REQUEST FOR TENDERS No. 21-016

FCPCC Stage IV Expansion – Clearing and Grubbing

ISSUED: February 10, 2021

CLOSING DATE AND TIME:
Tenders are requested to be received at the Closing Location prior to:
3:00 PM (15:00 hrs) Pacific Time on February 23, 2021

Regional District of Nanaimo (REGIONAL DISTRICT) Contact for Questions:
Rob Wood, Project Coordinator
250-758-1157
rwood@rdn.bc.ca

Questions are requested to be received by 4:30 p.m. on February 19, 2021.

Proponent's Information Meeting:
Non-mandatory site meeting is scheduled for **2:00 p.m., February 12, 2021** at the French Creek Pollution Control Centre, 957 Lee Rd, Parksville, BC V9P 1Z4

Project Introduction

The French Creek Pollution Control Centre will undergo a major upgrade and expansion in 2021 requiring additional lands for the new works, laydown, and construction access. The clearing and grubbing herein is the first step in preparing the property for the upcoming project.

The purpose of this Tender is to solicit submissions from qualified firms to clear and grub an area at the French Creek Pollution Control Centre. **The tree clearing portion of the work must be completed before the bird nesting window commences on March 15, 2021** based on Notice of Award issuance on or before March 8, 2021. The remainder of the work must be completed by April 16, 2021.

The RDN will provide archaeological monitoring services and permitting for the work.

Any award is subject to receipt of the OLTC permit from FLNRO, approval from the Archaeology Branch and approval from RDN Senior Management.

Instructions to Bidders

Article 1. Closing Date/Time/Location

Bidders are requested to submit their Tender prior to the closing time of 3:00 PM (15:00 hrs), Pacific Time, February 23, 2021.

Submission Method:

By Email Only: With "21-016 FCPCC Tree Removal" as the subject line at this electronic address:

rwood@rdn.bc.ca

The RDN will not be responsible for any technological delays. Vendors are advised to allow themselves enough time to submit their Tender according to these instructions.

Tenders received in any other manner will not be accepted. Tenders will not be opened in public. Unverified tender results will be posted the RDN and BC Bid websites as soon as practical.

ARTICLE 2. Scope of Work

The work includes:

- Clearing and decking merchantable timber, sorted by conifer and deciduous, at locations accessible for pick-up by a self-loading logging truck.
- Clearing all non-merchantable timber and shrubs and removing and disposing offsite.
- Grubbing all tree stumps and significant shrub roots and removing and disposing offsite.
- The underlying organic surficial soil is to remain onsite and be rough levelled.
- Installation of silt fencing and other temporary erosion and sediment control measures, to be left in place at end of project.

The successful Contractor will be responsible to prepare and submit for approval an Erosion and Sediment Control Plan prepared by a Qualified Professional to meet the requirements of the contract documents and applicable laws.

Contractor's responsibilities:

a) Any and all required permits will be the responsibility of the successful contractor unless noted otherwise.
b) Coordinate with RDN for work within BC Hydro (BCH) right-of-way. Tree felling to be by utility certified arborist within BCH right-of-way.
c) Contractor will need to make their own provisions for power, water and washrooms if required.
d) Erosion and Sediment Control Plan prepared by Qualified Professional.
e) The tree clearing portion of the work must be completed before the bird nesting window commences on March 15, 2021.
f) Completion of all work by April 16, 2021.

ARTICLE 3. Site Visit

Non-mandatory site meeting is scheduled for **2:00 p.m., February 12, 2021** at the French Creek Pollution Control Centre, 957 Lee Rd, Parksville, BC V9P 1Z4. It is the responsibility of the potential contractors to be familiar with the site to determine the existing conditions, layouts and limitations and ask any questions. In submitting a tender, the contractor confirms that he/she has viewed the site and the tender includes any equipment, materials and labour necessary for this project. The contractor will rely entirely upon his/her own judgment in submitting a tender and include a sum sufficient to cover all items required for the contract.

ARTICLE 4. Examine Documents and Site

The Tenderer must carefully examine the Contract Documents and the site of the proposed works, judging for and satisfying himself as to the probable conditions to be encountered. Should a Tenderer find discrepancies in, or omissions from the drawings or other documents, or should he be in doubt as to their meaning, he should, prior to submitting his tender, notify the REGIONAL DISTRICT in writing. The Tenderer may not claim, after the submission of a tender, that there was any misunderstanding with respect to the conditions imposed by the documents. No verbal agreement or conversation made or had at any time with any officer, agency or employee of the Owner shall affect or modify any of the terms or obligations herein stated, or, deemed to be any representation of warranty.

Article 5. Addenda

If the REGIONAL DISTRICT determines that an amendment is required to this TENDER, the REGIONAL DISTRICT will post an addendum on the RDN (https://www.rdn.bc.ca/current-bid-opportunities) and BC Bid websites. Each addendum will be incorporated into and become part of the TENDER. No amendment of any kind to the TENDER is effective unless it is contained in a written addendum issued by the REGIONAL DISTRICT. It is the sole responsibility of the Proponent to check and ensure all addendums are included prior to submitting their final Tender submission.

ARTICLE 6. Tender Price
All pricing is to be in Canadian Dollars. Prices shall be filled in where indicated on the Tender Form. In the event of a price extension discrepancy when calculating the total contract value, the REGIONAL DISTRICT reserves the right to correct the totals.

ARTICLE 7. Federal and Provincial Sales Taxes
Prices shall include provincial sales tax payable on all applicable materials and equipment incorporated in the work. GST is not to be included in the price. GST shall be shown separately on the Tender Form based on the total contract value.

ARTICLE 8. Tender Signing
The tender must be executed by an authorized signatory in a position to legally bind their Company to the information contained in the Tender Form.

ARTICLE 9. Revisions to Tenders
Any revision to the tender by the Tenderer must be in writing properly executed and received prior to the posted closing date and time as per the submission instructions outlined in Article 1.

Multiple Revisions
Where a Tenderer submits multiple revisions to the original tender price, each revision should be numbered sequentially by the Tenderer. Unless the Tenderer clearly stipulates to the contrary on the face of the revision, each successive revision will nullify and replace any previous revision to the identified item or tender price.

Unclear or Ambiguous Revisions
If in the opinion of the REGIONAL DISTRICT, any revision is unclear, ambiguous as to meaning or intent, or does not comply with the requirements of this article, that revision will be disregarded and the original tender price, or the tender price determined by consideration of any other revisions will prevail. The REGIONAL DISTRICT, its employees and agents will not assume any responsibility for timely receipt of any revisions.

ARTICLE 10. Tender Withdrawal
A Tenderer may, without prejudice to himself, withdraw his tender on written request received prior to the posted closing date and time as per the submission instructions outlined in Article 1.

ARTICLE 11. Tender Rejection
.1 The REGIONAL DISTRICT reserves the right to reject any or all tenders, or, accept other than the lowest tender and to accept the tender which it deems most advantageous.

.2 The REGIONAL DISTRICT may reject a tender if:

a) After investigation and consideration, the REGIONAL DISTRICT concludes that the Tenderer is not qualified to do the work and/or cannot do the work and perform the Contract in a manner satisfactory to the REGIONAL DISTRICT.
b) A tender contains qualifying conditions or otherwise fails to conform to these Instructions to Tenderers.

c) A tender is incomplete, is considered incomplete in the Instructions to Tenderers, is obscure or irregular, which has erasures or corrections in the Tender Form, in which prices are omitted or are unbalanced, or which has an insufficient or irregular surety.

d) The REGIONAL DISTRICT may, in its absolute discretion, reject a Tender submitted by Tenderer if the Tenderer, or any officer or director of the Tenderer is or has been engaged either directly or indirectly through another corporation in a legal action against the REGIONAL DISTRICT, its elected or appointed officers and employees in relation to:
   - any other contract for works or services; or
   - any matter arising from the REGIONAL DISTRICT's exercise of its powers, duties, or functions under the Local Government Act or another enactment within five years of the date of this Call for Tenders.

In determining whether to reject a tender under this clause, the REGIONAL DISTRICT will consider whether the litigation is likely to affect the Tenderer's ability to work with the REGIONAL DISTRICT, its consultants and representatives and whether the REGIONAL DISTRICT's experience with the Tenderer indicates that the REGIONAL DISTRICT is likely to incur increased staff and legal costs in the administration of this contract if it is awarded to the Tenderer.

.3 The REGIONAL DISTRICT may reject all tenders if for any reason the REGIONAL DISTRICT considers to be in its best interest to do so, including without limitation for any of the following reasons;

a) the lowest tender that the REGIONAL DISTRICT considers otherwise acceptable is higher than the funds budgeted or otherwise available for the project;

b) the REGIONAL DISTRICT decides not to proceed with the project or to defer the project;

c) the REGIONAL DISTRICT is delayed in obtaining, or is unable to obtain, all approvals or consents it considers necessary, whether required by law or otherwise.

.4 The REGIONAL DISTRICT reserves the right to consider and to reject any tender or all tenders without notice to a Tenderer or Tenderers and without permitting a Tenderer to provide additional information.

.5 In no event will the REGIONAL DISTRICT be responsible for a Tenderer's costs of preparing or submitting a tender.

ARTICLE 12. Award

Awards shall be made on tenders that will give the greatest value based on quality, service, and price. The Owner will, following receipt of an acceptable tender, issue in writing a Notice of Award to the successful Tenderer.

ARTICLE 13. Form of Agreement

The Agreement and General Conditions of the contract are enclosed at the end of this document. Proponents should carefully review this form of Contract. Proponents may (but are not required to) request that RDN consider revisions to the form of Contract, including the scope of Services. Proponents should submit such requests to the RDN well before the Closing Date and Time. If the RDN agrees to a request received prior to the Time, then RDN will issue an Addendum to modify the Contract. Failure to do so means acceptance of the agreement as presented.

ARTICLE 14. No Claim for Compensation
Except as expressly and specifically permitted in these Instructions to Tenderers, no Tenderer shall have any claim for any compensation of any kind whatsoever, as a result of participating in the tender, and by submitting a bid each Tenderer shall be deemed to have agreed that it has no claim.

ARTICLE 15. Solicitation of Board Members
"If a member of the Board, or a person who was a member of the Board in the previous six months has a direct or indirect interest in the contract, then the Tenderer shall report this to the REGIONAL DISTRICT in accordance with Section 107 of the *Community Charter* upon being notified of the award of the contract.

The Tenderer warrants and represents that it has not received any information or a record from any Board member or former Board member contrary to Section 108 of the *Community Charter*." The successful Tenderer will be required to direct all communications related to their contract through the staff members responsible for the project.

ARTICLE 16. WorkSafe BC Prime Contractor
The successful Tenderer is designated as the Prime Contractor and shall fulfill the Prime Contractor responsibilities as defined in:

a) WorkSafeBC *Occupational Health and Safety Regulation,* Notice of project, Section 20.2, and Coordination of multiple employer workplaces, Section 20.3;
b) *Workers Compensation Act* (BC), Coordination at multiple-employer workplaces, Section 118, Subsections (1) & (2); and
c) General Requirements, Section 3.10 WorkSafe BC.

The Prime Contractor will be required to coordinate the safety of all workers on the work site, including their employees, their subcontractors, REGIONAL DISTRICT work crews and their contractors, and private utilities, (such as BC Hydro, Telus, Shaw and FortisBC).

Prior to commencing work, the successful Tenderer will be required to provide the REGIONAL DISTRICT with its latest WorkSafeBC Clearance Letter demonstrating it is a member in good standing and its remittance is up to date. Otherwise, no work can commence until the Tenderer is either reinstated in good standing or if the REGIONAL DISTRICT decides to cancel the agreement because this would result in an unacceptable time delay.

ARTICLE 17. Freedom of Information and Protection of Privacy Act
All documents submitted to the REGIONAL DISTRICT will be held in confidence by the REGIONAL DISTRICT, subject to the provisions of the Province of British Columbia's *Freedom of Information and Protection of Privacy Act.*

ARTICLE 18. HOURS OF WORK
Tenderer is advised that no work will be permitted outside the hours defined below:

Before 7:00 a.m. or after 6:00 p.m., Monday to Friday. Work on weekends and holidays with permission from RDN only.

ARTICLE 19. CONFLICT OF INTEREST

The Bidder declares that it has no financial interest, directly or indirectly in the business of any third party that would be or be seen to be a conflict of interest in carrying out the services. It warrants that neither it nor any of its officers or directors, or any employee with authority to bind the Bidder, has any financial or personal relationship or affiliation with any elected official or employee of the REGIONAL DISTRICT or their immediate families which might in any way be seen to create a conflict.

ARTICLE 20. COLLUSION

The Bidder shall not engage in collusion of any sort and shall ensure that no person or other legal entity, other than the Bidder has an interest in the Bidder's submission and prepare the submission without any knowledge of, comparison of figures with, or arrangement with any other person or firm preparing a Submission for the same work.

TENDER FORM
FCPCC Stage IV Expansion – Clearing and Grubbing

Date: _____

Company Name:_____

Address: _____

Telephone:_____ Email: _____

To: Rob Wood, Project Coordinator
rwood@rdn.bc.ca

Having examined the Project site, and having carefully examined all of the tender documents including any addenda issued as supplements thereto, and having examined the site and complied with Instructions to Bidders, we hereby offer to perform the Work set forth in the aforesaid documents for the Stipulated Contract Price. Prices include the Contractor's labour, material, equipment, material costs, overhead and profit, all taxes, and duties, and shall represent the cost to the Owner of such charges excluding GST which shall be shown separately.

Lump Sum Total $_____

GST (5%) $_____

Total Stipulated Contract Price $_____

ACCEPTANCE

.1 The tender is open to acceptance for a period of sixty (60) calendar days from the date of bid closing.

.2 Submission of this Bid implies acceptance of the existing conditions at the site.

.3 We understand that the lowest or any Bid will not necessarily be accepted. The Owner may also elect not to proceed with the Project.

.4 The Owner reserves the right to waive minor defects or irregularities in the bid.

TENDER FORM
FCPCC Stage IV Expansion – Clearing and Grubbing

.5 We agree to be designated as the Prime Contractor for this project per WorkSafe BC OH&S Regulations and have the necessary qualifications and are willing to accept the responsibilities as Prime Contractor for the project.

.6 We can complete the tree clearing portion of the work before the bird nesting window commences on March 15, 2021 and complete all work by April 16, 2021.

Company: _____

Signature: _____
(Authorized Officer)

Printed: _____
(Authorized Officer)

MOBILIZATION AND DEMOBILIZATION

1. GENERAL

1.1 General

.1 Mobilization and demobilization shall include the Contractor's costs of mobilization at the beginning of the project and the cost of demobilization at the end of the project.

1.2 Mobilization

.1 Mobilization shall consist of preparatory work and operations including, but not limited to, those necessary to the movement of personnel, equipment, supplies and incidentals to the Site; and for all work and operations which must be performed or costs incurred prior to beginning work on the various items on the Site.

1.3 Demobilization

.1 Demobilization shall consist of cleanup work and operations including, but not limited to, those necessary for the removal of personnel, equipment, and incidentals from the Site.

1.4 Payment

.1 Refer to contract documents.

2. PRODUCTS

Not Applicable.

3. EXECUTION

Not Applicable.

END OF SECTION

TRAFFIC CONTROL, VEHICLE ACCESS AND PARKING

1. GENERAL

1.1 General

.1 This Section addresses general requirements for temporary vehicle movement, site access and parking during construction both on and off site.

.2 During progress of the Work, make adequate provision to accommodate normal traffic along streets immediately adjacent to or crossing the Work so as to minimize inconvenience to the general public.

.3 Inform all owners or occupants of properties where access is affected in the advance of proposed road and/or sidewalk closures.

.4 Entrance to the French Creek Pollution Control Centre is at Lee Road.

1.2 Reference

.1 Regulate traffic in accordance with the Traffic Control Manual for Work on Roadways, Province of B.C., Ministry of Transportation and Highways, Regional District of Nanaimo requirements, and the requirements of WorkSafe BC.

1.3 Administrative Requirements

.1 Coordinate with Engineer and Owner on managing traffic during the Work.

1.4 Submittals

~~.1 Provide traffic management plan with the following:~~

~~.1 Traffic routing plan: show sequences of construction affecting use of roadways, time required for each phase of the work, plans for signage, barricading and striping to provide protection or passage for pedestrians and vehicles.~~

~~.2 Truck access routing plan: provide haul routes for Contractor's trucks. Include cleaning activities, daytime parking and methods to minimize impacts along existing roadways.~~

1.5 Protection of Public Control

.1 Comply with requirements of Acts, regulations and bylaws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out work or haul material or equipment.

.2 Working on travelled way:

.1 Place equipment in position to present minimum interference and hazard to travelling public. Do not use public roads as a holding/staging or cleaning area for vehicles.

.2 Keep equipment units as close together as working conditions will permit on same side of travelled way.

.3 Do not close any lanes of road with approval of the Engineer. Before re-routing traffic erect suitable signs and devices in accordance with applicable regulations.

.1 Keep travelled way well graded, free of potholes and of sufficient width that required number of lanes of traffic may pass.

.2 Provide and maintain reasonable road access and egress to property fronting along or in vicinity of the Work unless other reasonable means of road access exists.

1.6 Information and Warning Devices

.1 Provide and maintain signs and other devices required to indicate construction activities or other temporary and unusual conditions resulting from the Work which may impact normal road usage.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in applicable regulations.

.3 Place signs and other devices in locations recommended in said regulations.

.4 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

1.7 Control of Public Traffic

.1 Provide competent flag persons, properly equipped as specified in applicable regulations in the following situations:

.1 When public traffic is required to pass working vehicles or equipment which may block all or part of travelled roadway.

.2 When it is necessary to institute one-way traffic system through the Work Site or other blockage where traffic volumes are heavy, approach speeds are high or traffic signal system is not in use.

.3 When workers or equipment are employed on travelled way at other locations where oncoming traffic would not otherwise have adequate warning.

.4 Where temporary protection is required while other traffic control devices are being erected or taken down.

.5 For emergency protection when other traffic control devices are not readily available.

.6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

1.8 Roadways

.1 If authorized to use existing roads for access to Site, maintain such roads for duration of Contract and make good damage resulting from contractors' use of roads.

.2 Prior to final inspection, obtain and submit to Owner written signed releases from owners of all roads used for Site access, verifying that roads have been adequately restored and left in a satisfactory condition.

.3 Trim loads of trucks hauling excavated material, cement, sand, stone, gravel, debris or other loose material before leaving the site, and ensure that the bodies of such vehicles are tight so that no spillage of loads occurs.

.4 Vehicle load over the bridge within the French Creek Pollution Control Centre is limited. Refer to contract drawing for the maximum loads.

1.9 Access to Utility Installations

.1 Do not obstruct hydrants, valve or control pit covers, valve boxes, curb stop boxes, fire or police call boxes, and all other utility controls, warning systems, and appurtenances.

1.10 Construction Parking

.1 Parking will be permitted on Site in designated areas and provided it does not disrupt the performance of Work.

2. PRODUCTS

Not Applicable.

3. EXECUTION

Not Applicable.

END OF SECTION

CLEARING AND GRUBBING

1. GENERAL

1.1 Definitions

.1 Clearing consists of cutting off trees and brush vegetative growth to not more than a specified height above ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.

.2 Grubbing consists of excavation and disposal of stumps and roots boulders and rock fragments of specified size to not less than a specified depth below existing ground surface.

1.2 Protection

.1 Prevent damage to fencing, trees, landscaping, natural features, bench marks, existing buildings, existing pavement, utility lines, Work Site appurtenances, water courses and root systems of trees which are to remain.

.2 Do not commence tree cutting until the Owner confirms that any required permits have been received.

.3 Repair any damaged items to approval of Engineer.

.4 Replace any trees designated to remain, if damaged, as directed by Engineer.

2. PRODUCTS

Not Applicable.

3. EXECUTION

3.1 Preparation

.1 Inspect Work Site and verify with Engineer, items designated to remain.

.2 Locate and protect utility lines. Preserve in operating condition active utilities traversing Work Site.

.3 Notify utility authorities before starting clearing and grubbing.

3.2 Clearing

.1 Clear as indicated or as directed by Engineer, by cutting at a height of not more than 300 mm above ground. In areas to be subsequently grubbed, height of stumps left from clearing operations to be not more than 1000 mm above ground surface.

.2 Cut off branches, down trees overhanging area cleared as directed by Engineer.

.3 Cut off unsound branches on trees designated to remain as directed by Engineer.

3.3 Grubbing

.1 Grub out stumps and roots to not less than 200 mm below ground surface.

.2 Grub out visible rock fragments and boulders, greater than 300 mm in greatest dimension, but less than 0.5 m^3.

3.4 Removal and Disposal

.1 Remove and dispose cleared and grubbed materials off-site.

3.5 Finished Surface

.1 Leave ground surface in condition suitable for immediate grading operations or stripping of topsoil.

END OF SECTION

EROSION AND SEDIMENT CONTROL NOTES:

1. IT IS INTENDED THAT EROSION AND SEDIMENT CONTROL STRATEGIES BE IMPLEMENTED DURING ALL CONSTRUCTION PHASES.

2. THE EROSION CONTROL MEASURES OUTLINED HERE ARE INTENDED TO:
   - PREVENT THE GENERATION OF SUSPENDED SEDIMENT
   - SUPPORT EROSION CONTROL MEASURES BY CAPTURING AND RETAINING SUSPENDED SEDIMENT
   - TO LIMIT THE TRANSPORT OF SEDIMENT ONTO ROADWAYS. ALL SITE ACCESS FROM DISTURBED AREAS TO PAVED SURFACES WILL BE RESTRICTED WHERE POSSIBLE.
   - ALL PERSONS INCLUDING, BUT NOT LIMITED TO , ENGINEER, THE EROSION AND SEDIMENT CONTROL SUPERVISOR, THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS INVOLVED WITH THE PROJECT (ALL PERSONS INVOLVED) SHALL COMPLY WITH ALL FEDERAL, PROVINCIAL AND REGIONAL DISTRICT OF NANAIMO (RDN) REGULATORY REQUIREMENTS FOR EROSION AND SEDIMENT CONTROL (ESC).

3. ALL PERSONS INVOLVED WITH THE PROJECT ARE RESPONSIBLE FOR ALL SITE ACTIVITIES THAT RESULT IN NON-COMPLIANCE WITH REGULATORY REQUIREMENTS.

4. PRIOR TO CONSTRUCTION START-UP, THE PROJECT PROPONENT OR PRIME CONTRACTOR MUST SCHEDULE AN ENVIRONMENTAL PRE-CONSTRUCTION MEETING TO DISCUSS SCHEDULING, ROLES AND RESPONSIBILITIES, AND ESC AND OTHER POLLUTION PREVENTION PRACTICES. MEETING INVITEES SHOULD INCLUDE THE DEVELOPER/PROJECT MANAGER, CONSULTANT, CONTRACTORS AND REGULATORS.

5. THE FOLLOWING INFORMATION MUST BE ON SITE (AND AVAILABLE UPON REQUEST), AND FILED FOR A MINIMUM OF TWO YEARS FOLLOWING FINAL SITE STABILIZATION:
   - THE EROSION AND SEDIMENT CONTROL REPORT AND/OR DRAWING(S), INCLUDING ALL AMENDMENTS;
   - DOCUMENTATION (INCLUDING PHOTOS AND UP-TO-DATE WRITTEN RECORDS) DETAILING IMPLEMENTATION, INSPECTION AND MAINTENANCE OF ESC PRACTICES.

7. REGULAR MONITORING INSPECTIONS ARE TO BE CARRIED OUT BY A QUALIFIED ESC MONITOR UNDER THE SUPERVISION OF THE ESC SUPERVISOR UNTIL PROJECT COMPLETION.

8. INSPECTIONS OF ALL ESC PRACTICES MUST BE COMPLETED AND DOCUMENTED AT LEAST EVERY 7 DAYS AND AT CRITICAL TIMES WHEN EROSION OR SEDIMENT RELEASES COULD OCCUR. NOTE: INSPECTIONS MUST BE COMPLETED AND DOCUMENTED DURING, OR WITHIN 24 HOURS OF, HEAVY SNOWMELT AND HEAVY AND/OR PROLONGED RAINFALL (DEFINED AS >12 MM PRECIPITATION WITHIN ANY 24 HOUR PERIOD, OR PRECIPITATION OR SNOWMELT ON WET OR THAWING SOILS).

9. AS DIRECTED BY THE ENGINEER OR ESC SUPERVISOR, PERSONS INVOLVED IN ESC MAINTENANCE ARE REQUIRED TO INSPECT AND UNDERTAKE ACTIVITIES TO MODIFY OR MAINTAIN ESC FACILITIES. THESE INCLUDE, BUT ARE NOT LIMITED TO ONSITE OR ADJACENT PAVED ROAD SURFACES, ONSITE OR ADJACENT CATCH BASIN AND FILTRATION FACILITY AND EQUIPMENT, AND ONSITE SEDIMENT FENCING.

10. THE ESC SUPERVISOR WILL BE RESPONSIBLE FOR ENSURING THAT MONITORING INSPECTIONS ARE CONDUCTED ON A REGULAR BASIS. THE ESC SUPERVISOR WILL REPORT TO THE RDN AND THE CONTRACTOR ON ESC ESC MEASURES AND SITE DISCHARGE. ESC MONITORING AND STORM DISCHARGE FROM THE SITE TESTED WEEKLY AND AFTER HIGH RAINFALL EVENTS (>25mm IN 24 HOURS).

11. THE ESC DRAWINGS ILLUSTRATES THE MINIMUM MEASURES REQUIRED TO MEET RDN REQUIREMENTS.ALL PERSONS INVOLVED WITH THE PROJECT WILL COMPLY WITH THE ESC PLAN AND WITH ALL INSTRUCTIONS ISSUED BY THE PROJECT'S ESC SUPERVISOR, RDN, AND FISHERIES AND OCEANS CANADA TO CORRECT DEFICIENCIES THAT WOULD RESULT IN NON-COMPLIANCE WITH THE CONDITIONS OF THE PERMIT.

12. THE APPROVED EROSION AND SEDIMENT CONTROL REPORT AND/OR DRAWING(S) MUST BE UPDATED WHEN THERE ARE CHANGES TO THE EROSION AND SEDIMENT CONTROL PRACTICES OR IMPLEMENTATION.

13. THE CONTRACTORS ARE REQUIRED TO HAVE A COPY OF THE ESC PLAN ONSITE AT ALL TIMES AND PROVIDE CONTACT DETAILS FOR THE ESC SUPERVISOR.

14. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL ESC MEASURES SPECIFIED ARE INSTALLED BEFORE CONSTRUCTION BEGINS. THE ESC SUPERVISOR SHALL CONDUCT MONITORING INSPECTIONS AS REQUIRED BY THE CONTRACT.

15. THESE PLANS AND NOTES ILLUSTRATES THE MINIMUM WORKS AND FACILITIES REQUIRED FOR CONTROLLING EROSION AND SEDIMENT . THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION AND SEDIMENT CONTROL WORKS AND FACILITIES INCLUDING BUT NOT LIMITED TO WHEEL WASH, SEDIMENT COLLECTION AND TEMPORARY DISCHARGE FACILITY AT SITE ACCESS POINT AS WORK PROGRESSES AND AS REQUIRED TO SUIT CONTRACTORS WORK FLOW AND METHODOLOGY TO ACHIEVE THE INTENT OF THE CONTRACTORS EROSION AND SEDIMENT CONTROL PLAN.

16. THE INTENT OF THE PLAN IS TO DIRECT CLEAN STORMWATER RUNOFF AWAY FROM THE WORK AREAS WHILE DIRECTING RUNOFF FROM ERODIBLE AREAS AND GRAVEL SURFACES SUBJECT FOR VEHICLE TRAFFIC TO CATCH BASINS WITH SEDIMENT BARRIERS OR SILT FILTERS.

17. SEDIMENT BARRIERS AND OTHER FACILITIES INTENDED TO PREVENT SEDIMENT FROM BEING DISCHARGED TO THE STORM DRAINAGE SYSTEM OR OTHER RECEIVING WATERS ARE CONSIDERED TO BE THE LAST LINE OF DEFENSE AND SHALL BE IMPLEMENTED IN CONJUNCTION WITH OTHER MEASURES THAT CONTROL SEDIMENT, SUCH AS SWEEPING, OR EROSION PREVENTION.

18. ALL EROSION AND SEDIMENT CONTROL WORKS AND FACILITIES SHALL BE MONITORED AND MAINTAINED IN PROPER OPERATING CONDITION ON AN ON-GOING BASIS. ALL COLLECTED SEDIMENT SHALL BE REMOVED AFTER SIGNIFICANT RAIN EVENTS.

19. ALL CATCH BASINS LOCATED ONSITE OR ADJACENT TO THE PROJECT, THAT COULD POTENTIALLY RECEIVE SEDIMENT LADEN RUNOFF DUE TO THE PROJECT WILL HAVE SEDIMENT PROTECTION INSTALLED TO MINIMIZE THE AMOUNT OF SEDIMENT ENTERING THE STORM SYSTEM. SEDIMENT BARRIERS ARE TO BE INSTALLED WITH A MINIMUM DEPTH OF 150mm TO FILTER, BUT NOT LIMIT, WATER FLOW.

20. GEOTEXTILE SEDIMENT FENCES ARE TO BE INSTALLED ALONG DITCHES AND OPEN WATER AT THE TOP OF BANK TO REDUCE MOVEMENT OF ERODED SEDIMENT. SEDIMENT FENCE WILL BE PLACED DUG IN A MINIMUM 150mm INTO THE GROUND, TO REDUCE SEDIMENT TRANSPORTATION AND ENSURE SEDIMENT IS KEPT AWAY FROM RIPARIAN AREAS (SEE DETAIL).

21. SILT FENCE IS TO BE 'CONTROL SILT FENCE PLUS' OR EQUIVALENT AS APPROVED BY THE ENGINEER. FENCE TO HAVE MIN. CLEAR WATER FLOW RATE OF 0.10cfs/sf. FENCE TO BE STAPLED @150mm O/C TO TREATED POSTS SPACED AT 1.0m O/C. BOTTOM OF SILT Ø100mm FENCE TO BE ANCHORED AS PER DETAIL.

22. GEOTEXTILE SEDIMENT FENCES ARE TO BE INSPECTED AND REPAIRED PRIOR TO EXPECTED RAIN EVENTS AND AFTER ALL SIGNIFICANT STORM EVENTS. SEDIMENT FENCES ARE TO BE CLEARED OF SEDIMENT OR REPLACED WHEN DEFICIENCIES ARE PRESENT.

23. PAVED ROAD SURFACES WITH ACCUMULATED SEDIMENT WILL BE CLEANED / SWEPT REGULARLY AS REQUIRED. FLUSHING OF ROADWAYS IS PROHIBITED.

24. ANY TEMPORARY STOCKPILES CONTAINING ERODIBLE MATERIAL WILL BE COVERED WITH A TARPAULIN OR PLASTIC TO PREVENT EROSION (SEE STOCKPILE DETAIL). A GEOTEXTILE SEDIMENT FENCE WILL BE PLACED 1 TO 2m FROM THE DOWNSLOPE TOE OF THE STOCKPILE AND DUG IN A MINIMUM 150mm INTO THE GROUND. TO REDUCE SEDIMENT TRANSPORTATION AND ENSURE SEDIMENT IS KEPT AWAY FROM DITCHES. STOCKPILES LEFT FOR PERIODS LONGER THAN ONE MONTH, WILL BE COVERED WITH VEGETATION (I.E., HYDROSEED). NO SEDIMENT LADEN MATERIALS SHALL BE DEPOSITED OR PILED OUTSIDE OF THE PROJECT BOUNDARIES, PARTICULARLY ON ACCESS ROAD SURFACES.

25. ALL INSTALLED EROSION AND SEDIMENT CONTROL FACILITIES ARE TO BE REPAIRED AND MAINTAINED WITHIN 24-HR OF DAMAGE BEING OBSERVED.

26. INSTALL GRAVEL SITE ACCESS AS SHOWN ON THE PLAN AT START OF CONSTRUCTION.

27. ALL CATCH BASIN PROTECTION DEVICES ARE TO BE INSPECTED WEEKLY MINIMUM, OR FOLLOWING SIGNIFICANT RAINFALL EVENTS, AND CLEANED-OUT OR REPAIRED AS NECESSARY WITHIN 24 HOURS. (MINIMUM CLEAN-OUT AT 40% CAPACITY)

28. AS CONSTRUCTION PROGRESSES, AND IF SITE GRADING REQUIRES TEMPORARY ELIMINATION OF DITCHES AND/OR OTHER MITIGATION MEASURES, THEY ARE TO BE IMMEDIATELY RESTORED BY THE END OF THE WORK DAY.

29. ALL GRAVEL PADS ARE TO BE IMMEDIATELY REPAIRED IF AFFECTED BY TRAFFIC OR CONSTRUCTION ACTIVITIES. ALL ROCK DRIVEWAY AND ACCESS PADS ARE TO BE MAINTAINED OR, IF SEDIMENT-LADEN, REPLACED.

30. ANY IRREGULARITIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

31. SOLID WASTE (INCLUDING COLLECTED SEDIMENT, ASPHALT AND CONCRETE MILLINGS, FLOATING DEBRIS, PAPER, PLASTIC, FABRIC, CONSTRUCTION AND DEMOLITION DEBRIS AND OTHER WASTES) WILL BE DISPOSED OF PROPERTY AND WILL COMPLY WITH THE DISPOSAL REQUIREMENTS.

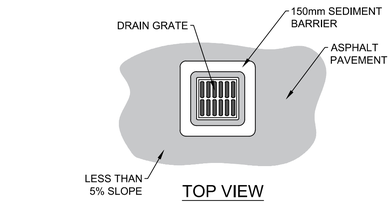
32. HAZARDOUS MATERIAL (INCLUDING OIL, GASOLINE, PAINT AND ANY HAZARDOUS SUBSTANCES) WILL BE PROPERLY STORED, INCLUDING SECONDARY CONTAINMENT, TO PREVENT SPILLS. LEAKS OR OTHER DISCHARGE. STORAGE AND DISPOSAL OF HAZARDOUS WASTE WILL BE IN COMPLIANCE WITH RDN REGULATIONS.

33. THE INTERNAL HAUL ROUTE(S) WILL BE DETERMINED BY THE EARTHWORKS CONTRACTOR AND CIRCULATED FOR REVIEW. THE HAUL ROAD WILL BE SPRAYED WITH WATER AS REQUIRED TO MINIMIZE DUST AND WIND EROSION.

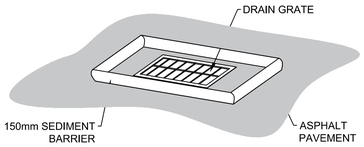
DECOMMISSIONING

1. ALL SILT FENCES SHALL BE REMOVED.
2. ANY POINTS OF ENTRY OTHER THAN THE PROPOSED DRIVEWAYS SHALL BE REMOVED AND AREA REINSTATED AS PER THE DESIGN DRAWINGS.

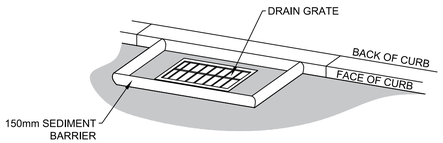
NOT APPLICABLE IN THIS CLEARING & GRUBBING CONTRACT



TOP VIEW



EXPOSED INLET PLACEMENT

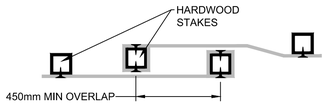


CURB AND GUTTER INLET PLACEMENT

SEDIMENT BARRIERS TYPICAL

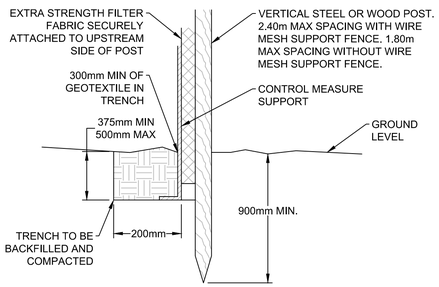
N.T.S.

NOTES:
1. TO ENSURE OPTIMAL PERFORMANCE, SILT FENCE TO BE INSTALLED IN AN EXCAVATED TRENCH, MIN 150mm X 150mm OR AS REQUIRED BY THE LOCAL REGULATORY AUTHORITY.
2. STAKES TO BE POUNDED IN UNTIL FABRIC REACHES BOTTOM OF THE TRENCH.
3. POSTS TO BE INSTALLED FACING DOWNHILL. RUNOFF SHOULD PUSH FABRIC AGAINST POST NOT AWAY FROM THEM.
4. THE TRENCH TO BE BACKFILLED BY A BACKHOE OR OTHER EARTH MOVING EQUIPMENT.



WHEN INSTALLING SEVERAL LENGTHS OF SILT FENCE END TO END, OVERLAP THE EDGES OF THE FABRIC AT LEAST 450mm.

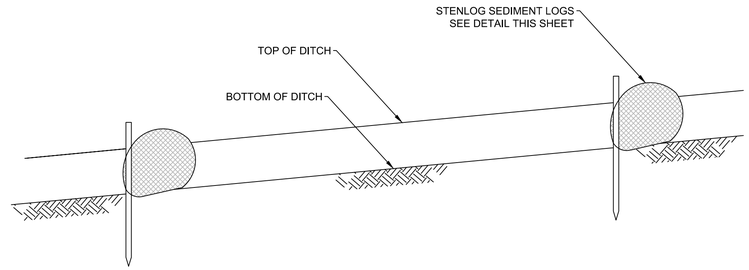
TOP VIEW



SITE VIEW

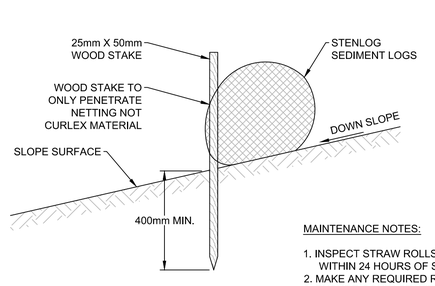
SILT FENCE INSTALLATION

N.T.S.

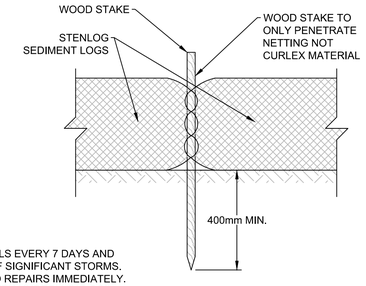


TEMPORARY STENLOG SEDIMENT LOGS

N.T.S.



PROFILE



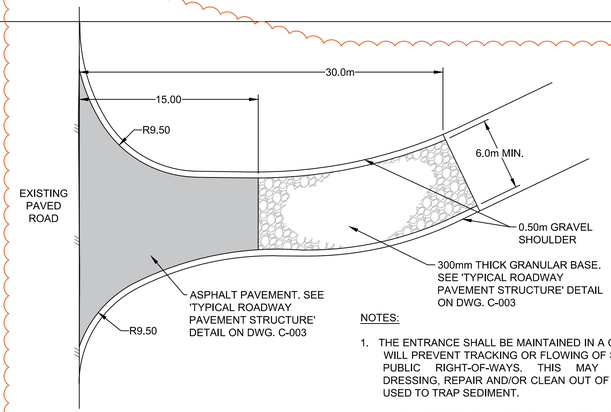
FRONT VIEW

MAINTENANCE NOTES:

1. INSPECT STRAW ROLLS EVERY 7 DAYS AND WITHIN 24 HOURS OF SIGNIFICANT STORMS.
2. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
3. ENSURE CONTACT WITH UNDERLYING SOIL.

