W3)/(W2-W1)) \times 100$	0.35	0.40
ORGANIC CONTENT, %		0.4	2.4

Notes:

1. Samples dried at 110 degree centigrade prior to testing.
2. Test performed according to ASTM D2974 Standard, test method C.
3. Organic matter determined by burning the oven dried samples in a muffle furnace at 440 degree centigrade.

PROJECT NUMBER	19115179(1000)
PROJECT NAME	KGS Group/Lab Testing/Miss
TESTED BY	GF
DATE OF TESTING	July 15, 2019

Checked by: 

Golder Associates

**CLIENT NAME: KGS GROUP
SUITE 402, 4310 SHERWOODTOWNE BLVD
MISSISSAUGA, ON L4Z4C4
(905) 848-2473**

ATTENTION TO: Shan Gnanasunthar

PROJECT: Red Pine Lake Dam (16-1538-004)

AGAT WORK ORDER: 19T488813

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Jul 15, 2019

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

***NOTES**

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 19T488813

PROJECT: Red Pine Lake Dam (16-1538-004)

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: KGS GROUP

SAMPLING SITE: RED PINE LAKE

ATTENTION TO: Shan Gnanasunthar

SAMPLED BY: S.G

O. Reg. 558 Metals and Inorganics

DATE RECEIVED: 2019-07-04

DATE REPORTED: 2019-07-15

Parameter	Unit	SAMPLE DESCRIPTION:		TP19-02	TP19-03	TP19-06
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2019-06-19	2019-06-19	2019-06-19
		G / S	RDL	326414	326423	326424
Arsenic Leachate	mg/L	2.5	0.010	<0.010	<0.010	<0.010
Barium Leachate	mg/L	100	0.100	0.401	0.638	0.510
Boron Leachate	mg/L	500	0.050	<0.050	<0.050	<0.050
Cadmium Leachate	mg/L	0.5	0.010	<0.010	<0.010	<0.010
Chromium Leachate	mg/L	5	0.010	<0.010	<0.010	<0.010
Lead Leachate	mg/L	5	0.010	<0.010	0.021	<0.010
Mercury Leachate	mg/L	0.1	0.01	<0.01	<0.01	<0.01
Selenium Leachate	mg/L	1	0.010	<0.010	<0.010	<0.010
Silver Leachate	mg/L	5	0.010	<0.010	<0.010	<0.010
Uranium Leachate	mg/L	10	0.050	<0.050	<0.050	<0.050
Fluoride Leachate	mg/L	150	0.05	<0.05	<0.05	<0.05
Cyanide Leachate	mg/L	20	0.05	<0.05	<0.05	<0.05
(Nitrate + Nitrite) as N Leachate	mg/L	1000	0.70	<0.70	<0.70	<0.70

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to O. Reg. 558 - Schedule IV Leachate Quality Criteria
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.
Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Divine Basily

Quality Assurance

CLIENT NAME: KGS GROUP

PROJECT: Red Pine Lake Dam (16-1538-004)

SAMPLING SITE: RED PINE LAKE

AGAT WORK ORDER: 19T488813

ATTENTION TO: Shan Gnanasunthar

SAMPLED BY: S.G

Soil Analysis

RPT Date: Jul 15, 2019

RPT Date: Jul 15, 2019			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 558 Metals and Inorganics															
Arsenic Leachate	326415		0.019	0.019	NA	< 0.010	98%	90%	110%	103%	80%	120%	109%	70%	130%
Barium Leachate	326415		0.610	0.610	0.0%	< 0.100	105%	90%	110%	106%	80%	120%	111%	70%	130%
Boron Leachate	326415		0.059	0.057	NA	< 0.050	104%	90%	110%	103%	80%	120%	84%	70%	130%
Cadmium Leachate	326415		<0.010	<0.010	NA	< 0.010	96%	90%	110%	100%	80%	120%	100%	70%	130%
Chromium Leachate	326415		<0.010	<0.010	NA	< 0.010	101%	90%	110%	118%	80%	120%	107%	70%	130%
Lead Leachate	326415		0.012	0.011	NA	< 0.010	106%	90%	110%	110%	80%	120%	108%	70%	130%
Mercury Leachate	326415		<0.01	<0.01	NA	< 0.01	96%	90%	110%	92%	80%	120%	88%	70%	130%
Selenium Leachate	326415		<0.010	<0.010	NA	< 0.010	100%	90%	110%	110%	80%	120%	113%	70%	130%
Silver Leachate	326415		<0.010	<0.010	NA	< 0.010	97%	90%	110%	119%	80%	120%	104%	70%	130%
Uranium Leachate	326415		<0.050	<0.050	NA	< 0.050	99%	90%	110%	111%	80%	120%	103%	70%	130%
Fluoride Leachate	326415		0.25	0.25	0.0%	< 0.05	103%	90%	110%	106%	90%	110%	97%	70%	130%
Cyanide Leachate	326415		<0.05	<0.05	NA	< 0.05	98%	90%	110%	96%	90%	110%	95%	70%	130%
(Nitrate + Nitrite) as N Leachate	326415		<0.70	<0.70	NA	< 0.70	100%	80%	120%	102%	80%	120%	98%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:



Divine Basily

Method Summary

CLIENT NAME: KGS GROUP

PROJECT: Red Pine Lake Dam (16-1538-004)

SAMPLING SITE: RED PINE LAKE

AGAT WORK ORDER: 19T488813

ATTENTION TO: Shan Gnanasunthar

SAMPLED BY: S.G

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Arsenic Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Barium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Boron Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Cadmium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Chromium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Lead Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Mercury Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Selenium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Silver Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Uranium Leachate	MET-93-6103	EPA SW-846 1311 & 3010A & 6020A	ICP-MS
Fluoride Leachate	INOR-93-6018	EPA SW-846-1311 & SM4500-F- C	ION SELECTIVE ELECTRODE
Cyanide Leachate	INOR-93-6052	EPA SW-846-1311 & MOE 3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
(Nitrate + Nitrite) as N Leachate	INOR-93-6053	EPA SW 846-1311 & SM 4500 - NO3- I	LACHAT FIA

APPENDIX D
MITIGATION LIST APPLICABLE TO DREDGING FOR TENDER



Mitigation List Applicable to Dredging

General

1. The Parks Canada Agency (PCA) Basic Impact Analysis (BIA) which includes both dam replacement and dredging works will be provided to the successful bidder, Mitigation Measures applicable to the dredging work are included in the following section.
2. Inform the Departmental Representative and the PCA Environmental Authority (Environmental Assessment Officer), regarding any changes to project plans and/or scheduling. Any changes not assessed under the BIA will require approval from PCA and may require further mitigation measures.
3. The contractor is required to submit an Environmental Plan and mitigation to Parks Canada that outlines all the measures to be implemented to eliminate or reduce environmental effects and address mitigation measures outlined in the BIA. The plan will be submitted in writing prior to the start of project activities and must be accepted by Parks Canada. The plan will detail monitoring measures to speak to the effectiveness of mitigation.
4. The contractor is to ensure that all on-site personnel are aware of, and comply with the prescribed mitigation measures within the BIA.
5. Should conditions at the work site indicate that there are unforeseen negative impacts to fish, wildlife, or cultural resources, all works shall cease until the problem has been corrected and/or any required input can be obtained by Parks Canada or other relevant authorities. The Trent-Severn Waterway has the right to require that work be altered or ceased immediately.
6. All materials and equipment used for the purpose of site preparation and project completion shall be operated and stored in a manner that prevents any deleterious substance (e.g. petroleum productions, debris etc.) from entering the water. Ensure measures are in place to minimize impacts of accidental spills.
7. Store all oils, lubricants, fuels and chemicals in secure areas on impermeable pads.
8. All machinery and equipment shall be clean, free of leaks, in optimal working condition.
9. All equipment using hydraulic fluids shall use vegetative (non-petroleum based) based fluids.
10. Use well-maintained heavy equipment and machinery, preferably fitted with fully functional emission control systems/muffler/exhaust baffles, engine covers, etc.; machines shall not be left to unnecessarily idle in order to avoid emissions.
11. Vehicle and equipment re-fueling and/or maintenance shall be conducted off of slopes and away from the water at a recommended distance of 30m, if possible. If not possible, fuelling sites will be as per Environmental Management Plan and mitigations to prevent substances from entering the water course applied.
12. A designated re-fueling depot will minimize the potential for extensive impacts at the site due to accidental releases of substances; proper spill management equipment shall be in place for fueling.
13. Drip trays shall be placed under fuel-powered equipment.
14. Only the working part of a machine is to enter the water; any part of a machine or equipment entering the water shall be free of fluid leaks and externally degreased to prevent any deleterious substance from entering the water. Complete the in-water activity as quickly as

possible to minimize the time equipment is in the water; do not leave equipment in water during breaks in work activity.

