

February 3, 2020

File: 16-1856

Pat Lapcevic, Section Head  
Water Protection  
Ministry of Forests, Lands, Natural Resource Operations & Rural Development  
2080A Labieux Road  
Nanaimo, BC V9T 6J9

Dear Ms. Lapcevic:

**RE: ENGINEER'S ORDER CLOSE-OUT REPORT: GARDOM POND DECOMMISSIONING - CONTRACT 16-1856**

Further to Engineer's Order for the decommissioning of Gardom Pond Dam, received on May 24, 2019 please accept this letter as the close-out report requested in the above referenced Order. Provided below is a summary of the decommissioning design, construction activities, archaeological protection measures, environmental protection, confirmation of water supply for firefighting, impact on the Razor Point Improvement District's water supply lines, and water license transfer.

**1. Decommissioning Design Summary**

The decommissioning work eliminated the storage of water that requires a water license under the BC Water Sustainability Act (WSA) for a dam. An outlet channel was cut into the existing dam embankment with a 900 mm culvert (inlet invert El. 84.4 m, outlet invert El. 84.3 m) with a downstream channel extending approximately 160 meters to the Harbour Hill Drive Road right of way (RROW) (El. 42 m) drainage ditch. At the RROW drainage ditch tie-in point, a 0.9 m sump lined with riprap is installed. Approximately 50 meters downhill of the tie-in, a new 600 mm culvert is installed across Razor Point Road continuing into a new outlet channel across 6618 Razor Point Road and ultimately dispersing into Browning Harbour. Along the length of the new outlet channel alignment, the channel is lined with 150 mm nominal riprap over a geotextile filter cloth and measures approximately 3 m wide by 0.45 m deep. A ditch block is installed upstream of the outlet channel tie-in at Harbour Hill RROW to divert upstream drainage flow westerly across an existing culvert.

The Engineer of Record is Jim Buchanan, P.Eng., and a copy of the record drawings and consultant site reports are attached to this letter report.



## **2. Decommissioning Construction Contract**

A public tender was closed on May 7, 2019 with three bids received. Advanced Energy Systems Management Corp. provided the lowest compliant bid. A Notice to Proceed was issued to Advanced Energy Systems Management Corp. on June 4, 2019. Construction work proceeded throughout the summer and the Contractor reached Substantial Completion on September 27, 2019.

Construction status reports are attached to this letter report.

## **3. Archaeological Protection Measures**

As a standard duty of care, the CRD conducted a Remote Access to Archaeological Data (RAAD) application review which confirmed that no registered archaeological sites were present, and also indicated low risk of encountering items of cultural significance within the project extents. Further, and in parallel with your office's notification to 13 First Nations, we retained Golder Associates as the project Archaeologist to provide archaeological services for the project. The project Archaeologist provided the following:

- Notification of First Nations
- A site-specific Archaeological assessment
- A project specific Chance Find Procedure
- Chance Find training for construction staff and project stakeholders

Following feedback from your office's notification, we contacted Tseycum First Nation and Cowichan Tribes to arrange a site review to discuss construction monitoring. Tseycum First Nation responded and attended both an initial site orientation and a later site visit with Golder to participate in the Chance Find Procedure training.

Tseycum First Nation provided two monitors, Simon Smith and James Jimmy, who were present on site during the dam embankment excavation on September 5, 6, 11 and 12, 2019 to monitor excavation activity.

A copy of the Chance Find Training meeting minutes is attached to this letter report.

## **4. Environmental Protection**

Both the Owners Environmental Impact Management Report prepared by Kathy Reimer, QEP, and the Contractors Construction Environmental Protection Plan prepared by Carla Schiller, RP Bio. of Titus Biological Services, have been previously provided to your office. The Contractors Construction Environmental Protection Plan was implemented as required during construction, with Carla Schiller attending the site on both June 18 and July 11, 2019 to conduct bird nesting surveys and provide review of the proposed pond dewatering configuration.

A copy of the contractor's environmental site reports are attached to this letter report.

## **5. Confirmation of Water Supply for Fire Fighting**

It was estimated that sufficient water volume in the decommissioned reservoir would satisfy fire protection provided by the Gardom Pond dry hydrant. The Fire Underwriters Survey (FUS) and NFPA 1142 require a minimum volume of 24,000 imperial gallons in order to supply a flow rate of 200 gallon/minute for two hours. Based on available bathymetry, at a reduced reservoir level of 84 m, the resulting volume is estimated at approximately 900,000 imperial gallons.

The project reinstated the existing 6" diameter standpipe located at the south shore of Gardom Pond and provided a fire truck turn-around apron as an improvement. The fire department successfully tested the standpipe on September 25, 2019.

## **6. Razor Point Improvement District's (RPID) Water Supply Lines**

Prior to construction commencement, the RPID had been given notice that their water supply lines will be temporarily disconnected starting June 15, 2019 and that they would be responsible to make arrangements for alternate water supply as well as removal and reinstatement of the existing water lines dissecting the dam embankment.

Prior to tender award, the RPID made a request to the CRD to direct the successful proponent to conduct the water line construction modifications. During the course of construction Change Orders 6a, b, c & 13 were issued to the Contractor to install the new RPID water works. The RPID provided on site their own plumber to conduct all flushing, testing and final acceptance. The RPID reimbursed the CRD for all costs associated with the works.

## **7. Water License Transfer**

Following from the Legal Joint Use Agreement amongst the water license holders, once all project cost liabilities are realized, a WSA application will be made to transfer five of the water licenses to the CRD. Once the five water licenses have been transferred to the CRD, the CRD will make a WSA application to either amend or abandon the license. The reason for this water license process is to address the WSA's Section 122 in that liability for damage remains.

I trust this letter report meets with your requirements at this time. On behalf of the CRD I want to thank yourself, John Baldwin, and David Robinson for assistance with this project delivery.