STRAW WATTLE DETAIL

N.T.S.

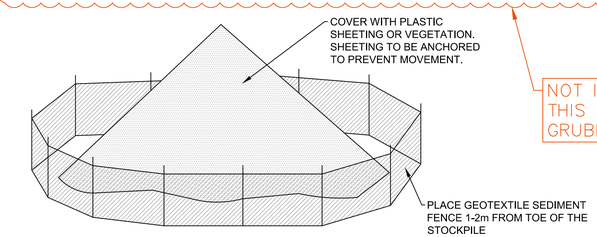


NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURED USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AND APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE / EXIT

N.T.S.



NOT INCLUDED IN THIS CLEARING & GRUBBING CONTRACT

STOCKPILE

N.T.S.

DRN BY:	VERIFY SCALE IF PLAN SHEET IS REDUCED				
SI	30 mm				
DES BY:					
MC					
CHK BY:		C	ISSUED FOR DRAFT TENDER	SI	2021/02/26
KM		B	ISSUED FOR 90% DETAILED DESIGN	BY	2020/07/24
APP BY:		A	ISSUED FOR 60% DETAILED DESIGN	KM	2019/09/24
MC		REV	DESCRIPTION	CHK	DATE (Y/M/D)
				DRN	

PREPARED FOR:

REGIONAL DISTRICT OF NANAIMO

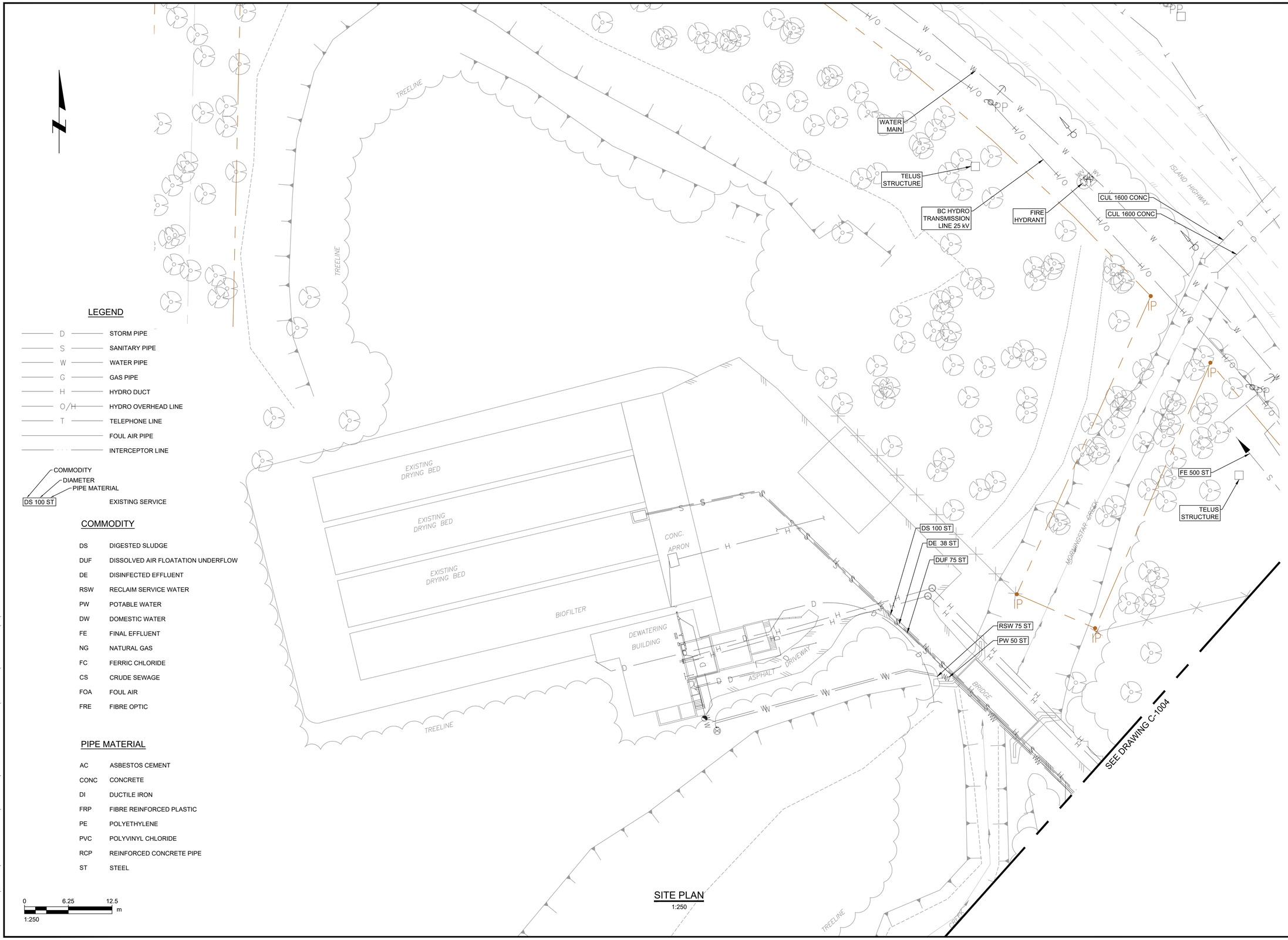
PREPARED BY:

AECOM
4th FLOOR,
3292 PRODUCTION WAY,
BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
FRENCH CREEK POLLUTION CONTROL CENTRE
STAGE IV EXPANSION
CIVIL
EROSION AND SEDIMENT CONTROL
NOTES AND DETAILS

PROJECT START DATE (M / Y)	SEP/2019
PROJECT NO.	60590631
FILENAME	60590631-C-002.dwg
RDN DRAWING No.	
DRAWING No.	C-002

Plotted By: snejaignatova
Plot File Date Created: Feb/08/2021 4:32 PM
Layout-Sheet Name: C-002
Filename: C:\USERS\SNEJA.IGNATOVA\DESKTOP\60590631-DESKTOP\910-CAD\20-SHEETS\C\60590631-C-002.DWG



LEGEND

D	STORM PIPE
S	SANITARY PIPE
W	WATER PIPE
G	GAS PIPE
H	HYDRO DUCT
O/H	HYDRO OVERHEAD LINE
T	TELEPHONE LINE
	FOUL AIR PIPE
	INTERCEPTOR LINE

COMMODITY
DIAMETER
PIPE MATERIAL
DS 100 ST — EXISTING SERVICE

COMMODITY

DS	DIGESTED SLUDGE
DUF	DISSOLVED AIR FLOATATION UNDERFLOW
DE	DISINFECTED EFFLUENT
RSW	RECLAIM SERVICE WATER
PW	POTABLE WATER
DW	DOMESTIC WATER
FE	FINAL EFFLUENT
NG	NATURAL GAS
FC	FERRIC CHLORIDE
CS	CRUDE SEWAGE
FOA	FOUL AIR
FRE	FIBRE OPTIC

PIPE MATERIAL

AC	ASBESTOS CEMENT
CONC	CONCRETE
DI	DUCTILE IRON
FRP	FIBRE REINFORCED PLASTIC
PE	POLYETHYLENE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
ST	STEEL

0 6.25 12.5 m
1:250

SITE PLAN
1:250

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
C	ISSUED FOR DRAFT TENDER	SI	BY	2021/02/26
B	ISSUED FOR 90% DETAILED DESIGN	SI	BY	2020/07/24
A	ISSUED FOR 60% DETAILED DESIGN	SI	KM	2019/09/24

DRN BY: SI
DES BY: SI
CHK BY: BY
APP BY: MC

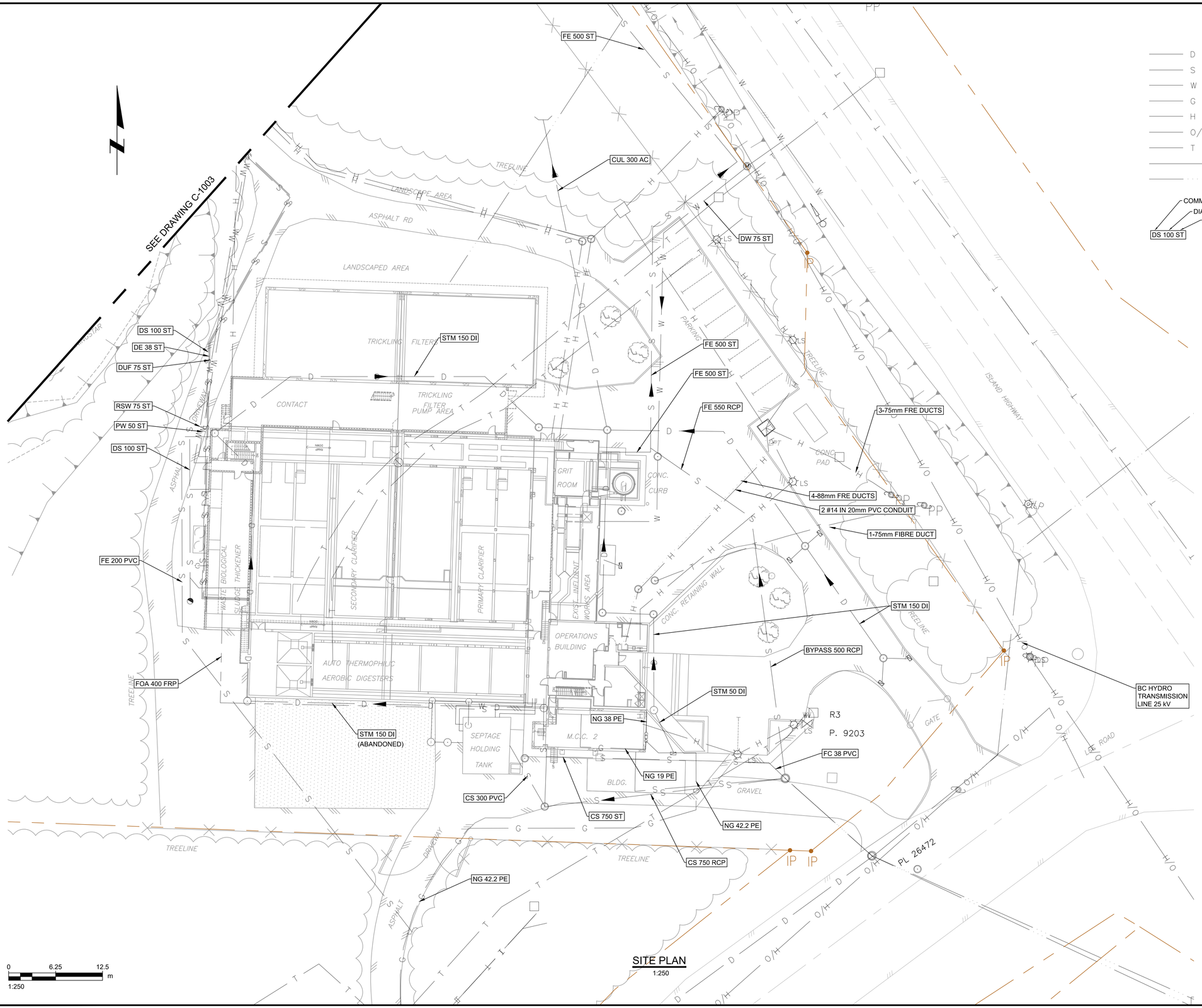
PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

PREPARED BY:
AECOM
4th FLOOR,
3292 PRODUCTION WAY,
BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
FRENCH CREEK POLLUTION CONTROL CENTRE
STAGE IV EXPANSION
CIVIL
EXISTING SITE AND SERVICES PLAN
SHEET 1 OF 2

PROJECT START DATE (M / Y): SEP/2019
PROJECT NO.: 60590631
FILENAME: 60590631-C-1003.dwg
RDN DRAWING No.:
DRAWING No.: **C-1003**

Plotted By: snejaignatova
Plot File Date Created: Jan/27/2021 3:32 PM
Layout-Sheet Name: C-1003
Filename: C:\USERS\SNEJAIGNATOVA\DESKTOP\60590631-DESKTOP\910-CAD\20-SHEETS\C\60590631-C-1003.DWG



SITE PLAN
1:250

0 6.25 12.5 m
1:250

LEGEND

D	STORM PIPE
S	SANITARY PIPE
W	WATER PIPE
G	GAS PIPE
H	HYDRO DUCT
O/H	HYDRO OVERHEAD LINE
T	TELEPHONE LINE
	FOUL AIR PIPE
	INTERCEPTOR LINE

COMMODITY
DIAMETER
PIPE MATERIAL
DS 100 ST — EXISTING SERVICE

COMMODITY

DS	DIGESTED SLUDGE
DUF	DISSOLVED AIR FLOATATION UNDERFLOW
DE	DISINFECTED EFFLUENT
RSW	RECLAIM SERVICE WATER
PW	POTABLE WATER
DW	DOMESTIC WATER
FE	FINAL EFFLUENT
NG	NATURAL GAS
FC	FERRIC CHLORIDE
CS	CRUDE SEWAGE
FOA	FOUL AIR
FRE	FIBRE OPTIC

PIPE MATERIAL

AC	ASBESTOS CEMENT
CONC	CONCRETE
DI	DUCTILE IRON
FRP	FIBRE REINFORCED PLASTIC
PE	POLYETHYLENE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
ST	STEEL

VERIFY SCALE IF PLAN SHEET IS REDUCED — 30 mm

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
C	ISSUED FOR DRAFT TENDER	SI	BY	2021/02/26
B	ISSUED FOR 90% DETAILED DESIGN	SI	BY	2020/07/24
A	ISSUED FOR 60% DETAILED DESIGN	SI	KM	2019/09/24

DRN BY: SI
DES BY: SI
CHK BY: BY
APP BY: MC

PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

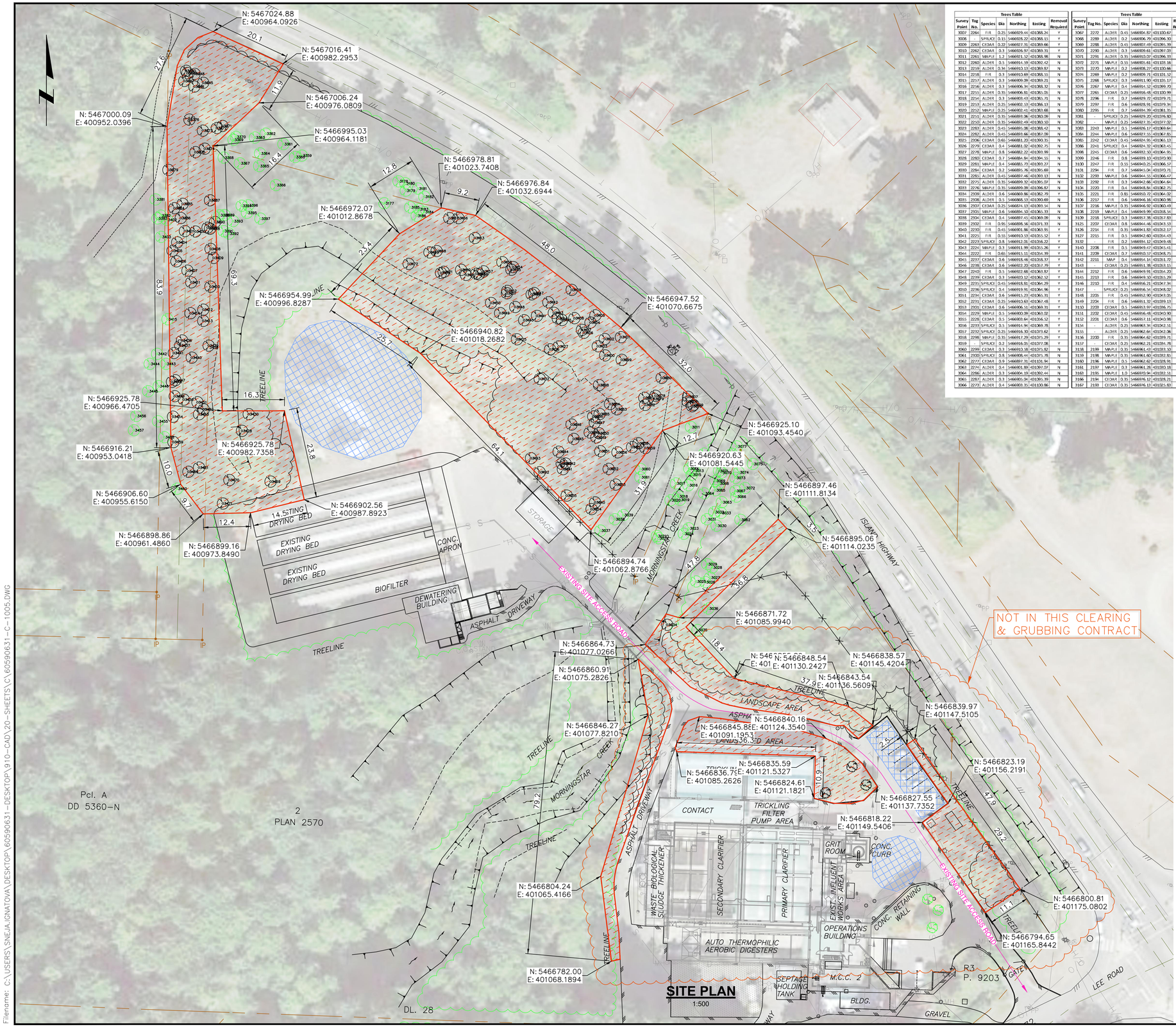
PREPARED BY:
AECOM
4th FLOOR,
3292 PRODUCTION WAY,
BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
FRENCH CREEK POLLUTION CONTROL CENTRE
STAGE IV EXPANSION

CIVIL
EXISTING SITE AND SERVICES PLAN
SHEET 2 OF 2

PROJECT START DATE (M / Y): SEP/2019
PROJECT NO.: 60590631
FILENAME: 60590631-C-1004.dwg
RDN DRAWING No.:
DRAWING No.: **C-1004**

Plotted By: snejaignatova
Plot File Date Created: Jan/27/2021 3:35 PM
Layout-Sheet Name: C-1004
Filename: C:\USERS\SNEJA.IGNATOVA\DESKTOP\60590631-DESKTOP\910-CAD\20-SHEETS\C\60590631-C-1004.DWG



SITE PLAN
1:500

Trees Table						
Survey Point	Tag No.	Species	Dia	Northing	Easting	Removal Required
3007	2264	FIR	0.25	5466929.44	401388.24	Y
3008	-	SPRUCE	0.15	5466928.22	401388.53	Y
3009	2263	CEDAR	0.22	5466927.31	401389.66	Y
3010	2262	CEDAR	0.3	5466926.97	401389.71	Y
3011	2261	MAPLE	1.2	5466931.52	401388.98	N
3012	2260	ALDER	0.5	5466914.59	401392.42	N
3013	2259	ALDER	0.34	5466913.13	401389.87	N
3014	2258	FIR	0.3	5466909.71	401391.32	N
3015	2257	ALDER	0.3	5466909.09	401389.21	N
3016	2256	ALDER	0.3	5466906.36	401388.52	N
3017	2255	FIR	0.35	5466905.84	401386.05	N
3018	2254	ALDER	0.3	5466903.43	401385.71	N
3019	2253	ALDER	0.25	5466901.53	401386.13	N
3020	2252	ALDER	0.25	5466902.61	401383.68	N
3021	2251	ALDER	0.35	5466893.06	401380.09	N
3022	2250	ALDER	0.35	5466892.49	401380.50	N
3023	2283	ALDER	0.45	5466895.08	401388.42	N
3024	2282	ALDER	0.45	5466893.66	401387.09	N
3025	2306	CEDAR	0.65	5466881.20	401393.35	N
3026	2279	CEDAR	0.4	5466881.03	401392.75	N
3027	2278	MAPLE	0.8	5466882.27	401393.99	N
3028	2280	CEDAR	0.7	5466884.86	401394.55	N
3029	2281	MAPLE	0.4	5466885.79	401393.27	N
3030	2284	CEDAR	0.2	5466895.36	401395.69	N
3031	2285	MAPLE	0.45	5466897.46	401393.13	N
3032	2275	ALDER	0.35	5466899.32	401395.07	N
3033	2276	MAPLE	0.35	5466899.09	401396.87	N
3034	2309	ALDER	0.6	5466901.86	401382.79	Y
3035	2308	ALDER	0.3	5466868.33	401390.69	N
3036	2307	CEDAR	0.25	5466874.31	401393.16	N
3037	2305	MAPLE	0.6	5466884.50	401396.33	N
3038	2304	CEDAR	0.4	5466897.65	401399.09	N
3039	2302	FIR	0.95	5466898.56	401371.33	N
3040	2298	FIR	0.45	5466901.58	401370.95	N
3041	2225	FIR	0.55	5466910.53	401355.52	Y
3042	2223	SPRUCE	0.8	5466912.01	401356.22	Y
3043	2224	MAPLE	0.3	5466911.96	401355.36	Y
3044	2222	FIR	0.65	5466915.11	401354.39	Y
3045	2237	CEDAR	0.6	5466918.46	401358.37	Y
3046	2238	CEDAR	0.3	5466922.30	401357.79	Y
3047	2240	FIR	0.5	5466922.66	401360.87	Y
3048	2239	CEDAR	0.3	5466920.12	401362.52	Y
3049	2235	MAPLE	0.45	5466918.83	401364.29	Y
3050	2236	SPRUCE	0.4	5466919.91	401366.96	Y
3051	2234	CEDAR	0.6	5466915.23	401365.31	Y
3052	2231	CEDAR	0.25	5466914.90	401366.26	Y
3053	2301	CEDAR	0.6	5466906.51	401369.31	Y
3054	2229	MAPLE	0.3	5466900.09	401363.02	Y
3055	2228	CEDAR	0.3	5466903.64	401366.52	Y
3056	2233	SPRUCE	0.3	5466914.96	401369.78	Y
3057	2232	SPRUCE	0.25	5466916.31	401373.62	Y
3058	2298	MAPLE	0.35	5466917.29	401371.29	Y
3059	-	SPRUCE	0.2	5466916.05	401377.08	Y
3060	2299	CEDAR	0.3	5466910.38	401373.82	N
3061	2300	SPRUCE	0.8	5466908.44	401375.78	N
3062	2277	CEDAR	0.9	5466897.31	401401.96	N
3063	2274	ALDER	0.4	5466901.88	401397.07	N
3064	2286	ALDER	0.3	5466904.18	401392.44	N
3065	2287	ALDER	0.3	5466905.06	401391.39	N
3066	2273	ALDER	0.4	5466903.35	401400.86	N

Trees Table						
Survey Point	Tag No.	Species	Dia	Northing	Easting	Removal Required
3067	2272	ALDER	0.45	5466904.87	401400.67	N
3068	2288	ALDER	0.2	5466906.99	401396.30	N
3069	2268	ALDER	0.45	5466907.49	401395.39	N
3070	2290	ALDER	0.3	5466909.61	401397.08	N
3071	2291	ALDER	0.35	5466913.07	401396.31	N
3072	2271	MAPLE	0.55	5466905.61	401403.16	N
3073	2270	MAPLE	0.2	5466906.27	401400.66	N
3074	2269	MAPLE	0.2	5466908.71	401401.32	N
3075	2268	SPRUCE	0.3	5466911.90	401395.17	N
3076	2267	MAPLE	0.4	5466914.52	401399.70	N
3077	2265	CEDAR	0.25	5466916.48	401400.99	N
3078	2296	FIR	0.7	5466929.72	401379.71	Y
3079	2297	FIR	0.6	5466928.91	401379.36	Y
3080	2295	FIR	0.7	5466916.99	401381.35	Y
3081	-	SPRUCE	0.25	5466929.20	401376.80	Y
3082	-	MAPLE	0.25	5466927.35	401377.02	Y
3083	2243	MAPLE	0.5	5466926.17	401369.66	Y
3084	2244	MAPLE	0.6	5466927.55	401367.85	Y
3085	2242	CEDAR	0.45	5466924.95	401365.13	Y
3086	2241	SPRUCE	0.4	5466924.32	401363.45	Y
3098	2245	CEDAR	0.6	5466932.10	401364.95	Y
3099	2246	FIR	0.5	5466919.10	401393.90	Y
3100	2247	FIR	0.55	5466903.25	401366.57	Y
3101	2296	FIR	0.7	5466941.04	401370.71	Y
3102	2293	MAPLE	0.6	5466944.13	401366.47	Y
3103	2292	FIR	0.3	5466942.66	401366.66	Y
3104	2220	FIR	0.4	5466948.84	401362.75	Y
3105	2221	FIR	0.55	5466953.72	401364.00	Y
3106	2217	FIR	0.6	5466946.16	401360.98	Y
3107	2216	MAPLE	0.35	5466946.92	401360.49	Y
3108	2215	MAPLE	0.4	5466949.99	401358.54	Y
3109	2218	SPRUCE	0.3	5466937.38	401357.83	Y
3125	2219	CEDAR	0.8	5466944.46	401363.53	Y
3126	2214	FIR	0.5	5466941.83	401352.17	Y
3127	2215	FIR	0.5	5466942.60	401354.43	Y
3132	-	FIR	0.3	5466936.12	401369.48	Y
3140	2208	FIR	0.5	5466949.47	401345.43	Y
3141	2209	CEDAR	0.7	5466953.17	401348.75	Y
3142	2211	MAP	0.4	5466954.14	401351.72	Y
3143	-	CEDAR	0.25	5466951.38	401353.15	Y
3144	2212	FIR	0.6	5466949.91	401354.20	Y
3145	2213	FIR	0.6	5466949.93	401355.29	Y
3146	2210	FIR	0.5	5466946.23	401347.36	Y
3147	-	SPRUCE	0.25	5466956.54	401348.02	Y
3148	2205	FIR	0.45	5466952.90	401343.05	Y
3149	2206	FIR	0.5	5466949.07	401341.43	Y
3150	2208	CEDAR	0.5	5466953.97	401336.75	Y
3151	2202	CEDAR	0.45	5466956.48	401340.90	Y
3152	2203	CEDAR	0.6	5466947.11	401340.98	Y
3154	-	ALDER	0.25	5466963.34	401342.51	Y
3155	-	ALDER	0.25	5466962.64	401342.06	Y
3156	2200	FIR	0.55	5466964.62	401339.71	Y
3157	-	CEDAR	0.25	5466962.21	401334.78	Y
3158	2199	MAPLE	0.35	5466961.43	401333.50	Y
3159	2198	MAPLE	0.35	5466961.60	401332.85	Y
3160	2196	MAPLE	0.5	5466962.62	401328.91	Y
3161	2197	MAPLE	0.3	5466961.26	401330.18	Y
3162	2195	MAPLE	1.0	5466970.94	401332.13	Y
3166	2194	CEDAR	0.35	5466976.12	401328.21	Y
3167	2193	CEDAR	0.35	5466976.13	401325.83	Y

Trees Table						
Survey Point	Tag No.	Species	Dia	Northing	Easting	Removal Required
3168	2192	CEDAR	0.35	5466967.53	401322.50	Y
3169	2189	MAPLE	0.6	5466961.36	401320.61	Y
3170	2190	FIR	0.35	5466961.79	401323.67	Y
3171	2191	FIR	0.35	5466962.08	401324.37	Y
3172	2188	MAPLE	0.4	5466964.17	401315.33	Y
3177	2177	MAPLE	0.45	5466983.00	401308.90	N
3178	2178	CEDAR	0.3	5466985.34	401312.56	N
3179	2180	FIR	0.35	5466981.31	401316.66	N
3180	2179	CEDAR	0.35	5466985.20	401314.33	N
3181	2181	CEDAR	0.35	5466983.86	401317.62	N
3182	2182	CEDAR	0.35	5466981.72	401319.93	N
3183	2184	FIR	0.4	5466978.44	401317.88	N
3184	2185	CEDAR	0.35	5466977.71	401318.27	N
3185	2183	FIR	0.35	5466979.15	401321.61	N
3186	2186	FIR	0.55	5466976.74	401317.35	N
3192	2227	CEDAR	0.4	5466959.34	401329.11	N
3193	2226	CEDAR	0.5	5466963.39	401347.19	Y
3341	2127	FIR	0.7	5467011.69	401961.69	Y
3346	2136	FIR	0.75	5467010.49	401963.18	Y
3347	2133	FIR	0.3	5467011.96	401956.16	Y
3348	2135	FIR	0.4	5467013.83	401959.21	Y
3349	2134	FIR	0.4	5467014.02	401957.35	Y
3350	1051	FIR	0.4	5467014.68	401957.01	Y
3359	2176	CEDAR	0.6	5466992.47	401987.28	N
3360	2175	CEDAR	0.4	5466992.08	401985.52	N
3361	2174	MAPLE	0.6	5466965.47	401982.43	N
3362	2170	ALDER	0.35	5466988.21	401977.82	N
3363	2169	FIR	0.5	5466987.39	401971.09	N
3366	-	CEDAR	0.25	5466993.03	401976.36	N
3367	2172	CEDAR	0.4	5466983.73	401976.13	N
3368	2173	MAPLE	0.7	5466984.27	401980.69	N
3367	2171	FIR	0.45	5466990.45	401971.08	N
3368	2166	CEDAR	0.4	5466991.93	401966.86	N
3369	2167	CEDAR	0.45	5466996.59	401966.41	N
3370	2168	CEDAR	0.45	5466997.35	401970.03	N
3371	2162	CEDAR	0.35	5467000.21	401966.54	Y
3372	2160	CEDAR	0.5	5466999.60	401960.39	Y
3373	2161	CEDAR	0.5	5466998.99	401961.41	Y
3374	2165	CEDAR	0.35	5466994.26	401961.90	Y
3375	-	FIR	0.25	5466993.37	401959.66	N
3376	-	ALDER	0.3	5467001.87	401957.88	Y
3379	1052	FIR	0.3	5466988.73	401952.40	Y
3381	1053	FIR	0.55	5466981.02	401960.25	N
3382	2148	FIR	0.65	5466976.95	401950.41	N
3383	1054	FIR	0.35	5466976.05	401949.54	N
3384	2150	CEDAR	0.5	5466978.73	401953.98	N
3385	2151	CEDAR	0.6	5466979.83	401956.13	Y
3386	2149	CEDAR	0.35	5466976.15	401955.63	Y
3387	-	CEDAR	0.4	5466980.78	401960.28	N
3388	-	CEDAR	0.3	5466976.89	401965.78	N
3389	2138	FIR	0.6	5466976.92	401967.11	N
3390	2139	FIR	0.6	5466971.10	401964.58	Y
3391	-	FIR	0.3	5466972.73	401966.81	N
3392	2133	FIR	0.45	5466972.08	401968.21	N
3393	2137	FIR	0.4	5466971.93	401969.30	N
3394	2136	FIR	0.7	5466979.35	401971.56	N
3395	2135	FIR	0.7	5466977.51	401972.93	N
3396	-	FIR	0.25	5466979.47	401973.21	N
3397	2134	FIR	0.7	5466976.00	401976.44	N
3398	2140	MAPLE	0.35	5466973.36	401963.29	Y

Trees Table						
Survey Point	Tag No.	Species	Dia	Northing	Easting	Removal Required
3399	2141	FIR	0.4	5466973.62	401962.66	Y
3400	2142	FIR	0.35	5466972.63	401959.46	Y
3401	2143	FIR	0.6	5466972.74	401955.72	Y
3402	2147	FIR	0.4	5466971.69	401952.06	N
3403	2146	FIR	0.5	5466971.23	401950.45	N
3404	2144	FIR	0.7	5466969.79	401954.71	Y
3405	2145	MAPLE	0.6	5466967.60	401953.48	Y
3406	2128	MAPLE	0.6	5466964.80	401954.49	Y
3407	-	FIR	0.25	5466962.42	401957.40	Y
3408	2132	FIR	0.4	5466968.08	401963.43	Y
3409	2131	MAPLE	0.5	5466961.72	401959.93	N
3410	2130	MAPLE	0.6	5466958.21	401963.40	Y
3411	2129	FIR	0.4	5466959.91	401967.23	Y
3412	2127	FIR	0.5	5466962.35	401963.32	Y
3413	2101	FIR	0.8	5466969.29	401961.31	Y
3414	1055	FIR	0.5	5466961.27	401958.18	Y
3415	1056	ALDER	0.4	5466969.71	401952.17	N
3428	-	FIR	0.3	5466920.33	402971.63	Y
3430	-	FIR	0.3	5466924.91	402973.39	Y
3436	2102	FIR	0.5	5466964.17	402955.97	Y
3437	2103	FIR	0.6	5466962.83	402951.49	Y
3438	2132	ALDER	0.5	5466962.93	402962.85	Y
3439	1058	ALDER	0.45	5466962.82	402962.91	Y
3440	2106	FIR	0.5	5466959.68	402958.32	Y
3441	1057	ALDER	0.4	5466963.98	402963.83	Y
3442	2106	FIR	0.4	5466960.66	402969.43	N
3443	2105	CEDAR	0.4	5466958.05	402951.72	N
3444	2107	MAPLE	0.35	5466958.90	402947.52	N
3445	2108	ALDER	0.6	5466930.90	402967.10	N
3446	2109	FIR	0.4	5466932.21	402969.87	N
3447	2110	FIR	0.7	5466931.27	402980.69	N
3448	-	CEDAR	0.25	5466933.35	402953.36	Y
3449	2111	ALDER	0.35	5466929.59	402954.05	Y
3450	2112	HEMLOCK	0.35	5466929.71	402950.33	Y
3451	2113	FIR	0.5	5466928.01	402959.99	Y
3452	2114	ALDER	0.45	5466926.15	402961.63	Y
3453	2115	CEDAR	0.45	5466926.18	402960.39	Y
3454	2116	FIR	0.3	5466924.24	402953.68	Y
3455	2119	ALDER	0.55	5466923.03	402969.69	N
3456	2120	CEDAR	0.4	5466924.45	402969.29	N
3457	2121	HEMLOCK	0.4	5466920.72	402943.38	N
3458	2118	CEDAR	0.55	5466918.88	402951.36	N
3459	2117	CEDAR	0.5	5466917.63	402953.72	N
3460	2123	CEDAR	0.8	5466905.44	402955.66	N
3461	2125	MAPLE	0.7	5466910.95	402960.40	Y
3466	2126	CEDAR	0.7	5466909.83	402957.67	Y
3469	2126	CEDAR	0.5	5466907.10	402979.11	Y
3470	-	CEDAR	0.25	5466907.69	402968.33	Y
3471	2301	MAPLE	0.4	5466881.56	402966.67	Y

GENERAL NOTES

1. ALL VEGETATION CLEARING AND TREE REMOVALS ARE TO OCCUR OUTSIDE OF THE BIRD NESTING WINDOW (MARCH 15 – AUGUST 15).
2. TREES ARE TO BE REMOVED PRIOR TO ANY CONSTRUCTION WORK. CONTRACTOR IS TO HAVE A FLAGGER OR WORKER ON SITE TO ENSURE AREA IS FREE OF PEDESTRIANS PRIOR TO FALLING TREES.
3. AREA TO BE GRUBBED MUST BE CLEARED OF GRUBBING REMAINS / MATERIALS REMOVED AND DISPOSED OFF SITE.
4. AT NO POINT DURING SITE PREPARATION IS DEBRIS OF ANY KIND TO ENTER EXISTING DRAINAGE SYSTEM. CONTRACTOR IS TO SET UP SEDIMENT CONTROL AS REQUIRED PRIOR TO GRUBBING / SITE PREPARATION.
5. CONTRACTOR TO CONTACT BC HYDRO @604-6233637 Ext 4 FOR POWER POLES PROTECTION PRIOR TO TREE REMOVAL.
6. CONTRACTOR TO CONTACT MOTI @250-7344801 (TAMMY THOMPSON) FOR CONSTRUCTION EASEMENT FOR TREE REMOVAL.
7. PROVIDE ACCESS AT ALL TIMES DURING CONSTRUCTION FOR OPERATING AND REMOVAL OF DEWATERED SOLIDS BIN.
8. MAXIMUM LOAD OVER THE BRIDGE TO BE THE FOLLOWING:

   2.7 TONNES –SINGLE AXLE WEIGHT
   5.4 TONNES–COMBINED TANDEM WEIGHT
   7.2 TONNES–COMBINED TRIDEM WEIGHT
   7.2 TONNES GVW FOR SINGLE–UNIT VEHICLE
   12.6 TONNES GVW FOR TWO–UNIT VEHICLE
   18 TONNES GVW FOR VEHICLE TRAIN

LEGEND:

- CLEARING AND GRUBBING AREA
- STOCK PILE AREA
- EXISTING TREES TO REMAIN
- EXISTING TREES TO BE REMOVED
- EXISTING TREE LINE

REV	DESCRIPTION	CHK	DATE (Y/M/D)
C	ISSUED FOR DRAFT TENDER	SI	2021/02/26
B	ISSUED FOR 90% DETAILED DESIGN	SI	2020/07/24
A	ISSUED FOR 60% DETAILED DESIGN	SI	2019/09/24

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

DRN BY: SI
DES BY: MC
CHK BY: KM
APP BY: MC

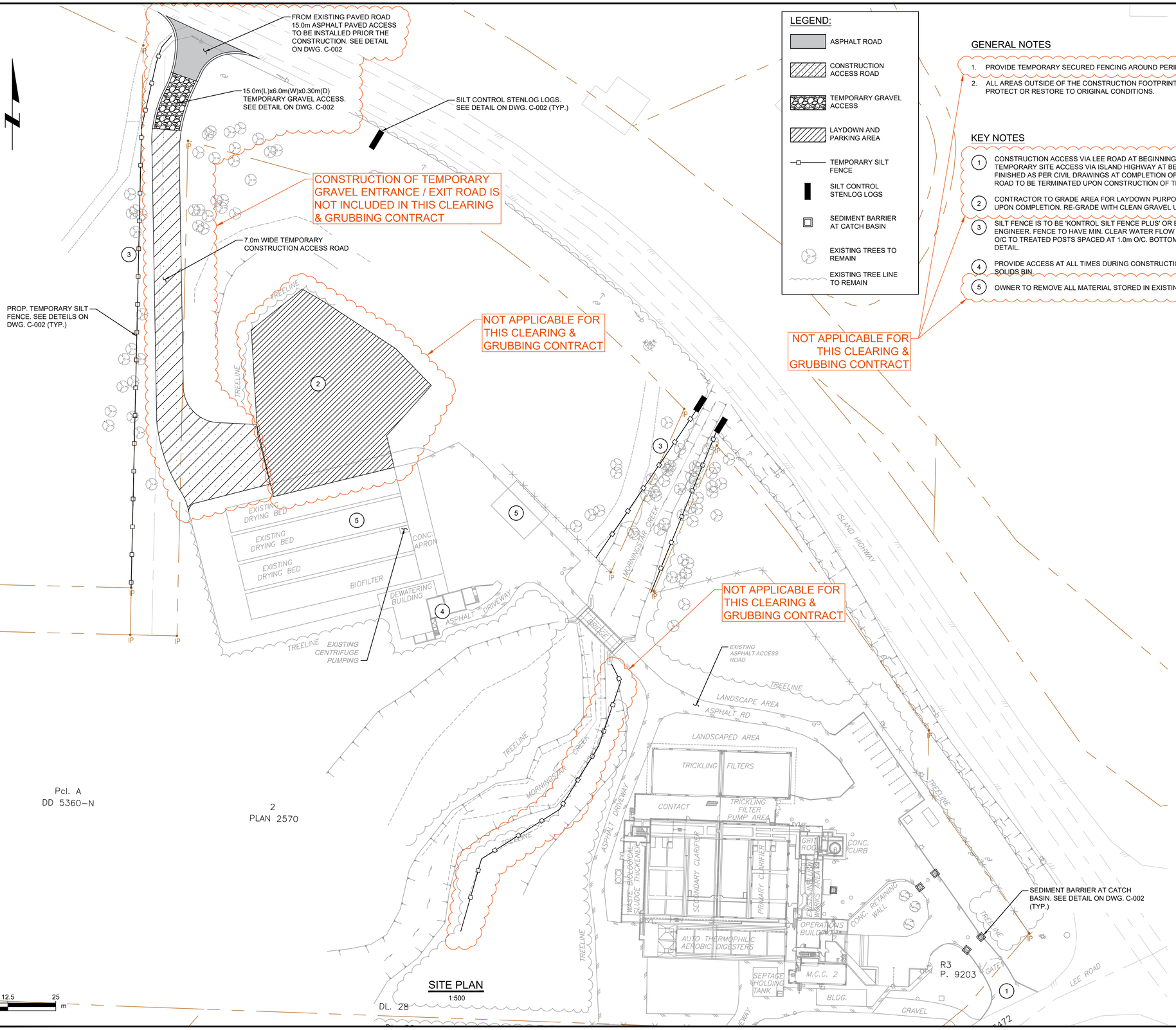
PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

PREPARED BY:
AECOM
4th FLOOR,
3292 PRODUCTION WAY,
BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
FRENCH CREEK POLLUTION CONTROL CENTRE
STAGE IV EXPANSION
CIVIL
CLEARING AND GRUBBING PLAN

PROJECT START DATE (M / Y): SEP/2019
PROJECT NO.: 60590631
FILENAME: 60590631-C-1005.dwg
RDN DRAWING No.:
DRAWING No.: C-1005

Plotted By: snejo.ignatova
Plot File Date Created: Feb/08/2021 4:38 PM
Layout-Sheet Name: C-1005
Filename: C:\USERS\SNEJA.IGNATOVA\DESKTOP\60590631-DESKTOP\910-CAD\20-SHEETS\C\60590631-C-1005.DWG



SITE PLAN
1:500

GENERAL NOTES

1. PROVIDE TEMPORARY SECURED FENCING AROUND PERIMETER OF CONSTRUCTION SITE AT ALL TIMES.
2. ALL AREAS OUTSIDE OF THE CONSTRUCTION FOOTPRINT ARE TO THE CONTRACTORS RESPONSIBILITY TO PROTECT OR RESTORE TO ORIGINAL CONDITIONS.