- 15.** There shall be no discharge of chemicals and cleaning agents in or near aquatic habitats; all such substances shall be disposed of at a facility licensed to receive them.
- 16.** No tools, equipment, temporary structures or parts thereof, used or maintained for the purpose of this project, shall be permitted to remain at the site after completion of the project unless approved by the departmental representative.
- 17.** Spill control and emergency plans will be in place prior to initiation of construction. A spills kit will be maintained on site and the contractor will ensure that adequate additional resources are available. Spills shall be reported as soon as possible to the Parks Canada Project Manager. The Ontario Ministry of the Environment Spills Action Center, (1-800-268-6060) shall be notified, if required.
- 18.** In the event of a spill, remediation will be conducted immediately contain and clean up in accordance with federal regulatory requirements and to the satisfaction of Parks Canada. Documentation of remediation, testing and results will be provided to Parks Canada.

Fish & Aquatic Habitat

- 19.** The in water restricted period for Red Pine Lake, given the importance of fall spawning species is October 1 to May 31, in order to avoid harm to spawning, hatching and rearing of Lake Trout.
- 20.** Monitor water quality for unacceptable suspended sediment levels during in water activities.
- 21.** Activities causing turbidity or release of sediment will comply with the CCME Guidelines on Total Particulate Matter (see <http://ceqg-rcqe.ccme.ca/download/en/217>).
- 22.** Should dredging activities result in suspended sediment levels above the CCME Guidelines on Total Particulate Matter, then additional mitigation measures must be employed in order to isolate water quality impacts (e.g. deployment of turbidity curtains). These contingency measures must be reviewed and accepted by PCA and included in the contractor's Environmental Plan.
- 23.** If required, turbidity curtains are to be anchored or weighted down along its length to form a continuous seal on the river bed with adequate flotation at water surface to prevent over spills of turbid water. Sediment/turbidity curtains shall be deployed in a manner that prevent entrapment of fish inside the curtain.

Aquatic Invasive Species

- 24.** To reduce the risk of introducing invasive species, all equipment must be thoroughly cleaned prior to coming to the site. Any machinery that appears to have not been cleaned will not be permitted on site. For additional information or guidance on how to properly clean equipment, see the Clean Equipment Protocol for Industry developed by the Ontario Invasive Plant Council and found here: http://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/07/Clean-Equipment-Protocol_June2016_D3_WEB-1.pdf and Parks

Canada's Environmental Standards and Guidelines Document - Ontario Waterways (July 2017) ESG-11-C Invasive Species Management.

- 25.** Any equipment or vehicles (including bilge and ballast waters) which are to be used in water, should be thoroughly cleaned before and after use of any visible mud, vegetation, mussels, etc.:
- Vessels/equipment should be drained of standing water;
 - Vessels/equipment should ideally be cleaned with hot water (>50 °C) at high pressure water (>250 psi);
 - Vessels/equipment should be dried for 2 – 7 days in sunlight before transported between waterbodies;
 - Cleaning of vessels/equipment should be conducted away from waterbodies at a recommended distance of at least 30m from the shoreline.
- 26.** Mud, dirt and vegetation should be cleaned from clothing and footwear prior to entering the work site, and prior to leaving the work site.
- 27.** Move only weed/contaminate-free materials into non-infested areas. Moving materials from one infested location to another within a particular zone may not cause contamination, but moving materials from infested to non-infested areas could lead to the introduction and spread of invasive plants.
- 28.** If removal of invasive species occurs, individuals will be disposed of appropriately, offsite to ensure no further propagation.
- 29.** Should an invasive species be encountered (or at least suspected) not identified in this BIA, a photo, location and report of the specimen should be sent to Parks Canada's EA staff.