Regards,



Ben Martin, P.Eng.  
Senior Project Engineer  
Parks & Environmental Services Department

BM/ljf

Attachments: Engineer's Order for Decommissioning of Gardom Pond Dam, dated May 24, 2019  
Decommissioning Record Drawings, dated January 31, 2020  
Consultants Site Review Reports  
Contractors Construction Status Reports  
Legal Joint Works Agreement  
Archaeological Chance Find Procedure, dated June 10, 2019  
Contractors Environmental Site reports

CC: John Baldwin, Dam Safety Officer, via email: john.baldwin@gov.bc.ca  
Pender Island Parks & Recreation Commission, via email: penderparks@crd.bc.ca  
William Hughes, Water License Holder, via email: bhughes@shaw.ca  
Kent Allan, Water License Holder, via email: kgallan@shaw.ca  
Terry Chantler & Kathleen Lightman, Water License Holders, via email:  
tchantler@shaw.ca & kathleenlightman@shaw.ca  
Norman & Sheila Twa, Water License Holders, via email: twa23@shaw.ca  
David Howe, SGI Director, via email: directorsgi@crd.bc.ca  
Ben Maberley, SGI Alternate, via email: directoraltsgi@crd.bc.ca  
Larisa Hutcheson, CRD, via email: lhutcheson@crd.bc.ca  
Steve May, CRD, via email: smay@crd.bc.ca  
Shawn Carby, CRD, via email: scarby@crd.bc.ca  
Ryan Evanoff, MoTi, via email: ryan.evanoff@gov.bc.ca  
Charlie Boyte, Pender Island Fire Rescue, via email: chief@penderfire.ca  
Robert Kojima, Islands Trust, via email: rkojima@islandstrust.bc.ca



File: 76915-20/D730149

Water Licence(s): 1001836, 1001837, 1001838, 1001839, 1001940, 1000316

May 24, 2019

Via Email: [bmartin@crd.bc.ca](mailto:bmartin@crd.bc.ca)

Ben Martin, Senior Project Engineer  
Capital Regional District  
625 Fisgard Street  
Victoria, British Columbia  
V8W 2S6

Dear Ben Martin:

**Re: Order for Decommissioning of Gardom Pond Dam**

Enclosed is an Engineer's Order issued under Section 93(2)(d) of the Water Sustainability Act (WSA), which sets out the conditions for the decommissioning of the Gardom Pond Dam.

For these purposes, a suitably qualified person might include engineering professionals with experience with dam construction and dam removal, and a qualified Environmental Monitor might be a registered professional biologist with experience with stream channel restoration and protection of the stream environment.

The Capital Regional District (CRD) has committed to working closely with First Nations on selection of a qualified Archaeological Monitor.

The current six land improvement purpose water licences held on Gardom Pond have not been abandoned. This office understands that due to a financial arrangement between the current water licence holders, once the decommission work has been completed then a WSA application will be made to transfer five of the water licences to the CRD. Once the five water licences have been transferred to the CRD then the CRD will make a WSA application to abandon all six water licences currently on Gardom Pond. The reason for this water licence process is to address the WSA's Section 122 in that liability of owner for damage remains.

Page 1 of 2

**Ministry of Forests, Lands,  
Natural Resource Operations  
and Rural Development**

Water Protection  
West Coast Region

Mailing Address:  
2080A Labieux Rd  
Nanaimo BC V9T 6J9


Telephone: 250 751-7220  
Facsimile: 250 751-7224  
Website: [www.env.gov.bc.ca/wsd](http://www.env.gov.bc.ca/wsd)

Ben Martin, Senior Project Engineer

Any appeal from this Order must be made in accordance with Section 105 of the WSA and must (1) be in writing, (2) include grounds for the appeal as well as the remedy being sought, (3) be delivered to the Environmental Appeal Board within 30 days of delivery of notice of this Order to you, (4) by delivery of the notice of appeal to the Environmental Appeal Board office on the 4th Floor, 747 Fort Street, PO Box 9425 Stn Prov Govt, Victoria, BC V8V 9V1, by ordinary mail, registered or certified mail, courier, or by leaving a copy at the Board's office during normal business hours, and (5) be accompanied by a filing fee of \$25, payable to the Minister of Finance.

You are also reminded that Section 105 of the WSA states that an appeal does not act as a stay or suspend the operation of the Order being appealed unless the appeal board orders otherwise.

Yours truly,

A handwritten signature in black ink, appearing to read "Pat Lapcevic". The signature is written in a cursive style with a large initial "P".

Pat Lapcevic  
Assistant Water Manager

Attachments: Engineer's Order dated May 24, 2019

## **ENGINEER'S ORDER**

### **SECTION 93 OF THE *WATER SUSTAINABILITY ACT***

**WHEREAS** Capital Regional District (CRD) acting as a current water licence (C109506) holder and the agent for the five water licence (C109507, C109510, C109511, C111318 and C111639) holders on Gardom Pond located on North Pender Island,

**AND WHEREAS** on March 6, 2019, the CRD made an application to the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) to decommission Gardom Pond Dam;

**AND WHEREAS** an application has not been made by the six current water licence holders on Gardom Pond to abandon the six water licences (C109506- CRD, C109507 –TR Chantler, C109510- Sara Steil, C109511 – William Hughes, C111318- Kent Allan and C111639 – Twan Developments Ltd) to store water for land improvement purpose;

**AND WHEREAS** under Section 17 of the Dam Safety Regulation, the Regional Dam Safety Officer has accepted the Gardom Pond Dam decommission plan attached to the CRD letter dated March 6th 2019;

**THEREFORE**, I, Patricia Lapcevic, Assistant Water Manager exercising the powers of an Engineer, HEREBY ORDER the CRD to decommission the Gardom Pond Dam and give permission to work within the Unnamed Stream flowing out of Gardom Pond with the following conditions:

1. Work is to be completed in a timely manner under supervision of a suitably qualified person,
2. The Dam Safety Officer is to be notified by the CRD at least 30 days before the onsite decommissioning work is started,
3. Work is to be completed before September 30, 2019 during the period May 25 to September 30,
4. A work is to be monitored by a qualified Environmental Monitor, and a Construction Environmental Protection Plan (CEPP) is to be submitted to this office BEFORE on site work is started. The CEPP is to be implemented when required,
5. A qualified Archaeological Monitor is to be on site during the period when any ground associated with the decommissioning is disturbed. The Monitor is to prepare a report on

- the archaeological monitoring of the work and a copy of the report is to be forwarded to this office within 60 days of substantial completion of the work,
6. An Archaeological Chance Find Procedure (CFP) prepared by a qualified person is to be prepared and a copy submitted to this office BEFORE on site work is started. This procedure is to be implemented if there is an archaeological finding,
  7. All disturbed areas are to be stabilized,
  8. The work is to be suspended if discharge of sediments cannot be controlled,
  9. The stream banks and bed shall be protected from erosion by adequately designed and constructed rock riprap bank protection,
  10. The dam owner shall exercise reasonable care is to avoid damaging land, works, trees, or other property; and shall make full compensation to the owners for damage or loss resulting from construction, maintenance, use, operation, or failure of the works,
  11. Any change in and about a stream must be designed, constructed, and maintained in such a manner that the change does not pose a significant danger to life, property, or the environment,
  12. The dam owner must while making the change in and about the stream:
    - i. maintain water quality;
    - ii. maintain stream channel integrity;
    - iii. maintain surface and sub-surface drainage systems and flows;
    - iv. conserve wildlife habitat, including riparian vegetation;
    - v. protect fish habitat and fish passage;
    - vi. prevent erosion, mass wasting, siltation; and
    - vii. prevent degradation to water quality at the intake of existing water supplies authorized under the Water Act,
  13. A brief letter report on the decommissioning work that includes photographs of the work, sketch of work completed and monitoring plan is to be submitted within 60 days of substantial completion of the work.

Dated at Nanaimo, British Columbia, this 24<sup>th</sup> day of May, 2019.



**Pat Lapcevic**  
**Assistant Water Manager, exercising the powers of an Engineer under the**  
**Water Sustainability Act**



**CAPITAL REGIONAL DISTRICT**

**GARDOM POND, NORTH PENDER ISLAND  
DAM NATURALIZATION**

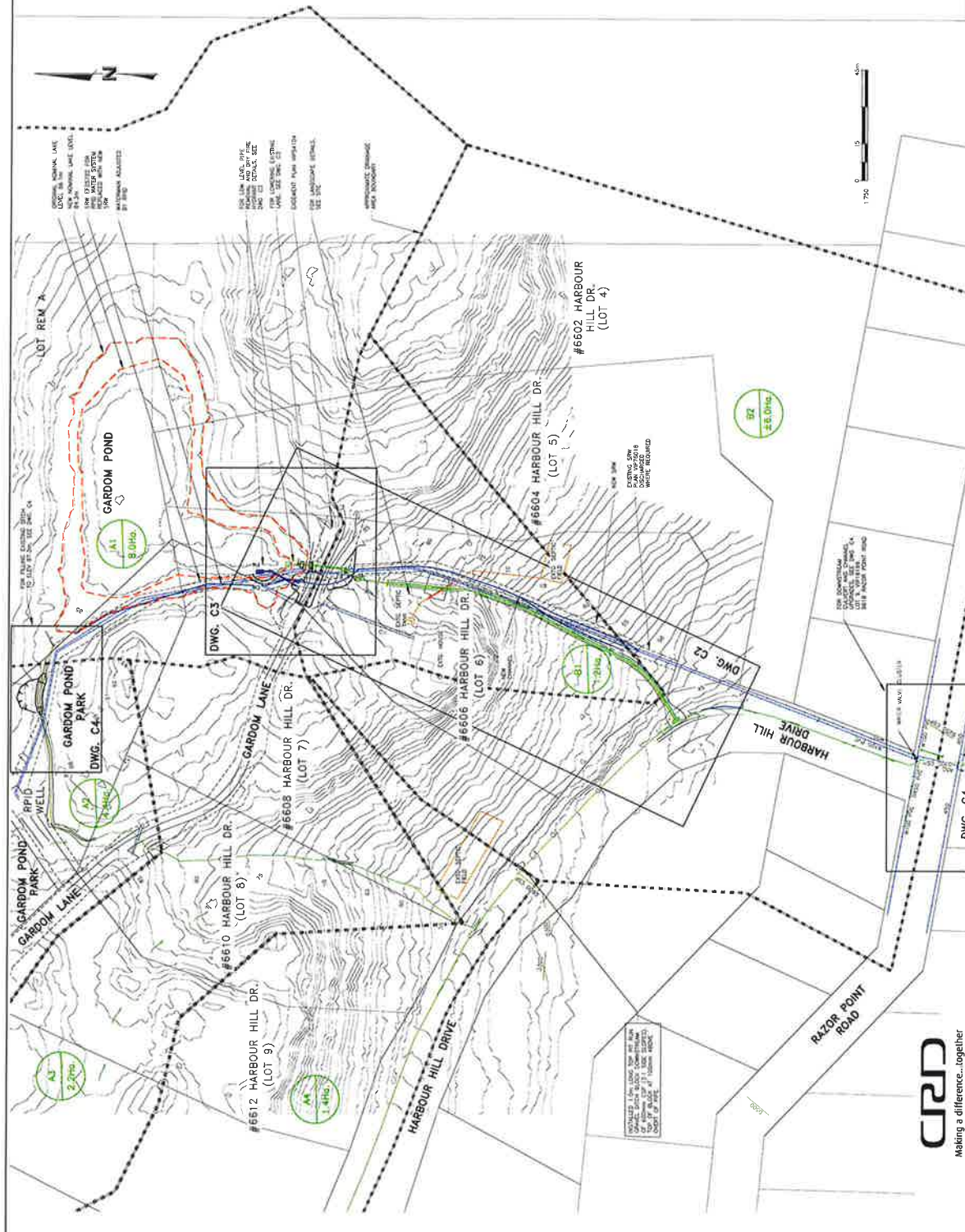
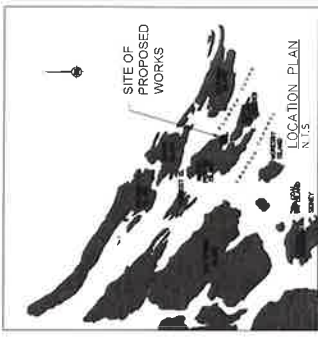
**CONTRACT 16-1856C**