KEY NOTES

1. CONSTRUCTION ACCESS VIA LEE ROAD AT BEGINNING OF CONSTRUCTION. CONTRACTOR TO CONSTRUCT TEMPORARY SITE ACCESS VIA ISLAND HIGHWAY AT BEGINNING OF PROJECT. TEMPORARY ACCESS TO BE FINISHED AS PER CIVIL DRAWINGS AT COMPLETION OF CONSTRUCTION. CONSTRUCTION ACCESS VIA LEE ROAD TO BE TERMINATED UPON CONSTRUCTION OF TEMPORARY ACCESS VIA LEE ROAD.
2. CONTRACTOR TO GRADE AREA FOR LAYDOWN PURPOSES WITH 200mm GRAVEL PAD. GRAVEL TO REMAIN UPON COMPLETION. RE-GRADE WITH CLEAN GRAVEL UPON COMPLETION OF WORK.
3. SILT FENCE IS TO BE 'KONTROL SILT FENCE PLUS' OR EQUIVALENT AS APPROVED BY THE ENGINEER. FENCE TO HAVE MIN. CLEAR WATER FLOW RATE OF 0.10cfs/sf. FENCE TO BE STAPLED @ 150mm O/C TO TREATED POSTS SPACED AT 1.0m O/C. BOTTOM OF SILT Ø100mm FENCE TO BE ANCHORED AS PER DETAIL.
4. PROVIDE ACCESS AT ALL TIMES DURING CONSTRUCTION FOR OPERATING AND REMOVAL OF DEWATERED SOLIDS BIN.
5. OWNER TO REMOVE ALL MATERIAL STORED IN EXISTING STORAGE AREAS PRIOR TO DEMOLITION.

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
C	ISSUED FOR DRAFT TENDER	SI	BY	2021/02/26
B	ISSUED FOR 90% DETAILED DESIGN	SI	BY	2020/07/24
A	ISSUED FOR 60% DETAILED DESIGN	SI	KM	2019/09/24

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

DRN BY: SI
DES BY: MC
CHK BY: KM
APP BY: MC

PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

PREPARED BY:
AECOM
4th FLOOR,
3292 PRODUCTION WAY,
BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
FRENCH CREEK POLLUTION CONTROL CENTRE
STAGE IV EXPANSION

CIVIL
TEMPORARY ACCESS, LAYDOWN AREAS AND FENCING

PROJECT START DATE (M / Y): SEP/2019
PROJECT NO.: 60590631
FILENAME: 60590631-C-1006.dwg
RDN DRAWING No.:
DRAWING No.: **C-1006**

Plotted By: snejа.ignatova
Plot File Date Created: Feb/08/2021 2:04 PM
Layout-Sheet Name: C-1006
Filename: C:\USERS\SNEJA.IGNATOVA\DESKTOP\60590631-DESKTOP\910-CAD\20-SHEETS\C\60590631-C-1006.DWG

Trees Table						
Survey Point	Tag No.	Species	Dia	Northing	Easting	Removal Required
3007	2264	FIR	0.25	5466929.44	401088.24	Y
3008	-	SPRUCE	0.15	5466928.22	401088.15	Y
3009	2263	CEDAR	0.22	5466927.31	401089.66	Y
3010	2262	CEDAR	0.3	5466926.97	401089.31	Y
3011	2261	MAPLE	1.2	5466921.52	401088.98	N
3012	2260	ALDER	0.5	5466914.59	401092.42	N
3013	2259	ALDER	0.34	5466910.13	401089.87	N
3014	2258	FIR	0.3	5466910.69	401088.55	N
3015	2257	ALDER	0.3	5466909.09	401089.21	N
3016	2256	ALDER	0.3	5466906.34	401088.32	N
3017	2255	ALDER	0.35	5466906.81	401085.05	N
3018	2254	ALDER	0.3	5466903.43	401085.71	N
3019	2253	ALDER	0.25	5466902.53	401086.13	N
3020	2252	MAPLE	0.25	5466902.41	401083.68	N
3021	2251	ALDER	0.35	5466893.06	401080.09	N
3022	2250	ALDER	0.35	5466892.49	401080.50	N
3023	2283	ALDER	0.45	5466895.08	401088.42	N
3024	2282	ALDER	0.45	5466893.66	401087.09	N
3025	2306	CEDAR	0.65	5466881.20	401090.35	N
3026	2279	CEDAR	0.4	5466881.02	401092.75	N
3027	2278	MAPLE	0.8	5466882.22	401093.99	N
3028	2280	CEDAR	0.7	5466884.84	401094.55	N
3029	2281	MAPLE	0.4	5466885.73	401093.27	N
3030	2284	CEDAR	0.2	5466895.76	401095.69	N
3031	2285	ALDER	0.45	5466897.46	401093.13	N
3032	2275	ALDER	0.35	5466899.32	401095.07	N
3033	2276	MAPLE	0.35	5466899.09	401096.87	N
3034	2309	ALDER	0.6	5466869.86	401082.79	Y
3035	2308	ALDER	0.5	5466868.53	401090.69	N
3036	2307	CEDAR	0.25	5466874.13	401093.54	N
3037	2305	MAPLE	0.6	5466894.50	401065.33	N
3038	2304	CEDAR	0.4	5466897.45	401069.09	N
3039	2302	FIR	0.95	5466898.56	401071.33	N
3040	2230	FIR	0.45	5466901.86	401063.95	Y
3041	2225	FIR	0.55	5466910.53	401055.52	Y
3042	2223	SPRUCE	0.8	5466912.01	401056.22	Y
3043	2224	MAPLE	0.3	5466911.99	401055.26	Y
3044	2222	FIR	0.65	5466915.11	401054.39	Y
3045	2237	CEDAR	0.6	5466918.46	401058.37	Y
3046	2238	CEDAR	0.6	5466922.20	401057.79	Y
3047	2240	FIR	0.5	5466922.68	401063.87	Y
3048	2239	CEDAR	0.3	5466920.12	401062.52	Y
3049	2235	SPRUCE	0.45	5466918.81	401064.29	Y
3050	2236	SPRUCE	0.4	5466919.91	401064.96	Y
3051	2234	CEDAR	0.6	5466915.23	401065.31	Y
3052	2231	CEDAR	0.25	5466910.63	401067.48	Y
3053	2301	CEDAR	0.6	5466906.51	401069.31	Y
3054	2229	MAPLE	0.5	5466900.09	401063.02	Y
3055	2228	CEDAR	0.5	5466903.64	401056.52	Y
3056	2233	SPRUCE	0.5	5466914.94	401069.78	Y
3057	2232	SPRUCE	0.25	5466916.30	401073.62	Y
3058	2298	MAPLE	0.35	5466917.29	401075.29	Y
3059	-	SPRUCE	0.2	5466916.05	401077.08	Y
3060	2299	CEDAR	0.3	5466910.58	401075.82	N
3061	2300	SPRUCE	0.8	5466908.44	401075.78	N
3062	2277	CEDAR	0.9	5466897.31	401101.94	N
3063	2274	ALDER	0.4	5466901.89	401097.07	N
3064	2286	ALDER	0.3	5466904.19	401092.44	N
3065	2287	ALDER	0.3	5466905.04	401095.39	N
3066	2273	ALDER	0.4	5466903.35	401100.86	N

Trees Table						
Survey Point	Tag No.	Species	Dia	Northing	Easting	Removal Required
3067	2272	ALDER	0.45	5466904.87	401100.67	N
3068	2289	ALDER	0.2	5466906.79	401096.30	N
3069	2288	ALDER	0.45	5466907.49	401095.39	N
3070	2290	ALDER	0.3	5466909.61	401097.03	N
3071	2291	ALDER	0.35	5466910.07	401096.33	N
3072	2271	MAPLE	0.55	5466905.61	401103.16	N
3073	2270	MAPLE	0.2	5466908.27	401100.66	N
3074	2269	MAPLE	0.2	5466909.71	401101.52	N
3075	2268	SPRUCE	0.3	5466911.90	401105.17	N
3076	2267	MAPLE	0.4	5466914.52	401099.70	N
3077	2265	CEDAR	0.25	5466916.48	401100.99	N
3078	2296	FIR	0.7	5466929.72	401079.71	Y
3079	2297	FIR	0.6	5466928.91	401079.34	Y
3080	2295	FIR	0.7	5466934.39	401081.35	Y
3081	-	SPRUCE	0.25	5466929.20	401076.80	Y
3082	-	MAPLE	0.25	5466927.35	401077.02	Y
3083	2243	MAPLE	0.5	5466926.17	401069.64	Y
3084	2244	MAPLE	0.6	5466927.55	401067.85	Y
3085	2242	CEDAR	0.45	5466924.95	401065.13	Y
3086	2241	SPRUCE	0.4	5466924.32	401063.45	Y
3098	2245	CEDAR	0.6	5466932.50	401064.95	Y
3099	2246	FIR	0.8	5466939.10	401070.90	Y
3100	2247	FIR	0.55	5466940.25	401066.57	Y
3101	2294	FIR	0.7	5466945.04	401070.71	Y
3102	2293	MAPLE	0.6	5466944.55	401066.47	Y
3103	2292	FIR	0.3	5466942.66	401064.64	Y
3104	2220	FIR	0.4	5466948.84	401062.75	Y
3105	2221	FIR	0.85	5466950.72	401064.02	Y
3106	2217	FIR	0.6	5466946.16	401060.98	Y
3107	2216	MAPLE	0.35	5466946.92	401060.49	Y
3108	2219	MAPLE	0.4	5466949.99	401058.54	Y
3109	2218	SPRUCE	0.3	5466957.38	401057.83	Y
3125	2207	CEDAR	0.8	5466944.46	401043.53	Y
3126	2214	FIR	0.35	5466941.83	401052.17	Y
3127	2215	FIR	0.5	5466942.60	401054.43	Y
3132	-	FIR	0.2	5466934.12	401049.48	Y
3140	2208	FIR	0.5	5466949.47	401045.41	Y
3141	2209	CEDAR	0.7	5466950.57	401048.75	Y
3142	2211	MAP	0.4	5466954.14	401051.72	Y
3143	-	CEDAR	0.25	5466951.38	401053.15	Y
3144	2212	FIR	0.6	5466949.91	401054.20	Y
3145	2213	FIR	0.6	5466949.50	401055.29	Y
3146	2210	FIR	0.4	5466956.21	401047.34	Y
3147	-	SPRUCE	0.25	5466956.54	401048.02	Y
3148	2205	FIR	0.45	5466952.90	401043.05	Y
3149	2204	FIR	0.6	5466951.32	401039.13	Y
3150	2203	CEDAR	0.5	5466953.97	401036.75	Y
3151	2202	CEDAR	0.45	5466956.48	401040.90	Y
3152	2201	CEDAR	0.6	5466957.11	401040.98	Y
3154	-	ALDER	0.25	5466963.34	401042.51	Y
3155	-	ALDER	0.25	5466962.64	401042.06	Y
3156	2200	FIR	0.35	5466964.62	401039.71	Y
3157	-	CEDAR	0.25	5466962.21	401034.78	Y
3158	2199	MAPLE	0.35	5466961.43	401033.50	Y
3159	2198	MAPLE	0.35	5466961.60	401032.85	Y
3160	2196	MAPLE	0.5	5466962.62	401028.91	Y
3161	2197	MAPLE	0.3	5466961.28	401030.18	Y
3163	2195	MAPLE	1.0	5466970.94	401032.51	Y
3166	2194	CEDAR	0.35	5466976.12	401028.21	Y
3167	2193	CEDAR	0.35	5466976.13	401025.83	Y

Trees Table						
Survey Point	Tag No.	Species	Dia	Northing	Easting	Removal Required
3168	2192	CEDAR	0.35	5466967.53	401022.50	Y
3169	2189	MAPLE	0.6	5466967.16	401020.65	Y
3170	2190	FIR	0.35	5466961.79	401023.67	Y
3171	2191	FIR	0.35	5466962.08	401024.37	Y
3172	2188	MAPLE	0.4	5466964.17	401015.19	Y
3177	2177	MAPLE	0.45	5466980.00	401008.90	N
3178	2178	CEDAR	0.3	5466985.74	401012.56	N
3179	2180	FIR	0.55	5466983.31	401014.46	N
3180	2179	CEDAR	0.35	5466985.20	401014.33	N
3181	2181	CEDAR	0.35	5466983.84	401017.63	N
3182	2182	CEDAR	0.35	5466981.72	401019.30	N
3183	2184	FIR	0.4	5466978.44	401017.88	N
3184	2185	CEDAR	0.35	5466977.71	401019.27	N
3185	2183	FIR	0.35	5466978.94	401015.61	N
3186	2186	FIR	0.55	5466976.74	401017.30	N
3192	2227	CEDAR	0.4	5466909.74	401049.44	Y
3193	2226	CEDAR	0.5	5466913.39	401047.19	Y
3345	2157	FIR	0.7	5467011.49	400961.49	Y
3346	2156	FIR	0.75	5467010.49	400959.18	Y
3347	2153	FIR	0.3	5467011.96	400956.56	Y
3348	2155	FIR	0.4	5467013.83	400959.25	Y
3349	2154	FIR	0.4	5467014.02	400957.35	Y
3350	1051	FIR	0.4	5467014.63	400957.01	Y
3359	2176	CEDAR	0.6	5466992.47	400987.28	N
3360	2175	CEDAR	0.4	5466992.09	400985.52	N
3361	2174	MAPLE	0.6	5466995.47	400982.45	N
3362	2170	ALDER	0.35	5466998.21	400977.82	N
3363	2169	FIR	0.5	5466997.19	400975.03	N
3364	-	CEDAR	0.25	5466993.03	400976.36	N
3365	2172	CEDAR	0.4	5466989.73	400976.13	N
3366	2173	MAPLE	0.7	5466984.77	400980.49	N
3367	2171	FIR	0.45	5466990.45	400971.08	N
3368	2166	CEDAR	0.4	5466991.93	400966.86	N
3369	2167	CEDAR	0.45	5466996.59	400969.41	N
3370	2168	CEDAR	0.45	5466997.35	400970.03	N
3371	2162	CEDAR	0.35	5467000.21	400966.54	Y
3372	2163	CEDAR	0.5	5466999.65	400965.07	Y
3373	2161	CEDAR	0.5	5466998.99	400961.41	Y
3374	2165	CEDAR	0.35	5466994.26	400961.90	Y
3375	-	FIR	0.25	5466993.37	400959.46	Y
3376	-	ALDER	0.3	5467001.87	400957.88	Y
3379	1052	FIR	0.5	5466988.73	400952.40	Y
3381	1053	FIR	0.85	5466981.02	400949.05	N
3382	2148	FIR	0.65	5466976.79	400950.41	N
3383	1054	FIR	0.35	5466976.05	400949.54	N
3384	2150	CEDAR	0.5	5466978.73	400953.98	Y
3385	2151	CEDAR	0.6	5466979.85	400956.13	Y
3386	2149	CEDAR	0.35	5466976.15	400955.63	Y
3387	-	CEDAR	0.4	5466980.78	400963.29	Y
3388	-	CEDAR	0.3	5466976.89	400965.78	N
3389	2138	FIR	0.6	5466976.92	400967.11	N
3390	2139	FIR	0.6	5466975.10	400964.58	Y
3391	-	FIR	0.3	5466972.73	400966.81	N
3392	2133	FIR	0.45	5466972.08	400968.21	N
3393	2137	FIR	0.4	5466975.33	400969.30	N
3394	2136	FIR	0.7	5466979.35	400971.56	N
3395	2135	FIR	0.7	5466977.51	400972.93	N
3396	-	FIR	0.25	5466979.47	400973.25	N
3397	2134	FIR	0.7	5466976.00	400976.44	N
3398	2140	MAPLE	0.35	5466973.36	400963.29	Y

Trees Table						
Survey Point	Tag No.	Species	Dia	Northing	Easting	Removal Required
3399	2141	FIR	0.4	5466973.62	400962.64	Y
3400	2142	FIR	0.35	5466972.63	400959.46	Y
3401	2143	FIR	0.6	5466972.74	400956.72	Y
3402	2147	FIR	0.4	5466975.69	400952.04	N
3403	2146	FIR	0.5	5466971.23	400950.48	N
3404	2144	FIR	0.7	5466969.79	400954.71	Y
3405	2145	MAPLE	0.6	5466967.60	400953.48	Y
3406	2128	MAPLE	0.6	5466964.84	400954.49	Y
3407	-	FIR	0.25	5466962.42	400957.40	Y
3408	2132	FIR	0.4	5466968.08	400963.43	Y
3409	2131	MAPLE	0.5	5466965.74	400964.22	Y
3410	2130	MAPLE	0.6	5466958.21	400963.40	Y
3411	2129	FIR	0.4	5466959.34	400958.38	Y
3412	2127	FIR	0.55	5466952.20	400961.52	Y
3413	2101	FIR	0.8	5466949.29	400961.51	Y
3414	1055	FIR	0.5	5466951.27	400958.18	Y
3415	1056	ALDER	0.4	5466949.71	400952.17	N
3428	-	FIR	0.3	5466920.53	400971.63	Y
3430	-	FIR	0.3	5466924.91	400973.39	Y
3436	2102	FIR	0.5	5466944.17	400955.97	Y
3437	2103	FIR	0.6	5466942.85	400955.49	Y
3438	2152	ALDER	0.5	5466942.33	400962.85	Y
3439	1058	ALDER	0.45	5466942.82	400962.91	Y
3440	2104	FIR	0.5	5466939.68	400958.52	Y
3441	1057	ALDER	0.4	5466940.88	400953.83	Y
3442	2106	FIR	0.4	5466940.66	400949.43	N
3443	2105	CEDAR	0.4	5466938.05	400951.72	N
3444	2107	MAPLE	0.35	5466938.04	400947.52	N
3445	2108	ALDER	0.6	5466930.90	400947.10	N
3446	2109	FIR	0.4	5466932.21	400949.87	N
3447	2110	FIR	0.7	5466933.77	400954.19	Y
3448	-	CEDAR	0.25	5466933.35	400953.34	Y
3449	2111	ALDER	0.35	5466929.59	400954.05	Y
3450	2112	HEMLOCK	0.35	5466928.71	400956.43	Y
3451	2113	FIR	0.5	5466928.01	400959.99	Y
3452	2114	ALDER	0.45	5466926.15	400961.63	Y
3453	2115	CEDAR	0.45	5466924.88	400960.39	Y
3454	2116	FIR	0.3	5466924.24	400953.61	Y
3455	2119	ALDER	0.55	5466923.03	400949.69	N
3456	2120	CEDAR	0.4	5466924.44	400944.00	N
3457	2121	HEMLOCK	0.4	5466920.72	400943.38	N
3458	2118	CEDAR	0.55	5466918.89	400951.34	N
3459	2117	CEDAR	0.5	5466917.63	400953.72	Y
3460	2123	CEDAR	0.8	5466905.44	400954.66	N
3461	2125	MAPLE	0.7	5466910.95	400960.40	Y
3464	2124	CEDAR	0.7	5466909.85	400957.63	Y
3469	2126	CEDAR	0.5	5466907.30	400979.11	Y
3470	-	CEDAR	0.25	5466907.69	400968.33	Y
3471	2303	MAPLE	0.4	5466901.56	400966.67	Y

Revision: 0 **Date: 2/5/2021**

BRITISH COLUMBIA | Ministry of Transportation

Permit/File Number: 2020-01455
Office: Vancouver Island District

PERMIT TO CONSTRUCT, USE, AND MAINTAIN ACCESS TO A CONTROLLED ACCESS HIGHWAY

PURSUANT TO TRANSPORTATION ACT AND/OR THE INDUSTRIAL ROADS ACT AND/OR THE MOTOR VEHICLE ACT AND/OR AS DEFINED IN THE NISGA'A FINAL AGREEMENT AND THE NISGA'A FINAL AGREEMENT ACT.

BETWEEN:

The Minister of Transportation and Infrastructure
Vancouver Island District
Third Floor
2100 Labieux Road
Nanaimo, BC V9T 6E9
("The Minister")

AND:

Regional District of Nanaimo
6300 Hammond Bay Road
Nanaimo, British Columbia V9T 6N2
("The Permittee")

WHEREAS:

A. The Minister has the authority to grant permits for the auxiliary use of highway right of way, which authority is pursuant to both the Transportation Act and the Industrial Roads Act, the Motor Vehicle Act, as defined in the Nisga'a Final Agreement and the Nisga'a Final Agreement Act;

B. The Permittee has requested the Minister to issue a permit pursuant to this authority for the following purpose:

The installation, operation and maintenance of a Controlled Industrial Road Access (1 X 30m) to serve Lot A, District Lot 28, Nanoose District, Plan EPP80238 for French Creek Pollution Control Center Access from Island Highway West within Cardigan Road, in accordance with Design Drawings 60590631-C-002; C-003; C-1015 to C-1020.

C. The Minister is prepared to issue a permit on certain terms and conditions;

ACCORDINGLY, the Minister hereby grants to the Permittee a permit for the Use (as hereinafter defined) of highway right of way on the following terms and conditions:

1. The Minister shall designate an official ("the Designated Ministry Official") who shall act as the Minister's agent in the administration of this permit in the manner hereinafter set out.
2. The Use shall be carried out according to the reasonable satisfaction of the Designated Ministry Official.
3. The Permittee shall indemnify and save harmless the Ministry, its agents and employees, from and against all claims, liabilities, demands, losses, damages, costs and expenses, fines, penalties, assessments and levies made against or incurred, suffered or sustained by the Ministry, its agents and employees, or any of them at any time or times, whether before or after the expiration or termination of this permit, where the same or any of them are based upon or arise out of or from anything done or omitted to be done by the Permittee, its employees, agents or Subcontractors, in connection with the permit.
4. The Permittee shall make diligent attempts to determine if there are other users of the right of way in the vicinity of the Permittee's location whose use may be affected. It shall be the responsibility of the Permittee to contact any such users before exercising any of the rights granted hereunder and to attempt to reach an accommodation.
5. The Minister shall take reasonable care to do as little damage or interference, as possible, to any Use authorized by this permit in the carrying out of the construction, extension, alteration improvement, repair, maintenance or operation of any work adjacent thereto, but the Minister shall not be responsible for any damage regardless.
6. The Minister at the absolute discretion of the Minister may, at any time, cancel this permit for any reason upon giving reasonable notice; provided, however, that in the case of default by the Permittee or in the case of an emergency no notice shall be necessary. The Minister shall not be liable for any loss incurred as a result of permit cancellation.

7. Placing of speed arresters on the access (or accesses) or in the Permittee's property without the prior consent in writing of the Designated Ministry Official shall render the permit void.

8. The Permittee shall be responsible for replacing any survey monuments that may be disturbed or destroyed by the Use. Replacement must be by a British Columbia land surveyor at the Permittee's expense.

9. The Permittee shall remove any mud, soil, debris, or other foreign material tracked onto the highway from the access authorized herein. Such removal shall be at the Permittee's expense and shall be done at any time the material unduly inconveniences traffic and, in any event, daily.

10. The Permittee acknowledges that the issuance of this permit by the Minister is not a representation by the Minister that this permit is the only authority needed to carry out the Use. The Permittee shall give deference to any prior permission given for use of the right of way in the vicinity of the permit area, shall obtain any other permission required by law, and shall comply with all applicable laws regardless of their legislative origin.

11. At the end of the term of this permit, or when the permit is cancelled or abandoned, the Permittee shall, if so requested by the Minister, remove all installations and shall leave the site as near as reasonably possible in the condition it was in before this permit was issued or such other condition as shall reasonably be required by the Designated Ministry Official. If the Permittee refuses to comply with these obligations, the Minister may perform them as required and the Permittee shall be liable to the Minister for the costs of doing so.

12. The rights granted to the Permittee in this permit are not assignable without the consent of the Minister.

13. As a condition of this permit, the permittee unconditionally agrees with the Ministry of Transportation and Infrastructure that the permittee is the prime contractor or will appoint a qualified prime contractor, as described in Section 118 of the Workers Compensation Act, for the purposes of the work described by this permit, at the work location described in this permit, and that the permittee or designated prime contractor will observe and perform all of the duties and obligations which fall to be discharged by the prime contractor pursuant to the Workers Compensation Act and the Occupational Health and Safety Regulation.

14. The permittee is advised and acknowledges that the following hazards may be present at the work location and need to be considered in coordinating site safety: overhead hazards, particularly electrical or telecommunications lines; buried utilities, particularly electrical, telecommunication, and gas lines; traffic, danger trees, falling rocks, and sharp or infectious litter.

15. Any works within the Ministry right-of-way that fall within the scope of "engineering" under the Engineers and Geoscientists Act will be performed by a Professional Engineer and shall comply with this Ministry's "Engineer of Record and Field Review Guidelines". The Guidelines can be viewed on the Ministry's website at http://www2.gov.bc.ca/assets/gov/driving-and-transportation/transportation-infrastructure/engineering-standards-and-guidelines/technical-circulars/2009/t06-09.pdf

16. The Permittee is responsible for preventing the introduction and spread of noxious weeds on the highway right-of-way as defined by the British Columbia Weed Control Act and Weed Control Regulation.

17. The Use shall be carried out according to the following drawings and specifications, which are attached and shall be considered to be part of this permit: Drawings 60590631-C-002; C-003; C-1015 to C-1020

18. (a) The rights granted under this permit shall not be exercised before February 1, 2021.

    (b) The Construction and Installations must be completed on or before February 1, 2022.

19. LOCATION:

20. The layout shown on the attached drawing is a condition of this permit, and any change in layout without the prior consent in writing of the Designated Ministry Official shall render the permit void.

21. CONSTRUCTION AND INSTALLATIONS:

22. The rights granted under this permit and certificate are temporary and will expire on February 1, 2023.

    The Permittee will be required to apply for a renewal before the above expiry date.

23. The applicant is to retain a Professional Engineer to supervise and certify that all road construction has been completed in accordance with the latest edition of the Ministry's Standard Specifications for Highway Construction. The Professional Engineer shall be responsible for submission of inspection reports, photographs of different stages of construction, a list of material sources, sieve analysis of all granular material and compaction testing results. Compaction testing results shall be a minimum of one test at ten (10) metre increments or stations and all road base materials shall be compacted such that 100% Standard Proctor Density is achieved as described in Section 202 of the Standard Specifications for Highway Construction.

    The following must be adhered to:

    a) Upon completion of the final design, and prior to construction, the Engineer of Record (EOR) shall execute and submit to the Ministry representative the signed original Assurance of Professional Design and Commitment for Field Reviews (Form H1252).

b) The parties will confirm the assignment of field review responsibilities in accordance with the assignments noted in Schedule A - Summary of Design and Field Review Assignments (Form H1252a).

c) Upon completion of the construction the EOR will submit an Assurance of Professional Design - Post Construction (Form H1253), attaching copies of any Assurance of Field Reviews and Compliance (Form H1254) upon which the EOR is relying.

The applicant shall provide the Ministry with engineered drawings of the proposed road prior to commencement of any construction. The drawings must include, at minimum, a plan view, vertical alignment, horizontal alignment, cross section and drainage. The drawings shall be submitted in a manner and scale as per the Transportation Association of Canada (TAC) Geometric Design for Canadian Roads Manual and the BC Supplement to TAC Geometric Design Guide.

The applicant shall provide record drawings in PDF format prepared and signed by a Professional Engineer indicating that all construction has been completed to Ministry of Transportation and Infrastructure standards. The record drawings must show all utilities and underground works.

24. The Permittee shall take all reasonable precautions to attempt to ensure the safety of the public in connection with the Use. In particular, but not so as to limit this obligation, the Permittee shall, if required by the Designated Ministry Official on reasonable grounds, prepare and implement a traffic control plan. The contents of the plan and the manner in which it is implemented must meet the reasonable satisfaction of the Designated Ministry Official.

25. The Permittee shall, at their cost, supply, erect, and maintain standard traffic control devices in accordance with the Ministry of Transportation and Infrastructure Traffic Management Manual for Work on Roadways and Occupational Health and Safety Regulation.

26. A stop sign must be erected on Cardigan Road at the entrance to Island Highway 19A.

27. No Left Turn Signs (R-015-L) and any other signs as required by the Designated District Official to be erected either side of the access in accordance with the Ministry of Transportation and Infrastructure Manual of Standard Traffic Signs and Pavement Markings.

28. The access (or accesses) shall be paved to the satisfaction of the Designated Ministry Official.

29. The access (or accesses) shall be constructed with a minimum 500mm culvert pipe manufactured to CSA or ASTM standards and laid at ditch invert elevation. Maintenance and periodic cleaning of this culvert is the responsibility of the Permittee.

30. The profile of the access (or accesses) shall not exceed 2% grade from the ditch-line for a distance of at least 10 metres as measured away from the highway along the centerline of the access.

31. The finished grade of the access (or accesses) at the ditch-line shall be 15 cm below the highway shoulder elevation.

32. Access to be constructed at 90 degrees to the highway for a distance of 10 metres from the highway shoulder.

33. The Permittee is responsible for ensuring that all works are contained to the highway right of way. Any works located within private property must have the owner's permission.

34. The Permittee is responsible for obtaining the necessary approvals from all other agencies whose interests are affected.

35. Harvesting of Timber on Highway Right-of-way

Permittee is to contact the Ministry of Natural Resource Operations to obtain the necessary approval for removal of merchantable timber within the Highway right-of-way.

Merchantable timber shall be cold decked and loaded from approved access locations. Merchantable timber shall not be loaded from the traveled roadway or road shoulder.

36. The Permittee will be responsible for any damage to existing overhead or underground utilities in the area covered by this permit.

37. Protection of Roads

The Permittee shall ensure all equipment working on or hauling material on to and from the Site does not damage or deposit material onto any part of an existing roadway. Materials spilled onto the public roadways or driveways opened to public traffic shall be cleaned up immediately. The Permittee has the full responsibility to repair any damage to existing highways, local roads and driveways caused by its construction equipment and/or operations.

38. Archaeological Interests (Archaeological Potential)

Provincial records indicate the proposed development is located within an area with only limited potential to contain archaeological sites protected by the Heritage Conservation Act.

However, the applicant should be aware that there is still a chance that the lot may contain previously unrecorded archaeological material that is protected under the Heritage Conservation Act. This would most likely be indicated by the presence of areas of dark-stained soils containing conspicuous amounts of fire-stained or fire-broken rock, artifacts such as arrowheads and other

stone tools, or even buried human remains. If such material is encountered during demolition or construction, a Heritage Conservation Act Permit may be needed before further development is undertaken. This may involve the need to hire a qualified archaeologist to monitor the work.

Please contact the Archaeology Branch immediately at (250) 953-3334 if archaeological site deposits are encountered on the subject property.

39. C. AUTHORIZED ACTIVITIES

40. The access (or accesses) shall be restricted to the following movements only: Right In and Right Out.

The Permittee shall construct and erect all necessary channelization, signs, and other traffic-control devices at their cost.

41. The access shall be used jointly with the residential access which services the property legally described as Lot 1, District Lot 28, Nanoose District, Plan 37634

42. This permit does not provide licensing and insurance and/or oversize, overweight authorization for a commercial vehicle to access a provincial highway from an industrial road. Commercial vehicle operators require authority pursuant to Section 8 of the Commercial Transport Act, R.S.B.C. 1996, and should contact the Provincial Permit Centre at 1-800-559-9688 to obtain a Highway Crossing Permit.

43. No permanent structures, gates or fences are permitted to be installed within the right-of-way. If any structures are installed, they may be removed by the Ministry at the cost to the Permittee.

44. D. OPERATION AND MAINTENANCE

45. The Minister is under no obligation, express or implied, to provide financial assistance or to contribute toward the cost of servicing, creating or developing the Permit Area or the Improvements and the Permittee is solely responsible for all costs and expenses associated with their use of the Permit Area and Improvements.

46. The Permittee will ensure that the works do not, impair, impede or otherwise interfere with;

I. public passage on the Highways;

II. the provision of highway maintenance services by the Province, or by its servants, contractors, agents or authorized representatives of the Province in connection with the Highways; or

III. the operation of the Highways;

47. That where the said works are in the proximity of any bridge, culvert, ditch or other existing work, such work shall be properly maintained and supported in such manner as not to interfere with its proper function, and on the completion of the said works any bridge, culvert, ditch or other existing work interfered with shall be completely restored to its original condition.

48. That before opening up any highway or interfering with any public works, written notice of intention to do so must be given to the Designated Ministry Official at least 72 hours before the work is begun, except in the case of an emergency situation, the Permittee will immediately contact the Road & Bridge Maintenance Contractor or local RCMP.

49. That when necessary all excavations, materials, or other obstructions are to be efficiently fenced, lit, and watched, and at all times every possible precaution is to be taken to ensure the safety of the public.

50. The Permittee is responsible for keeping the area of the crossing clean and free of any debris tracked onto the roadway from the industrial road.

51. This permit in no way grants exclusive use to the permittee for any portion of the access on the road right-of-way. At all times, the public has the right to use any portion of the access.

52. The Permittee shall be the first point of contact for any disputes regarding the use of the Permit Area and shall make every effort to resolve the dispute.

53. The Permittee shall be responsible for the maintenance of all drainage courses during the project and for the drainage courses along Cardigan Road for the duration of the permit.

54. The Permittee shall be responsible to restore all road features disturbed by the installation works for a period of two (2) years after completion of the works. Any condition deemed substandard by the Ministry Representative must be repaired within 30 days of written notification. In cases of emergency or hazardous conditions or where the permittee fails to comply with 30 days, the Ministry may carry out that work and invoice the Permittee for all related costs.

55. A copy of the permit is to be kept by the field supervisor, in order that he is aware of all permit conditions.

56. The Permittee is to contact the Ministry Representative for a final inspection upon completion of the works.

The rights granted to the Permittee in this permit are to be exercised only for the purpose as defined in Recital B on page 1.

Dated at Nanaimo, British Columbia, this 25 day of January 2021

Tammy Thompson

On Behalf of the Minister

INTERIM

Final Report of the Archaeological Impact Assessment at the French Creek Pollution Control Centre, 957 Lee Road, Parksville, British Columbia, HCA Permit 2019-0098



Prepared for: The Regional District of Nanaimo

Prepared by: Colleen Parsley and Steve Thompson

AQUILLA
ARCHAEOLOGY

February 2, 2021

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Finally, we wish to thank Joel Kinzie of the Archaeology Branch for the permit support.

Management Summary

This report documents the results of an Archaeological Impact Assessment (AIA) undertaken at the French Creek Pollution Control Centre (FC PCC), French Creek, British Columbia to investigate a previously undeveloped area of the FC PCC that is to be impacted by proposed expansion and new infrastructure construction. This AIA targeted areas of archaeological potential previously surveyed during a preliminary field reconnaissance (PFR) pedestrian survey of the FC PCC in 2018. This work was carried out under Heritage Conservation Act (HCA) Blanket Permit 2019-0098.

Forty-seven shovel tests were completed in the areas of moderate archaeological potential and six were positive. Within these positive tests, a total of 26 pieces of fire broken rock were recovered in a matrix of otherwise sterile alluvial silts. No artifacts and no shell midden or faunal remains were recovered at this newly identified site.

This new and previously unrecorded archaeological site identified during this AIA is located approximately 150m to the south and spatially disconnected from the two known and recorded archaeological sites DiSc-3 and DiSc-27 and was given the Borden designation **DiSc-57**.

This site is composed of 2 polygons. The NW polygon is a 5m diameter buffer around positive test ST 24. The SE polygon measures 30m E–W by 23m N–S around positive tests ST3, 4, 5, 8 and 15, with 5m buffer applied around the positive tests. There is a 26.5m gap between the two polygons and following instruction from the BC Archaeology Branch a total dimension for DiSc-57 of 74m E–W by 30m N–S was applied.

This new site is located within a proposed area of construction impact. As it is unlikely this archaeological site can be avoided and given it is of low significance, and there are currently no options for alternatives, archaeological monitoring under an HCA Site Alteration Permit is required during ground disturbing impacts associated with the FC PCC project.

No sampling program can be assumed to have found all archaeological remains. If in the event archaeological material is unexpectedly encountered, work in the vicinity should stop and the Archaeology Branch and respective First Nation communities should be contacted immediately.