Wildlife

- 30.** The contractor must avoid disturbance/harm to wildlife.
- 31.** On a daily basis, an inspection or "sweep" of the work area shall be performed prior to commencement of project works and activities to ensure wildlife are not present in the work area (include in site checklist).
- 32.** Field information regarding incidental encounters with wildlife (non-SAR wildlife) shall be compiled and reported. For incidental encounters, the following information should be recorded in the field:
- Locations, dates and time of day where the species were encountered;
 - Names of species encountered;
 - Photographs of the species, if taken;
 - Condition of animal.
- 33.** If injured/dead wildlife are encountered report to PCA immediately. PCA may require retrieval and storage on ice of carcass for laboratory testing
- 34.** All vehicles and equipment used by project personnel will follow any construction zone speed limits to reduce the risk of hitting wildlife, as enforced by the site supervisor.

- 35.** Work areas will be kept clean and free of potential hazards to wildlife such as wire, cable, tubing, plastic, antifreeze or other materials that wildlife may eat or become entangled in.
- 36.** Waste will be stored, handled, and transported in accordance with the Waste Management Plan, including storage of all solid waste in sealed, bear-proof containers.
- 37.** Feeding of wildlife is prohibited.

Species at Risk

- 38.** Should any suspected species at risk – snakes or turtles and/or eggs be encountered during construction - project staging, implementation or demobilization - work would halt immediately and Parks Environmental Assessment Staff would be notified. Stop work immediately and contact EA staff on how to proceed. Additional measures to avoid impacts may be required before work can restart. Stand back and allow the animal to leave the site.
- 39.** Construction access and work areas are to be confined to the minimum area required for construction activities and such areas are to be defined in the field using appropriately installed protective fencing or other suitable barriers. Minimize the disturbed area; clearly mark the work space.

Noise /Air

- 40.** Notify adjacent cottagers of planned activities that may cause disturbance and schedule them to avoid sensitive time periods.
- 41.** Monitor and mitigate public complaints by keeping a record of complaints and addressing any issues raised by the public.
- 42.** All on-site vehicles are expected to have a Drive Clean Emissions Report in compliance with O. Reg. 361/98: Motor Vehicles under the Environmental Protection Act, R.S.O. 1990, c. E.19. Parks Canada may stop a vehicle if they believe the vehicle is emitting excessive exhaust smoke or suspect that emission control equipment has been tampered with or removed.
- 43.** Use well-maintained heavy equipment and machinery, fitted with fully functional emission control systems/muffler/exhaust baffles, engine covers, etc.
- 44.** Machines shall not be left to unnecessarily idle in order to avoid emissions.

Cultural Resources

- 45.** If unrecorded archaeological resources (i.e. structural remains and/or artifact concentrations) or any other cultural resource be encountered, work shall cease until the item can be reviewed by a PCA or PCA appointed archaeologist, the situation reviewed and direction for mitigation measures is provided to the Environmental Assessment Coordinator and Project Manager. Ensure that all exposed underwater cultural materials are kept submerged and/or wet while waiting for direction.

Waste Disposal

- 46.** Recyclable material and waste shall be removed from the site, in accordance with all federal, provincial and municipal regulations, to disposal facilities licensed to receive them;
- 47.** Waste generated will be disposed according to applicable provincial and local regulations.