LIST OF DRAWINGS	
DWG. No.	TITLE
27-M156-C1	DRAINAGE AREA PLAN / SITE PLAN
27-M156-C2	POND OUTLET PLAN AND PROFILE
27-M156-C3	CHANNEL AND DAM AREA DETAILS
27-M156-C4	DOWNSTREAM WORKS / DETAILS / SILT CONTROL
27-M156-C5	100mm WATERMAIN PLAN AND PROFILE



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Capital Regional District | Parks & Environmental Services  
625 Fisgard Street, PO Box 1000  
Victoria, BC V8W 2S6



**GENERAL NOTES:**

1. THE LOCATIONS AND COORDINATES OF POINTS SHOWN ARE APPROXIMATE DATA. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE EXACT LOCATIONS OF THE WORK AND TO VERIFY THE LOCATION OF ALL POINTS AND TO BE RESPONSIBLE FOR THE ACCURACY OF THE DATA.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE RELEVANT AUTHORITIES.
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**JEA**  
**J.E. ANDERSON & ASSOCIATES**  
 SURVEYORS & ENGINEERS  
 1A - 3411 SHENTON ROAD, NANAIMO, B.C. V9T 2H1  
 TEL: 250 - 758 - 4631 FAX: 250 - 758 - 4660  
 E-MAIL: [nanaimo@jeanderson.com](mailto:nanaimo@jeanderson.com)

NO.	REVISION DESCRIPTION	DATE	CHECK	APPROV
1	ISSUED FOR TENDER	FEB 27/18	JR	JR
2	REVISED FOR CONSTRUCTION	FEB 27/18	JR	JR

LEGEND	SYMBOL	DESCRIPTION
1	---	PROPERTY BOUNDARY
2	---	EXISTING ROAD
3	---	PROPOSED ROAD
4	---	EXISTING DRAINAGE
5	---	PROPOSED DRAINAGE
6	---	EXISTING UTILITY
7	---	PROPOSED UTILITY
8	---	EXISTING ELEVATION
9	---	PROPOSED ELEVATION

NO.	REVISION DESCRIPTION	DATE	CHECK	APPROV
1	ISSUED FOR TENDER	FEB 27/18	JR	JR
2	REVISED FOR CONSTRUCTION	FEB 27/18	JR	JR

**CRD**  
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VP 5331, VP 38342, AND VP 28575  
 ELEVATIONS ARE GROUND AND TO NAD83

LEGAL DESCRIPTION  
 PROJECT DRAWING

DATE: 27-FEB-2018 10:58:11 AM  
 DRAWN BY: JR  
 CHECKED BY: JR  
 SCALE: 1:1000  
 SHEET: 2 OF 3

CLIENT: CAPITAL REGIONAL DISTRICT  
 PROJECT: PARKS AND ENVIRONMENTAL SERVICES  
 GARDOM POND, NORTH PENDER ISLAND  
 DAM DECOMMISSIONING  
 DRAINAGE AREA PLAN / SITE PLAN  
 CONTRACT # 16-1556  
 27-M156-C1  
 ISSUE 2