All archaeological sites, whether recorded or unidentified, are protected by legislation and may not be altered, damaged, moved, excavated in, or disturbed in any way without a permit issued under either Section 12 or Section 14 of the *Heritage Conservation Act*.

Final Report of the Archaeological Impact Assessment at the French Creek Pollution Control Centre, 957 Lee Road, Parksville, British Columbia, HCA Permit 2019-0098

1 INTRODUCTION

This report documents the results of an Archaeological Impact Assessment (AIA) undertaken within the French Creek Pollution Control Centre (FC PCC) at 957 Lee Road, Parksville, British Columbia. This work was carried out under Heritage Conservation Act (HCA) Blanket (now Multi-Assessment Permit – MAP) Permit 2019-0098.

This is a Section 14 Inspection Permit issued by the Archaeology Branch on May 6, 2019 and valid until December 30, 2020 that authorized Colleen Parsley of Aquilla Archaeology to undertake "*Archaeological impact assessments of five infrastructure projects and other 'as and when' projects proposed by the Regional District of Nanaimo*".

The subject property is located to the south west of French Creek Harbour on the southern side of Island Highway West (19A) at the junction with Lee road. The property is bisected by Morningstar Creek which flows into French Creek Harbour. The existing FC PCC was built in 1977-78 and requires expansion as it is nearing capacity.

The FC PCC is located within 150m of two previously recorded archaeological sites DiSc-3 and DiSc-27 located on the northern side of the Island Highway West (19A). See below.

The intent of this project is to complete an archaeological impact assessment of the property and identify the location and extent of protected archaeological sites that may be affected by the proposed expansion and upgrade to the FC PCC and assess the integrity and significance archaeological materials and if necessary recommend the next steps for an archaeological management/mitigation plan.

The AIA was undertaken on 5th and 6th November 2020 and this report is submitted as partial requirement of the HCA Permit 2019-0098.

1.1 Study Objectives

This study was carried out in accordance with the Archaeological Impact Assessment Guidelines (Archaeology Branch 1998), and the HCA S14 Permit Application for granted Permit 2019-0098. The primary objectives of the assessment were to:

- Identify the location and extent of protected archaeological sites that may be affected by potential future development
- Assess site significance
- Identify the nature and magnitude of direct and indirect impacts of potential future development on protected archaeological
- Formulate management options for avoiding or mitigating the impacts to protected sites including a preliminary program for:
    - Implementing and scheduling impact management actions; and, where necessary
    - Conducting surveillance and/or monitoring.

In British Columbia, the *Heritage Conservation Act* (BC Government 1996) protects archaeological sites from any type of disturbance unless authorized by permit. Archaeological sites are defined as locations on public or private land containing evidence of human activity pre-dating 1846.

This assessment is provided without prejudice to Aboriginal Rights and Title but is not intended to address potential impacts in regard to traditional use of the study area and does not in any part constitute consultative duty.

1.2 Organisational Format

This report is organized using the format provided in the Archaeological Impact Assessment Guidelines, Appendix A: Guidelines for Report Content (1998).

2 PROJECT

The project is an expansion and odour upgrade to the current facility built in the 1970's for an expanding population in the region. The project involves:

The proposed expansion and upgrades to the FC PCC will include:

- select tree and vegetation removal
- installation of suspended growth aeration tanks (bioreactors) and secondary clarifiers
- 750m³ tank
- a new maintenance building and storage area
- a new effluent pumpstation
- improved general vehicular access
- expansions of existing buildings for additional laboratory and changerooms
- upgrades to the Morningstar bridge crossing
- new highway access
- new electrical services
- other associated ancillary construction activities (i.e. services, landscaping etc.)

3 STUDY AREA

3.1 Location

French Creek Pollution Control Centre is located at 957 Lee Road, Parksville, BC, V9P 1Z4 at the junction with the Island Highway West (19A). The property legal description is: PID 030705029, Folio 769009194.005, Lot: A, DISTRICT LOT 28, NANOOSE DISTRICT, Plan: EPP80238, RDN ID 40687. The property is bordered by Lee Road Community Park to the south, and by private properties (PID: 000201570 and PID 03119587) and French Creek

Community Park to the west and southwest) (Figures 1–2).

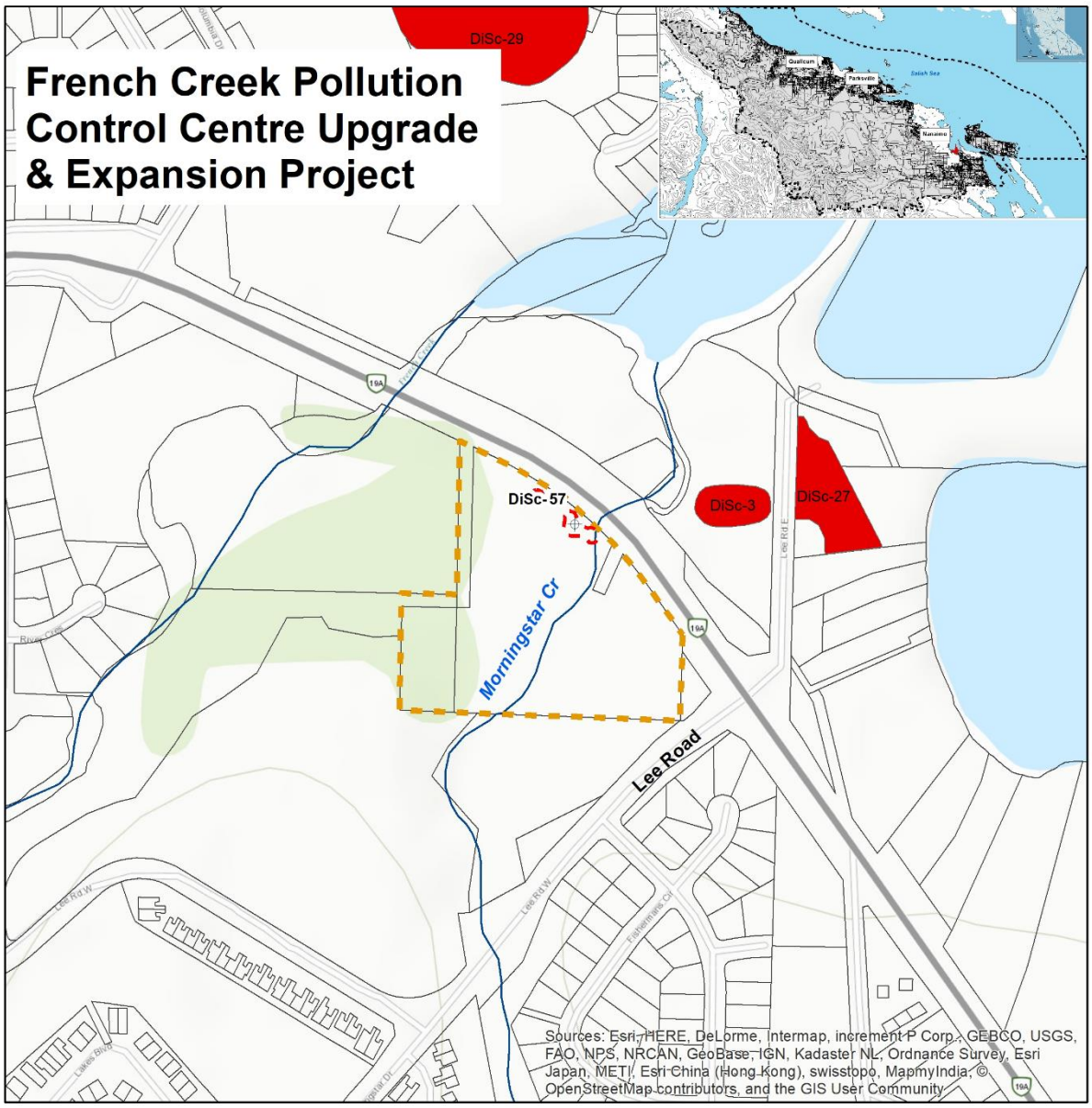


Figure 1: Project Location.

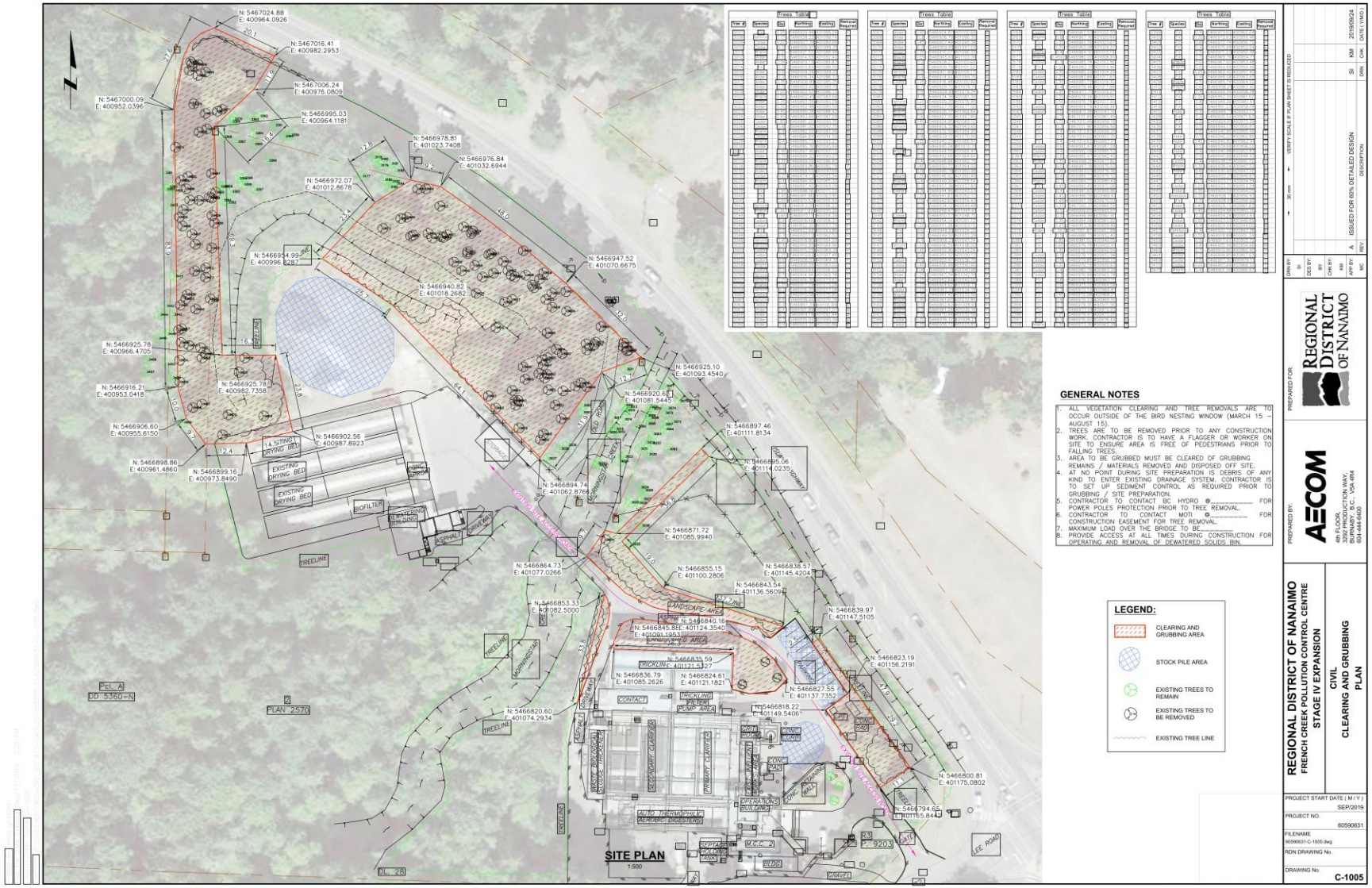


Figure 2: Tree Clearance Plan.

The study area is within the asserted traditional territory of the Snaw-Naw-As, K'omoks, and Qualicum First Nations and the representative organizations of the Nanwakolas Council and the Te'mexw Treaty Association.

3.2 Environment

The study area was overlain by glacial ice about 15, 000 year ago and a minor re-advance at about 11, 500 years before present (B.P.) likely made the area uninhabitable until 10,000 to 11,000 years ago (Mathews et al. 1970). Ocean fluctuations have shown a trend to gradual decline in sea levels, but fluctuations such as present higher water levels have created raised benches with some potential for sites at higher elevations than present shorelines. Inland areas were exploited throughout the prehistoric period though not as intensively as the area near the modern shoreline. Older occupations are possible in intertidal and even underwater areas associated with older lower sea levels.

The study area is located within the Coastal Douglas-Fir moist maritime (CDFmm) biogeoclimatic zone. This zone is limited to only a small area of south eastern Vancouver Island, several Gulf Islands and a portion of the adjacent BC mainland (Nuszdorfer et al. 1991: 82). The climate within the CDF zone is relatively dry with mild annual temperatures and the vegetation is diverse with species that occupy rock outcrops, seaside, aquatic and forest habitats.

The CDF is characterized by the predominance of Douglas-fir (*Pseudotsuga menziesii*), with an understorey of salal (*Gaultheria shallon*), and/or Oregon grape (*Mahonia aqua folium*). Other tree species commonly occurring in this zone include western red cedar (*Thuja plicata*), grand fir (*Abies grandis*), Red alder (*Alnus rubra*) and, in drier areas, arbutus (*Arbutus menziesii*) and Garry Oak (*Quercus garryana*). Other less-common species include Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), shore pine (*Pinus contorta*), bitter cherry (*Prunus emarginata*), bigleaf maple (*Acer macrophyllum*), western flowering dogwood (*Cornus nuttallii*), black cottonwood (*Populus trichocarpa*), and trembling aspen (*Populus tremuloides*) (Nuszdorfer et al. 1991: 82).

Native wildlife commonly found within the Coastal Douglas Fir zone includes black-tailed deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), elk (*Cervus elaphus*), cougar (*Felis concolor*) and various other small land mammals. Birds and waterfowl known to be found in this zone include the pileated woodpecker (*Dryocopus pileatus*), blue grouse (*Dendragapus obscurus*), Stellar's jay (Cyanocitta stelleri), great blue heron (Ardea herodias), raven (Corvus corax), hooded merganser

(*Lophodytes cucullatus*), mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*) and glacous gull (*Larus hyperboreus*) (Nuszdorfer et al. 1991: 88-90).

Sea mammals known to occupy the waters near to the current study area include harbour seal (*Phoca vitulina richardi*), northern sea lion (*Eumetopias jubata*), California sea lion (*Zalophus californianus*), killer whale (*Grampus rectipinna*) and harbour porpoise (*Phocoena vomerina*). Many types of fish are also commonly found in the area, each occupying a specific local habitat such as a rocky shoreline or sandy beach. Fish species include dogfish (*Squalus suckleyi*), skate (*Raja binoculata*), Pacific herring (*Clupea harengus*), rockfish (*Sebastodes* spp.), flounder (*Atheresthes stomias*), halibut (*Hippoglossus stenolepis*), sole (numerous species), ling cod (*Ophiodon elongates*) and several species of sea perch (Mitchell 1971). Five species of salmon also reside in the ocean and rivers surrounding the study area depending on the season which include Chinook (*Onocorhynchus tshawytscha*), chum (*O. keta*), Coho (i), pink (*O. gorbuscha*) and sockeye (*O. nerka*).

Various types of shellfish can be found in specific local habitats in the Gulf of Georgia region. Species of shellfish include, but are not limited to, butter clam (*Saxidomus giganteus*), littleneck clam (*Protothaca staminea*), horse clam *Schizothaerus nuttalli*), basket cockle (*Clinocardium nutalli*), mussel (*Mytilus edulis*), native oyster (*Ostrea lurida*), whelk (*Nucella* sp.), wrinkle purple (*Nucella lamellose*),periwinkle (Littiorina sp.), limpet (*Lottidae*), and acorn barnacle (*Balanus nubilis*).

3.3 Paleoenvironmental

Geologically the study area is situated between the St. Elias Insular Belt on the west side and the Cascade Belt to the east. These belts form the two western most tectonic regions of the Canadian Cordillera.

The different bedrock geology on either side of the Strait of Georgia indicates that the strait between the two areas lies over a boundary between the two structural regions. The Strait of Georgia essentially follows the contact between the granitic rocks of the coast intrusions of Jurassic age and older rocks of the Vancouver Group.

The study area lies within the boundaries of the Nanaimo Group that consists of boulder, cobble and pebble conglomerate, coarse to fine sandstone, siltstone, shale, coal, formed during the Upper Cretaceous.

In British Columbia, the most important agent of erosion has been glacial ice as described by Holland (1964): Glaciation within the Georgia Depression was intense. Ice pouring westward from the Coast Mountains and eastward from the Vancouver Island Ranges coalesced in the strait to form a composite glacier which flowed south-eastward and southward and escaped to the sea westward through Juan de Fuca Strait. The depression in part is of structural origin, but in part was over deepened by ice erosion. Low lying rock surfaces were stripped by weathered materials and were shaped, while elsewhere glacial materials were deposited as ground moraines, or as outwash.

The unconsolidated deposits of Pleistocene and Holocene age, comprised of marine, fluvial and glacial materials are quite extensive and locally may exceed 100 metres in thickness. Elsewhere these unconsolidated deposits are found to be thin or absent with bedrock being widely exposed (Hutchinson et al. 2004; Ronneseth et al. 2005).

Successive periods of glaciation shaped the terrain of the mainland coast of British Columbia. The land surface has been carved and smoothed by massive sheets of ice formed in the alpine regions of the interior and flowing to meet with continental ice sheets and pooling in Georgia Strait. Lower elevations have filled with glacial till, and waterborne glacio-marine sediments in stratified deposits formed under the melting and floating ice sheets. Following the most recent period of glaciation which concluded about 12,000 years ago, the east coast of Vancouver Island was uplifted in a process known as isostatic rebound. This uplift resulted in an increase in stream activity producing the many “box canyons” seen in the area today (Holland 1964).

Quadra Sands are the main source of the sand covering much of this region of the Island where they deposited from the Coast mountains into a floodplain that is now the Strait of Georgia between 26,000 and 29,000 BP (Dunster 2000) or 28,800-35,400 BP (Clague 1976). These ancient sands are famously known in Parksville Bay. Parksville Bay is a low elevation bay with a small and gradual change in elevation to where the park is situated today on a former glacial beach. Further, to the south the elevation slopes up towards the Island Highway that was a glacial shoreline ca. 18,000-15,000 years ago and rapidly dropped after de-glaciation. Paleo-beach terraces were formed along what is likely now the Island Highway in the locality of Parksville Bay (Hutchinson et al. 2004). Stable paleo-shorelines are

where late Pleistocene and early Holocene people may have lived and are where archaeological sites are expected to be located. From 13,000 Radio Carbon Years Before Present (RCYBP) the east coast of Vancouver Island was ice free (Mackie et al. 2011), and by 12,000 RCYBP archaeological evidence suggests an increase in the amount and variety of terrestrial and marine mammals on and around Vancouver Island (Harington and Ross 2007; Mackie et al. 2011). Level terraces adjacent to shorelines are attributes considered favourable for archaeological potential.

3.4 Cultural Overview

The present study area is within the core asserted territories of Snaw-Naw-As and Qualicum First Nations. This project area is located at the very southern periphery of K'omoks First Nation. Snaw-Naw-As are a Hul'qumi'num speaking Coast Salish community centred around Nanoose Bay in the Central Coast Salish region of the Salish Sea. The cultural history of Snaw-Naw-As people is not well understood. Conflict and successive colonial pressures related to epidemics and alienation of lands led to a drastic decline in population and subsequent destruction of oral histories; the main conduit for the transmission of cultural knowledge in Coast Salish cultures.

Summaries of Snaw-Naw-As cultural histories are presented in (Bouchard & Kennedy, 1995; Brown & Hayman, 1989; Dewhirst, 1994; Nicholls, 1958; Rozen, 1985). Accounts of successive attacks from the Alberni Inlet area around 1836 and again in 1856 from Kwakuitl peoples (citing Walbran in Dewhirst, 1994) led to one sole survivor of the Snaw-Naw-As community, Nanoose Bob. On October 9, 1855 it is recorded in the HBC Memoranda at Nanaimo that, "…a vague report arrived that some Northern Indians had massacred all the [Nanooas?] a part of the Nanaimo tribe, their villages being about ten to twelve miles apart…(*Transcript of Hudson's Bay Company Nanaimo Memoranda 1855-1857. Transcribed by Marv Worden, 2005; Carol Hill 3013-4*).

Then on the 13th of October 1855 it is noted in the journal… "a canoe arrived from Nanoos confirming the report of the murder of three men and two women belonging to the tribe. The deed is supposed to have been committed by the Mamillillikillas…"then again in 1856 another attack is recorded as, "A Canoe arrived from Nanooa the Indians in it reported that the Sympsians, who left here yesterday [sic] had killed the Chief of that place (Nanooa)". (*Transcript of Hudson's Bay Company Nanaimo Memoranda 1855-1857. Transcribed by Marv Worden, 2005; Carol Hill 3013-4*, n.d.).

These accounts corroborate the conflict faced by this community. The works compiled by Kennedy and Bouchard were focused on addressing the question legitimacy as it related to a landmark blockade by Nanoose First Nation to protest the legality of a Heritage Conservation Act permit which was the subject of well publicized protest (Watts, 1995 among others). This permit allowed the removal of the archaeological site DhSb-8, the village site of Qilxemait the ancient Nanoose settlement and residential development now known as Craig Bay Estates. The intent of this cultural overview was to assess the relationship between the Coast Salish Pentlatch, documented as formerly occupying the lands between Comox Harbour to the vicinity of the Englishman River by Franz Boas and other ethnographers who had recorded Pentlatch histories. The result of this assessment was inconclusive as the boundaries drawn by previous ethnographies were vague in relation to Snaw-Naw-As lands.

Qualicum First Nation are descendants of both Pentlatch and other Coast Salish communities (Recalma-Clutesi in Wylie, 1992). The core cultural area of Qualicum First Nation is situated within the northern Coast Salish Pentlatch territory formerly from Cape Lazo to a debated southern boundary which is either at Parksville (Kennedy and Bouchard 1990) or around Northwest Bay at Nanoose (Boas, 1897) . Pentlatch people suffered near total population collapse from various direct and indirect colonial pressures such as epidemic disease and increased hostilities (Barnett, 1955; Brown and Hayman, 1989; Kennedy and Bouchard, 1990; (Recalma-Clutesi *in* Wylie, 1992). Due to these catastrophic tolls, one

known survivor Joe Nimnim, moved to the Comox village (Barnett, 1955) and the Pentlatch winter village at Qualicum River was re-occupied by descendants of a high-ranking Pentlatch woman previously married away (Recalma-Clutesi *in* Wylie, 1992) so it is little surprise the such sparse ethnographic information from Pentlatch people survives.

Bouchard and Kennedy (1995) interviewed Mary Clifton from K'omoks who was a Pentlatch knowledge holder. Mrs. Clifton identified the traditional names of the Englishman River and French Creek which were verified by Andy Frank and recorded by linguists. The Pentlatch name for French Creek is ***swáxlhu7lh***.

3.5 Archaeological Overview

Chronological cultural sequences developed from previous dated archaeological work on the Northwest Coast have been established to understand cultural development and change through time. Sequences are derived by defining and describing physical and stylistic attributes of archaeological materials encountered and repeated in patterns across geographical regions. Not all researchers entirely agree on these sequences although consensus is more or less achieved in a broader sense with differences often resulting from divergent views on regional contexts. A generalized sequence for the northern Strait of Georgia presented here (Table 1) is based on Borden (1975), Mitchell (1990), Carlson (2003), Matson and Coupland (2009).

Mackie et al. (2011) have presented a synthesis of emerging data on late Pleistocene/early Holocene sites in relation the early peopling of British Columbia. Using archaeological data from Haida Gwaii, Barkley Sound, and the Stave watershed combined with detailed sea level and paleontological data they assert sites between 13,000-7,000 may exist at various elevations and coastal environments in coastal British Columbia.

Table 1: Archaeological Sequence for the Salish Sea

Years Ago	Epoch	Period	Archaeological Sequence
100-present	Late Holocene	Historic	Post-Contact
250–100		Late	Contact
1800–250			Developed Coast Salish/Gulf of Georgia
2400–1800	Mid Holocene	Middle	Marpole
3300–2400			Locarno
4500–3300			Charles/St. Mungo/Mayne
9000–4500	Early Holocene	Early	Old Cordilleran/Pebble Tool Tradition
			Archaic
Pre 10 000	Pleistocene		

Old Cordilleran 9000-4500 years ago

Until recently, this phase was associated with the first peopling of coastal British Columbia to inhabit stabilizing sea levels, landforms, and biological communities. Very few archaeological sites of this type are found in coastal British Columbia and even less in the Salish Sea. Sites of this age are limited to a

handful of locations such as Namu (9,700 yrs BP) Glenrose Cannery (8,150 yrs BP), Milliken (7,050-9,080 yrs BP), Saltery Bay (7,600 yrs BP), Bear Cove (8,200 yrs BP), Stave Lake (7,000-10,000 yrs BP), and now Grace Harbour (7,500 yrs BP). At coastal sites, Old Cordilleran sites are often found on paleo-beach terraces associated with shifting sea levels. Characteristics of the Old Cordilleran culture or Pebble Tool Tradition are described by Carlson as, "*defined on the basis of the co-occurrence of unifacial pebble choppers and leaf-shaped bifaces in early assemblages …but sometimes…pebble tools by themselves*" (1990:62). Pebble tools are defined as large cobbles with flakes removed on one side and are considered a cruder and simplified stone tool technology. The bifacial tools are flaked leaf-shaped lithics and often large resembling Cascade-style points found south in Washington and Oregon. Faunal assemblages from these sites indicate the diets of people living in these locations emphasized land and sea mammal subsistence and less emphasis on fish (Matson and Coupland 2009:81).

Charles Phase – 4500-3300 years ago

In the Salish Sea, again very few archaeological components from Charles Phase have been found. Charles components have been identified at Helen Point on Mayne Island (Carlson 1970) and Pender Canal on North Pender Island (Carlson 1986; Carlson and Hobler 1993), Glenrose Cannery, Tsable River and Buckley Bay (Mitchell, 1974), Deep Bay (Monks, 1977), Shell Beach in Ladysmith Harbour (Lake et al, 2004), Bliss Landing (Beattie, 1971). Ground stone technology is first seen during this period but in very limited amounts. Leaf shaped points are still present in stemmed and shoulder forms but tend to be smaller and in general flaked stone tools are dominant. Pebble tools are much less frequently found. Subsistence patterns demonstrate a strong orientation to a reliance on coastal resources, where shellfish and marine fish, particularly Pacific salmon, dominate the faunal assemblages (Matson and Coupland, 2009:100-103).

Locarno 3300-2400 years ago

Numerous sites in the Salish Sea have dated Locarno phase components. Attributes of this assemblage include the first toggling harpoon weaponry, unilateral and bilateral barbed harpoon points, faceted ground slate projectile points and knives, ground stone celts, ground stone abraders, labrets, and flaked stone projectile points (Matson and Coupland, 2009:156). Mitchell notes clay lined depressions and rock slab features are present during this period as well as small unretouched cryptocrystalline cutting blades (1990:341).

During this period subsistence patterns shift towards fish-based diets with fish found in priority sequence: salmon, herring, various other fishes and shellfish. It has been demonstrated at some Locarno phase sites that a lack of salmon cranial elements indicate storage (Matson and Coupland 2009:166-169), a marked technological change in adaptation and indication of abundance. Grave goods and cairn burials are also documented at some Locarno sites. Locarno phased sites are not well documented in the northern Salish Sea (exceptions are the Buckley Bay and Tsable River sites studied by Mitchell (1974) with most evidence sourced to archaeological sites located in the central and southern Salish Sea. An undated Locarno component is thought to be present at Shelter Point, DjSc-1 based on indirect artifact assemblage inferences of microblades and faceted ground slate points (Parsley 2013).

Marpole 2400-(1800-1500) years ago

Marpole archaeological components are perhaps the most frequently identified phase in the south Salish Sea region. Decorated objects are more frequently found in Marpole-aged sites than any other evidenced by the presence of stone sculpture in some elaborate forms such as zoomorphic and anthropomorphic bowls (Burley 1980:24). Labrets and microblades are in use during this period. House platforms are clearly definable at some excavated sites (Matson and Coupland 2009:208-209). Cranial modification is noted during this period. Flaked stone tools are still present but in less frequent numbers. According to Burley (1980:23), this period sees the florescence of heavy woodworking tools such as

antler wedges, large ground stone adzes, and hand mauls with conical tops being stylistically diagnostic but plain topped and grooved topped also occurring (Mitchell 1990:345). This cultural phase is marked

by the increase of ground tool technology, and in particular slate points and knives. The composite toggling harpoon weaponry found during Locarno times is now absent and replaced with unilateral and fixed ground antler harpoons (Mitchell 1990:345).

Developed Coast Salish 1800-250 years ago

This period is difficult to discern based strictly on cultural material as artifact assemblages subtly shift in emphasis from Marpole culture to descendants of current populations of Coast Salish communities. To summarize from Matson and Coupland, *"this period is marked by the almost complete absence of chipped stone, the dominance of bone and antler objects, but with some pecked and ground occurring. The most common harpoon is the composite toggling harpoon valve, and flat-topped mauls are introduced. Bone unipoints and bipoints are very abundant and barbed bone points of various sizes are also found. A well-developed weaving technology is clearly present, as indicated by blanket pins, combs, and spindle whorls"* (Mitchell, 1990:348). According to Mitchell, intertidal features as evidence of the many well-developed fish and shellfish harvesting systems are associated with this period and states river and saltwater traps are particularly noted in the northern Strait of Georgia (1990:347). A late period component is present at above mentioned Shelter Point, DjSc-1 on Texada Island and determined radiocarbon dates from an excavated hearth of 830 +/- 30 years B.P. (Parsley 2013).

3.6 Regional Archaeology and Previous work

The current study area is located approximately 150m to the WSW of two known and recorded archaeological sites DiSc-3 and DiSc-27.

DiSc-3 is located approximately 96 m to the north across the Island Highway and measures approximately 30 m x 60 m in size. Previous archaeological assessments described the site as heavily impacted from past logging and clearing contributing to an unclear understanding of actual site dimensions and level of intact cultural remains (Dewhirst 1993). The archaeological deposits are described as discontinuous, lacking any substantial archaeological deposits and typified by the presence of fire broken rock. The occasional pockets of shell were identified in the former campground area along with an abrader fragment and an ungulate long bone fragment (Dewhirst 1993). Prior to the 1993 report, ancestral human remains were noted to have been removed and taken to the Royal BC Museum (RBCM).

DiSc-27 is located 147 m to the northeast of the subject facility and is approximately 23 m east of DiSc-3 separated by Lee Road (Murton 1975). The size of DiSc-27 as it appears on the Remote Access to Archaeological Data (RAAD) is approximately 135 NW/SE x 59 m SW/NE. The site is likely a continuation of DiSc-3 but was re-recorded as DiSc-27 in 1975 (Dewhirst 1993) having been initially recorded as DiSc-3 by John Sendey in 1964.

Sendey described the site as, "…*a shell midden of about 3ft of deposit of clam shells overlying beach sand and gravel"* (Dewhirst 1993); but despite the documentation of cultural material reaching depths of 1.0 m; Sendey stated, "…*only a few undisturbed areas remain"* and the site was "*not worth further investigation"*(Dewhirst 1993). The French Creek House Resort construction and development of the surrounding area has impacted the site and according to Dewhirst (1993), little intact cultural material survives. However, DiSc-27 was not investigated through sub-surface testing in 1993 and so the extent and preservation of archaeological remains is unknown. Stratified shell midden was recorded along the

ditch on the east side of Lee Road and several artifacts were recovered, suggesting intact and significant archaeological remains may in fact survive (Dewhirst 1993).

Located approximately 540m to the west and northwest is site DiSc-29. This is a shell midden site located on the west side of French Creek and recorded as 869 m long E/W and 230 m N/S and covering and area of approximately 15 hectare area extending west from the mouth of French Creek.

DiSc-29 was originally recorded by Murton and Foster (1975) and revisited by Scott and von Krough (1977) and it was observed that there were several impacts upon and disturbances to the cultural deposits. Scott and von Krough (ibid) recorded that Tom Tyron, who had farmed the land since 1912, reported that indigenous people continued to use the land in the summer up to 1920. Following the 1970s archaeological surveys a number of permitted and non-permitted archaeological studies have been conducted within DiSc-29. Except for the recovery of fire broken rock (FBR), a single human vertebra, anthropogenically altered sands, and thin shell midden deposits; these studies have produced negative archaeological results. An AIA in 2017 (Bible 2017) identified shell midden through surficial exposures in Columbia Drive Community Park, that had been heavily affected by a recreational bike park. An AIA at 1522 Admiral Tryon Blvd (Thompson & Parsley 2020) identified FBR, subsurface shell fragments and anthropogenically colour-stained sediments stratigraphically intact above glacial sands and gravels, indicative of the basal portion of a formerly present cultural deposit. In October 2020 an AIA was carried out to investigate the surficial exposures within the Columbia Drive Community Park impacted by the bike track and revealed the cultural sediments are more extensive than initially recorded (Parsley & Thompson 2020 in prep).

4 METHODOLOGY

Field methods followed those set out in the application for Permit 2019-0098.

4.1 Documentary Research

The Remote Access Archaeological Data (RAAD) and Provincial Archaeological Report Library (PARL) applications provided by the Archaeology Branch were utilized to access all the existing archaeological site information and associated reports.

4.2 Surface Inspection

As per the Permit Application for HCA Permit 2019-0098 areas of low potential are surveyed at discretion, and areas of moderate potential are surveyed at 25 m traverse. Visual surface inspection includes review for archaeological resources (e.g., cultural depressions, trees with modifications that may pre-date AD 1846), and areas exhibiting potential for archaeological resources (e.g., landforms and exposures). Traverses are determined based on anticipated potential which is contingent on physiography, development boundaries and visibility. The pedestrian survey visually inspects the ground surface for exposures of cultural sediments and cultural features. The bases of trees other exposed areas of ground are inspected for evidence of subsurface archaeological deposits. Suitable tree stands are examined for cultural modification. This surface inspection followed on from a Preliminary Field Reconnaissance (PFR) carried out in December 2018, the results of which are presented in Appendix 2.

Detailed field records and observations were recorded and maintained in a field-book and all photographs were recorded in a photo log.

4.3 Subsurface Inspection

As per the application for Permit 2019-0098, *"…lands considered to have potential for archaeological sites will be tested at 5 m intervals or less"*. Instances where a greater testing interval is employed may include reduction of potential from proven testing; obstructions to spacing or inaccessible test locations, and as per the application each shovel test was 35cm by 35cm in size and excavated until culturally sterile basal sediments were observed unless constraints such as significant mature tree roots prevented this. All excavated material from these tests was screened through ¼ inch mesh.

The field data collected was digitized using GIS software ArcMap 10.6.1 to convey all archaeological features, landforms, subsurface tests, survey coverage, existing facilities, and recent disturbances.

4.4 Analysis

Comparative analysis of faunal remains was conducted from representative samples whenever possible. Consulted texts included Olsen's *Mammal Remains from Archaeological Sites* (1964), Gilbert's *Mammalian Osteology* (1980), and Smart's *Carpals and Tarsals of Mule Deer, Black Bear, and Human: An Osteology Guide* (2009).

Lithic artifacts will be subjected to a technological analysis with the aim of providing an assessment of site function. Analysis will be done according to an established system (e.g. Andrefsky 1998, Magne 1983) that provides insight into lithic technologies represented at the site, such as core reduction, bipolar reduction bifacial thinning, pressure flaking for tool manufacture/maintenance, blade production, heat treatment, etc. Diagnostic tools will be measured and photographed, with technological attributes noted. Raw material sourcing will be done where appropriate.

4.5 Site Significance Evaluation

The significance of sites within the Study Area was evaluated using the Checklist of Criteria for Pre-Contact Site Evaluation (Appendix D) and Checklist of Criteria for Post-Contact Site Evaluation (Appendix E) from the British Columbia Archaeological Impact Assessment Guidelines (Archaeology Branch 1998).

4.6 Impact Identification and Assessment

The potential for impacts to sites within the Study Area was examined using the Indicators for Assessing Impacts on Archaeological Sites (Appendix F), in the British Columbia Archaeological Impact Assessment Guidelines (Archaeology Branch 1998).