APPENDIX E
MITIGATION LIST APPLICABLE TO DREDGING FOR TENDER



Mesures d'atténuation — dragage

Généralité

1. Une analyse d'impact de base (AIB) de l'Agence Parcs Canada (APC) comprenant les travaux de remplacement de barrage et de dragage sera fournie au soumissionnaire retenu. Les mesures d'atténuation applicables aux travaux de dragage sont décrites dans la section suivante.
2. L'entrepreneur informera le représentant du Ministère et le responsable des questions environnementales de l'Agence Parcs Canada (APC) (agent de l'environnement) de tout changement aux plans ou à l'échéancier du projet. Toute modification qui n'est pas évaluée dans le cadre de la présente analyse d'impact de base (AIB) nécessite l'approbation de l'APC et peut exiger d'autres mesures d'atténuation.
3. L'entrepreneur doit présenter à Parcs Canada un plan de gestion et des mesures d'atténuation environnementales qui décrit l'ensemble des mesures qu'il mettra en œuvre sur le site du projet afin d'éliminer ou de réduire les effets sur l'environnement. De plus, il est tenu d'examiner les mesures d'atténuation décrites dans la présente AIB. Le plan sera présenté par écrit à Parcs Canada au moment de la mise en œuvre des activités du projet à des fins d'acceptation. Ce plan définit les mesures d'atténuation qui font état de l'efficacité de l'atténuation.
4. L'entrepreneur doit veiller à ce que les membres du personnel sur place connaissent les mesures d'atténuation prescrites dans la présente AIB.
5. Si les conditions sur le chantier laissent entendre des répercussions négatives sur le poisson, la faune ou les ressources culturelles, tous les travaux cessent jusqu'à ce que le problème soit rectifié et que Parcs Canada ou d'autres autorités compétentes aient été consultés. La Voie navigable Trent-Severn a le droit d'exiger la modification ou l'interruption immédiate des travaux.
6. Tous les matériaux et l'équipement servant à la préparation du chantier et à la réalisation du projet doivent être utilisés et entreposés de manière à éviter toute infiltration dans l'eau de substances nocives (p. ex., produits pétroliers, débris, etc.). L'entrepreneur verra à la mise en œuvre de mesures pour réduire au minimum les effets d'un déversement accidentel.
7. Les huiles, les lubrifiants, le carburant et les produits chimiques sont entreposés en lieu sûr, sur des socles imperméables.
8. L'entrepreneur fait en sorte que toutes les machines et tout le matériel sont propres, exempts de fuite et en état de fonctionnement optimal.
9. Tous les équipements utilisant des fluides hydrauliques doivent utiliser des fluides à base de végétaux (sans base de pétrole).
10. L'entrepreneur utilisera des équipements et de la machinerie lourde bien entretenus, munis de préférence de systèmes de réduction des émissions, de silencieux, de dispositifs antibruit, de carters de moteur, etc. Il ne laissera pas les moteurs tourner inutilement au ralenti afin d'éviter les émissions.
11. Le ravitaillement et l'entretien des véhicules et de l'équipement doivent être faits à l'écart des pentes et à une distance recommandée de 30 m de l'eau, si possible. Si ce n'est pas possible, l'entrepreneur effectuera le ravitaillement aux sites prévus selon le plan de gestion environnementale et les mesures d'atténuation afin d'éviter l'infiltration de substances dans les cours d'eau.

- 12.** Un dépôt de ravitaillement réduit au minimum le potentiel de répercussions importantes des rejets accidentels de substances sur le chantier; un matériel approprié de gestion des déversements doit être en place pour le ravitaillement.
- 13.** L'entrepreneur doit placer des plateaux d'égouttage sous les machines alimentées par carburant.
- 14.** Seule une pièce fonctionnelle d'une machine peut pénétrer dans l'eau; une pièce de machine ou d'équipement qui pénètre dans l'eau ne présente aucune fuite de liquides et sa surface est dégraissée afin d'empêcher toute substance nocive de s'infiltrer dans l'eau. Il faut exécuter les activités dans le cours d'eau aussi rapidement que possible afin de réduire au minimum la durée d'immersion du matériel.
- 15.** Il ne doit y avoir aucun rejet de produits chimiques ou de nettoyage dans les habitats aquatiques ou à proximité; toutes ces substances doivent être éliminées dans des installations autorisées à les recevoir.
- 16.** Aucun outil, matériel, ouvrage temporaire ou partie de ces éléments ayant été utilisé ou entretenus dans le cadre du projet ne sera laissé sur le site à la fin du projet à moins d'une autorisation du représentant du ministère.
- 17.** Des plans de réduction des déversements et d'intervention en cas d'urgence sont en place avant le début de travaux de construction. Une trousse d'urgence en cas de déversement restera sur place, et l'entrepreneur veillera à ce que des ressources supplémentaires soient disponibles en quantité suffisante. Les déversements doivent être signalés dès que possible au chargé de projet de Parcs Canada. Le Centre d'intervention en cas de déversement du ministère de l'Environnement, de la Protection de la nature et des Parcs de l'Ontario (1-800-268-6060) doit être avisé du déversement, le cas échéant.
- 18.** En cas de déversement, exécuter immédiatement les activités d'assainissement en vue du confinement et du nettoyage du déversement, conformément aux exigences réglementaires fédérales et à la satisfaction de Parcs Canada. L'entrepreneur fournira les documents concernant l'assainissement, les essais et les résultats à Parcs Canada.