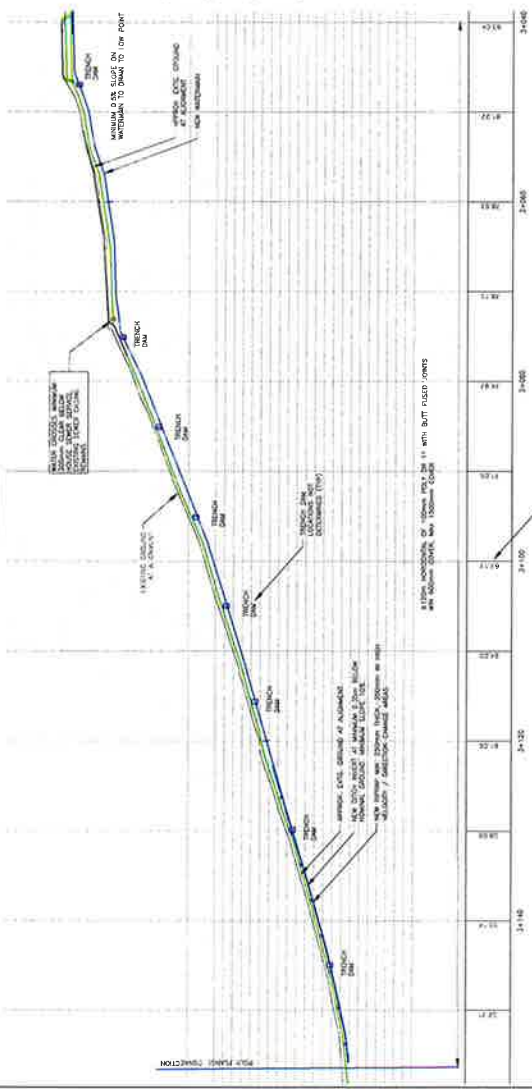
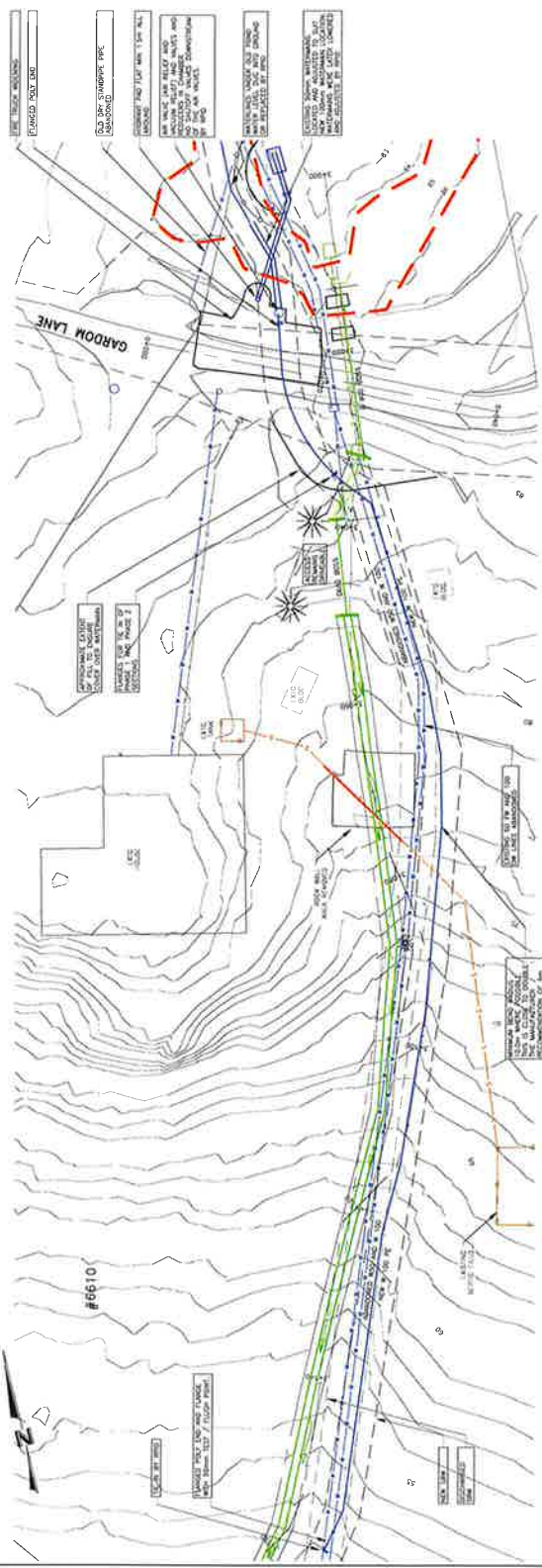






**WATERMAIN NOTES**

1. ALL WORK TO BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS AND STANDARDS OF THE DISTRICT OF COLUMBIA.
2. ALL WORK TO BE DONE IN ACCORDANCE WITH THE DISTRICT OF COLUMBIA WATER MAINS SPECIFICATIONS AND STANDARDS.
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16. ALL WORK TO BE DONE IN ACCORDANCE WITH THE DISTRICT OF COLUMBIA WATER MAINS SPECIFICATIONS AND STANDARDS.



**GENERAL NOTES**

1. FOR GENERAL ROAD AND SERVICES NOTES REFER TO DRAWING C1
2. THE LOCATIONS AND ELEVATIONS OF EXISTING SERVICES ARE APPROXIMATE ONLY. IF IT IS NECESSARY TO VERIFY THE LOCATION AND DEPTH OF ANY EXISTING SERVICE, THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ANY EXISTING SERVICE.
3. RECORD WATERMAIN LOCATION PROVIDED BY CONTRACTOR.
4. CONTRACTOR TO VERIFY, TELLUS, SHOW AND LOGS BC (BC DDC CALL) A MINIMUM 3 DAYS PRIOR TO START OF ANY WORK.



**JEA**  
**J.E. ANDERSON & ASSOCIATES**  
 SURVEYORS -- ENGINEERS  
 1A - 3411 SHERIDAN ROAD, NANAIMO, B.C. V9T 2H1  
 TEL: 250 - 758 - 4631 FAX: 250 - 758 - 4660  
 E-MAIL: nanaimo@jeadson.com

**CAPITAL REGIONAL DISTRICT**  
**PARKS AND ENVIRONMENTAL SERVICES**  
 GARDOM POND, NORTH PENDER ISLAND  
 DAM DECOMMISSIONING  
 100mm WATERMAIN PLAN AND PROFILE  
 CONTRACT # 16-1B5C  
 ISSUE 3

NO.	REVISION DESCRIPTION	DATE	CHECK	APPR.	SCALE	DATE	SCALE
1	ISSUE DRAWING	APR 27/22	JR		AS SHOWN		
2	REVISED DRAWING	MAY 10/22	JR		AS SHOWN		
3	REVISED PER COMMENTS	MAY 10/22	JR		AS SHOWN		
4	REVISED PER COMMENTS	MAY 10/22	JR		AS SHOWN		
5	REVISED PER COMMENTS	MAY 10/22	JR		AS SHOWN		
6	REVISED PER COMMENTS	MAY 10/22	JR		AS SHOWN		
7	REVISED PER COMMENTS	MAY 10/22	JR		AS SHOWN		
8	REVISED PER COMMENTS	MAY 10/22	JR		AS SHOWN		
9	REVISED PER COMMENTS	MAY 10/22	JR		AS SHOWN		
10	REVISED PER COMMENTS	MAY 10/22	JR		AS SHOWN		