5 RESULTS

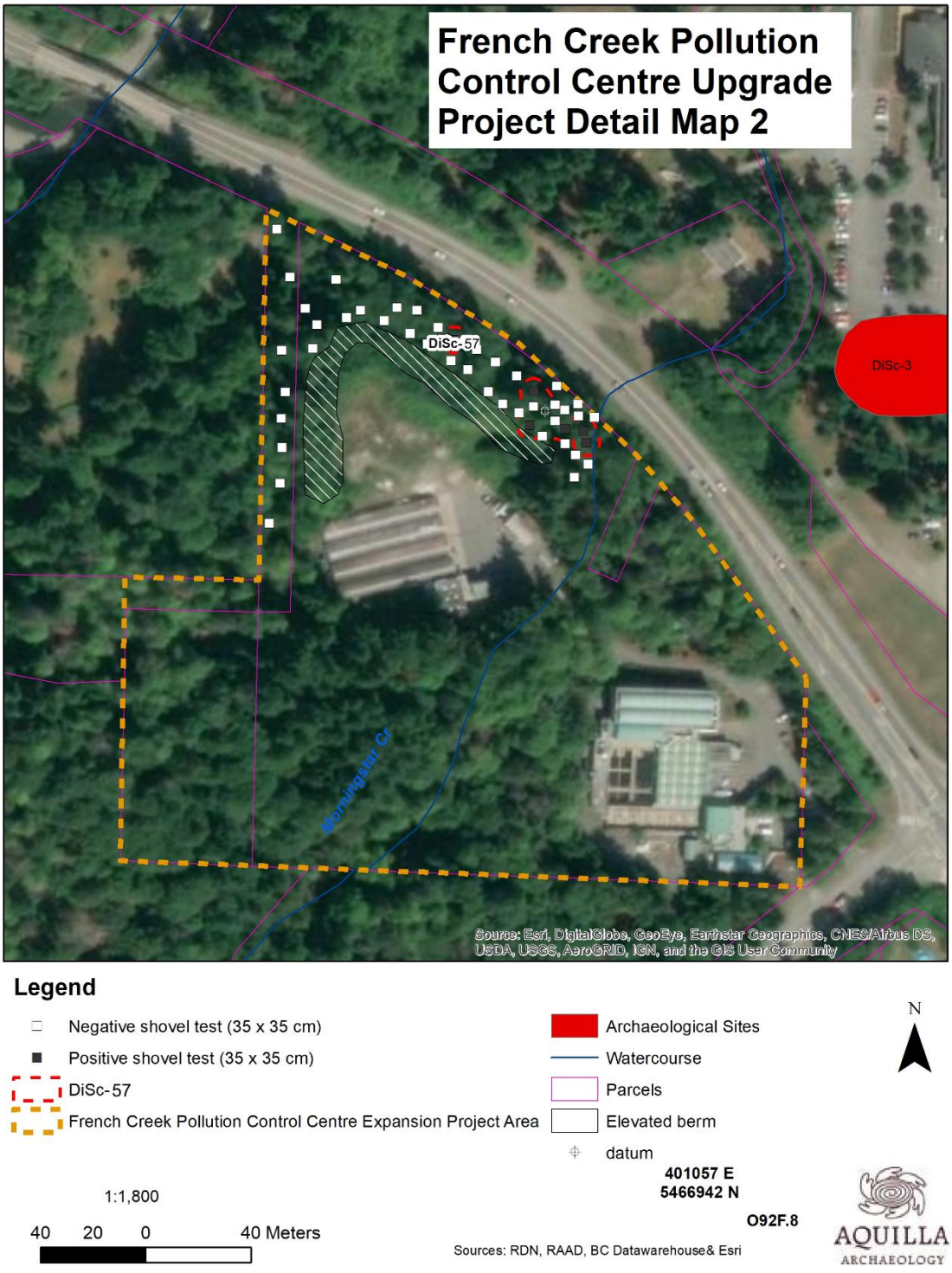


Figure 3: FC PCC Results Map (midrange)

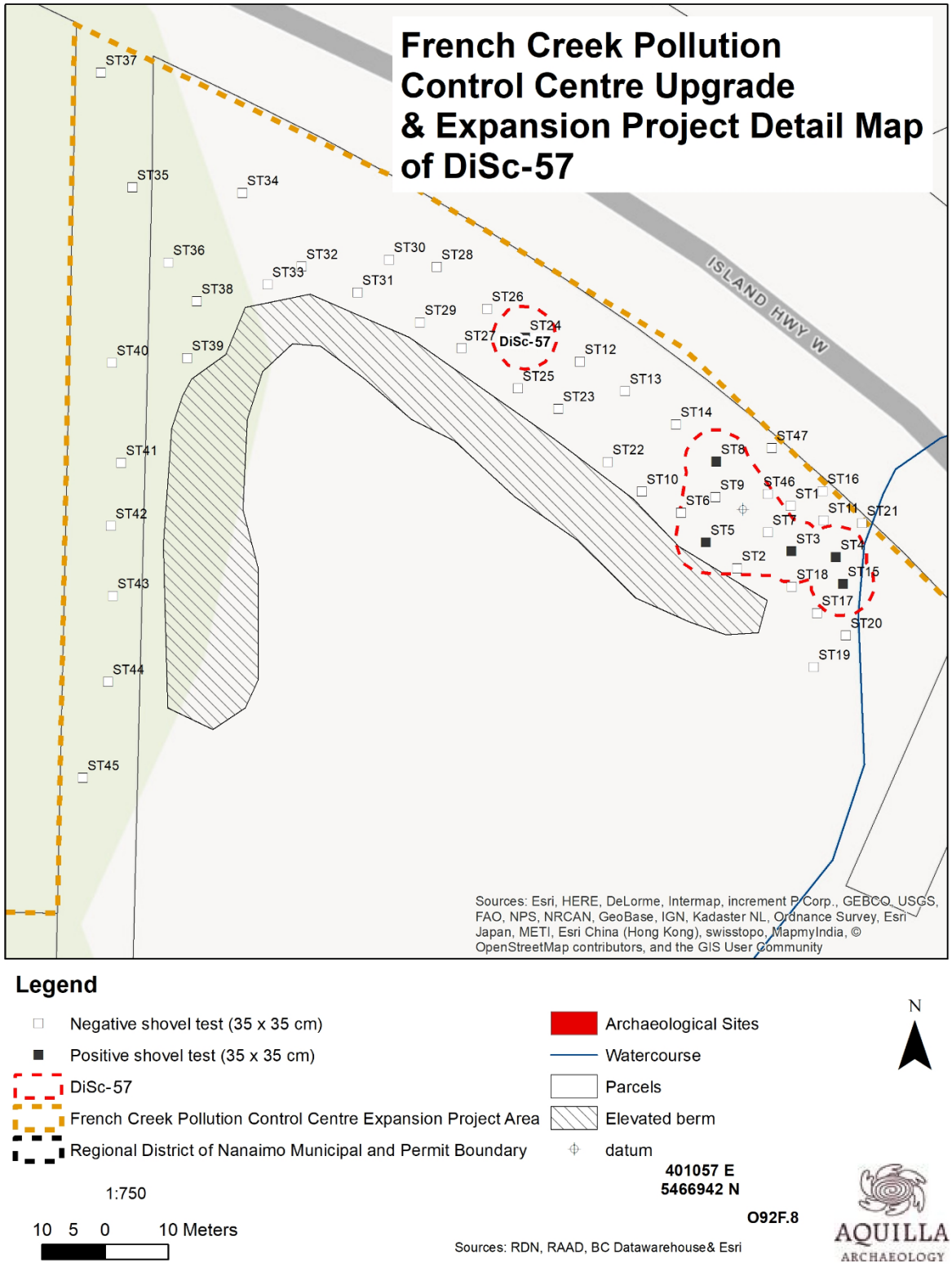


Figure 4: FC PCC Detailed Results.

5.1 Surface Inspection

A preliminary field reconnaissance was completed PFR (Appendix 2) was completed in 2018 where pedestrian survey of the entire property found two areas of interest with moderate archaeological potential located in northern portion of the subject property to the northwest of Morningstar Creek in between Island Highway West (19A) and the existing facility. This area is relatively low-lying and level with second or third growth Douglas-fir, Western redcedar, and Bigleaf maple. The understorey consists of sword fern, Oregon grape, with invasive blackberries on the outer edges of the forest, next to the highway. There are also numerous tree throws, and push piles of gravel and other redeposited material.

A raised bank discussed in the PFR is approximately 4m high by 15–20m wide and forms the southern boundary of the areas of potential. This berm separates the northern portion of the property (closest to the Island Highway West) from the developed portion of the property to the south and is assumed to have been piled from the excavated material removed during the original facility construction in the 1970's (Figures 5 & 6). The vegetation on the berm is consistent with this historic disturbance. In the northwest corner of the northern portion was a particularly dense area of understory vegetation (Figure 7)



Figure 5: Looking east along the 4m high push pile berm.



Figure 6: Looking west along the 4m high push pile berm.



Figure 7: Looking south. Dense understory vegetation in the northwest corner. 4m high berm in background.



Figure 8: Looking east to old access road from Island Highway West into the FC PCC, with deep rutting.

Significant disturbance was found within the northern area where some deep vehicle ruts were observed running parallel to the Island Highway West and north of the large berm (Figures 8 & 9) which lead from an old vehicle access road (immediately adjacent to Morningstar Creek) connecting the Island Highway West into the facility (Figure 10). The berm formed a natural test boundary, and the deep wheel ruts reduced the testable area immediately adjacent to Morningstar Creek.



Figure 9: Working shot. Excavation of STs 1 and 2, with vehicle ruts to the left and gravel push piles in the background (under the sword fern)



Figure 10: Looking south. Morningstar Creek (left) and the old access road.



Figure 11: Springboard notched stump.

Ample evidence of historic logging is found on several old growth western red-cedar stumps (Figure 11).

5.2 Subsurface Inspection

A total of n=47 hand dug shovel tests (ST1–ST47) were excavated in the area of potential of the FC PCC. Of these tests, six (n=6) were positive for archaeological evidence as each contained the presence of fire broken rock (FBR). Details of the stratigraphical sequences and deposits within each test are presented in Appendix 1, while a summary of the positive tests is presented below Table 2.

The tests were excavated at 5m or less intervals in areas of potential, however once there was a clear indication of a reduction in potential, i.e. following three negative tests, or the tests were to be placed in inaccessible or disturbed areas the subsurface testing intervals were increased.

Table 2: Summary of Positive Tests, Cultural Deposits. Depth Below Surface & Thickness

Test	Depth Below Surface (cm)	Deposit Type	Intact deposit thickness (cm)	Disturbed deposit thickness (cm)	FBR/Fauna/shell
ST3	7		n/a	16	5 x FBR (<500g)
ST4	14		n/a	6	1 x FBR (50g)
ST5	7		n/a	11	3 x FBR (40g)
ST8	10		n/a	11	10 x FBR(1kg)
ST15	18		n/a	12	5 X FBR (<500g)
ST24	4		n/a	21	2 x FBR (<500g)

Site Stratigraphy

The site stratigraphy is uniform across the northern portion of the subject property with sterile silts below a variably 5–10cm thick surficial leaf litter ("L"-horizon deposit of decomposing rich organic leaf-litter forest floor material of shed leaves, branches, bark and stems). A loose medium to dark brown organic humic, heavily bioturbated silty loam is present variably to around 12 cm depth below surface which is an "A"-horizon topsoil layer which ranged in thickness from 2–20cm (Pennock, Watson & Sanborn 2015).

The variations in the thickness of this silty loam is potentially the result of disturbance (i.e. logging) prior to and construction of the FC PCC.The FBR is typically found in a matrix of light to medium grey silt ("Ae"-horizon) found ranging from 4-30 cm depth below surface but is typically at the 10-20 cm below surface range.



Figure 12: ST3. Western wall. Scale 50cm & 20cm.



Figure 13: ST4. Eastern wall showing root disturbance. Scale 50cm & 20cm.



Figure 14: ST5. Eastern wall. Scale 50cm & 20cm.



Figure 15: ST8. Western wall. Scale 50cm & 20cm.

In the tests which didn't have an "Ae"-horizon deposit the overlying topsoil lay directly upon the sterile naturally deposited basal material which was characterised as a compact light to medium brown silty clay with iron staining present and this deposit becomes lighter with depth. No rock or gravels were observed within this sterile glacial deposit.

Slight stratigraphic variability was observed in four tests, but each continued to be negative for cultural materials.

ST12 revealed a 7cm thick sterile light-yellow brown (tan) silty clay with occasional iron staining patches (very similar to the basal deposit observed in other tests, but this was clearly disturbed/redeposited as it contained an iron nail and overlay a mottled orange and light grey compact silty clay with 20% small (<4cm) rounded and subrounded pebbles/gravel indicative of a waterborne sterile basal deposition. This glacial sediment was clearly different to the stone-free material observed in the other tests (Figure 16). A modern nail was found between 10-17 cm dbs.

In ST13 the basal deposit was recorded as a compact dark grey clay with large sand and gravel particles. This is potentially an imported dumped deposit, as there are several push piles of gravel in the area and this deposit became impenetrable at 20cm dbs.

ST19 was positioned at the eastern end of the 4m high push pile berm and revealed a series of redeposited/disturbed layers of material associated with the construction of the FC PCC. No evidence of the older ground surface was observed, and the basal material was observed at 44cm dbs (Figure 18).

ST22 revealed a basal deposit of compact dark grey-brown sandy silt with 10% small, rounded pebbles. This was similar to ST13 however it is unclear if this is an *in situ* sterile basal deposit or redeposited sterile basal material from elsewhere. There is evidence of disturbance to the ground surface in this area. Test halted at 20cm dbs due to the compact nature of this deposit.

ST24 revealed beneath the topsoil a mixed and mottled medium grey and dark grey clay silt. The mixed and mottled nature of this deposit indicates that it is redeposited, with patches of anaerobic dark grey clay. Two pieces of FBR weighing <500g were recovered from this disturbed deposit (Figure 19).



Figure 16: ST12. Southern wall. Scale 50cm & 20cm.



Figure 17: ST15. Southern wall. Scale 50cm & 20cm.



Figure 18: ST19. Southern wall. Scale 50cm & 20cm.



Figure 19: ST24. Southern wall. Scale 50cm & 20cm.

Other than the scattered distribution of FBR (Table 3), no artifacts, shell or faunal remains were observed. A single iron nail was recovered from ST12 indicating disturbance.

Table 3: Fire Broken Rock

Shovel Test	No of FBR
ST3	5

ST4	1
ST5	3
ST8	10
ST15	5
ST24	2
Total	26

Fire broken rock (FBR) or Fire-cracked rock (FCR) is intrinsically linked with human activity and *"is the most abundant artifact identified at many prehistoric sites in the Pacific Northwest. Even a cursory review of archaeological and ethnographic literature indicates drying and processing facilities employed 'hot rocks' as heat radiators; sweat lodges used heated rocks as a source for steam; and boiling stones were used in the cooking of foods. Large hearths filled with FCR usually formed the central core of houses. Roasting ovens associated with processing of roots, especially camas (Camassia quamash), employed large quantities of rocks as heating elements. In spite of its central role in prehistoric household activities, FCR remains an understudied and undervalued analytical resource compared with its more attractive and traditional counterparts, such as flaked and ground stone tools, floral and faunal remains, and even lithic debitage"* (Wilson and DeLyria 1996).

6 DISCUSSION

This AIA at the French Creek Pollution Control Centre was successful in its stated aims of identifying the presence of cultural material in the northern portion of the property and establishing the location and extent of the remains that may be affected by potential future development. The evidence for archaeological remains is limited with just 26 pieces of FBR and no evidence of shell, artifacts or faunal remains.

FBR is intrinsically linked with human activity which involved the heating of rocks within a fire, but whether this was for cooking as boiling stones, or from a hearth surround, a rock oven, or steaming pit, or from a myriad of other uses is unclear.

It is likely that this new archaeological site is related to the other archaeological sites in the vicinity and may have at one time formed the periphery of a larger culturally used landform associated with the French Creek delta and related fisheries that once took place here.

Archaeological sites that are located inland from the shoreline are more prevalent in this particular area. DisC-29 is located to the west of French Creek is a good example of discontinuous cultural deposition of sparse FBR such as found at 1522 Admiral Tryon Boulevard (Thompson & Parsley 2020a).

The assessment work completed for DhSb-3 found that this site too, is typified by discontinuous FBR with the occasional pocket of shell matrix in the former campground. This patterning of sporadic FBR is perhaps indicative that these two archaeological sites were at one time connected prior to historic impacts. Likewise, this is probably connected to DiSc-27 to the east of Lee Road although these archaeological deposits are described as dense with stratified shell midden and containing significant artifacts. It is highly plausible this new site relates to the sporadic low-density scatter of FBR relating to DhSb-3 however, it is unclear given the spatial discontinuity of ~190 m and it cannot be confirmed these are indeed the same archaeological site. Further, it cannot be discounted that this new site may be the edge of a former, now destroyed archaeological site that may have been situated where the FC PCC is presently found.

The lack of any shell or faunal remains and the lack of 'midden' material characterised by dark organic charcoal and shell rich deposits is potentially due to a number of reasons.

1) There has been substantial disturbance in this portion of the property, historic logging as shown from the spring board notched stumps in the northwest corner, the building of the Island Highway West and the building of the FC PCC itself has had an effect in this area and it is likely any cultural deposits present, were removed during this disturbance.

2) The site may represent an isolated and was either very short-lived with brief cultural use and so dense deposits of cultural material did not accumulate.

3) The site is on the periphery of a much larger and densely occupied site (such as DiSc-3 and DiSc-27) to the north. The surviving archaeological deposits are indicative of a short-lived or seasonal site with perhaps limited occupation, as the FBR were recovered from medium to light brown floodplain silts or glacial silts, that show no evidence of anthropogenic staining. Long occupied sites with high density of overlying cultural deposits often result in the basal deposits becoming stained black through the leaching of anthropogenic material (charcoal rich organic deposits) through the process of percolating precipitation into the upper layers of the underlying sterile natural deposits.

4) There were no cultural deposits here and the FBR arrived as a result of imported material during development in this area.

Its is likely that the limited archaeological evidence is a combination of reasons 1 and 3, disturbance and the location on the periphery of a much larger and densely occupied site.

6.1 Site Significance Evaluation

The significance of sites was evaluated using the Checklist of Criteria for Pre-Contact Site Evaluation (Appendix D) and Checklist of Criteria for Post-Contact Site Evaluation (Appendix E) from the British Columbia Archaeological Impact Assessment Guidelines (Archaeology Branch 1998).

The site is evaluated according to the specified criteria: Scientific, Public, Ethnic and Economic

This newly identified site, which potentially represents the periphery of activity associated with the two previously recorded archaeological sites to the north, DiSc-3 and DiSc-29 can be considered low in all specified criteria of site significance. Though this is a newly discovered archaeological site, the scientific information that can be obtained from its study is low to nil due to the lack of anthropogenically altered sediments, lack of artifacts, and lack of faunal remains. The archaeological deposits consist of sporadic and discontinuous FBR archaeological material present. The site also has low public and economic significance. Qualicum and Snaw-Naw-As First Nations should be consulted to determine the ethnic significance assessment.

If DiSc-3 and DiSc-27 were better understood in terms of the size and extent of each site and the state of preservation of remains, and these sites were clearly tied to this new site, then perhaps the significance could be re-evaluated.

Archaeological distributions of cultural material in this vicinity of DiSc-57, DiSc-3 and DiSc-27 would be better understood if future work sought to address these questions.

6.2 Impact Identification and Assessment

The potential for impacts to the sites was examined using the Indicators for Assessing Impacts on Archaeological Sites (Appendix F), in the British Columbia Archaeological Impact Assessment Guidelines (Archaeology Branch 1998) and the Ministry of Forests' Memorandum of Agreement on Trails (1995).

The impacts affecting a site are assessed according to the specified criteria: Magnitude, Severity, Duration, Range, Frequency, Diversity, Cumulative Effect and Rate of Change

The proposed developments at FC PCC will also have a detrimental effect on the underlying surviving remains with clearance of trees and stump removal and the construction of a new road access at the very northwest corner of the property. The largest portion of tree clearance in preparation for the construction of new buildings, facilities and infrastructure adjacent to the Island Highway West is located in the area of positive tests and will result in the complete removal of the limited archaeological deposits identified.

7 RECOMMENDATIONS

This new site is located in an area within the French Creek Pollution Control Centre that is to be developed. Preventing further impacts to this newly identified site is the priority recommendation however, there are no alternatives for the project as currently planned to avoid this site.

Any impacts that are planned within DiSc-57, **are required** to be completed under an HCA section 12.4 Site Alteration Permit. Any impacts to DiSc-57 must be monitored by a qualified archaeologist and archaeological monitoring under an HCA Alteration Permit is required to minimize impacts and if necessary, record and collect archaeological data if unavoidable. Monitoring of tree stump removal and ground impacts for grading or initial construction excavations is required.

8 CONCLUSIONS

A new site boundary is to be established for this newly discovered site, composed of 2 polygons. The NW polygon is a 5m diameter buffer around positive test ST 24. The SE polygon measures 30m E–W by 23m N–S around positive tests ST3, 4, 5, 8 and 15, with 5m buffer applied around the positive tests. There is a 26.5m gap between the two polygons and following instruction from the BC Archaeology Branch a total dimension for DiSc-57 of 74m E–W by 30m N–S was applied.

This study found a new archaeological site DiSc-57 located 300 m inland from the mouth of Morningstar Creek. This site demonstrates that even in heavily disturbed areas from large scale developments, archaeological evidence may survive. Further, this study shows that inland archaeological sites are more prevalent than formerly understood.

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Appendix 1: Subsurface Test Log

Prior to the excavation of each test the slightly decomposing rich organic leaf-litter forest floor material (shed leaves, branches, bark and stems – 'O'-horizon) which sealed the underlying deposits was removed. This ranged in thickness from 5–10cm and overlay an "A"-horizon deposit.

Test#	Depth Below Surface (cm)	Cultural	Intact	Matrix Description
ST1	0–20	N	N	Loose medium to dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	20–35	N	N	Compact yellow silty clay with orange iron staining. Sterile basal material. Test halted at 35cm dbs.
ST2	0–20	N	N	Loose medium to dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. Test abandoned at 20cm due to very large tree root.
ST3	0–7	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	7–23	**Y**	**N**	**Mottled light grey fine silty clay which transitions with depth to a medium to light yellow silty clay. 5 pieces of fire broken rock (FBR) <0.5kg.**
	23+	N	N	Compact medium yellow silty clay with dark orange iron staining. Sterile basal material. Test halted at 23cmn dbs
ST4	0–14	N	N	Loose medium to dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	14–20	**Y**	**N**	**Fine light grey yellow silty clay. 1 piece of FBR (50g).**
	20–30	N	N	Compact medium yellow silty clay with dark orange iron staining. Sterile basal material.
ST5	0–7	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	7–18	**Y**	**N**	**Compact medium grey silty clay with 3 x FBR (40g).**
	18–25	N	N	Compact medium yellow silty clay with dark orange iron staining. Sterile basal material. Test halted at 25cm dbs.
ST6	0–2	N	N	Thin loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	2–20	N	N	Compact medium yellow silty clay with dark orange iron staining. Sterile basal material.
ST7	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.

	10–22	N	N	Compact medium grey silt.
	22–30	N	N	Compact medium yellow silty clay with dark orange iron staining. Sterile basal material. Test halted at 30cm dbs.
ST8	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	10–21	**Y**	**N**	**Heavily rooted grey silt with 10 pieces of FBR weighing 1kg.**
	21–30	N	N	Compact grey silty clay with dark orange irons staining patches which transitions with depth to medium to light yellow silty clay with depth. Test halted at 30cm dbs.
ST9	0–5	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	5–14	N	N	Heavily rooted grey silt.
	14–20	N	N	Compact grey silty clay with dark orange irons staining patches which transitions with depth to medium to light yellow silty clay with depth. Test halted at 20cm dbs.
ST10	0–5	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	5–10	N	N	Heavily rooted grey silt.
	10–20	N	N	Compact grey silty clay with dark orange irons staining patches which transitions with depth to medium to light yellow silty clay with depth. Test halted at 20cm dbs.
ST11	0–6	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	6–18	N	N	Heavily rooted grey silt.
	18–22	N	N	Compact grey silty clay with dark orange irons staining patches which transitions with depth to medium to light yellow silty clay with depth. Test halted at 20cm dbs.
ST12	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	10–17	Y	N	Light yellow brown (tan) silty clay with occasional orange irons staining patches. Disturbed as an iron nail recovered.
	17–26	N	N	Mottled orange and light grey compact silty clay with 20% small (<4cm) rounded and subrounded pebbles/gravel indicative of a waterborne sterile basal deposition. Test halted at 26cm dbs.
ST13	0–5	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.

	5–9	N	N	Thin band of mixed and mottled light grey and light yellow clay.
	9–20	N	N	Compact dark grey clay with sand and gravel. Large sand and gravel particles. This is potentially an imported dumped deposit, there are several push piles of gravel in the areas. Test halted at 20cm as this deposit was impenetrable.
ST14	0–12	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	12–22	N	N	Heavily rooted grey silt.
	22–30	N	N	Compact grey silty clay with dark orange irons staining patches which transitions with depth to medium to light yellow silty clay with depth. Test halted at 30cm dbs.
ST15	0–18	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	18–30	**Y**	**N**	**Loose fine light grey yellow silt which transitions to medium yellow silt clay with depth, with 5 pieces of FBR (<500g).**
	30+	N	N	Compact medium brown clay silty clay with orange iron staining patches.
ST16	0–12	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	12–17	N	N	Heavily rooted grey silt.
	17–26	N	N	Compact grey silty clay with dark orange irons staining patches which transitions with depth to medium to light yellow silty clay with depth. Test halted at 26cm dbs.
ST17	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	10–20	N	N	Heavily rooted grey silt.
	20–35	N	N	Compact grey silty clay with dark orange irons staining patches which transitions with depth to medium to light yellow silty clay with depth. Test halted at 35cm dbs.
ST18	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	10–20	N	N	Medium to dark fine greys silt which becomes lighter with depth, heavily rooted/bioturbated.
	20–30	N	N	Mottled light and medium yellow and brown compact silty clay, sterile basal deposit. Test halted at 30cm dbs.

ST19	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	10–21	N	N	Mottled light yellow and brown silty clay. This is a redeposited and reworked deposit associated with the initial construction of the French Creek Pollution Control Centre (FC PCC), and the test is located to the west of large push pile berm which forms the southern boundary of the developed portion of the FC PCC.
	21–33	N	N	Mixed and mottled medium grey and dark grey clay silt. The mixed and mottled nature of this deposit indicates that it is redeposited.
	33–44	N	N	Dark brown silt, which is heavily bioturbated with extant roots at this level.
	44–50	N	N	Loose medium brown and orange sandy silt with patches of iron staining. Sterile basal deposit. Test halted at 50cm dbs.
ST20	0–5	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	5–17	N	N	Layer of decayed wood, this deposit suggests a downed or felled tree was allowed to rot and decay in situ but was then crushed. There is evidence of vehicle tracks close to this test which could account for that crushing.
	17+	N	N	At 17cm dbs a large root was encountered which filled the whole of the test. Test halted at 17cm dbs.
ST21	0–6	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	6–15	N	N	Medium grey silt. Heavily rooted.
	15–20	N	N	Medium grey silt which transitions to medium yellow brown silty clay. Test halted at 20cm dbs.
ST22	0–9	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	9–20	N	N	Compact dark grey brown sandy silt with 10% small rounded pebbles, similar deposit to ST13 however it is unclear if this is an in situ sterile basal deposit or redeposited sterile basal material from elsewhere. There is evidence of disturbance to the ground surface in this area. Test halted at 20cm dbs due to the compact nature of this deposit.
ST23	0–12	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	12–20	N	N	Compact and tenacious grey silty clay with patches of orange iron staining. Low energy anaerobic clay deposit. Sterile basal material. Test halted at 20cm dbs.

ST24	0–4	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	4–25	**Y**	**N**	**Mixed and mottled medium grey and dark grey clay silt. The mixed and mottled nature of this deposit indicates that it is redeposited, with patches of anaerobic dark grey clay. Two pieces of FBR weighing <500g were recovered from this disturbed deposit.**
	25–30	N	N	Compact yellow brown and very light grey silt clay with orange iron staining. Sterile basal material. Test halted at 30cm dbs.
ST25	0–2	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	2–16	N	N	Medium brown silty clay with no inclusions.
	16–26	N	N	Light grey silty clay with orange iron staining patches. Sterile basal material. Test halted at 26cm dbs.
ST26	0–4	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	4–35	N	N	Heavily rooted medium to dark brown organic silty clay - not cultural - no inclusions. Very large root at 24cm dbs.
	35+	N	N	Compact light grey silty clay with orange iron staining. Sterile basal deposit. Test halted at 35cm dbs.
ST27	0–13	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	13–25	N	N	Heavily rooted dark brown silty clay.
	25–36	N	N	Compact light grey silty clay with orange iron staining. Sterile basal deposit. Test halted at 36cm dbs.
ST28	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	10–20	N	N	Compact dark grey sand silt with 30% subrounded and rounded pebbles and gravels. Water borne sterile basal deposit. Test halted 20cm dbs.
ST29	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	10–25	N	N	Compact medium yellow silty clay with dark orange iron staining. Sterile basal material. Test halted at 25cm dbs.
ST30	0–11	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	11–31	N	N	Compact dark yellow sandy silt with reddish/orange hue. Sterile basal material. Test halted at 25cm dbs.

ST31	0–9	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	9–22	N	N	Mixed and mottled heavily bioturbated dark brown and orange yellow silty clay.
	22–36	N	N	Compact yellow/brown silty clay sterile basal deposit. Test halted at 36cm dbs.
ST32	0–17	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	17–19	N	N	Thin very dark brown black burnt root layer, of heavily decayed root layer.
	19–30	N	N	Compact medium to light yellow brown silty clay with iron staining. Sterile basal material. Test halted at 30cm dbs.
ST33	0–4	N	N	Very thin loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	4–20	N	N	Mixed and mottled dark brown silt and orange silty clay mix of overlying topsoil (A horizon) mixing with basal sterile material. It is unclear if this is the result of bioturbation or man-made disturbance during activities in this area - i.e. logging.
	20–30	N	N	Compact light to medium brown silty clay with iron staining present. Sterile basal material. Test halted at 30cm
ST34	0–3	N	N	Very thin loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	3–18	N	N	Mixed and mottled dark brown silt and orange silty clay mix of overlying topsoil (A horizon) mixing with basal sterile material. It is unclear if this is the result of bioturbation or man-made disturbance during activities in this area - i.e. logging.
	18+	N	N	Compact light to medium brown silty clay with iron staining present. Sterile basal material. Test halted at 18cm
ST35	0–4	N	N	Very thin loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	4–23	N	N	Mixed and mottled dark brown silt and orange silty clay mix of overlying topsoil (A horizon) mixing with basal sterile material. It is unclear if this is the result of bioturbation or man-made disturbance during activities in this area - i.e. logging.
	23+	N	N	Compact light to medium brown silty clay with iron staining present. Sterile basal material. Test halted at 18cm
ST36	0–6	N	N	Very thin loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	6–25	N	N	Compact light to medium brown silty clay with iron staining present. Sterile basal material. Test halted at 25cm
ST37	0–20	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	20–30	N	N	Compact light to medium brown silty clay with iron staining present. Sterile basal material. Test halted at 30cm

ST38	0–5	N	N	Very thin loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	5–30	N	N	Mixed and mottled dark brown silt and orange silty clay mix of overlying topsoil (A horizon) mixing with basal sterile material. It is unclear if this is the result of bioturbation or man-made disturbance during activities in this area - i.e. logging.
	30–35	N	N	Compact light to medium brown with iron staining present. Sterile basal material. Test halted at 35cm.
ST39	0–26	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	26–34	N	N	Compact light to medium brown with iron staining present. Sterile basal material. Test halted at 34cm.
ST40	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	10–30	N	N	Compact light to medium brown silty clay with iron staining present. This deposit becomes lighter with depth. Sterile basal material. Test halted at 30cm.
ST41	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	10–28	N	N	Compact light to medium brown silty clay with iron staining present. This deposit becomes lighter with depth. Sterile basal material. Test halted at 30cm.
ST42	0–6	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	6–30	N	N	Compact light to medium brown with iron staining present. This deposit becomes lighter with depth. Sterile basal material. Test halted at 30cm.
ST43	0–6	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	6–20	N	N	Compact light to medium brown silty clay with iron staining present. This deposit becomes lighter with depth. Sterile basal material. Test halted at 20cm.
ST44	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam. "A"-horizon.
	10–18	N	N	Heavily rooted medium yellow brown silty clay which becomes darker with depth.
	18–35	N	N	Dark brown silty clay with very sharp boundary onto the deposit below.
	35+	N	N	Compact light to medium brown silty clay with iron staining present. This deposit becomes lighter with depth. Sterile basal material. Test halted at 35cm.
ST 45	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	10–19	N	N	Heavily rooted grey silt.

	19–25	N	N	5Compact grey silty clay with dark orange irons staining patches which transitions with depth to medium to light yellow silty clay with depth. Test halted at 2cm dbs.
ST 46	0–6	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	6–18	N	N	Heavily rooted grey silt.
	18–22	N	N	Compact grey silty clay with dark orange irons staining patches which transitions with depth to medium to light yellow silty clay with depth. Test halted at 20cm dbs.
ST 47	0–10	N	N	Loose dark brown organic humic, heavily bioturbated silty loam, with a sharp horizon with the deposit below. "A"-horizon.
	10–15	N	N	Heavily rooted grey silt.
	15–25	N	N	Compact grey silty clay with dark orange irons staining patches which transitions with depth to medium to light yellow silty clay with depth. Test halted at 25cm dbs.

Appendix 2: Preliminary Field Reconnaissance (PFR)

AQUILLA ARCHAEOLOGY

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To: Michael Celli, AECOM
Sean De Pol, Regional District of Nanaimo

Re: Archaeological Preliminary Field Reconnaissance (PFR) for the proposed French Creek Pollution Control Centre Expansion and Upgrade Project, French Creek, BC

December 11, 2018

Introduction

Colleen Parsley of Aquilla Archaeology was contacted by Michael Celli of AECOM, to conduct an archaeological review and preliminary field reconnaissance (PFR) of the study area for the proposed upgrades to the French Creek Pollution Control Centre Expansion. A review of the Remote Access Archaeological Data (RAAD) within the study area showed two previously recorded archaeological sites in the vicinity. Due to the presence of the archaeological sites, a preliminary field reconnaissance was conducted.

Proposed Project

The Regional District of Nanaimo is proposing the expansion and upgrades to the existing French Creek Pollution Control Centre. The project will include multiple upgrades to the centre which include: the demolition and relocation of several buildings; the construction of several buildings, including two large clarifiers; the removal and reconstruction of bridge girders and concrete deck over Morningstar Creek, and various other upgrades both inside and outside the centre.

Study Area

The French Creek Pollution Control Centre is located in French Creek, on the east side of Vancouver Island, between the towns of Parksville and Qualicum Beach. The 8.77-acre facility is situated at the intersections of Lee Road and the Island Highway.

The subject property is situated along moderately sloped terrain with northeast aspects that descend to a low-lying area that fronts the Island Highway.

Archaeological Sites in Vicinity

Situated to the northeast, directly across the Island Highway from the facility, two previously

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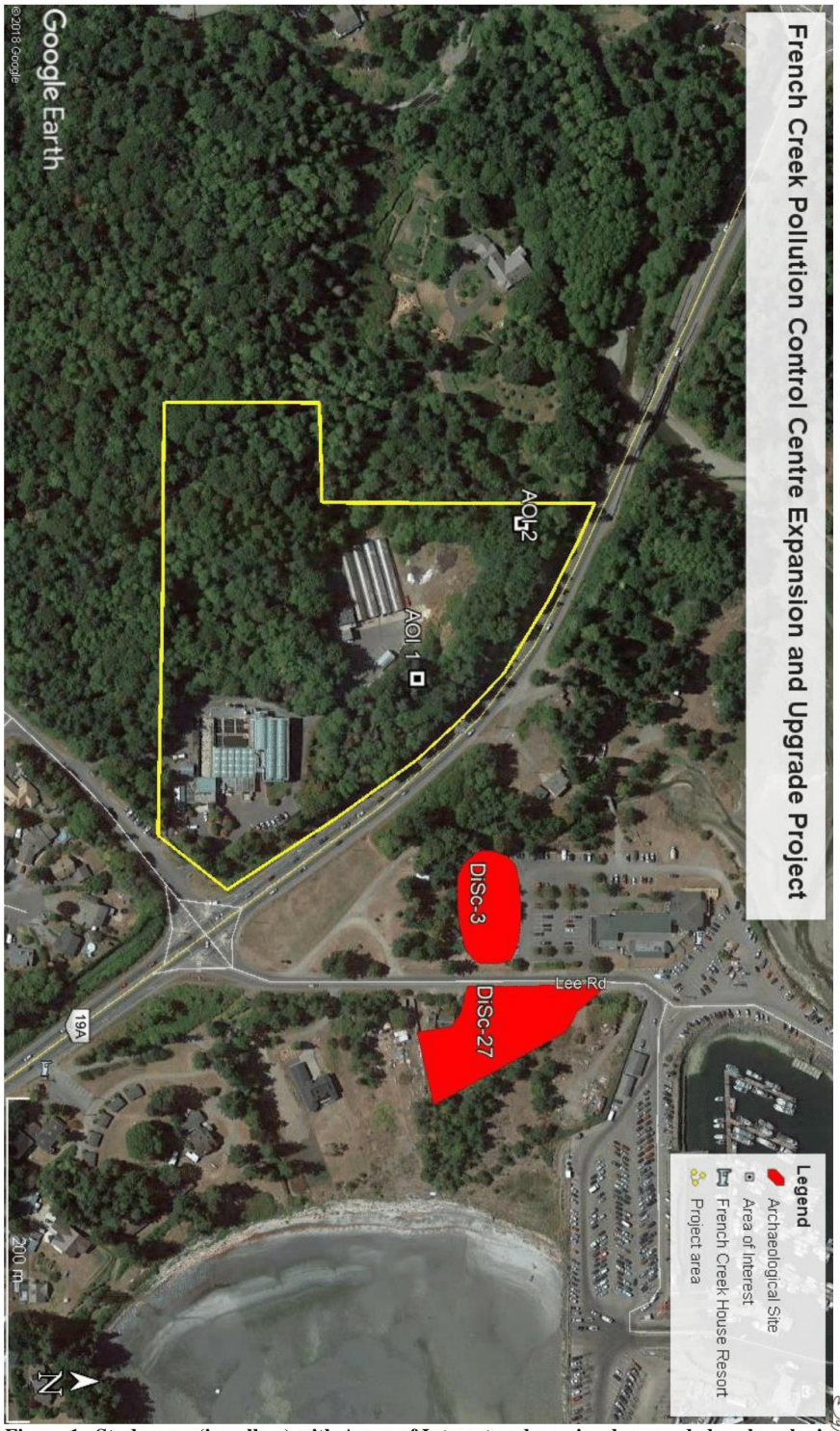


Figure 1. Study area (in yellow) with Areas of Interest and previously recorded archaeological sites.

recorded archaeological sites are located. Both sites are described as precontact shell midden with associated cultural material as well as ancestral remains. DiSc-3 is located approximately 166 m to the north across the Island Highway and measures approximately 30 m x 60 m in size. Previous archaeological assessments described the site as heavily impacted from past logging and clearing contributing to an unclear understanding of actual site dimensions and level of intact cultural remains (Dewhirst 1993).

DiSc-27 is located 185 m to the northeast of the subject facility and is approximately 23 m east of DiSc-3 separated by Lee road (Murton 1975). The size of DiSc-27 as it appears on the Remote Access to Archaeological Data (RAAD) is approximately 135 NW/SE x 59 m SW/NE. The site is likely a continuation of DiSc-3 but was re-recorded as DiSc-27 in 1975 (Dewhirst 1993). The construction of the French Creek House Resort and development of the surrounding area has impacted the site leaving very little intact cultural material. Stratified shell midden was recorded along the ditch on the east side of Lee Road.

Methods

A preliminary field reconnaissance (PFR) is a physical site visit to gather information and make observations about the characteristics of a subject area intended to help inform archaeological potential. The goal is to determine whether archaeological potential requires further steps for evaluation. PFRs are simply site visits of very limited scope.

Methods for this PFR consisted of a 100% pedestrian survey coverage of the entire subject property. Surface inspection included all available ground exposures, river embankments, drainage ditches, and landscaping features. All mature trees were inspected for cultural modification.

The pedestrian survey was tracked via a handheld GPS unit. Photos were taken during the survey and all notes were documented in field.

Results

The PFR was conducted from December 10 - 11, 2018 by Adam Love of Aquilla Archaeology. Exposures adjacent the Island Highway drainage area along the northeast perimeter of the subject property were inspected. No signs of cultural material were observed where exposures were visible. Sediments were consistent with sterile glacial sediments along the ditch with no shell or black organic silts that would point to cultural in origin or an extension of archeological site DiSc-3 or DiSc-27. The raised bank between the Island Highway and the subject property is completely obscured by invasive blackberries making surface inspection difficult (Figure 2).

Northwest from Morningstar Creek, between the Island Highway and the existing facility, the property is low-lying and level. The forested sections are second or third growth with Douglas-fir, Western redcedar, and Bigleaf maple. The understorey consists of sword fern, Oregon grape, with invasive blackberries on the outer edges of the forest, next to the highway. Due to the abundance of Bigleaf maple, leaves covered much of the survey area obscuring the ground.