Poisson et habitat aquatique

- 19.** Compte tenu du grand nombre d'espèces qui fraie à l'automne dans le lac Red Pine, la période de restriction pour les travaux en milieu aquatique s'étend du 1 octobre au 31 mai afin de ne pas perturber la fraie, l'éclosion et l'élevage du touladi.
- 20.** Surveiller la qualité de l'eau pour détecter tout niveau inadmissible de sédiments en suspension pendant les activités dans le cours d'eau.
- 21.** Les activités causant la turbidité ou le rejet de sédiments respectent les Recommandations du CCME sur les matières particulaires totales (consulter <http://ceqg-rcqe.ccme.ca/download/fr/129>).
- 22.** Si les activités de dragage génèrent des niveaux de sédiments en suspension supérieurs aux Recommandations du CCME sur les matières particulaires totales, des mesures d'atténuation supplémentaires doivent être utilisées pour isoler les impacts sur la qualité de l'eau (par exemple, le déploiement de rideaux anti-turbidité). Ces mesures d'urgence

doivent être examinées et acceptées par la PCA et incluses dans le un plan de gestion et des mesures d'atténuation environnementales du contractant.

- 23.** Si nécessaire, les rideaux anti-sédimentation ou anti-turbidité doivent être ancrés ou lestés sur toute leur longueur pour former un scellement continu sur le lit de la rivière avec une flottation adéquate à la surface de l'eau pour éviter les débordements d'eau trouble. Les rideaux anti-sédimentation ou anti-turbidité seront déployés de manière à éviter que des poissons s'y retrouvent prisonniers.

Espèces aquatiques envahissantes

- 24.** Pour réduire le risque d'introduction d'espèces envahissantes, tout l'équipement doit être nettoyé à fond avant d'arriver sur le site. Toute machinerie qui ne semble pas avoir été nettoyée ne sera pas autorisée à accéder au site. Pour de plus amples renseignements ou des directives sur la façon de nettoyer correctement l'équipement, consulter le Clean Equipment Protocol for Industry élaboré par l'Ontario Invasive Plant Council, qui se trouve à l'adresse suivante http://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/07/Clean-Equipment-Protocol_June2016_D3_WEB-1.pdf (en anglais) et dans les Normes et lignes directrices relatives à l'environnement de l'Agence Parcs Canada – Voies navigables de l'Ontario (2017) ESG-11-C Invasive Species Management (en anglais).
- 25.** Tout équipement ou véhicule allant à l'eau (y compris les eaux de cale et de ballast) doit être nettoyé en profondeur avant et après utilisation pour éliminer les particules visibles de boue et de végétation, les moules, etc et :
- Les navires et l'équipement devraient être vidangés pour éliminer l'eau stagnante;
 - Les navires et l'équipement doivent idéalement être nettoyés à l'eau chaude (plus de 50 °C) avec un jet à haute pression (plus de 250 lb/po²);
 - Il faut faire sécher les navires et l'équipement pendant deux à sept jours au soleil avant de les transporter d'un plan d'eau à un autre;
 - Le nettoyage des navires et de l'équipement doit être effectué à l'écart des plans d'eau, à une distance recommandée d'au moins 30 m de toute rive.
- 26.** Les vêtements et les chaussures doivent être exempts de boue, de saletés et de particules de végétation lorsque le personnel entre dans la zone des travaux ou en sort.
- 27.** Ne mettre que des matériaux exempts de mauvaises herbes ou de contaminants dans les zones non infestées. Le déplacement de matériaux d'un endroit infesté à un autre au sein d'une zone particulière n'entraîne pas forcément une contamination, mais le déplacement de matériaux d'un endroit infesté à un endroit non infesté peut entraîner l'introduction et la propagation des plantes envahissantes.
- 28.** En cas d'enlèvement d'espèces envahissantes, il faut éliminer adéquatement les individus à l'extérieur du chantier pour éviter toute autre propagation.
- 29.** Si on constate ou soupçonne la présence d'une espèce envahissante dont l'ABI ne fait pas mention, il faut envoyer une photographie, l'emplacement et un rapport au personnel du responsable de l'environnement de l'APC.