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LEGAL DESCRIPTION: NP 5371, NP 3524, AND NP 2625

PROJECT DATUM: ELEVATIONS ARE GEODETIC AND TO NAVD83

1A - 3411 SHENTON ROAD  
NANAIMO, BC V9T 2H1  
TEL: (250) 758-463  
FAX: (250) 758-4660  
[nanaimo@jeanderson.com](mailto:nanaimo@jeanderson.com)



SINCE 1959  
**J.E. ANDERSON  
& ASSOCIATES**  
SURVEYORS - ENGINEERS

## Site Observations Report

Date Reviewed: July 8,9, 2019

File No.: JEA: 89126  
Project Location: Gardom Pond  
Contractor: AESML  
Site Reviewer: Jim Buchanan

Weather:  
Max. Today 21 C

Fair  Cloudy  Rain  Cold  Snow

Distribution: Ben Robinson, Skylark  
Ben Martin, CRD

July 8, 2019

Visited site at 3:15 PM to review work in progress.

Excavator and one laborer/ dump driver working on ditching, riprap, and cleanup.

Bedrock was at a shallow depth so minimal riprap was placed over fairly clean rock to maintain the riprap look.

Culvert has been completed. Concrete filled sandbags were used at the lower end of the culvert as expected. Some larger rocks have been added at the downstream end of the culvert as indicated on the drawings. The culvert outlet invert is approximately 0.4m below adjacent property level, and the ditch remains about 0.4m below adjacent property as expected.

Rock was stacked at the upper end of the culvert when concrete filled sandbag headwalls were expected. The invert is below the expected old ditch invert, so drainage is not expected to follow the existing ditch.

Excavated material is being stockpiled adjacent to the ditch line close to Harbour Hill Drive.

Culvert crossing road has been laid out at an angle to avoid the existing rock wall and to line up with the ditch through the lower property.

Looked for the 2 - 50mm watermain locations on the uphill side of the ditch without getting wet. Did not locate them. The rod measuring water depth was at 0.7m.

July 9, 2019

Visited site at 7:10 AM to review work in progress.

Excavator was cleaning up the disturbed area.

Culvert inlet riprap and related top of riprap seem high. Advised AESL on site. Laborer started moving some rock while he had some down time. Plans are to make minor adjustments to lower the top of ditch level at the culvert.



8:30

AESL continuing to dig ditch up the hill. No rock was encountered, so this became a standard section. Ground prior to filter cloth was 0.61 (0.25 riprap, 0.37m ditch depth) below top of slope for 1 bucket width, then benched on the way up to 1.6m wide at top of riprap, and 2.05m wide at top of ditch.

A 25mm poly waterline was located approximately 0.3m inside Al's property. It had a hole in it and did not flow. We will assume that it is abandoned until we are advised otherwise.

Filter cloth was placed and riprap started before I left at approximately 10:00 AM.

Neighbor had tree fallers on site. Neighbor advised that he had concerns with the tree shown in the picture due to root compromise.









## Site Observations Report

Date Reviewed: July 12, 2019

File No.: JEA: 89126  
Project Location: Gardom Pond  
Contractor: AESML  
Site Reviewer: Jim Buchanan

Weather:  
Max. Today 21 C

Fair  Cloudy  Rain  Cold  Snow

Distribution: Ben Robinson, Skylark  
Ben Martin, CRD

July 12, 2019

Arrived on site at 9:30AM.

Excavator and operator waiting on site

Ben arrived at 9:45

Liam and helper arrived with pipe at approximately 10:00 AM Arrived with 2 – 45 degree bends and 2 – 90 degree bends (pipe is DR11 as expected).

### Watermain

Trench has been dug up to Kent's road access. Ran into some rock so trench jogged over. I asked that the short section of trench jog be cut out for a better alignment – this was done.

Layed out trench dams – at about 10m (actually 9.5m) and then 15m on center.

The watermain was more parallel to the proposed ditch and closer to the ditch than the existing right of way would indicate. A 45 degree bend was necessary. Laid this out (where water bucket is in picture) and flange location on the ground. Advised that the portion under the ditch should be left loose for easier tie in later.

Advised about 0.9m cover at bend then sloping up to 0.1m under the existing WM. Radius starts close to new ditch line.

Trench dam installations started with bottom bags placed in a shallow groove dug into the trench base and sides.

### Ditch Below Razor Point Road

Joe / Ben advised that they rushed getting the ditch and riprap up to the road in preparation for rain. We recommend that AESL review the ditch and riprap to ensure that the ditch widths, depths, and riprap depth meet the required section. It is expected that some adjustments will be required.

Checking and adjustments should be made before carrying on up the hill so that methods can be adjusted where required.











1A - 3411 SHENTON ROAD  
NANAIMO, BC V9T 2H1  
TEL: (250) 758-463  
FAX: (250) 758-4660  
[nanaimo@jeanderson.com](mailto:nanaimo@jeanderson.com)



SINCE 1959  
**J.E. ANDERSON  
& ASSOCIATES**  
SURVEYORS - ENGINEERS

## Site Observations Report

Date Reviewed: July 22, 2019

File No.: JEA: 89126  
Project Location: Gardom Pond  
Contractor: AESML  
Site Reviewer: Jim Buchanan

Weather:

Max. Today 21 C

Fair  Cloudy  Rain  Cold  Snow

Distribution: Ben Robinson, Skylark  
Ben Martin, CRD

July 22, 2019

Arrived on site at about 3:00.

Excavator and operator and two laborers working on ditch. Ben R. also on site, using a bobcat to load the tracked dumper when required.

### Watermain

New watermain is tied in to existing watermain – watermain in use.

Watermain is exposed from 45 degree bend on. Trench has been dug, but will likely have to be adjusted for curve at dam.