However, enough exposures from tree throws and possible machine push piles enabled a view of some subsurface sediments. Sediments were typical forested organics with some clays and gravels. No cultural material was observed. The area between Morningstar Creek and the northwest corner of the subject property contain several old-growth, historically logged stumps. Where possible, the stumps (predominately Douglas-fir) were inspected for modification. Apart from historic springboard notches, no precontact tool marks were observed. Two locations of interest were noted (Figure 3), along the northeast boundary of the facility where a remnant and level landform is situated between Morningstar Creek and French Creek. These locations of interest have low to moderate potential for archaeological remains. Area of Interest 1 is adjacent to Morningstar Creek, is level, moderately drained, with a few old growth stumps. Area of Interest 2 is located in the northwest corner of the subject property and is a level area with a few old growth stumps. Area of Interest 2 is approximately 75 m southeast of French Creek.

The modern garden beds observed within the facility grounds were inspected for any sign of redistributed cultural material but these were consistent with modern landscaping material. In general, the original surface impacted has been visibly impacted from former construction activities of the various buildings associated with the centre. In the northwest area of the facility, an open area has been artificially levelled and terraced creating a semi-circle embankment that descends steeply to the northwest and north (Figure 4). The exposures from this clearing and levelling along the margins were inspected with no signs of cultural material. Several piles of dark rich organic sediment with shell were observed in this levelled area. These were inspected and determined to be modern oyster shells with abundant wood chips and modern organics. Origin of this is unknown but likely the result of a biproduct from the facility.

The southeast boundary of the facility includes a small portion of the greater elevated terrace that extends to the south continuing outside of the property. This small portion present on the property descends steeply to Morningstar Creek creating a small cut that bisects the landform in a northeast direction. Due to the presence of a few large old growth Western redcedar and Douglas-fir stumps on the slope descending to the creek, this landform represents an original surface but is deemed to have low archaeological potential. Historic springboard notches were located on all stumps but no sign of any precontact modification was found and limited exposures showed sterile glacial sediments.

Both sides of Morningstar Creek were inspected from the southwest property boundary to where the creek exits along the northeast boundary at the Island Highway. Bank exposures and underneath a small bridge for an ancillary road showed no signs of cultural sediments. Each side of the creek consists of low-lying and poorly drained terrain with abundant sword fern obscuring many areas of the creek banks (Figure 5).

The northwest side of Morningstar Creek ascends steeply to small isolated and level landform that is a remnant of pre-levelling of the facility. Again, leaves obscure much of the ground cover but available exposures show a sterile glacial sediment.

If archaeological deposits are present, the two described areas of interest show the greatest potential due to proximity to the creeks, levelness of terrains, and a relatively intact landform.



Figure 2. View SE showing drainage ditch and ground obscuring blackberries.

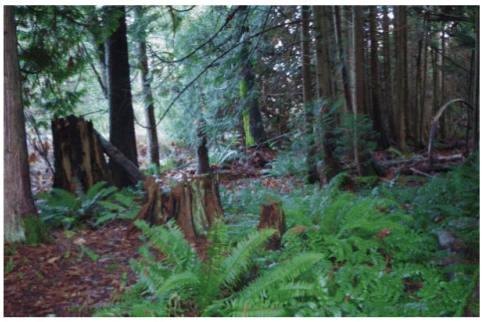


Figure 3. View SE showing level landform and historically logged stumps between Areas of Interest 1 and 2.

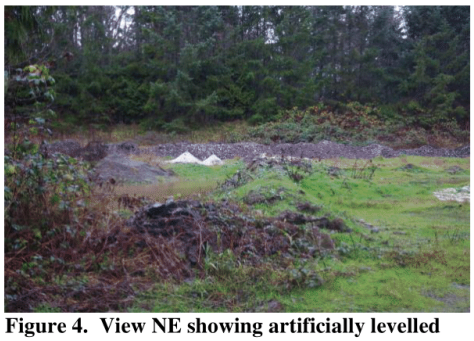


Figure 4. View NE showing artificially levelled area with berm and modern black soil with shell.



Figure 5. View SW showing Morningstar Creek with low-lying, wet areas.

Evaluation and Discussion

Impacts from past levelling, grading, and logging of the subject property have obscured most remnants of a precontact landform. The original landform was likely a moderately sloping terrain that ascended to what is now the Island Highway with an upper terrace existing in the southwest corner of the subject property. Archaeological potential for the majority of the subject property is low due previous impacts, lack of old growth trees, original slope of terrain, and low-lying wet areas along Morningstar Creek. Two areas along the northeast boundary of the facility show a remnant and level landform, situated between Morningstar Creek and French Creek. These areas have low to moderate potential for archaeological remains.

As observed in the drainage ditch running adjacent to the Island Highway and along the northeast boundary of the facility, no signs of cultural material were visible and shows that the likelihood of the extension of DiSc-3 and/or DiSc-27 is low. The potential of precontact archaeological evidence within the majority of the facilities is low as much of the landform has been levelled and graded.

Recommendations

Archaeological assessment prior to development impacts should focus on the observed areas of interest (Area of Interest 1 and 2) that contain moderate archaeological potential. Once these areas of interest are assessed, recommendations will be forwarded for whether monitoring low archaeological potential areas are necessary.

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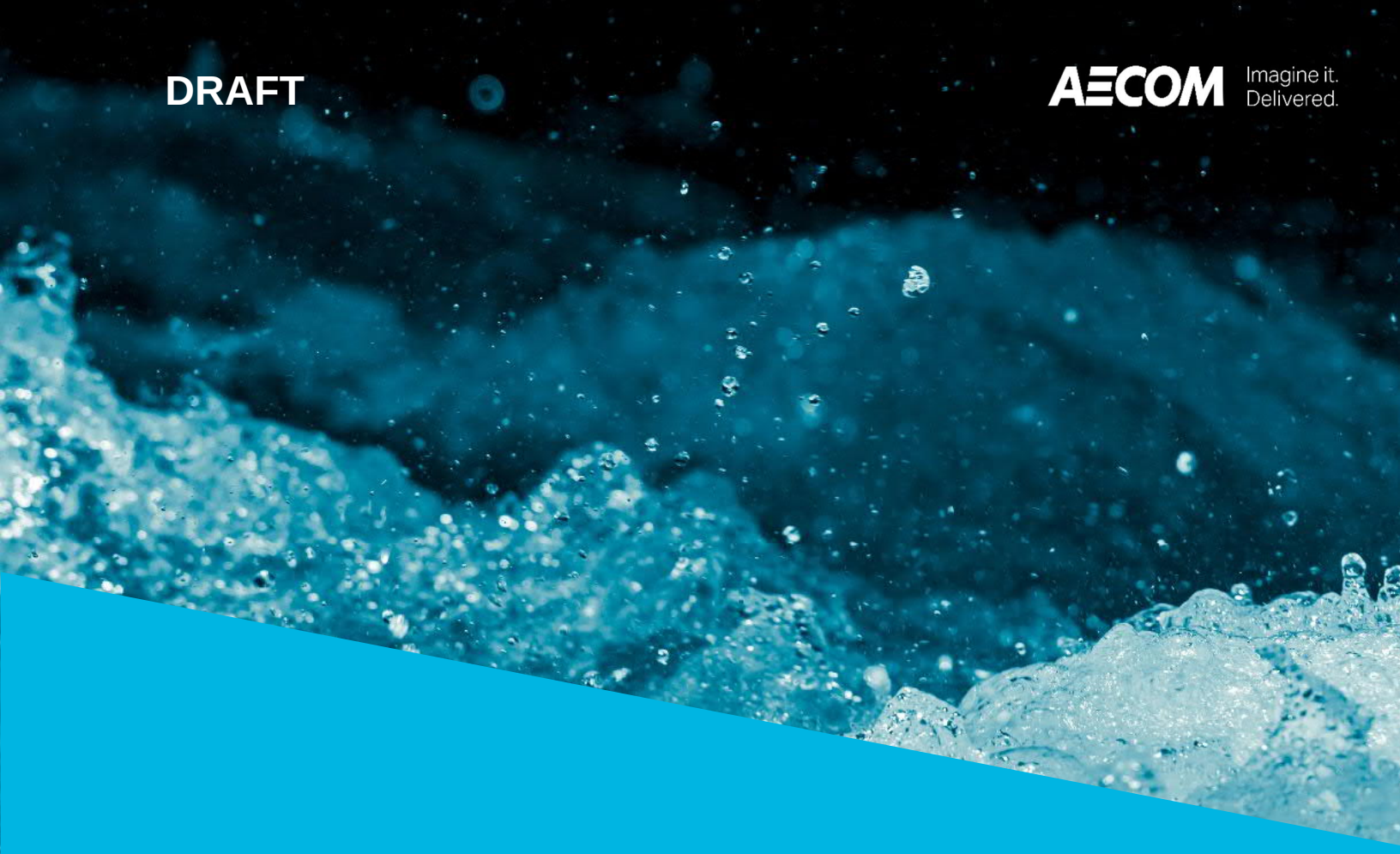



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Archaeological and Cultural Management Services for Vancouver Island and Coastal BC

DRAFT



French Creek Pollution Control Centre Stage 4 Expansion

Construction Environmental Impact Study

Prepared for the Regional District of Nanaimo

Project number: 60590631

February 2021

DRAFT

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1. Introduction

AECOM has been retained by the Regional District of Nanaimo (RDN) for the pre-design, detailed design, construction, and post-construction phases of the French Creek Pollution Control Centre Stage 4 Expansion Project ("the Project"). This report provides an assessment of environmental effects associated with the Project, including identification of environmental challenges and constraints associated with the site. The report also provides measures to mitigate potential project effects

2. Project Overview

The French Creek Pollution Control Centre (FCPCC) is a secondary wastewater treatment plant operated by the RDN near Parksville, BC (Figure 1). The plant provides primary treatment followed by secondary treatment to remove the remaining solids and organic pollutants from the wastewater. The effluent currently meets provincial and federal regulatory requirements.

The FCPCC is near its operating capacity of 10 mega litres per day, average flow, and the expansion will increase the capacity to approximately 13.3 mega litres per day to meet growth in the service area to the year 2035. This upgrade is referred to as the Stage 4 Expansion.

The new infrastructure for the Stage 4 Expansion will be located on the lower portion of the site to the northwest of the existing plant, on the opposite side of Morningstar Creek. The existing influent dewatering building is located in this area. The existing plant is located on the upper portion of the site on the southwest side of the property, near the intersection of Highway 19A and Lee Road.

The Stage 4 Expansion includes the following items:

- New secondary treatment infrastructure based on a conventional activated sludge process
- Upgrade of the odour control system
- Maintenance building and storage area adjacent to secondary treatment infrastructure
- Effluent pump station replacement with a new facility for all flows
- New dewatered sludge bin loading conveyors and relocated truck scale
- Renovated administration building with second story addition
- Upgrades to the Morningstar Creek crossing, involving replacement of the existing bridge with a new arch culvert
- New site access from the Island Highway complete with vehicle gate
- New electrical service and power distribution
- Relocate the existing Motor Control Center above the hydraulic grade line where needed to mitigate flood risk
- New generator and fuel tank adjacent to new Stage 4 secondary treatment infrastructure
- Equalization tank to attenuate peak diurnal flows and improve wet weather management

The main components of the upgrade are shown on Figure 2 which shows the location of the new footprint for the upgrades on the northwest corner of the RDN site. The total FCPCC site is 4.1 ha, the total ground disturbance associated with the Stage 4 Expansion is 0.97 ha. The footprint for new Combined Treatment Unit (CTU) building, clarifiers and bioreactors is approximately 4700 m^2 and will be located on a section of the lot that is currently treed. The new access road/driveway will be added along the western edge of the property which and will cover approximately 1800 m^2 in an area that is also currently a treed. The crossing of Morningstar Creek will be upgraded by removing the existing bridge and replacing it with a 17.8 m long by 3.3 m wide open bottom arch culvert. The

836000
837000
Highway 19A
French Creek
Strait of Georgia
Morningstar Creek
Highway 19A
5476000
836000
837000
5476000

Basemapping from ESRI, City of Burnaby, DataBC, Government of Canada and AECOM 2018.

N
W E
S

0 40 80 120
Metres

1:4,000
NAD 1983 UTM Zone 9N

Legend

- FCPCC Site Boundary
- Morningstar Creek Bridge
- Highway 19A Roadside Ditch
- Road
- Watercourse
- Waterbody
- Pond Boundary (Approximate)

Overview Map



French Creek Pollution Control Centre (FCPCC)

October 2019

AECOM

Figure 1

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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PLANT AREAS	
AREA 100	PRELIMINARY TREATMENT
AREA 200	SEDIMENTATION TANKS
AREA 300	ATADs
AREA 400	TRICKLING FILTERS
AREA 500	SLUDGE DEWATERING
AREA 600	SECONDARY TREATMENT
AREA 800	OPERATIONS BUILDING

6.0m WIDE ASPHALT ACCESS ROAD
PROPOSED FENCE (TYP)
BIOREACTOR 2
SECONDARY CLARIFIER 5
SRS DISTRIBUTION BOX
TRANSFORMER
SECONDARY CLARIFIER 4
BIOREACTOR 1
TRUCK AXLE SCALE
AREA 600
PROPERTY LINE (TYP)
CTU BUILDING
MOTORIZED SLIDING GATE WITH ACCESS CONTROL
EXISTING DRYING BED
EXISTING DRYING BED
EXISTING DRYING BED
CENTRATE PUMP STATION
DEWATERING BUILDING
ASPHALT DRIVEWAY
GENSET
AREA 500
TREELINE
MORNINGSTAR CREEK
ISLAND HIGHWAY
REMOVE EXISTING BRIDGE AND REPLACE WITH ARCH CULVERT
AREA 100
EQUALIZATION TANK
TRICKLING FILTERS
AREA 400
CONTACT
FILTER PUMP
SRS SPLITTER BOX
PARKING STALLS
RIPARIAN AREA
15m BUFFER ZONE FROM MORNINGSTAR CREEK AND 4.5m FROM PROPERTY LINE. (TYP)
Pcl. A
DD 5360–N
2
PLAN 2570
AREA 300
AREA 200
CONC. CURB
AREA 800
RETAINING WALL
WASTE BIOLOGICAL THICKENER BUILDING
SURVEYED HIGH WATER MARK OF MORNINGSTAR CREEK (TYP)
SEPTAGE HOLDING TANK
OPERATIONS BUILDING
R3
P. 9203
EXISTING GATE TO BE REMOVED. INSTALL MOTORIZED GATE WITH CONTROL ACCESS
LEE ROAD
GRAVEL
DL. 28
4
N 2570

0 12.5 25 m
1:500

SITE PLAN
1:500

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
B	ISSUED FOR 90% DETAILED DESIGN	SI	BY	2020/07/24
A	ISSUED FOR 60% DETAILED DESIGN	SI	KM	2019/09/24

DRN BY: SI
DES BY: MC
CHK BY: KM
APP BY: MC

PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

PREPARED BY:
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REGIONAL DISTRICT OF NANAIMO
FRENCH CREEK POLLUTION CONTROL CENTRE
STAGE IV EXPANSION
CIVIL
SITE LAYOUT AND AREA PLAN

PROJECT START DATE (M / Y)	SEP/2019
PROJECT NO.	60590631
FILENAME	60590631-C-1001.dwg
RDN DRAWING No.	
DRAWING No.	C-1001

Plotted By: snejа.ignatova
Plot File Date Created: Jul/20/2020 3:28 PM
Layout-Sheet Name: C-1001
Filename: C:\USERS\SNEJA.IGNATOVA\DESKTOP\60590631-DESKTOP\910-CAD\20-SHEETS\C\60590631-C-1001.DWG

culvert crossing will provide a 5 m wide road surface and will support and protect several utilities including electrical cables and the main pipes that carry sewage from the intake building and primary treatment facility to the new clarifiers and bioreactors. The layout for the new culvert is provided in Appendix A.

3. Regulatory Context

The information below summarizes federal, provincial and municipal legislation applicable to the Project.

3.1 Federal Legislation and Requirements

3.1.1 Fisheries Act

The federal *Fisheries Act* applies to all Canadian fisheries waters and provides protection and conservation for fish and fish habitat on provincial, federal, and private lands. Morningstar Creek supports fish population and provides spawning and rearing habitat for a variety of fish species. Therefore, the *Fisheries Act* protects the fish, the fish habitat including water quality of the creek.

Construction of a new culvert in the creek has the potential to impact fish and fish habitat. To avoid infringing on the protections provided under the Fisheries Act, a request for review has been submitted to Fisheries and Oceans Canada (DFO) and the project is currently under review. It is anticipated that the project can proceed with an Authorization under the *Fisheries Act* but this will not be confirmed until DFO completes its review of the proposed works in Morningstar Creek.

Section 36(3) of the *Fisheries Act* prohibits the discharge of deleterious substances into a water body (administered

3.1.2 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA) protects migratory bird populations in Canada by regulating potential harmful human activities. The Regulations under the MBCA provide for the conservation of migratory birds and for the protection of their nests and eggs. Specifically, they prohibit depositing or permitting the deposit of a substance that is harmful to migratory birds in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area. A prohibition against the disturbance, destruction, or taking of a nest, egg, or nest shelter of a migratory bird is also set out in the Regulations. Possession of a migratory bird, nest, or egg without a permit is also prohibited. The Act and its regulation could apply to this project if cutting of trees and removal of vegetation takes place during the active nesting season from March 15 and August 15.

3.1.3 Species at Risk Act

The *Species at Risk Act* (SARA) is designed to prevent Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species and encourage the management of other species to prevent them from becoming at risk. Under SARA, critical habitat is defined as the habitat that is necessary for the survival or recovery of listed extirpated, endangered, or threatened species, and that is identified in a recovery strategy or action plan.

3.2 Provincial Legislation

3.2.1 Riparian Areas Regulation

The Riparian Areas Protection Regulation (RAR), enabled by the *Riparian Areas Protection Act*, guides development in riparian areas. The RAR applies to residential, commercial, or industrial activities in the RDN. However, the RAR does not restrict the construction of municipal infrastructure, referred to as “Institutional Development” in Section 1.4.1 of the Riparian Areas Regulation Assessment Regulations (BC Ministry of Forests Lands and Natural Resource Operations 2006). Since the Project is exempt from RAR requirements, the RAR assessment and results are presented for information purposes only.

The RAR assessment methodology presents the approach to determine a Streamside Protection and Enhancement Area (SPEA). The SPEA is defined as the area that is “adjacent to a stream that links aquatic to terrestrial ecosystems and includes both existing and potential riparian vegetation and existing and potential adjacent upland vegetation that exerts and influence on the stream”. The Detailed Assessment methodology requires an evaluation of stream width, reach breaks, potential vegetation type and channel type and then applies a formula to determine the SPEA width. The Detailed Assessment determines the “Zone of Sensitivity” for the features, functions and conditions of the riparian assessment area through a series of assessments. The SPEA width is then the largest “Zone of Sensitivity” resulting from an individual assessment.

The RAR defines a stream as any watercourse – natural or human-made – that provides fish habitat that contains water on a perennial or seasonal basis, is scoured by water or contains observable deposits of mineral alluvium or has a continuous channel bed including a watercourse that is obscured by overhanging or bridging vegetation or soil mats. A stream may not itself be inhabited by fish, but may provide water, food and nutrients to streams that do support fish. Wetlands directly connected to other watercourses are also included in the definition of a stream in accordance with RAR.

3.2.2 Water Sustainability Act

The work in and around Morningstar Creek is an approved works under the Water Sustainability Regulation as it is a culvert installed for a road crossing of the creek. Installation of the culvert will require the stream flow to be diverted around the work area and this is also an approved works under the regulation and will require the submission of a notification.

A notification of proposed work must be submitted to FrontCounter BC a minimum of 45 days before beginning work. Submitting more than 45 days ahead of time is recommended. If a habitat officer with Ministry of Forests, Lands and Natural Resource Operations & Rural Development (MFLNRORD) has not responded within 45 days (or by the proposed start date, if you submitted more than 45 days in advance), work may proceed. However, the proponent is responsible must make sure that the work meets the terms and conditions described in Part 3 of the Water Sustainability Regulation and any terms and conditions specific to the region in which the work is proposed.

3.2.3 Wildlife Act

The *Wildlife Act* defines wildlife as all native and some non-native amphibians, reptiles, birds, mammals that live within BC. Within Canada, the management of wildlife is a shared responsibility between federal and provincial governments. Provincial agencies are responsible for all matters involving the conservation and management of wildlife populations and habitat within the province that are not under federal government jurisdiction.

Section 34 of the *Wildlife Act* provides legal protection of: birds and their eggs; the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron, or burrowing owl, regardless of the nest status (i.e., active or inactive); as well as the active nest of other species. Due-diligence must be exercised by attempting to identify existing nests. The destruction of any nest (or nest tree) requires a permit from the province.

To conduct works in fish bearing water, a permit to salvage or collect fish is required under the Wildlife Act. This would apply to the establishment and dewatering of a work area for the culvert installation.

3.3 Municipal Legislation

The Project Site is in Electoral Area G of the RDN. No RDN bylaws that would apply to the environmental aspects of the project were identified. Municipal bylaws of the adjacent City of Parksville and Town of Qualicum Beach do not apply to this area.

RDN Bylaw 1469.02 - A Bylaw To Establish Floodplains, Construction Levels In Floodplains, And Setbacks For Landfill And Structures In Floodplains, specifies construction setbacks in floodplains adjacent to watercourses, applicable to Electoral Area G. Based on Section 13 of this bylaw, a horizontal setback of 15 m is required from the Natural Boundary of a Watercourse for a landfill or portion of a landfill slope, or a structural support required to support a floor system or Pad above the Designated Flood Level.

4. Biophysical Conditions

4.1 Methods

4.1.1 Desktop Review

A desktop review of available information on existing environmental conditions in the Project area was conducted in January 2019. Sources of information included:

- BC Ministry of Environment and Climate Change Strategy (BC MOECCS) Habitat Wizard webmap (BC MOECCS 2019a)
- Conservation Data Centre (CDC, BC MOECCS 2019b)
- Fisheries Information Summary System (FISS, BC MOECCS 2019c)
- DFO Aquatic Species at Risk Maps (DFO 2017)

Wildlife components were assessed based on existing reports and databases describing key habitat features. A desktop assessment of wildlife and wildlife habitat was completed to characterize general terrestrial habitats, identify sensitive ecosystems or wildlife features, and assess the potential for species at risk within the study area. Understanding existing wildlife habitat is important to identify features that could be affected by the proposed Project, assess the type and extent of Project effects on wildlife and wildlife habitat, as well as to provide recommendations on measures to mitigate potential adverse effects.

4.1.2 Field Survey

A site investigation was completed on 25 January 2019. A Qualified Environmental Professional (QEP) visited the site and completed a visual reconnaissance of the Project area. The QEP completed an assessment following the RAR Detailed Assessment Methods (BC MFLNRO 2006). A Reconnaissance (1:20,000) Fish and Fish Habitat Inventory site card was also completed, in accordance with the Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures (RIC 2001). Photographs documenting the existing environmental conditions were taken. Locations of Project components and environmental features were recorded using a handheld GPS unit.

Dominant vegetation species in the vicinity of the FCPCC were identified and recorded. Because of the time of year of the survey no rare plant or ecosystem survey was conducted as part of this reconnaissance. Incidental observations of wildlife and potential wildlife habitat features were recorded. Existing biophysical conditions were used to determine general habitat suitability for potential species at risk. No species-specific surveys were conducted.

An assessment to determine the potential width of a Streamside Protection and Enhancement Area (SPEA) was completed following the RAR Detailed Assessment Methods as laid out in the RAR Assessment Methods Schedule (Government of BC 2016). The assessment to determine the width of the SPEA was conducted within the Riparian Assessment Area (RAA), defined as a 30 m wide strip on either side of a watercourse. The RAR Detailed Assessment requires a QEP to evaluate stream width, reach breaks, potential vegetation type and channel type in the RAA. This information is entered into formulas to determine the SPEA width. Once the SPEA has been determined, measures to protect the integrity of the SPEA may also be determined. However, because this is a preliminary assessment and the Project is not bound by RAR, specific measures to protect the SPEA were not developed.

4.2 Results

4.2.1 Desktop Overview

4.2.1.1 Fish and Fish Habitat

Historic fish capture records and conservation statuses of these species are available for Morningstar Creek and French Creek are provided in Table 1.

Table 1: Historic Fish Capture Records for Morningstar Creek and French Creek

Common Name	Scientific Name	Morningstar Creek	French Creek	BC Status	SARA Status
Coho salmon	*Oncorhynchus kisutch*	✓	✓	Yellow – S4	No Status
Chinook salmon	*Oncorhynchus tshawytscha*		✓	Yellow – S4	Endangered (East Vancouver Island Stream Spring population)
Chum salmon	*Oncorhynchus keta*		✓	Yellow – S5	No status
Pink salmon	*Oncorhynchus gorbuscha*		✓	Yellow – S5	No status
Atlantic salmon	*Salmo salar*		✓	Exotic	No status
Rainbow trout/ steelhead	*Oncorhynchus mykiss*		✓	Yellow – S5	No status
Coastal cutthroat trout	*Oncorhynchus clarkii clarkii*	✓	✓	Blue – S3S4	No status
Sculpin (general)	*Cottus* sp.	✓		-	-
Stickleback (general)	*Gasterosteus* sp.	✓		-	-

Notes:
✓= Present
Yellow = Species at least risk of being lost; Blue = Species that is of special concern; Red = Species that is at risk of being lost (extirpated, endangered, or threatened);
S3S4 = Either Vulnerable or Apparently Secure; S4 = Apparently secure; S5 = Secure;
Reference: BCMOECCS 2019a

4.2.1.2 Vegetation and Terrestrial Resources

The Project is within the Coastal Douglas Fir zone Moist Maritime subzone (CDFmm). This zone occurs at low elevations along southeast Vancouver Island, from sea level up to 150 m in elevation (Green and Klinka 1994). Climate in this zone is typically mild, with warm, dry summers, and milt, wet winters. The CDFmm subzone forest is typically dominated by Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), and western redcedar (*Thuja plicata*). Common understorey species include salal (*Gaultheria shallon*), dull Oregon-grape (*Mahonia nervosa*), and ocean-spray (*Holodiscus discolor*).

The BC MOECCS Vancouver Island Region Environmental Stewardship Division reports that a wide variety of wildlife species are known to inhabit the CDF subzone on Vancouver Island (BC MOECCS 2019d). A total of 323 bird species, 11 amphibian species, 9 reptile species, and 44 terrestrial mammals are found in this zone for at least part of the year.

A search of the Habitat Wizard database was conducted to identify recorded wildlife species observations within a 5 km buffer of the Project area. Results of this search are presented in Table 2.

Table 2: Historic Wildlife Observations within 5 km of the FCPCC Site

Common Name	Scientific Name	Wildlife Group	BC Status	SARA Status
Common garter snake	*Thamnophis sirtalis*	Reptile	Yellow – S5	None
Northwestern garter snake	*Thamnophis ordinoides*	Reptile	Yellow – S4	None
American bullfrog	*Lithobates catesbeianus*	Amphibian	Exotic	None
Great blue heron	*Ardea herodias fannini*	Bird	Blue – S2S3B, S4N	Special Concern
Roosevelt elk	*Cervus elaphus roosevelti*	Ungulate	Blue – S3S4	None
Harbour seal	*Phoca vitulina*	Marine mammal	Yellow – S5	None

Notes:
Yellow = Species at least risk of being lost; Blue = Species that is of special concern; Red = Species that is at risk of being lost (extirpated, endangered, or threatened);
S2S3B = Either Imperilled or Vulnerable Breeding Population; S4N = Apparently Secure Nonbreeding Population; S4 = Apparently secure; S5 = Secure;
Special Concern = A species that may become threatened or endangered.

Reference: BCMOECCS 2018c

No great blue heron colonies were identified in the vicinity of the Project area in the COSEWIC Assessment and Update Status Report for Great Blue Heron during the desktop review (COSEWIC 2008). A breeding colony is shown on the Habitat Wizard webmap approximately 6.8 km to the southwest of the Project area, near the community of Coombs, BC, however the colony was reported as inactive in 2002 (BC MOECCS 2019a; MWLAP and MSRM 2002).

Harbour seal observations were recorded in the marine environment of the Strait of Georgia. No marine habitat suitable to support harbour seals is located at the Project site.

4.2.1.3 Sensitive Species

A search of the CDC database was conducted to determine sensitive species within a 2 km and a 5 km buffer of the Project area. No sensitive species occurrences were identified within the 2 km buffer. Within the 5 km buffer, four occurrences of sensitive species were identified: one blue-listed rush species, one red-listed forest ecosystem, and two Secured CDC features. A Secured CDC Occurrence indicates the presence of a species or ecosystem that is susceptible to harm and has been masked from public access to protect it. The edges of the masked occurrences are located more than 2 km from the Project area and are therefore unlikely to be impacted by Project activities. A request for more information on the masked polygons was submitted to CDC and CDC staff confirmed that the mapped species are not anticipated to be impacted by Project activities (pers. comm. J. Clare, MOECCS). Identified species occurrences are presented in Table 3.

The FCPCC site is located in an area that may provide habitat for bats at risk, including Townsend's big-eared bat (*Corynorhinus townsendii*, Provincial Blue list – S3S4), as reported by CDC biologists during a review of the project area (pers. comm. J. Clare, MOECCS).

Table 3: Sensitive Species/Ecosystems Identified within a 5 km Buffer of the Project Area

Species Group	Common Name	Scientific Name	Provincial Status	SARA Status	Habitat Requirement
Plant	Pointed rush	*Juncus oxymeris*	Blue – S3	None	Wet meadows and riverbanks in lowland CDFmm, CWHdm, and CWHxm biogeoclimatic zones
Plant community	Douglas-fir/dull Oregon grape	*Pseudotsuga menziesii/Berberis nervosa*	Red – S1	None	Middle slopes, on all elevations and at low elevations in coastal BC. Moderately dry moisture regime. Douglas-fir-dominated forest with dull Oregon grape-dominated shrub layer.
Unknown	Two Secured Conservation Data Centre Species Occurrences	N/A	Unknown	Unknown	Unknown

Notes: CWHdm is Coastal Western Hemlock Dry Maritime subzone; CWHxm is Coastal Western Hemlock Very Dry Maritime subzone.

4.2.2 Field Survey

4.2.2.1 Fish and Fish Habitat

Three aquatic features were identified on the FCPCC site: Morningstar Creek, a roadside ditch adjacent to Highway 19A, and a small, isolated pond near the existing FCPCC building.

Morningstar Creek is a well-defined stream with a riffle-run morphology (Photos 1 and 2). It runs generally towards the northeast, through the FCPCC site. The creek crosses under Highway 19A at the FCPCC site boundary, then drains into the Strait of Georgia, approximately 500 m downstream of the Project area. French Creek also discharges to the Strait of Georgia near the Morningstar Creek outlet. French Creek was designated as a sensitive watershed by the BC Ministry of Water, Land, and Air Protection (MWLAP and MSRM 2002).



Photo 1: Facing upstream showing a typical section of Morningstar Creek downstream of the bridge crossing.



Photo 2: Facing downstream, showing a typical section of Morningstar Creek upstream of the bridge crossing.



Photo 3: Facing upstream, showing detail of the instream bridge abutment on the left downstream bank.



Photo 4: Facing downstream, showing the inlet of the dual-culvert crossing of Morningstar Creek at Highway 19A.

Two crossing structures over Morningstar Creek were identified on or near the FCPCC site – a bridge on the FCPCC site and a dual-culvert crossing under Highway 19A (Photos 3 and 4). The Morningstar Creek bridge consists of a concrete deck supported on concrete abutments that are located within the high-water mark of the creek. At the time of survey, the western abutment was within the wetted area of the creek and the eastern abutment was outside of the wetted area, but below the high-water mark. The dual-culvert crossing at Highway 19A consisted of two parallel 1500 mm diameter concrete pipes with a length of approximately 20 m. Both pipes were conveying water with no evident obstacles. Neither the bridge nor the culvert structure appeared to present a barrier to fish passage under the observed flow conditions.

Morningstar Creek was characterized by a series of alternating riffle and run habitat types with an irregular meandering pattern through the FCPCC site. Channel dimensions were measured at eleven transect sites, extending over approximately 150 m of stream channel. Measurements are presented in Table 4. Mean bank-full channel width was 6.74 m, mean wetted width was 5.66 m, mean residual pool depth was 0.70 m, and mean bank-full depth was 0.72 m. Measured channel gradients ranged from 1.5 to 2.0 %. Channel substrates were dominated by gravels, with fines subdominant. D95[1] was 0.56 m and D[2] was 0.10 m. Water temperature at the time of survey was 5.5°C and the water was moderately turbid. Side- and mid-channel gravel bars were present throughout Morningstar Creek, particularly in the upper portion of the study reach. Small off-channel wetted areas were present throughout the study

[1] D95 is defined as the diameter of the bed material particle that is larger than 95% of the materials in the stream channel.
[2] D is defined as the size of the largest particle on the channel bed that will be moved at channel forming flow levels.

reach, the largest of which was a shallow pool measuring approximately 5 m by 5 m on the left downstream bank[3] of the creek, approximately 20 m downstream of the bridge crossing (Photo 5). Large and small woody debris was present in the channel, with the largest accumulation present approximately 45 m downstream of the bridge in a large channel-spanning jam (Photo 6).

Channel banks were generally sloping, with some nearly-vertical eroding sections. Bank substrates were dominated by fines, gravels, and small cobbles. Riparian vegetation consisted of mixed mature forest, described in greater detail in Section 4.2.2.2. Crown closure provided by riparian vegetation was estimated to be between 21 and 40%.

Table 4: Morningstar Creek Channel Dimensions

Location	Transect	Bank-full Width (m)	Wetted Width (m)	Residual Pool Depth (m)	Bank-full depth (m)
Downstream of Morningstar Creek Bridge	1	5.10	4.90	-	-
	2	4.85	4.35	0.67	-
	3	4.95	4.30	-	0.65
	4	5.95	5.70	0.64	-
	5	7.40	7.20	-	-
	6	7.70	7.20	0.63	-
Upstream of Morningstar Creek Bridge	7	6.15	5.80	-	-
	8	5.15	4.95	1.10	-
	9	11.10	8.80	-	-
	10	7.25	3.00	-	0.78
	11	8.55	7.10	0.45	-
Mean	-	6.74	5.66	0.70	0.72



Photo 5: Facing the left downstream bank, showing an off-channel pool downstream of the bridge crossing.



Photo 6: Facing downstream, showing a channel-spanning accumulation of woody debris. This jam is not anticipated to impede fish passage.

[3] Left downstream bank is defined as the bank on the observer's left-hand side when facing downstream.



Photo 7: Facing upstream, showing the furthest downstream riffle habitat unit. The instream rock appears to be artificially-placed angular material intended to provide habitat complexity.



Photo 8: Facing the right downstream bank, showing two piles of angular stone placed against an eroding bank, likely intended to minimize further erosion.

Cover available for fish was estimated to be moderate in abundance, covering approximately 20% of the channel area. Deep pool with low water clarity was the dominant cover type, with boulders, large woody debris, and overhanging vegetation the subdominant cover types. Small woody debris, undercut banks, and instream vegetation provided trace amounts of cover for fish.

Habitat quality for salmonid species was generally rated as good throughout Morningstar Creek. Juvenile rearing habitat quality was good, based on the diversity of habitat and cover types and the presence of pool and off-channel areas for feeding. Spawning habitat quality was rated as good for the portion of the creek upstream of the bridge where clean gravel substrates are abundant. Spawning habitat is poor downstream of the bridge, where substrates are dominated by coarse placed rock and deeper pools with fine substrates. Migratory habitat quality was rated as good, based on the absence of barriers to fish movement under observed flow conditions. Overwintering habitat was rated as good, based on the presence of deep pools and observed high water levels during winter conditions.

Instream habitat enhancement features were observed in Morningstar Creek during the site visit. Downstream of the bridge crossing, a series of three riffles, constructed from apparently artificially-placed angular cobbles and boulders, spanned the channel (Photo 7). Additionally, placed angular cobble and boulder material was present along the right downstream bank at two sites - one upstream and one downstream of the bridge crossing, at eroding banks, likely to provide erosion protection (Photo 8). Several pieces of large woody debris cabled together were identified approximately 60 m upstream of the bridge crossing. This coarse rock material and woody debris increases habitat complexity and is expected to increase the quality of the habitat available for fish.

The small pond on the FCPCC site, shown on Figure 1, is approximately 25 m long and 8 m wide, with a maximum water depth of 40 cm (Photo 9). The pond was fed by a 300 mm diameter concrete pipe culvert, which is expected to provide stormwater drainage from the adjacent road surface (Photo 10). Minimal inflows were observed at the time of survey and no discernible flow in the pond was observed. Organic material, including decomposing leaves and woody debris was abundant and a strong organic odour was noted. Common duckweed (*Lemna minor*), sedges, and grasses were observed in the pond. No overland flow from the pond was identified and fish access to the pond is not expected to exist. Subsurface seepage from the pond to Morningstar Creek is expected to provide water and food and nutrient inputs only.

The Highway 19A roadside ditch runs parallel to the Highway at the northeast side of the FCPCC site and drains directly into Morningstar Creek immediately upstream of the Highway 19A culvert crossing (Photos 11 and 12). The ditch had a defined channel with a mean width of approximately 1 m and a bankfull depth of 15 cm. At the time of survey, the mean wetted width of the ditch was approximately 0.9 m. Ditch substrates were dominated by clean scoured gravel. No obstacles to fish access were identified. This ditch is expected to provide seasonal fish habitat for small-bodied fish, including juvenile salmonids when water depths are sufficient to allow access.



Photo 9: Facing northwest, showing the isolated pond.



Photo 10: Facing down, showing the thick layer of accumulated organic debris in the isolated pond.



Photo 11: Facing down, showing the clean gravel substrate and shallow flowing water in the Highway 19A roadside ditch.



Photo 12: Facing the right downstream bank of Morningstar Creek, where the Highway 19A roadside ditch joins the creek.

4.2.2.2 Vegetation

The vegetation community in the vicinity of Morningstar Creek consists of two general types: a narrow strip of deciduous-dominated forest immediately adjacent to the watercourse and a coniferous-dominated forest adjacent to the deciduous zone (Photos 13 and 14). The coniferous-dominated forest continued to the west and east of Morningstar Creek and Highway 19A where the majority of trees will be cleared for the CTU Building and bioreactors (Figure 2). Also, on the west side of Morningstar Creek, a disused and vegetated roadbed runs between the bridge crossing and Highway 19A (Photos 15 and 16). This roadbed had a mean width of 6 m and runs between the two observed forest types. Vegetation on the road surface included grasses, and mosses with patches of sedge.



Photo 13: Facing north, showing the trunks of deciduous trees immediately adjacent to Morningstar Creek. Coniferous trees can be seen to the right and at the background of the frame, further from Morningstar Creek.



Photo 14: Facing downstream, showing a narrow buffer of deciduous trees adjacent to Morningstar Creek with coniferous trees located further from the creek.



Photo 15: Facing southwest near Highway 19A, showing the old road bed that runs along the west side of Morningstar Creek.