Faune

- 30.** L'entrepreneur doit éviter de perturber la faune et de lui nuire.
- 31.** Il faut inspecter la zone de travail tous les jours pour s'assurer qu'aucun animal sauvage ne s'y trouve (inclure cette tâche dans la liste de contrôle du chantier.
- 32.** Les informations recueillies sur le terrain concernant des rencontres accidentelles d'espèces d'animaux sauvages qui ne sont pas en péril doivent être compilées et signalées. Les renseignements suivants doivent être consignés sur le terrain :
- lieux, dates et heures de la journée où l'espèce a été rencontrée;
 - noms des espèces rencontrées;
 - photographies des espèces, si prises;
 - état de l'animal.
- 33.** Si l'on croise des animaux sauvages blessés ou morts, le signaler immédiatement à l'APC. L'APC peut exiger de récupérer et de conserver la carcasse sur de la glace pour des essais en laboratoire.
- 34.** Tous les véhicules et l'équipement utilisés par le personnel du projet doivent respecter les limites de vitesse de la zone de construction afin de réduire le risque de collision avec des animaux sauvages, comme l'exige le superviseur sur les lieux.
- 35.** Les aires de travail doivent être maintenues propres et exemptes de sources de danger pour la faune, comme des fils, des câbles, des tuyaux, du plastique, de l'antigel ou d'autres matières que les animaux pourraient manger ou avec lesquelles ils pourraient s'emmêler.
- 36.** Les déchets seront stockés, manipulés et transportés conformément au plan de gestion des déchets, y compris le stockage de tous les déchets solides dans des conteneurs scellés et à l'épreuve des ours.
- 37.** Il est interdit de nourrir les animaux sauvages.

Espèces en péril

- 38.** En présence ou en cas de soupçons d'espèces en péril — serpents, tortues ou œufs pendant la construction — pendant les travaux de préparation, la mise en œuvre ou la démobilitation — les travaux doivent cesser sur-le-champ et le personnel de l'évaluation environnementale du parc doit en être avisé afin de connaître la marche à suivre. Il pourrait être nécessaire de prendre de nouvelles mesures pour éviter les impacts avant la reprise des travaux. Éloignez-vous et laissez l'animal quitter le chantier.
- 39.** Les aires d'accès à la construction et de travaux seront limitées à l'étendue nécessaire pour les activités de construction et elles seront délimitées sur le terrain au moyen de clôtures de protection installées de manière appropriée. La superficie perturbée doit être réduite au minimum et la zone des travaux, clairement délimitée.

Pollution sonore et atmosphérique

- 40.** L'entrepreneur doit informer les propriétaires de chalet aux alentours des activités prévues qui pourraient entraîner des perturbations et les planifier de manière à éviter les périodes sensibles.
- 41.** L'entrepreneur surveillera les plaintes du public et en tiendra compte : il tiendra un registre des plaintes et trouvera une solution aux problèmes soulevés.

- 42.** Tous les véhicules sur place sont censés avoir une fiche d'analyse des gaz d'échappement, conformément au règlement 361/98 de l'Ontario, *Motor Vehicles* [en anglais seulement], pris en application de la *Loi sur la protection de l'environnement de l'Ontario* (L.R.O. 1990, c. E.19). Les employés de Parcs Canada peuvent arrêter un véhicule s'ils estiment que ce dernier émet trop de gaz d'échappement ou s'ils soupçonnent que le dispositif de réduction des émissions a été enlevé ou modifié.
- 43.** L'entrepreneur est tenu d'utiliser un équipement lourd et des machines bien entretenus, équipés de systèmes de contrôle des émissions, silencieux, déflecteurs d'échappement, capots de moteur, etc. pleinement fonctionnels.
- 44.** Il faut éviter de laisser les machines tourner au ralenti inutilement afin d'éviter les émissions.

Ressources culturelles

- 45.** Si des ressources archéologiques non consignées (par exemple, des éléments structuraux ou des concentrations d'artefacts) sont observées pendant les activités de construction, il faut interrompre les travaux jusqu'à ce que ces ressources puissent être examinées par Parcs Canada ou l'archéologue désigné par l'Agence, que la situation soit examinée et que le coordonnateur de l'évaluation environnementale et le gestionnaire de projet aient émis des directives concernant les mesures d'atténuation à prendre. Veiller à ce que tous les matériaux culturels immergés exposés soient mouillés en attendant la direction.

Élimination des déchets

- 46.** Les matériaux recyclables et les déchets seront retirés du site, conformément aux règlements fédéraux, provinciaux et municipaux, et acheminés vers des installations d'élimination autorisées à les recevoir;
- 47.** Tout déchet sera éliminé conformément à la réglementation provinciale et locale applicable.