50mm wide detector tape shows up at end of backfilled trench, located at the top of base gravel, approx. 100mm above pipe.

100mm flanged pipe is lying on the ground – was this pressure tested and chlorinated, bug tested, and then sealed to ensure nothing gets into it to avoid a second chlorination / flush / bug test?

New watermain location is difficult to define by stakes, particularly lower tie in. We recommend that AESL provide offsets to watermain so that location is not lost (don't assume that locator tape can be found without special equipment). I provided flagging tied to trees at two locations. We recommend that the equipment running up and down hill be used to compact the watermain trench line. This will increase slope stability, reduce the risk of soft areas that could become saturated mud holes when it gets wet.

### Pond Lowering

Pond level has dropped about 0.3m. A 50mm line was tied into the old watermain. The tie in includes 90 and 45 degree bends, so these are slowing flow to some extent, effective length of bends may be 8 metres.

Level is not dropping fast enough, so plan is to pump as well as gravity flow.

## **Ditch Above Harbour Hill**

### **Steep Section**

Sump has been completed – looks good, although riprap is small. Larger riprap needs to be dug in at base of road slope opposite ditch line as energy block against high flows eroding the road.

Steep slope over 40% above road: Width and depth look OK, riprap is too small, short on depth - 150mm to 200mm deep in areas. There is too high a risk of material being washed down the slope. Larger rock will have to be dug in to make up for lack of size and thickness. AESL to advise regarding rocks available to dig into the present riprap. Suggest a row of 250 to 350mm angular rocks at 1.0m on center, running along 0.7m base, and 0.4m horizontal beyond at the sides. Start just above the sump base. Note that the length is short, and is generally accessible from the road.

### **Flatter Portion (about 10m)**

Discussed on site with Ben. Watch riprap width and depth. Add larger rocks (225 to 250mm) to compensate for the undersize riprap. Approximately 20% of area.

### **Channel Not completed.**

Excavate trench for ditch so that there is sufficient room for the required riprap, and ensure that the ground each side of the ditch slopes toward the ditch. Add large angular rocks to riprap presently being used. Do not use undersized riprap on steep portion of slope (over 30%), and critical areas.

Ensure that any new riprap supplied is in general conformance with drawings and pictures that were provided.

AESL plans to construct the ditch in a straight line up the hill as expected. The centerline of ditch will be over 3.5m from the watermain.

### **Alternate to concrete pipe**

We have requested life expectancy of composite inlet structure from a supplier.











## Site Observations Report

Date Reviewed: July 30, 2019

File No.: JEA: 89126  
Project Location: Gardom Pond  
Contractor: AESML  
Site Reviewer: Jim Buchanan

Weather:  
Max. Today 23 C

Fair  Cloudy  Rain  Cold  Snow

Distribution: Ben Robinson, Skylark  
Ben Martin, CRD

July 30, 2019

Arrived on site at about 3:30.

Excavator and operator and one laborer on site. Ben R. also on site. Bob Cooke was on site to review the watermain route, and Kent Allan was on site to review the landscape.

### Watermain

Reviewed watermain route over dam with Bob and Ben. Looks like a length of 100mm sched 40 PVC c/w schedule 80 fittings will be required.

Bob will review the air release and chamber that will be required. H20 rating is expected to be required for chambers as they will be under the fire truck widening.

1.2m cover on watermain confirmed.

### Pond Lowering

Pond lowering is continuing.

There is no sign of erosion in the ditch along Harbour Hill Drive.

### New Source of Riprap

Visited the pit in Shawnigan Lake last Friday to review new source of riprap as I was driving down the Malahat. Riprap is OK to use. See pictures below.

The Shawnigan Lake riprap has bigger material mixed with smaller broken rock.

### Road Culvert Crossing

The 600mm culvert has been installed across the road, with bell end on the uphill side. Looks good.

The riprap continues from the downhill side of the culvert to Al's property. The downhill side of the culvert riprap was from Shawnigan Lake Pit.

### **Ditch Above Harbour Hill**

Reviewed adding bigger riprap at steep slope with Ben.

### **Landscape Area**

Painted proposed path for landscape area on ground to avoid existing rock and rock pile with Kent on site. Existing building is smaller than shown on dwg. The layout should be reviewed with the Landscape Architect.

It looks like the path elevation will be higher than existing ground, the excavation for the ditch below existing ground.

Exact bridge location can be determined later. Path to area beyond the pond was discussed between Joe and Kent. Locate and wrap the trail around to provide suitable walking path for Kent.

From memory of previous correspondence, the new 600mm culvert should be installed with 300mm cover at the uphill side, then 5% slope. Ditch downhill of culvert invert set 300 to 400 below existing ground so that water does not head for the building. At the last layout, the downhill side of the 8m culvert would have tied into an existing row of rock at the driveway slope.

### **Landscape Area to Harbour Hill Drive**

Riprap has been extended up the hill to the downhill end of the riprap area. Shawnigan Lake riprap was used at the upper 20 metres or so – some of the steeper area. Work looks good. Will confirm ditch dimensions later.







## Site Observations Report

Date Reviewed: September 10, 2019

File No.: JEA: 89126  
Project Location: Gardom Pond  
Contractor: AESML  
Site Reviewer: Jim Buchanan

Weather:  
Max. Today 20 C

Fair  Cloudy  Rain  Cold  Snow

Distribution: Ben Robinson, Skylark  
Ben Martin, CRD  
Garth Campbell, CRD

September 10, 2019

Attended site to review fire standpipe route and other issues, and complete a site review.

### Fire Standpipe

The new trench in the pond can be excavated using the existing machine if the ground at the edge of the pond is dug out for the excavator, and the top of the bank is pulled back after digging the deep spot to create a 3:1 slope. The far edge of the excavation in the pond can be sloped back at a steeper angle – say 1:1 if the deep area is deepened in the middle by 0.2m at the intake and 0.6m beyond on each side.