Photo 16: Facing southwest, showing the old road bed near the Morningstar Creek bridge crossing

The deciduous strip was dominated by red alder (*Alnus rubra*) and bigleaf maple (*Acer macrophyllum*) trees. This width of this strip was approximately 5 to 10 m on both sides of Morningstar Creek. The coniferous zone was dominated by Douglas-fir, western redcedar, and sitka spruce (*Picea sitchensis*), with big-leaf maple also present. Dominant understorey species were sword fern (*Polystichum munitum*) and salmonberry (*Rubus spectabilis*), with common snowberry (*Symphoricarpos albus*), Himalayan blackberry (*Rubus armeniacus*), salal, dull Oregon-grape, English ivy (*Hedera helix*), and trailing blackberry (*Rubus ursinus*) also present. Sedges (*Carex* spp.), grasses (Graminoids), and mosses (Bryophytes) were also present throughout the site. Species identified on the FCPCC site are presented in Table 5.

Table 5: Plant Species Identified at the FCPCC Site

Scientific Name [1]	English Name	Form	Native	Exotic
Pseudotsuga menziesii	Douglas-fir	Tree	X	-
Thuja plicata	Western redcedar	Tree	X	-
Picea stichensis	Sitka spruce	Tree	X	-
Alnus rubra	Red alder	Tree	X	-
Acer macrophyllum	Big-leaf maple	Tree	X	-

Scientific Name [1]	English Name	Form	Native	Exotic
Gaultheria shallon	Salal	Shrub	X	-
Mahonia nervosa	Dull Oregon-grape	Shrub	X	-
Rubus spectabilis	Salmonberry	Shrub	X	-
Symphoricarpos albus	Common snowberry	Shrub	X	-
Rubus ursinus	Trailing blackberry	Shrub	X	-
Rubus armeniacus	Himalayan blackberry	Shrub	-	X
Hedera helix	English ivy	Shrub	-	X
Polystichum munitum	Sword fern	Herb	X	-
Graminoid species	Grass	Herb	X	-
Carex species	Sedge	Herb	X	-
Bryophyte species	Moss	Herb	X	-

1. Names according to Klinkenberg (2018)

4.2.2.3 Wildlife

Based on information obtained from desktop review, the Project Site does not overlay areas of species or ecosystems at risk, nor have there been any recorded observation of wildlife in the Project Site (BC MOECCS 2019). Notwithstanding the desktop review and field observation, the CDFmm biogeoclimatic zone on Vancouver Island is home to a wide variety of animals, many of which are highly mobile and have the potential to occur at the site (BC MOECCS 2019d). During the site reconnaissance visit the prints of black-tailed deer (*Odocoileus hemionus columbianus)* and raccoon (*Procyon lotor*) were observed. Both are Yellow listed species with no status under SARA.

There is a wide diversity of birds found on Vancouver Island with the potential to nest or feed, permanently or seasonally, within the Project Site. Raptors and owls have the potential to nest and/or feed in the vicinity the Project site owing to the surrounding mature forest and likely presence of prey such as small rodents. Passerine species are also expected to occur within the Project Site. During the field survey no raptor nests were observed within the Project Site. One inactive passerine nest was observed near Morningstar Creek (Photo 17). Several standing dead trees (snags) were present on site (Photo 18). These trees provide foraging and cavity nesting opportunities for a variety of birds and small mammals.

Herptiles with the potential to occur at the site include frogs, salamanders, snakes, and lizards; though a desktop review and field observations did not identify species within the Project Site. The area offering the highest suitability for amphibians is anticipated to be the pond area located to the northeast of the Morningstar Creek bridge site. In addition, low velocity side channel areas of Morningstar Creek or the Highway 19A roadside drainage ditches also offer suitable habitat for amphibian species. No herptiles were observed or heard calling during the site reconnaissance visit.



Photo 17: An inactive stick nest in a tree near Morningstar Creek.



Photo 18: A standing dead tree with abundant cavities created by foraging animals.

4.2.3 Riparian Setbacks

4.2.3.1 SPEA Width Determination

Data gathered during the field assessment was entered into the RAR Detailed Assessment Form (Form 3) to calculate the resulting SPEA widths for the watercourse and the wetland. Results are summarized below and the completed detailed assessment form is attached to this report (Appendix B).

The following characteristics are used to determine watercourse Zones of Sensitivity (ZoS):

- Reach breaks: the subject watercourse consists of a single reach within the site.
- Average channel width: 6.474 m
- Average channel slope: 1.8%
- Channel type: Riffle-pool
- Site Potential Vegetation Type (SPVT): Deciduous or coniferous tree (TR).

These characteristics determine the width of the ZoS for the features, functions, and conditions of riparian areas described in Table 6.

Table 6: RAR Zones of Sensitivity

Zone of Sensitivity Category	Description of Calculation	Resulting Zone of Sensitivity Width (m)
Large Woody Debris, Bank, and Channel Stability	For riffle-pool streams with TR SPVT, ZoS is three times the channel width of 6.47 m. Maximum value is 30 m and minimum value is 10 m.	19.4 m
Litter Fall and Insect Drop	For streams with TR SPVT, ZoS is three times the channel width of 6.47 m. Maximum value is 15 m and minimum value is 10 m.	15 m
Shade	For streams with TR SPVT, ZoS is three times the channel width of 6.47 m along the south side of the stream. Maximum value is 30 m.	19.4 m

[4] *Note that the RAR Detailed Assessment methodology for calculating the average channel width involves removal of the highest and lowest stream width measurements, leading to a slightly different mean width than was presented in Section 4.2.2.1.*

The largest ZoS width is used to establish the SPEA. The 19.4 m ZoS for Large Woody Debris, Bank, and Channel Stability and Litter Fall and Insect Drop results in a SPEA width of 19.4 m on both sides of the watercourse. The 19.4 m SPEA would apply to the riparian area extending from the high-water mark of Morningstar Creek.

4.2.3.2 Proposed Riparian Setback

The existing design for the FCPCC calls for a 15 m setback from the high-water mark of Morningstar Creek, in accordance with RDN Bylaw 1469.02. Site infrastructure will be generally placed outside of a 15 m wide area on both sides of Morningstar Creek. The exception to this setback will be the construction area required for Morningstar Creek crossing works.

Within the 15 m buffer, existing vegetation will be retained where possible and riparian vegetation planting will be conducted following the completion of construction activities to enhance the quality of the aquatic environment of Morningstar Creek. Any disturbed areas within this buffer area will be reclaimed and revegetated following completion of construction. The planting area will include a portion of the existing old roadbed on the west side of Morningstar Creek. The old roadbed is vegetated only with graminoids and other low growing herbs and currently offers little value to the creek in terms of shading, provision of woody debris, or organic debris inputs. Although the proposed 15 m buffer is narrower than the 19.4 m buffer suggested by the RAR assessment, the maintenance of a 15 m vegetated buffer and the establishment of riparian vegetation on the road bed adjacent to the creek is anticipated to offer reasonable protection and potential improvement of the aquatic environment.

5. Potential Project Effects

Potential project effects associated with the construction phase are described and discussed in this section. Project activities discussed here with the potential to cause environmental effects include:

- Replacement of the existing bridge with an open bottom culvert crossing system, and
- Vegetation clearing within the new FCPCC footprint.

The two activities listed above have the potential to directly impact the aquatic environment of Morningstar Creek. The fish habitat in Morningstar Creek is known to support blue-listed coastal cutthroat trout and Pacific salmon species, most likely coho salmon. In order to minimize effects to fish and fish habitat, instream works would take place during the period of least risk to fish which is August 15 to September 15 based on the species of fish that could be present in these creeks (see Section 6.6.4). Under ideal conditions, the installation of the culvert crossing would be completed during a period of no flow in Morningstar Creek. If this is not possible due to flow conditions or construction timing restrictions, the crossing work area would be isolated, fish salvaged from the work area and water pumped around so that work can be conducted in the dry. Once the work is complete, the stream bed and banks would be restored to pre-construction conditions including replanting of riparian vegetation. The appropriate Instream Work Standards and Best Practices (WLAP 2004) will be followed to minimize potential effects and appropriate approvals or authorizations would be required from Fisheries and Oceans Canada under the *Fisheries Act* and the provincial Ministry of Forests Lands and Natural Resource Operations and Regional Development under the *Water Sustainability Act*.

Vegetation clearing will be required to prepare for the installation of the Morningstar Creek culvert (approximately 560 m^2), the area for the CTU building and the bioreactors is approximately 4700 m^2 and the new access road along the western boundary is approximately 1800 m^2. Clearing for the culvert installation will have the potential to impact fish habitat by removing vegetation in the riparian area. Removal of riparian vegetation can cause a number of changes to the existing fish habitat, including increased water temperatures due to loss of shading, decreased nutrient inputs from falling insects and organic debris, decrease of hydraulically-functional woody debris inputs, and decrease in bank stability. Removal of vegetation during bird nesting season (typically occurring from mid-March to mid-August on Vancouver Island) has the potential to result in the destruction of nests or the death of birds protected under the *Migratory Birds Convention Act* or the *Wildlife Act*. Vegetation clearing has been kept to a minimum and it is unlikely that any new trees will have to be cleared for the culvert installation and the building setback on the west side of the creek will allow the preservation of at least a 15 m wide riparian area next to Morningstar Creek.

Where clearing results in the exposure of soils there is the potential for erosion and sedimentation. Standard best practices for construction works, in particular when working around watercourses, can eliminate or reduce erosion and sedimentation issues.

Non-native plant species were identified in the vicinity of the FCPCC site, namely Himalayan blackberry. Additional non-native and invasive plants are expected to be present in the vicinity. Between seeds from nearby plants the use of construction equipment moving soils around that could contain seeds, there is a significant risk for invasive species to proliferate the area.

No mapped habitat of at-risk mammals or amphibians was identified during the desktop review and field reconnaissance. However, Morningstar Creek, roadside ditches, and the pond area on the FCPCC site may provide habitat for small aquatic mammals or amphibians. Prior to the start of construction, a QEP should conduct a Project-specific assessment of amphibian and mammal habitat. This assessment would be used to determine whether aquatic mammal or amphibian salvage/relocation work is required and to identify the specific areas requiring salvage.

Construction activities can be an issue for nearby residents and users of nearby public spaces from increased traffic and on site activity causing additional noise.

6. Environmental Protection and Mitigation Measures

The adoption of appropriate mitigation measures and best management practices during construction will reduce the potential impacts associated with Project activities. This section provides general guidelines and recommendations for environmental protection and mitigation during the construction phase. The following information is general in nature and should be refined prior to construction and incorporated into an environmental management plan (EMP) to address the specific construction equipment and methods and timing of works.

6.1 General Measures

6.1.1 Demarcation of Construction Boundaries and Sensitive Areas

Prior to any site preparation or construction activities, footprint boundaries, sensitive areas, riparian areas, and known sensitive habitat features (e.g., nests) should be outlined on site plans and in the field with ‘No Work Area’ or similar flags, to reduce the possibility of causing unnecessary disturbance to surrounding ecosystems. Visual boundaries should be reviewed throughout the construction phase to ensure all boundaries are marked remain clear and as accurate as possible.

6.1.2 Monitoring

Throughout construction and particularly during works near Morningstar Creek, environmental monitoring and reporting should be conducted to confirm that environmental protection measures are being applied and effective. If they are not effective, the monitor will work with the contractor to modify protection measures until they are. The environmental monitor will be an appropriately qualified professional and will have the authority to stop construction if there is any contravention of environmental protection guidelines or regulations (i.e., impact to fish habitat) or if there is imminent threat of environmental damage. This is particularly important around the riparian areas of Morningstar Creek.

6.2 Erosion and Sediment Control

Figure 3 provides erosion and sediment control (ESC) details to be applied to this project and will be included with the drawings that will be issued for tender. The successful contractor will be required to develop an ESC plan detailing the specific time periods, locations and activities that will be followed to manage erosion and sedimentation, i.e. where silt fencing and sediment barriers will be installed. Due to the dynamic nature of site conditions, it is expected that measures will require additional adjustments and actions once construction begins. Additional erosion and sediment control measures will be incorporated as required based on observations during monitoring. Below are general minimum erosion and sediment control measures:

EROSION AND SEDIMENT CONTROL NOTES:

1. IT IS INTENDED THAT EROSION AND SEDIMENT CONTROL STRATEGIES BE IMPLEMENTED DURING ALL CONSTRUCTION PHASES.

2. THE EROSION CONTROL MEASURES OUTLINED HERE ARE INTENDED TO:
   - PREVENT THE GENERATION OF SUSPENDED SEDIMENT
   - SUPPORT EROSION CONTROL MEASURES BY CAPTURING AND RETAINING SUSPENDED SEDIMENT
   - TO LIMIT THE TRANSPORT OF SEDIMENT ONTO ROADWAYS. ALL SITE ACCESS FROM DISTURBED AREAS TO PAVED SURFACES WILL BE RESTRICTED WHERE POSSIBLE.
   - ALL PERSONS INCLUDING, BUT NOT LIMITED TO , ENGINEER, THE EROSION AND SEDIMENT CONTROL SUPERVISOR, THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS INVOLVED WITH THE PROJECT (ALL PERSONS INVOLVED) SHALL COMPLY WITH ALL FEDERAL, PROVINCIAL AND REGIONAL DISTRICT OF NANAIMO (RDN) REGULATORY REQUIREMENTS FOR EROSION AND SEDIMENT CONTROL (ESC).

3. ALL PERSONS INVOLVED WITH THE PROJECT ARE RESPONSIBLE FOR ALL SITE ACTIVITIES THAT RESULT IN NON-COMPLIANCE WITH REGULATORY REQUIREMENTS.

4. PRIOR TO CONSTRUCTION START-UP, THE PROJECT PROPONENT OR PRIME CONTRACTOR MUST SCHEDULE AN ENVIRONMENTAL PRE-CONSTRUCTION MEETING TO DISCUSS SCHEDULING, ROLES AND RESPONSIBILITIES, AND ESC AND OTHER POLLUTION PREVENTION PRACTICES. MEETING INVITEES SHOULD INCLUDE THE DEVELOPER/PROJECT MANAGER, CONSULTANT, CONTRACTORS AND REGULATORS.

5. THE FOLLOWING INFORMATION MUST BE ON SITE (AND AVAILABLE UPON REQUEST), AND FILED FOR A MINIMUM OF TWO YEARS FOLLOWING FINAL SITE STABILIZATION:
   - THE EROSION AND SEDIMENT CONTROL REPORT AND/OR DRAWING(S), INCLUDING ALL AMENDMENTS;
   - DOCUMENTATION (INCLUDING PHOTOS AND UP-TO-DATE WRITTEN RECORDS) DETAILING IMPLEMENTATION, INSPECTION AND MAINTENANCE OF ESC PRACTICES.

7. REGULAR MONITORING INSPECTIONS ARE TO BE CARRIED OUT BY A QUALIFIED ESC MONITOR UNDER THE SUPERVISION OF THE ESC SUPERVISOR UNTIL PROJECT COMPLETION.

8. INSPECTIONS OF ALL ESC PRACTICES MUST BE COMPLETED AND DOCUMENTED AT LEAST EVERY 7 DAYS AND AT CRITICAL TIMES WHEN EROSION OR SEDIMENT RELEASES COULD OCCUR. NOTE: INSPECTIONS MUST BE COMPLETED AND DOCUMENTED DURING, OR WITHIN 24 HOURS OF, HEAVY SNOWMELT AND HEAVY AND/OR PROLONGED RAINFALL (DEFINED AS >12 MM PRECIPITATION WITHIN ANY 24 HOUR PERIOD, OR PRECIPITATION OR SNOWMELT ON WET OR THAWING SOILS).

9. AS DIRECTED BY THE ENGINEER OR ESC SUPERVISOR, PERSONS INVOLVED IN ESC MAINTENANCE ARE REQUIRED TO INSPECT AND UNDERTAKE ACTIVITIES TO MODIFY OR MAINTAIN ESC FACILITIES. THESE INCLUDE, BUT ARE NOT LIMITED TO ONSITE OR ADJACENT PAVED ROAD SURFACES, ONSITE OR ADJACENT CATCH BASIN AND FILTRATION FACILITY AND EQUIPMENT, AND ONSITE SEDIMENT FENCING.

10. THE ESC SUPERVISOR WILL BE RESPONSIBLE FOR ENSURING THAT MONITORING INSPECTIONS ARE CONDUCTED ON A REGULAR BASIS. THE ESC SUPERVISOR WILL REPORT TO THE RDN AND THE CONTRACTOR ON ESC ESC MEASURES AND SITE DISCHARGE. ESC MONITORING AND STORM DISCHARGE FROM THE SITE TESTED WEEKLY AND AFTER HIGH RAINFALL EVENTS (>25mm IN 24 HOURS).

11. THE ESC DRAWINGS ILLUSTRATES THE MINIMUM MEASURES REQUIRED TO MEET RDN REQUIREMENTS.ALL PERSONS INVOLVED WITH THE PROJECT WILL COMPLY WITH THE ESC PLAN AND WITH ALL INSTRUCTIONS ISSUED BY THE PROJECT'S ESC SUPERVISOR, RDN, AND FISHERIES AND OCEANS CANADA TO CORRECT DEFICIENCIES THAT WOULD RESULT IN NON-COMPLIANCE WITH THE CONDITIONS OF THE PERMIT.

12. THE APPROVED EROSION AND SEDIMENT CONTROL REPORT AND/OR DRAWING(S) MUST BE UPDATED WHEN THERE ARE CHANGES TO THE EROSION AND SEDIMENT CONTROL PRACTICES OR IMPLEMENTATION.

13. THE CONTRACTORS ARE REQUIRED TO HAVE A COPY OF THE ESC PLAN ONSITE AT ALL TIMES AND PROVIDE CONTACT DETAILS FOR THE ESC SUPERVISOR.

14. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL ESC MEASURES SPECIFIED ARE INSTALLED BEFORE CONSTRUCTION BEGINS. THE ESC SUPERVISOR SHALL CONDUCT MONITORING INSPECTIONS AS REQUIRED BY THE CONTRACT.

15. THESE PLANS AND NOTES ILLUSTRATES THE MINIMUM WORKS AND FACILITIES REQUIRED FOR CONTROLLING EROSION AND SEDIMENT . THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION AND SEDIMENT CONTROL WORKS AND FACILITIES INCLUDING BUT NOT LIMITED TO WHEEL WASH, SEDIMENT COLLECTION AND TEMPORARY DISCHARGE FACILITY AT SITE ACCESS POINT AS WORK PROGRESSES AND AS REQUIRED TO SUIT CONTRACTORS WORK FLOW AND METHODOLOGY TO ACHIEVE THE INTENT OF THE CONTRACTORS EROSION AND SEDIMENT CONTROL PLAN.

16. THE INTENT OF THE PLAN IS TO DIRECT CLEAN STORMWATER RUNOFF AWAY FROM THE WORK AREAS WHILE DIRECTING RUNOFF FROM ERODIBLE AREAS AND GRAVEL SURFACES SUBJECT FOR VEHICLE TRAFFIC TO CATCH BASINS WITH SEDIMENT BARRIERS OR SILT FILTERS.

17. SEDIMENT BARRIERS AND OTHER FACILITIES INTENDED TO PREVENT SEDIMENT FROM BEING DISCHARGED TO THE STORM DRAINAGE SYSTEM OR OTHER RECEIVING WATERS ARE CONSIDERED TO BE THE LAST LINE OF DEFENSE AND SHALL BE IMPLEMENTED IN CONJUNCTION WITH OTHER MEASURES THAT CONTROL SEDIMENT, SUCH AS SWEEPING, OR EROSION PREVENTION.

18. ALL EROSION AND SEDIMENT CONTROL WORKS AND FACILITIES SHALL BE MONITORED AND MAINTAINED IN PROPER OPERATING CONDITION ON AN ON-GOING BASIS. ALL COLLECTED SEDIMENT SHALL BE REMOVED AFTER SIGNIFICANT RAIN EVENTS.

19. ALL CATCH BASINS LOCATED ONSITE OR ADJACENT TO THE PROJECT, THAT COULD POTENTIALLY RECEIVE SEDIMENT LADEN RUNOFF DUE TO THE PROJECT WILL HAVE SEDIMENT PROTECTION INSTALLED TO MINIMIZE THE AMOUNT OF SEDIMENT ENTERING THE STORM SYSTEM. SEDIMENT BARRIERS ARE TO BE INSTALLED WITH A MINIMUM DEPTH OF 150mm TO FILTER, BUT NOT LIMIT, WATER FLOW.

20. GEOTEXTILE SEDIMENT FENCES ARE TO BE INSTALLED ALONG DITCHES AND OPEN WATER AT THE TOP OF BANK TO REDUCE MOVEMENT OF ERODED SEDIMENT. SEDIMENT FENCE WILL BE PLACED DUG IN A MINIMUM 150mm INTO THE GROUND, TO REDUCE SEDIMENT TRANSPORTATION AND ENSURE SEDIMENT IS KEPT AWAY FROM RIPARIAN AREAS (SEE DETAIL).

21. SILT FENCE IS TO BE 'CONTROL SILT FENCE PLUS' OR EQUIVALENT AS APPROVED BY THE ENGINEER. FENCE TO HAVE MIN. CLEAR WATER FLOW RATE OF 0.10cfs/sf. FENCE TO BE STAPLED @150mm O/C TO TREATED POSTS SPACED AT 1.0m O/C. BOTTOM OF SILT Ø100mm FENCE TO BE ANCHORED AS PER DETAIL.

22. GEOTEXTILE SEDIMENT FENCES ARE TO BE INSPECTED AND REPAIRED PRIOR TO EXPECTED RAIN EVENTS AND AFTER ALL SIGNIFICANT STORM EVENTS. SEDIMENT FENCES ARE TO BE CLEARED OF SEDIMENT OR REPLACED WHEN DEFICIENCIES ARE PRESENT.

23. PAVED ROAD SURFACES WITH ACCUMULATED SEDIMENT WILL BE CLEANED / SWEPT REGULARLY AS REQUIRED. FLUSHING OF ROADWAYS IS PROHIBITED.

24. ANY TEMPORARY STOCKPILES CONTAINING ERODIBLE MATERIAL WILL BE COVERED WITH A TARPAULIN OR PLASTIC TO PREVENT EROSION (SEE STOCKPILE DETAIL). A GEOTEXTILE SEDIMENT FENCE WILL BE PLACED 1 TO 2m FROM THE DOWNSLOPE TOE OF THE STOCKPILE AND DUG IN A MINIMUM 150mm INTO THE GROUND. TO REDUCE SEDIMENT TRANSPORTATION AND ENSURE SEDIMENT IS KEPT AWAY FROM DITCHES. STOCKPILES LEFT FOR PERIODS LONGER THAN ONE MONTH, WILL BE COVERED WITH VEGETATION (I.E., HYDROSEED). NO SEDIMENT LADEN MATERIALS SHALL BE DEPOSITED OR PILED OUTSIDE OF THE PROJECT BOUNDARIES, PARTICULARLY ON ACCESS ROAD SURFACES.

25. ALL INSTALLED EROSION AND SEDIMENT CONTROL FACILITIES ARE TO BE REPAIRED AND MAINTAINED WITHIN 24-HR OF DAMAGE BEING OBSERVED.

26. INSTALL GRAVEL SITE ACCESS AS SHOWN ON THE PLAN AT START OF CONSTRUCTION.

27. ALL CATCH BASIN PROTECTION DEVICES ARE TO BE INSPECTED WEEKLY MINIMUM, OR FOLLOWING SIGNIFICANT RAINFALL EVENTS, AND CLEANED-OUT OR REPAIRED AS NECESSARY WITHIN 24 HOURS. (MINIMUM CLEAN-OUT AT 40% CAPACITY)

28. AS CONSTRUCTION PROGRESSES, AND IF SITE GRADING REQUIRES TEMPORARY ELIMINATION OF DITCHES AND/OR OTHER MITIGATION MEASURES, THEY ARE TO BE IMMEDIATELY RESTORED BY THE END OF THE WORK DAY.

29. ALL GRAVEL PADS ARE TO BE IMMEDIATELY REPAIRED IF AFFECTED BY TRAFFIC OR CONSTRUCTION ACTIVITIES. ALL ROCK DRIVEWAY AND ACCESS PADS ARE TO BE MAINTAINED OR, IF SEDIMENT-LADEN, REPLACED.

30. ANY IRREGULARITIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

31. SOLID WASTE (INCLUDING COLLECTED SEDIMENT, ASPHALT AND CONCRETE MILLINGS, FLOATING DEBRIS, PAPER, PLASTIC, FABRIC, CONSTRUCTION AND DEMOLITION DEBRIS AND OTHER WASTES) WILL BE DISPOSED OF PROPERTY AND WILL COMPLY WITH THE DISPOSAL REQUIREMENTS.

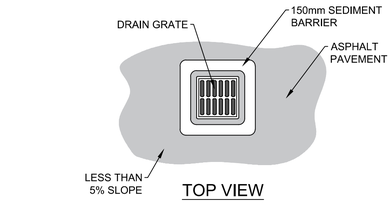
32. HAZARDOUS MATERIAL (INCLUDING OIL, GASOLINE, PAINT AND ANY HAZARDOUS SUBSTANCES) WILL BE PROPERLY STORED, INCLUDING SECONDARY CONTAINMENT, TO PREVENT SPILLS. LEAKS OR OTHER DISCHARGE. STORAGE AND DISPOSAL OF HAZARDOUS WASTE WILL BE IN COMPLIANCE WITH RDN REGULATIONS.

33. THE INTERNAL HAUL ROUTE(S) WILL BE DETERMINED BY THE EARTHWORKS CONTRACTOR AND CIRCULATED FOR REVIEW. THE HAUL ROAD WILL BE SPRAYED WITH WATER AS REQUIRED TO MINIMIZE DUST AND WIND EROSION.

DECOMMISSIONING

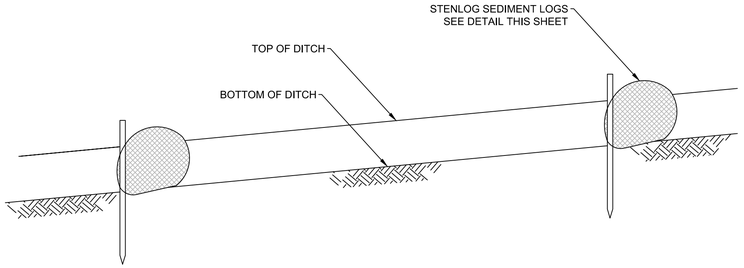
1. ALL SILT FENCES SHALL BE REMOVED.

2. ANY POINTS OF ENTRY OTHER THAN THE PROPOSED DRIVEWAYS SHALL BE REMOVED AND AREA REINSTATED AS PER THE DESIGN DRAWINGS.



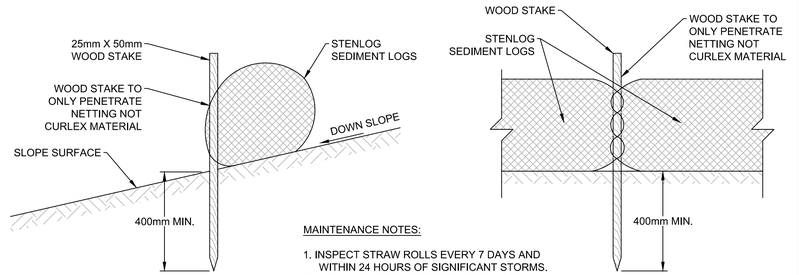
SEDIMENT BARRIERS TYPICAL

N.T.S.



TEMPORARY STENLOG SEDIMENT LOGS

N.T.S.



MAINTENANCE NOTES:

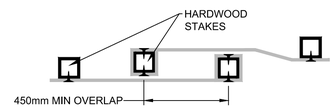
1. INSPECT STRAW ROLLS EVERY 7 DAYS AND WITHIN 24 HOURS OF SIGNIFICANT STORMS.
2. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
3. ENSURE CONTACT WITH UNDERLYING SOIL.

STRAW WATTLE DETAIL

N.T.S.

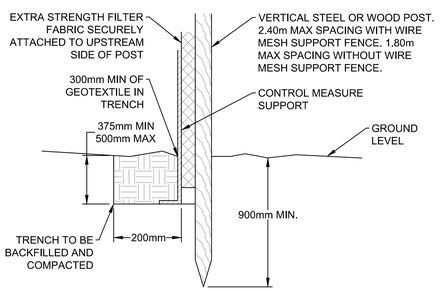
NOTES:

1. TO ENSURE OPTIMAL PERFORMANCE, SILT FENCE TO BE INSTALLED IN AN EXCAVATED TRENCH, MIN 150mm X 150mm OR AS REQUIRED BY THE LOCAL REGULATORY AUTHORITY.
2. STAKES TO BE POUNDED IN UNTIL FABRIC REACHES BOTTOM OF THE TRENCH.
3. POSTS TO BE INSTALLED FACING DOWNHILL. RUNOFF SHOULD PUSH FABRIC AGAINST POST NOT AWAY FROM THEM.
4. THE TRENCH TO BE BACKFILLED BY A BACKHOE OR OTHER EARTH MOVING EQUIPMENT.



WHEN INSTALLING SEVERAL LENGTHS OF SILT FENCE END TO END, OVERLAP THE EDGES OF THE FABRIC AT LEAST 450mm.

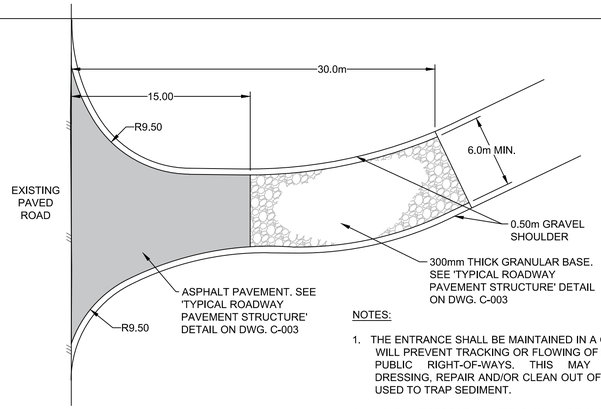
TOP VIEW



SITE VIEW

SILT FENCE INSTALLATION

N.T.S.

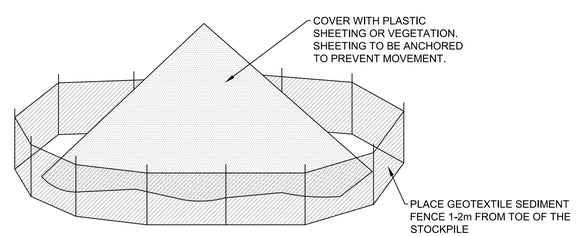


NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURED USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AND APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE / EXIT

N.T.S.



STOCKPILE

N.T.S.

DRN BY:	DES BY:	CHK BY:	APP BY:
SI	BY	KM	MC

REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)
B	ISSUED FOR 90% DETAILED DESIGN	SI	BY	2020/07/24
A	ISSUED FOR 60% DETAILED DESIGN	SI	KM	2019/09/24

VERIFY SCALE IF PLAN SHEET IS REDUCED — 30 mm

PREPARED FOR: REGIONAL DISTRICT OF NANAIMO

PREPARED BY:
AECOM
4th FLOOR, 3292 PRODUCTION WAY, BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
FRENCH CREEK POLLUTION CONTROL CENTRE
STAGE IV EXPANSION
CIVIL
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

PROJECT START DATE (M / Y)	SEP/2019
PROJECT NO.	60590631
FILENAME	60590631-C-002.dwg
RDN DRAWING No.	
DRAWING No.	C-002

Plotted By: sneja.ignatova
Plot File Date Created: Jul/20/2020 3:05 PM
Layout-Sheet Name: C-002
Filename: C:\USERS\SNEJA.IGNATOVA\DESKTOP\60590631-DESKTOP\910-CAD\20-SHEETS\C\60590631-C-002.DWG

- Implement the sediment and erosion control measures identified in the EMP prior to starting any works that may result in sediment mobilization.
- Ensure sediment and erosion control measures are maintained by the Contractor throughout the life of the Project.
- Retain existing vegetation and minimize disturbance to ground cover to the extent possible.
- Protect all disturbed areas from erosion and restore them to stable condition as soon as practical.
- Store excavated or fill material and debris in a stable location beyond the high-water mark of any watercourse, and cover or otherwise stabilize so material does not erode during rain events.
- Direct clean rainwater away from areas susceptible to erosion to minimize the amount of contaminated water that must be managed.
- Contain sediment laden water and prevent its re-entry to the watercourse downstream by diverting water to dry land or developing a system for filtration or settlement.
- Ground disturbances and earth moving activities should be stopped or restricted during periods of heavy rain.
- Extra ESC materials (i.e. silt fence, straw bales, etc.) to be maintained.

6.3 Management of Deleterious Substances

6.3.1 Concrete

If concrete is to be poured on site care must be made to avoid uncured concrete reaching Morningstar Creek or ditches that may convey water to fish bearing waters. Concrete, cement, mortars, grouts and other Portland cement or lime-containing materials are basic or alkaline and can significantly increase the pH of stream water. During any concrete work:

- Do not directly or indirectly expose concrete, cement, mortars and other Portland cement or lime-containing materials into or about any watercourse.
- There shall be no discharge of concrete wash water to ground, watercourses (including ditches), or storm drains from concrete trucks and/or equipment related to the supply, pumping, or placement of concrete. This includes, but is not limited to, concrete truck chutes and hoppers, and pump line hoses.
- All concrete wash water and/or excess concrete should be collected in an impermeable container and disposed off-site in accordance with applicable regional bylaws, and provincial and federal legislation.
- If concrete pouring takes place in or adjacent to a watercourse or any other location where run-off from wet concrete can enter a watercourse, the pH of the water shall be monitored before, during, and 48 hours after the work. Water quality guidelines for pH are presented in Section 6.6.3.
- Detailed procedures for managing concrete spills should be included in a Spill Prevention and Emergency Response Plan (see Section 6.3.2.2), which is to be on site at all times.

6.3.2 Hydrocarbons and Spill Response

6.3.2.1 General Measures for Hydrocarbon Use

General measures for equipment and hydrocarbon products are as follows:

- Equipment, vehicles, and machinery shall be in good operating condition, free of leaks, and excess oil and grease.
- Equipment, vehicles, and machinery will be inspected regularly to ensure that they are in good operating condition and free of leaks. Drip trays should be used for equipment that is parked on site overnight or extended periods of time.
- All hydraulic machinery working in and around a watercourse, including ditches or ponds, will use environmentally sensitive hydraulic fluids that are non-toxic to aquatic life and are readily or inherently biodegradable, wherever feasible.

- Servicing and refueling of equipment (including refilling of small field containers) shall be undertaken a minimum of 15 m away from any watercourse, ditch, or pond.
- Storage of fuels and petroleum products will comply with safe operating procedures [e.g. *A Field Guide to Fuel Handling, Transportation and Storage* (MWLAP and MOF, 2002)] and include containment facilities.
- Storage, handling, fueling and equipment maintenance and repair sites will be located on flat, stable ground, at least 15 m away from environmentally sensitive areas such as watercourses, ditches, and ponds.
- The Contractor shall have a written Spill Prevention and Emergency Response Plan on site at all times (see Section 6.3.2.2).

6.3.2.2 Spill Response Planning

To prevent the occurrence and minimize the impacts of potential spills, accidents or malfunctions, an Emergency Spill Response, Containment and Management Plan shall be developed and implemented; copies of which shall always be on site and readily available. The plan would address issues such as procedures required to prevent spills and accidents, as well as appropriate responses for specific events to minimize potential effects. Regular site inspections should be conducted to ensure adherence to the plan, particularly during construction activities. If standards are followed and prudence is observed amongst work crews, risks and effects will be minimized.

Any spill of reportable quantities of a substance that is toxic, polluting, or deleterious to aquatic life shall be reported to the Emergency Management BC 24-hour phone line. It will be the responsibility of the Contractor to implement all activities in accordance with applicable legislative requirements.

6.3.3 General Waste

A regular disposal program will be implemented to prevent the unnecessary accumulation of construction-related wastes. The Contractor will ensure that upon completion of each day's work, and upon completion of substantial portions of construction works, that all waste or other materials that may potentially impact nearby watercourses are removed to a stable location and secured.

Sanitary facilities provided for the use of workers shall be secured to ensure they do not fall over and shall be located at least 15 m from top of bank of any watercourse.

6.3.4 Hazardous Materials

The Contractor will be responsible for ensuring that all relevant personnel are adequately trained for the handling and transport of Dangerous Goods and Controlled Products. hazardous waste generated during project works must be disposed in compliance with the *British Columbia Hazardous Waste Regulation*. Hazardous materials – including Dangerous Goods as defined under the *Transportation of Dangerous Goods Act* and Controlled Products as defined under the *Occupational Health & Safety Regulation* (BC Regulation 296/97) pursuant to the *Workers Compensation Act* – used during project works shall be stored and handled to protect worker health, avoid loss, and to allow containment and recovery in the event of a spill in accordance with all applicable legislation.

If construction activities encounter possible contaminated materials, including contaminated soils, the Contractor shall stop all work in the vicinity of the possible hazardous materials until further direction is provided.

6.4 Vegetation

Construction procedures to minimize the introduction and spread of invasive plants and noxious weeds are important and should include the following:

- Earth-moving equipment should be cleaned before arriving on site to remove any foreign soil and vegetation.
- Surficial material taken from areas infested by invasive plants should be handled appropriately to minimize the spread of invasive plants including covering stockpiles or removing them for proper disposal off site as soon as practical.
- Fully remove and properly dispose of noxious weeds and other invasive plants, as appropriate.
- Remove trees in accordance with any applicable jurisdictional legislation and ensure appropriate wildlife timing windows are adhered to (see Section 6.5.1).

- Complete restoration activities, i.e. seeding or planting, as required, that will lead to natural pre-disturbance conditions.
- Use native vegetation for site restoration and erosion control or use alternative methods until re-planting with native vegetation can occur.
- Any disturbed areas must be restored to function as it did in the pre-disturbance condition.

6.5 Wildlife and Wildlife Habitat

Several mitigation measures are available to minimize potential interactions between the Project construction site and local wildlife, and thus reduce the associated effects. Mitigation measures may include:

- Minimize sensory disturbance by:
  - Ensuring machines are well-maintained and use noise dampeners
  - Limit unnecessary lighting (i.e., reducing lighting at night and in areas where construction activities are not immediately occurring)
  - Adhering to municipal bylaws regarding light and noise restrictions (if applicable)
- Ensure staging areas (e.g., for machines, fuels) are minimized and as far as possible from nearby sensitive habitats, including Morningstar Creek, roadside ditches, or wetland areas.
- Reduce and ensure proper storage of potential attractants such as food, garbage, petroleum products or other materials with strong odours.

If project works have potential to affect any SARA-listed or provincially Red- or Blue-listed species, it is necessary to ensure compliance with species at risk legislation and to take steps to limit or avoid potential adverse effects. Some listed species may have no period of least risk. BCMOECCS's Regional Species at Risk Biologists or the Canadian Wildlife Service (CWS) should be contacted for project-specific guidance.

6.5.1 Migratory Bird Timing Restrictions

In the Vancouver Island region, the breeding bird window occurs from March 15 to August 15. Scheduling of construction activities (e.g., vegetation clearing) with potential to disturb or harm resident and migratory birds or their active nests should take place outside of the breeding bird season. This is to prevent contravention of the federal *Migratory Birds Convention Act* and the *Migratory Birds Regulation*, as well as Section 34 of the provincial *Wildlife Act*. If such activities must be conducted during the breeding bird season, a survey for active bird nest should be conducted by a QEP familiar with local avifauna and behaviours associated with nesting and territorial establishment of bird species that may be encountered.

In addition to the general breeding bird window, raptors require further consideration due to their extended breeding seasons and distinct life histories. Raptors and herons and their nests are also given special attention under provincial legislation and BMPs.

If an active nest is found (i.e., a nest occupied by a bird or its eggs, or if a bird is near the nest and displays signs of breeding or rearing activity), radial buffers based on provincial BMPs (Table 7) will be implemented. No vegetation clearing will be permitted within the target buffer area until the nest is determined to be inactive.

Table 7: Summary of Target Buffer Distances for Sensitive Wildlife Habitat Features

Feature	Target Buffer Distances (m)		Buffer Measured From
	Urban	Breeding Season "Disturbance Free" Zone	
Bald Eagle Nests	1.5 tree lengths	100	Base of nesting structure
Other Raptors	1.5 tree lengths	200	Base of nesting structure
Active Bird Nest (general)	30	30	Base of nesting structure

References: BC MOE (2013), Demarchi and Bentley (2005)

6.5.2 Shrew and Amphibian Salvage

A shrew and amphibian survey should be undertaken by a QEP well in advance of construction. If these animals are observed or the QEP recommends, a salvage should be conducted prior to construction. Salvage locations should be specified by a QEP at sensitive locations on the Project site. Captured animals would be relocated to a location downstream of the Project site before the start of Project activities. The process for salvage would include:

a. Obtain a wildlife salvage permit which will specify the measures to capture, handle and collect amphibians;

b. Identify the trapping techniques applicable to the observed species;

c. Conduct pre-construction trapping and relocation in accordance with best management practices detailed below;

d. If advised by the QEP, install fencing or other means to keep animals from returning to the construction area, and

e. Conduct post-salvage survivorship monitoring (if required).

Further information on the best management practices to be adopted is found in:

- British Columbia Ministry of Environment. 2014. Guidelines for Amphibian and Reptile Conservation during Urban and Rural Land Development in British Columbia;
- Best Management Practices for Amphibian and Reptile in Urban and Rural Environments in British Columbia (Ovaska et al. 2004).

6.6 Fish and Aquatic Habitat

6.6.1 Instream Works, Diversion and/or Dewatering

Any diversion of water and/or dewatering related to Project activities shall adhere to the following:

- Water intakes are to meet the *Freshwater Intake End-of-Pipe Fish Screen Guideline* issued by DFO (1995).
- Any sediment-laden water, including seepage that may collect within the isolated work area, will be collected and removed or discharged to an appropriate area as outlined in an EMP or as directed by a QEP.
- Construction machinery is not to encroach into the wetted area of a watercourse at any time outside of isolation areas.
- Instream activities must be conducted in the dry and the worksite must be isolated from water flowing in the stream channel.
- All equipment must be located and operated in the dry.
- Equipment used within or in close proximity to the wetted perimeter must be free of deleterious material (e.g. hydrocarbons) and in good mechanical condition (e.g. no fuel or hydraulic leaks).
- Measures must be taken to ensure that no harmful material (e.g. fuel and other hydrocarbons, soil, road fill, or sediment), which could adversely impact water quality, fish and other aquatic life, and /or fish habitat, can enter the wetted perimeter as a result of the project activities.
- Erosion and sediment control structures are to be available onsite and utilized as necessary.
- No work is to be conducted in weather conditions likely to cause sediment laden water to enter the stream.
- Minimize disturbance to natural materials (e.g. embedded logs) and vegetation that contribute to habitat or stream channel stability.
- If dewatering of a stream or bypass pumping systems are required for worksite isolation, the natural rate of water flow will be maintained downstream of the work area.

6.6.2 Fish Salvage

A fish salvage would be required if instream work requires areas to be isolated from stream flow. Federal and provincial permits are required to conduct a fish salvage. Salvaging activities should be conducted by QEPs trained in fish capture techniques. The salvage area should be isolated to prevent fish access and allow for effective removal of fish. Fish captured should be released downstream within the same watercourse.

6.6.3 Surface Water Quality

Water quality in watercourses and discharged water should be monitored as appropriate to ensure they meet the provincial guidelines presented in Table 8.

Table 8: British Columbia Approved Water Quality Guidelines for the Protection of Freshwater Aquatic Life

Parameter	Guidelines
Turbidity	Change from background of 8 NTU at any one time for a duration of 24 hours in all waters during clear flows or in clear waters Change from background of 2 NTU at any one time for a duration of 30 days in all waters during clear flows or in clear waters Change from background of 5 NTU at any time when background is 8 - 50 NTU during high flows or in turbid waters Change from background of 10% when background is >50 NTU at any time during high flows or in turbid waters
Total Suspended Solids	Change from background of 25 mg/L at any one time for a duration of 24 hours in all waters during clear flows or in clear waters Change from background of 5 mg/L at any one time for a duration of 30 days in all waters during clear flows or in clear waters Change from background of 10 mg/L at any time when background is 25 - 100 mg/L during high flows or in turbid waters Change from background of 10% when background is >100 mg/L at any time during high flows or in turbid waters
pH	6.5 to 9.0: unrestricted change permitted within this range. This component of the freshwater guidelines should be used cautiously if the pH change causes the carbon dioxide concentration to decrease below a 10 µmol/L minimum or exceed a 1,360 µmol/L maximum, as these concentrations may be toxic to fish.

Notes: BC MOECCS 2018

6.6.4 Aquatic Work Timing Restrictions

Any works in or about a stream should be undertaken only during the period of least risk (and with the appropriate regulatory approvals and permitting in place), as defined by MFLNRORD and DFO. The blue shaded areas in Table 9 represent applicable least risk periods for fisheries resources in the Project area. Considering the presence of cutthroat trout and coho salmon within Morningstar Creek; the refined least risk period would be August 15 to September 15. Project approvals and permits may reflect altered timing windows as determined appropriate by regulatory agencies.

Table 9: Periods of Least Risk (Blue) for Works in or about a Stream for Vancouver Island Region

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Coastal cutthroat trout												
Coho salmon												

Blue highlighted cells represent the reduced risk work windows.

Reference: Guidelines for Reduced Risk Instream Work Windows, BC MOE, Vancouver Island Region (2011)

6.7 Land Use

There are several residents within 200 m of the FCPCC with beach and creek side areas with in 400 m. The removal of trees will reduce the on-site barriers to noise. Construction activities can also affect local air quality. The measures presented above to minimize disturbance to wildlife will also limit disturbance to nearby residents and others. Properly maintained equipment fitted with proper noise suppression are effective mitigation measures for both air quality and noise concerns. Construction traffic can impact normal traffic flow. A traffic management plan may be required to address potential hazards associated with heavy trucks arriving and leaving the work site.

6.8 Site Restoration

At the end of the project, all equipment, supplies, and non-biodegradable materials will be removed from the site. Disturbed areas will be re-graded to a stable angle and returned as closely as possible to their natural state. A detailed site restoration plan will be required, specifically for riparian areas. Riparian planting criteria should be based on DFO's guidance document *Riparian Revegetation* and the BC MOE's *Planting Criteria for Restoration and Enhancement of Fish and Wildlife Habitat* (DFO No Date; BC MOE 2008).

Other disturbed areas will also be protected from surface erosion by re-seeding with an approved local seed mixture and/or installing biodegradable erosion blankets. All seeding and planting shall be planned to allow establishment before the end of growing season; the recommended timing is in the fall during September and October, or spring during March and April.

7. Summary

The Stage 4 Expansion of the FCPCC will increase treatment capacity by approximately 33% to meet projected population growth through 2035. The increased effluent flow will continue to meet provincial and federal effluent quality requirements. The expansion will be developed within the existing property boundaries of the FCPCC facility. The main elements of the expansion include clearing approximately 6500 m^2 of treed land and the replacement of an existing bridge over Morningstar Creek.

Morningstar Creek is the main environmental feature that could be affected by the project. The site layout was designed to maintain a 15 m setback from the creek and no additional trees within the riparian area will be cleared to upgrade the creek crossing. An open bottomed arch culvert was selected as a replacement for the existing bridge to maintain natural gravels in the channel and to provide a road bed over the creek that will also accommodate the pipes required to transfer the sewage from the east side to the west side of the lot.

The proposed Environmental Protection and Management Plan will be used to mitigate construction related issues such as erosion and sedimentation, emergency response, additional wildlife survey and if necessary, salvage and measures to mitigate effects related to the installation of the culvert.

With the measures adopted in the design of the project (i.e. riparian setbacks) and the proposed mitigation measures for the construction, the environmental effects of the Stage 4 Expansion will be confined to RDN's property and the on site effects will be minimal and remediated once the construction is complete.

8. References

British Columbia Ministry of Environment (BC MOE). 2008. Riparian Restoration Guidelines. Available at: http://www.env.gov.bc.ca/lower-mainland/electronic_documents/RiparianRestorationGuidelines.doc. Accessed February 2019.

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British Columbia Ministry of Environment (BC MOE). 2013. Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia. Available at: http://www.env.gov.bc.ca/wld/documents/bmp/raptor_conservation_guidelines_2013.pdf. Accessed February 2019.

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Appendix A.

Morningstar Creek Culvert Design Drawings

PROPOSED:
Ø63mm ROW WATER PVC PIPE
Ø75mm POTABLE WATER PVC PIPE

PROPOSED:
Ø300mm STM PVC PIPE
Ø200mm STM PVC PIPE
Ø200mm STM PVC PIPE
Ø200mm STM PVC PIPE
Ø450mm STM PVC PIPE

A
C-1009

SEE SECTION 'A' ON
DWG. C-1009

EXISTING:
Ø450mm STORM CULVERT
Ø75mm ROW WATER STEEL PIPE
Ø50mm POTABLE WATER STEEL PIPE

EXISTING:
Ø75mm DBUF STEEL PIPE
Ø38mm DE STEEL PIPE
Ø100mm DS STEEL PIPE

PROPOSED:
Ø600mm SRS PE PIPE
Ø100mm SS PE PIPE
Ø75mm WAS STEEL PIPE
Ø900mm SE PE PIPE
Ø600mm FE PE PIPE

450Ø RIP RAP PLACED 1.5m UP THE BANK ALONG INLET HEADWALL TO DIRECT FLOW AND PROTECT AGAINST BANK SCOUR. VOIDS IN RIP RAP INFILLED WITH COBBLY/FINES MIXED BETWEEN THE BOULDERS. INSTALLED WILLOW STAKES LOWER THIRD OF SLOPE DURING PLACEMENT OF RIP RAPE, TYP.

REGRADE APPROXIMATELY 5.4m OF OUTLET CHANNEL AND REINSTATE THE CHANNEL WITH NATIVE STREAM BEDDING

A ROW OF 600mmØ ROCKS ALONG THE NEW TOE OF CHANNEL TO BE INSTALLED AND EMBEDDED BELOW INVERT OF EXISTING CHANNEL

PROP. TOE OF CREEK

EX. TOE OF CREEK

REALIGN APPROXIMATELY 9.2m OF INLET CHANNEL AND REINSTATE WITH NATIVE STREAM BEDDING

0+000

0+010

0+020

0+032

450Ø RIP RAP PLACED TO THE TOP OF BANK ALONG OUTLET HEADWALL TO DIRECT FLOW AND PROTECT AGAINST BANK SCOUR. VOIDS IN RIP RAP INFILLED WITH COBBLY/FINES MIXED BETWEEN THE BOULDERS. INSTALLED WILLOW STAKES LOWER THIRD OF SLOPE DURING PLACEMENT OF RIP RAPE,

EXISTING BRIDGE AND HEADWALLS TO BE REMOVED PRIOR CULVERTS INSTALATION

PROP. MSE WALL, SEE DETAIL ON DWG. C-1009

17.76m of 3350mm SPAN x 1360mm RISE SPCSP ARCH CULVERT, SEE PROFILE ON DWG. C-1009

PROP. GRAVEL MAINTENANCE PAD

PLAN
1:75

B	ISSUED FOR 90% DETAILED DESIGN	SI	MC	2020/07/24
A	ISSUED FOR 60% DETAILED DESIGN	SI	MC	2019/09/24
REV	DESCRIPTION	DRN	CHK	DATE (Y/M/D)

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

DRN BY: SI
DES BY: SI
CHK BY: BY
APP BY: MC

PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

PREPARED BY:
AECOM
4th FLOOR,
3292 PRODUCTION WAY,
BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
FRENCH CREEK POLLUTION CONTROL CENTRE
STAGE IV EXPANSION

CIVIL
MORNINGSTAR CREEK CULVERT
PLAN

PROJECT START DATE (M / Y)
AUG./2019

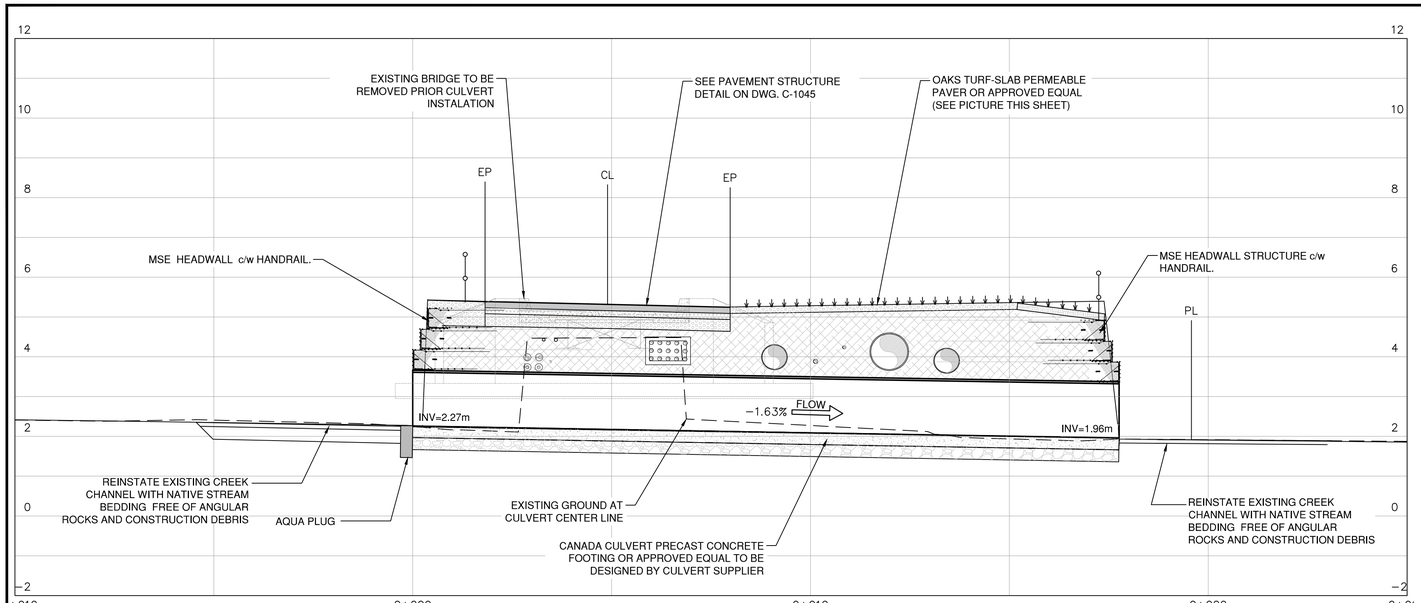
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60590631

FILENAME
60590631-C-1008-C-1009.dwg

RDN DRAWING No.

DRAWING No.
C-100

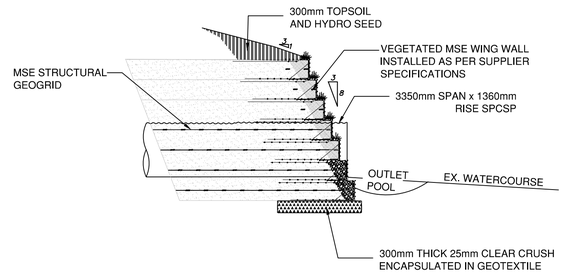
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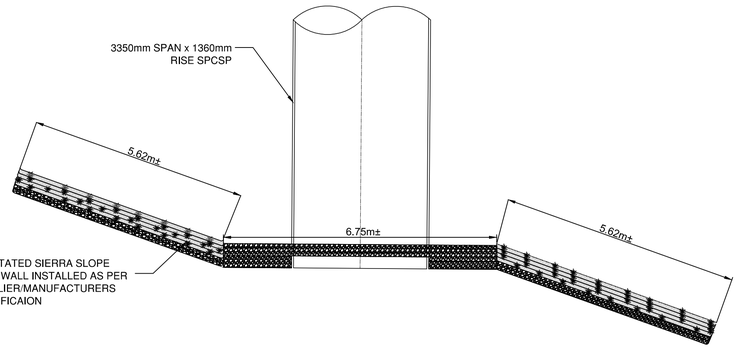
PROFILE
1:75



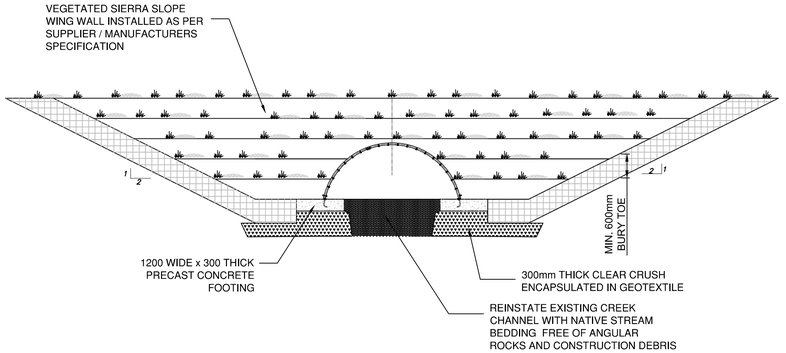
PERMEA□LE PAVER
N.T.S.



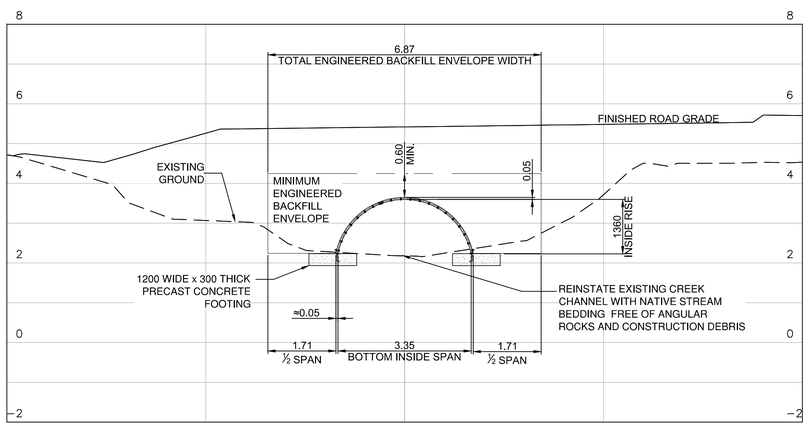
HEAD□ ALL DETAIL-SIDE VIE□
1:75



HEAD□ ALL DETAIL-PLAN VIE□
1:75

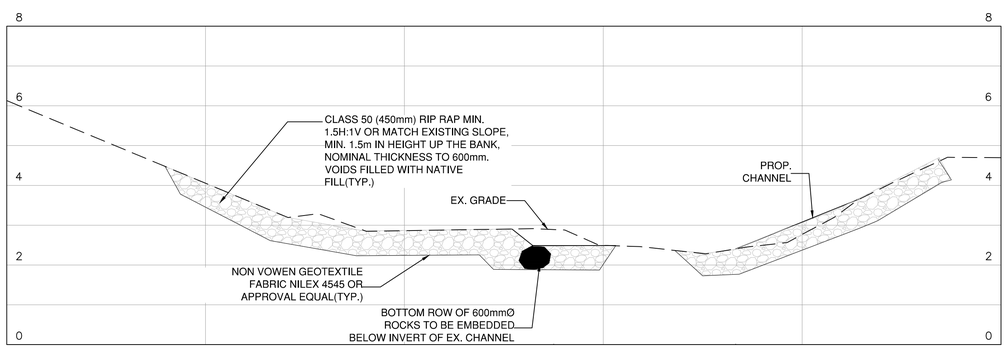


HEAD□ ALL DETAIL-FRONT VIE□
1:75



TYPICAL SECTION AT CULVERT
1:75

NOTE: MSE WALL DETAIL FOR INFORMATION PURPOSE ONLY
MSE WALL TO BE DESIGNED BY THE CULVERT SUPPLIER



SECTION A
1:75

VERIFY SCALE IF PLAN SHEET IS REDUCED
30 mm

REV	DESCRIPTION	DRN	CHK	BY	DATE (Y/M/D)
B	ISSUED FOR 90% DETAILED DESIGN	SI	MC	SI	2020/07/24
A	ISSUED FOR 60% DETAILED DESIGN	SI	MC	SI	2019/09/24

DRN BY: SI
DES BY: SI
CHK BY:
APP BY: MC

PREPARED FOR:
REGIONAL DISTRICT OF NANAIMO

PREPARED BY:
AECOM
4th FLOOR, 3292 PRODUCTION WAY, BURNABY, B.C., V5A 4R4
604-444-6400

REGIONAL DISTRICT OF NANAIMO
FRENCH CREEK POLLUTION CONTROL CENTRE
STAGE IV EXPANSION
CIVIL
MORNINGSTAR CREEK CULVERT
PROFILE□ SECTIONS AND DETAILS

PROJECT START DATE (M / Y): AUG./2019
PROJECT NO.: 60590631
FILENAME: 60590631-C-1008-C-1009.dwg
RDN DRAWING No.:
DRAWING No.: C-100□

Plotted By: snejaignatova
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BETWEEN: _____ (the "Contractor")

AND: The Regional District of Nanaimo (the "Regional District")

THIS AGREEMENT WITNESSES that the Contractor and the REGIONAL DISTRICT agree as follows:

1. The Contractor shall provide all labour, Contractor's Plant and Equipment and materials required to perform the Work within the required time, as required by the Contract Documents.

2. The REGIONAL DISTRICT shall pay the Contractor the Contract Price, as required by the Contract Documents.

3. The Contract Price shall be the sum in Canadian Dollars of the following:

   (a) Up to the Tender Price set out in the accepted Tender Form and;

   (b) Payments made on account of change orders, as may be required by the Contract Documents.

   The Contract Price shall be the entire compensation owing to the Contractor by the REGIONAL DISTRICT for the Work and shall cover and include all supervision, labour, materials, Contractor's Plant and Equipment, overhead, profit, financing costs and all other costs and expenses whatsoever incurred in performing the Contract.

4. The Contractor shall commence the Work within 7 Days after issuance of the Notice to Proceed from the REGIONAL DISTRICT, unless the Notice to Proceed states otherwise, and shall attain completion of the Work by [____].

5. The Contract Documents shall form a part of this Agreement as though recited in full.

6. The Contract supersedes all prior negotiations, representations, or agreements, whether written or oral and is the entire agreement between REGIONAL DISTRICT and the Contractor with respect to the subject matter of this Agreement.

7. Defined terms in this Agreement shall have the same meanings as set out in the General Conditions, except where the contrary is expressed.

8. In entering into and executing this Agreement, the Contractor has relied on its own examination of the Site, access to the Site, and on all other data, matters and things requisite to the fulfilment of the Work, and on its own knowledge of existing services or utilities along or crossing or in the vicinity of the route or facility to be installed or

SAMPLE

constructed under this Contract, and not on any representation or warranty of the REGIONAL DISTRICT.

9. The Contractor shall not assign the Contract, or any portion of the Contract, or any payments due or to become due under the Contract, without the express written consent of the REGIONAL DISTRICT.

10. No action or failure to act by the REGIONAL DISTRICT or an authorized representative of the REGIONAL DISTRICT shall constitute a waiver of any right or duty afforded any of them under the Contract, or constitute an approval or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

11. This Agreement shall enure to the benefit of and be binding upon the REGIONAL DISTRICT and the Contractor and their respective heirs, executors, legal representatives, successors and permitted assigns. In the event of more than one person being the Contractor, the grants, covenants, provisos and claims, rights, powers, privileges, and liabilities shall be construed and held to be several as well as joint.

12. Time shall be of the essence of this Agreement.

13. This Agreement may be executed in any number of counterparts, each of which will be deemed to be an original and all of which taken together will be deemed to constitute one and the same instrument. Delivery by electronic transmission in portable document format (PDF) of an executed counterpart of this Agreement is as effective as delivery of an originally executed counterpart of this Agreement.

SAMPLE

IN WITNESS WHEREOF the parties hereto have executed this Agreement as follows:

The Regional District of Nanaimo by its authorized signatory on _____ day of _____, 20__ (the date of Agreement):

SIGNED on behalf of the REGIONAL DISTRICT by:

Signature: _____

Name: _____

Title: _____

[CONTRACTOR'S NAME]

by its authorized signatory on _____ day of _____, 20__:

SIGNED on behalf of the Contractor by:

Signature: _____

Name: _____

Title: _____

END OF SECTION

SAMPLE

REGIONAL DISTRICT OF NANAIMO
ESTABLISHED 1967

GENERAL TERMS & CONDITIONS OF CONTRACT

PART 1 LAW APPLICABLE

This Contract shall be construed under and according to the laws of the Province of British Columbia, Canada.

PART 2 PRIME CONTRACTOR DESIGNATION

The Contractor must be registered with WorkSafe BC and be in good standing with remittance up to date throughout the agreement and is designated as the Prime Contractor and shall fulfill the Prime Contractor responsibilities as defined in:

a) WorkSafeBC *Occupational Health and Safety Regulation,* Notice of Project, Section 20.2, and Coordination of multiple employer workplaces, Section 20.3;

b) *Workers Compensation Act* (BC), Coordination at multiple-employer workplaces, Section 118, Subsections (1) & (2); and

c) General Requirements, Section 3.10 WorkSafe BC.

PART 3 QUALITY OF WORK AND MATERIALS

The whole of the materials and/or the work, whether or not so stated herein, shall be done in the most substantial and professional manner with new materials, articles, equipment and work of the best quality and description and by employment of properly skilled trades and in strict conformity with and as required by this contract to the satisfaction of the REGIONAL DISTRICT whether or not so stated herein. Materials and equipment shall be the products of suppliers or manufacturers of established reputation engaged in the supply or manufacture of such materials or equipment.

Materials are to be installed or incorporated into the Work applied in accordance with the manufacturer's directions. Use the techniques and application best suited for the type of material being used.

PART 4 JUDGE OF WORK AND MATERIALS

The REGIONAL DISTRICT shall be the final judge of all work, materials, and plants in respect of both quality and quantity and their decisions of all questions in dispute with regard thereto will be final.

All materials shall be subject to inspection and test by and shall meet the approval of the REGIONAL DISTRICT.

SAMPLE

In case any materials, equipment and supplies are defective in material or quality or otherwise not in conformity with the specifications of the contract, the REGIONAL DISTRICT shall have the right either to reject them or to require their correction.

Acceptance or rejection of the materials, equipment, supplies, etc. shall be made as promptly as practicable after delivery, but failure to inspect and accept or reject supplies shall not relieve the contractor from responsibility for such supplies as are not in accordance with the specifications.

PART 5 RECTIFICATION OF DAMAGE AND DEFECTS

The Contractor shall rectify any loss or damage for which, in the opinion of the REGIONAL DISTRICT, the Contractor is responsible, at no charge to the REGIONAL DISTRICT and to the satisfaction of the REGIONAL DISTRICT. In the alternative, the REGIONAL DISTRICT may repair the loss or damage and the Contractor shall pay to the REGIONAL DISTRICT the costs of repairing the loss or damage forthwith upon demand from the REGIONAL DISTRICT. Where, in the opinion of the REGIONAL DISTRICT, it is not practical or desirable to repair the loss or damage, the REGIONAL DISTRICT may estimate the cost of the loss or damage and deduct such estimated amount from the amount owing to the Contractor hereunder.

PART 6 WARRANTY AND GUARANTEE

The work shall be warranted to be free of defects and shall be guaranteed by the Contractor for a period of one (1) year from the date of acceptance. On receipt of notice from the REGIONAL DISTRICT the Contractor shall promptly make all repairs arising out of defective work or any equipment or materials supplied by him.

The REGIONAL DISTRICT is hereby authorized to make such repairs if, ten (10) days after the giving of such notice to the Contract, the Contractor has failed to make or undertake with due diligence said repairs; provided, however, that in the case of an emergency, where, in the opinion of the REGIONAL DISTRICT delay would cause serious loss or damage, repairs may be made without notice being sent to the Contractor, and all expense in connection therewith shall be charged to the Contractor.

PART 7 ASSIGNMENT

The Contractor shall not assign, sub-contract or let out as task work any part of the work, and shall not assign any interest herein or any right to payment hereunder without first having had and obtained the consent in writing of the REGIONAL DISTRICT; which consent the REGIONAL DISTRICT may withhold in its absolute discretion. If the REGIONAL DISTRICT should consent to any such assignment, sub-contracting or letting out as task work of all or any part of the work, the Contractor shall by reason thereof be in no ways relieved from his responsibility for the fulfillment of the work, but shall continue to be responsible for the same in the same manner as if all the work had been performed by the Contractor himself.

SAMPLE

PART 8 TERMINATION

The REGIONAL DISTRICT may by written notice to the Contractor terminate the whole or any part of this contract in any one of the following circumstances:

a) If the Contractor fails to perform the work within the time specified herein or any extension thereof.

b) If the Contractor fails to perform any of the other provisions of this contract, or so fails to make progress as to endanger performance of this contract in accordance with its terms and in any of these circumstances, does not cure such failure within a period of ten (10) days, or such longer period as the REGIONAL DISTRICT may authorize, in writing, after receipt of notice from the REGIONAL DISTRICT specifying any such failure.

d) In the event that the Contractor performs any act or does anything by which the REGIONAL DISTRICT shall incur any liability whatsoever.

e) The REGIONAL DISTRICT may terminate the Agreement, without any cost or penalty or consequence whatsoever, if it concludes, acting reasonably on the information available to it, that the Contractor is in material non-compliance with, or has been convicted of a material offence or violation of, health, safety, labour or environmental laws.

f) In the event that any creditor of the Contractor causes a writ of execution or similar writ or court order to be served upon the REGIONAL DISTRICT requiring the REGIONAL DISTRICT to pay to such creditor or to a sheriff or other public official or to the Court any portion of the consideration due to the Contractor under this Contract.

g) In the event that the Contractor shall be adjudged bankrupt or if it should make a general assignment for the benefit of creditors or if it becomes insolvent or is appointed by a creditor of if it should take the benefit of any Act that may be in force for bankrupt or insolvent debtors.

Upon termination of the Contract as aforesaid, the REGIONAL DISTRICT shall have no obligation to the Contractor except for such labour and materials as have been supplied or performed up to the date of the termination of the Contract.

SAMPLE

PART 9 STATUTES, MUNICIPAL BY-LAWS, AND PERMITS

Unless otherwise noted, the Contractor shall take out all necessary permits and licenses required to permit the Contractor to perform its obligations under the Contract. The Contractor shall give all notices and comply with all REGIONAL DISTRICT regulations, all laws, by-laws, ordinances, rules and regulations, whether federal, provincial or municipal, relating to the business it carries on and the services provided pursuant to the Contract, including the Workers' Compensation Act and the Employment Standards Act.

PART 10 SITE INSPECTION

The Contractor shall make site inspections of all appropriate areas to determine their general condition and to ensure the fulfillment of the contract requirements.

PART 11 USE OF PREMISES

The Contractor shall abide by, and shall ensure its employees abide by, all appropriate regulations, including but not limited to regulations relating to fire, safety, parking, traffic control and health. The Contractor will ensure that all of its employees are aware of the applicable regulations. Contractor will make their own provisions for power, water and washrooms if required.

PART 12 DAMAGE TO PERSON AND PROPERTY

The Contractor shall use due care that no persons are injured, no property damaged or lost, and no rights are infringed in the performance of the Work, and the Contractor shall be solely responsible for all loss, damages, costs and expenses in respect of any injury to persons, damage of property, or infringement of the rights of others incurred in the performance of the Work or caused in any other manner whatsoever by the Contractor, or its employees.

PART 13 CLEAN UP

The Contractor shall at all times conduct the work in an orderly and reasonably tidy manner and shall at suitable intervals remove any accumulation of rubbish or refuse materials. At no time shall any person employed by the Contractor or by any of his Subcontractors discard any litter or garbage on or adjacent to the site, except into a suitable container. Upon completion and before final acceptance of the work, the Contractor shall remove all rubbish, surplus, or discarded materials and equipment and shall leave the site in a clean and neat condition.

PART 14 CURRENCY OF PAYMENT

All reference to money in this Contract shall refer to and mean lawful money of Canada.

SAMPLE

PART 15 DAMAGES FOR DELAY

If the work is not completed and/or the materials delivered before or upon the expiration of the time limited therefore all costs which the REGIONAL DISTRICT shall be put to by reason thereof shall be charged to the Contractor.

PART 16 PAYMENTS

The Contractor will be solely responsible for invoicing the REGIONAL DISTRICT ensuring to include the REGIONAL DISTRICT's Purchase Order number on all invoices to assure timely payment.

All invoices are subject to prior review and approval by the REGIONAL DISTRICT and approved invoices will be paid on a net 30 day basis unless otherwise negotiated and agreed to in writing.

If the REGIONAL DISTRICT does not approve of the services or part of them which are the subject of the invoice, the REGIONAL DISTRICT shall advise the Contractor in writing of the reasons for non-approval and the Contractor shall remedy at no additional cost to the REGIONAL DISTRICT before the REGIONAL DISTRICT shall be obliged to pay the invoice or any part of it, as the case may be.

PART 17 CHANGE ORDERS

If for any reason it may become desirable during the course of the work to change the alignment, dimensions or design, or to add to or to omit portions thereof, the REGIONAL DISTRICT reserves the right to issue change orders to give effect to such changes as may, in the opinion of the REGIONAL DISTRICT be necessary or desirable.

The change may or may not result in a change in the amount of the work or the schedule. If the changes do, in the opinion of the REGIONAL DISTRICT, change the amount of the work or the schedule or both, the contract price and schedule shall be adjusted as mutually agreed between the Contractor and the REGIONAL DISTRICT.

PART 18 PROTECTION OF REGIONAL DISTRICT AGAINST CLAIMS

The Contractor shall assume the defense of, and indemnify and hold harmless the REGIONAL DISTRICT and its officers, employees and agents, from and against all claims relating to materials furnished and to inventions, copyrights, trademarks, or patents and rights thereto used by the Contractor in the execution of this contract and in subsequent use and/or operation by the REGIONAL DISTRICT.

PART 19 INSURANCE

Insurance Obtained by Contractor

SAMPLE

The Contractor shall itself and cause each subcontractor to obtain and maintain, at its own expense, the insurance set out below until all conditions of the Contract have been fully complied with.

Commercial General Liability Insurance

Commercial General Liability Insurance providing third party bodily injury, death, and property damage coverage in an amount of not less than $5,000,000 per occurrence, indicating that the REGIONAL DISTRICT is added as Additional Insureds. The policy shall include Premises and Operations Liability; Contractor's Protective Liability with respect to the Operations of sub-contractors; Completed Operations Liability; Contractual Liability; Non-Owned Automobile Liability; and a Cross Liability and/or Severability of Interest clause protecting each insured to the same extent as if they separately insured.

The policy shall also contain a clause providing that the REGIONAL DISTRICT will receive 30 days' notice of cancellation or of any material change in coverage which will reduce the extent of coverage provided to the REGIONAL DISTRICT.

The Contractor shall file with the REGIONAL DISTRICT, prior to the commencement of work, a certificate of insurance in a form acceptable to the REGIONAL DISTRICT evidencing this policy. The Contractor shall also file with the REGIONAL DISTRICT evidence of the renewal on this policy. The Contractor is responsible for paying all deductibles.

Automobile Third Party Liability Insurance

A Standard Owner's Form Automobile Policy for each vehicle used in the performance of the Contract and regulated by the Insurance (Motor Vehicle) Act or similar legislation. The Third-Party Legal Liability Limits are to be in an amount not less than $2,000,000 per occurrence.

Contractor's Equipment Insurance

The Contractor shall maintain an All Risk insurance policy covering all construction equipment, mobile equipment, miscellaneous equipment, tools, office contents and other miscellaneous property whether owned, leased or rented or for which the Contractor may be responsible, that is used in any way in connection with this Contract.

Other Insurance

The Contractor and subcontractors shall provide at their own cost any additional insurance which they are required by law to provide or which they consider necessary.

Waiver of Subrogation

SAMPLE

Each insurance policy obtained by the Contractor or any subcontractor shall include the following clause:

"Waiver of Subrogation

It is understood and agreed that in the event of a loss and upon payment of any claim hereunder, the insurer will waive its right of subrogation against the REGIONAL DISTRICT and any of their servants, agents, employees, parent, subsidiary, affiliated or related firms."

PART 20 FORCE MAJEURE

Neither party shall be responsible for any delay or failure to perform its obligations under this agreement where such a delay or failure is due to fire, flood, explosion, war, embargo, governmental action, pandemic, epidemic, act of public authority, act of god or to any other cause beyond its control, except labour disruption. In the event force majeure occurs, the party who is delayed or fails to perform shall give prompt notice to the other party and shall take all reasonable steps to eliminate the cause. Should the force majeure event last longer than 30 calendar days, the REGIONAL DISTRICT may terminate this agreement immediately by written notice to the contractor without further liability, expense, or cost of any kind.

PART 21 DISPUTE RESOLUTION

21.1 If the parties to this Agreement are unable to agree on the interpretation or application of any provision in the Agreement, or are unable to resolve any other issue relating to this Agreement, the parties agree to the following process in the order it is set out:

(a) the party initiating the process will send written notice to the other party (the "Dispute Notice"); and

(b) the parties will promptly, diligently and in good faith, including the senior management of both parties, take all reasonable measures to negotiate an acceptable resolution to the disagreement or dispute.

21.2 If the parties are unable to negotiate a resolution within 30 days of the Dispute Notice, the parties may request the assistance of a mediator agreed to by the parties within 30 days written notice of a request to appoint a mediator by any party, failing which the mediator will be appointed by the B.C. International Commercial Arbitration Centre (BCICAC), and unless the parties agree otherwise, this mediation will follow BCICAC rules and will terminate 60 days after the appointment of the mediator.

SAMPLE

21.3 The parties will be responsible for their own costs under the dispute resolution process set out in this part 21.0.

PART 22 INDEPENDENT CONTRACTOR

The Contractor shall be, and in all respects be deemed to be, an independent contractor and nothing in this *Agreement* shall be construed to mean that the Contractor is an employee of the REGIONAL DISTRICT or that any agency, joint venture or partnership exists between the *Contractor* and the *REGIONAL DISTRICT*.

PART 23 HOURS OF WORK

No work will be permitted outside the hours defined below:

Before 7:00 a.m. or after 6:00 p.m., Monday to Friday. Work on weekends and holidays with permission from RDN only.

PART 24 CONTRACT DOCUMENTS

"Contract Documents" consist of the following documents:

(1) The duly executed Agreement

(2) The General Conditions

(3) The duly executed Tender Form

(4) Addenda

(5) Drawings

(6) Specifications

(7) Appendices

(8) The Tender Documents

(9) Other relevant documents such as but not limited to letters of clarification and any reports, standards or the like included by reference

SAMPLE