If the top of the bank is pulled back by 1.0m, there will be an additional  $1.5 \times 2.5 \times 1.0\text{m} = 3.75$  cubic metres of material to remove, plus edge tapers (probably 10 cubic metres) plus original excavation for machine.

We recommend that the excavated material be spread in the area uphill of the intake, with minimum 3:1 side slopes remaining. It may be necessary to build a berm using the excavated material to lower the machine so that the wet excavated material is controlled / water / mud flowing into the bushes or around the excavation once mud has settled. The area of re-grading will be soft until it dries out and vegetation is established.

A swamp pad may have to be constructed to support the excavator. Coordinate swamp pad with potential other users. Note that the area will be very mucky for future machine access.

We recommend that the excavated area and access be left in place so that the fire department can access the area in the future.

Checked the area of excavation for rock using a bar. There was no sudden stop to the bar and related noise that would indicate rock. The ground was hard below a shallow thickness of soft material (looked like clay from how the bar stuck, and the clay on the end of the bar).

### 900mm Culvert

The 900mm Boss 2000 pipe has arrived on site. Excavator digging trench for culvert. Base gravel being compacted at the bottom of the culvert. Trench is dry as pond water level is well below the inlet (pond level at about 83.93m). Trench looks good.



### **Stairs**

Top stair has been placed. See picture.

### **Existing Pipes Being Extended**

The existing pipes have partially been extended

### **Ditch at Razor Point / Harbour Hill Intersection**

A shovel was used to expose a rock edge at the ditch adjacent to the wall. Can't reasonably dig back farther without digging up original concrete. Capacity will be increased by removing the edge vegetation, and removing it is easy. We recommend removing vegetation and exposing this rock edge and top.

### **Ditch at Waterfront**

Painted area where ditch should be dug out by hand – probably less than 1.5m long. Don't remove roots.















## Site Observations Report

Date: September 26, 2019

File No.: JEA: 99126  
Project Location: Gardom Pond  
Contractor: AESML  
Site Reviewer: Jim Buchanan

Weather:  
Max. Today 18 C

Fair  Cloudy  Rain  Cold  Snow

Distribution: Ben Robinson, Skylark  
Ben Martin, CRD

September 25, 2019 Engineer Review for Substantial completion.

Site is looking good. Rye is starting to grow, particularly on the steep slope on Kent's property.  
The heavier than normal winter rain is creating some mud.

### List of work remaining:

#### General

Cleanup  
Additional Rye seeding bare spots  
Record Drawings

#### Kent's lot:

Final grading / raking  
Rocks at dry hydrant intake per paint marks  
Backfill Headwall and install fence  
Landscaping  
Fill in outlet ditch above Harbour Hill Drive  
Leave filter cloth in place above Harbour Hill Drive.  
Stake new watermain route in vicinity of dam and along pond for surveyor.

#### Dry Hydrant

The hydrant intake is under water and not visible. Kayak has been taken off the island, so could not measure depths.

Provide pictures, slopes of bank, detailed record drawing of intake and slopes. Ben R advised float set for pipe 0.6m below lake level, 3 - 22 degree bends installed.

The slope may be over 3:1. There may be steep drop offs. A fence for safety may be applicable - round treated post and galvanized farm fence with relatively small openings (maximum 100mm) may be applicable. Locate at ground elevation 84.4m (100mm above outlet invert) so fence is slightly above normal winter water level. Coordinate with lot owner and fire department.

Fire Department to test and confirm operation.

**Al's Lot / Razor Point Road**

Ditch / Riprap at waterfront

Adjust riprap at painted marks along channel (2 locations)

Remove silt control filter cloth / bales, etc.

Razor Point Road asphalt patch

Clear out vegetation at Razor Point Road retaining wall for increased ditch capacity.

Legal surveyor to replace iron pin on Al's site (not AESLM responsibility).

AESLM should easily be substantially complete by the end of this week, September 27, 2019.







ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Weekly Progress Report  
Contract 16-1856C

TO: Ben Martin, Capital Regional District  
FROM: Ben Robinson, Advanced Energy Systems Management Corp.  
DATE: June 17, 2019  
SUBJECT: Weekly Progress Report – June 10<sup>th</sup> - 14<sup>th</sup>

### Progress Overview

- Stump removal on Al's property.
- Installation of sediment fence on Al's property.
- Shut off old 2" and 4" lines from lower valve box per direction from CRD.
- Construction meeting took place on July 12<sup>th</sup>.
- Located old 2" line and active 4" line at the crest of the hill below the future landscape area on Kent's property.
- Purchased water trailer and delivered to site.
- Started digging diversion trench for RPID lines.
- Mobilization, falling, and clearing/grubbing on Kent's property and on Al's property down to the nesting trees had been completed during the prior week.

### Pictures - (morning of 2019-06-17)

Looking down from crest of dam. Water trailer now on site.



ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Weekly Progress Report  
Contract 16-1856C  
Crest of hill on Kent's property.



Sewer (above) and RPID 4" water (below) exposed. (pipe to the right was old unused pipe to take surface water through Al's rock garden).





ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Weekly Progress Report  
Contract 16-1856C  
Suspected RPID leak. Diverted from work area.



RPID diversion ditch. Mostly completed. 2" line (right) and 4" line (left by shovel) exposed.





ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Weekly Progress Report  
Contract 16-1856C  
Cleared area for channel out to Harbour Hill and temporary culvert.



Clearing & grubbing on AI's property down to nesting trees.



ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Weekly Progress Report  
Contract 16-1856C

TO: Ben Martin, Capital Regional District  
FROM: Ben Robinson, Advanced Energy Systems Management Corp.  
DATE: June 25, 2019  
SUBJECT: Weekly Progress Report – June 17<sup>th</sup> – 21<sup>st</sup>

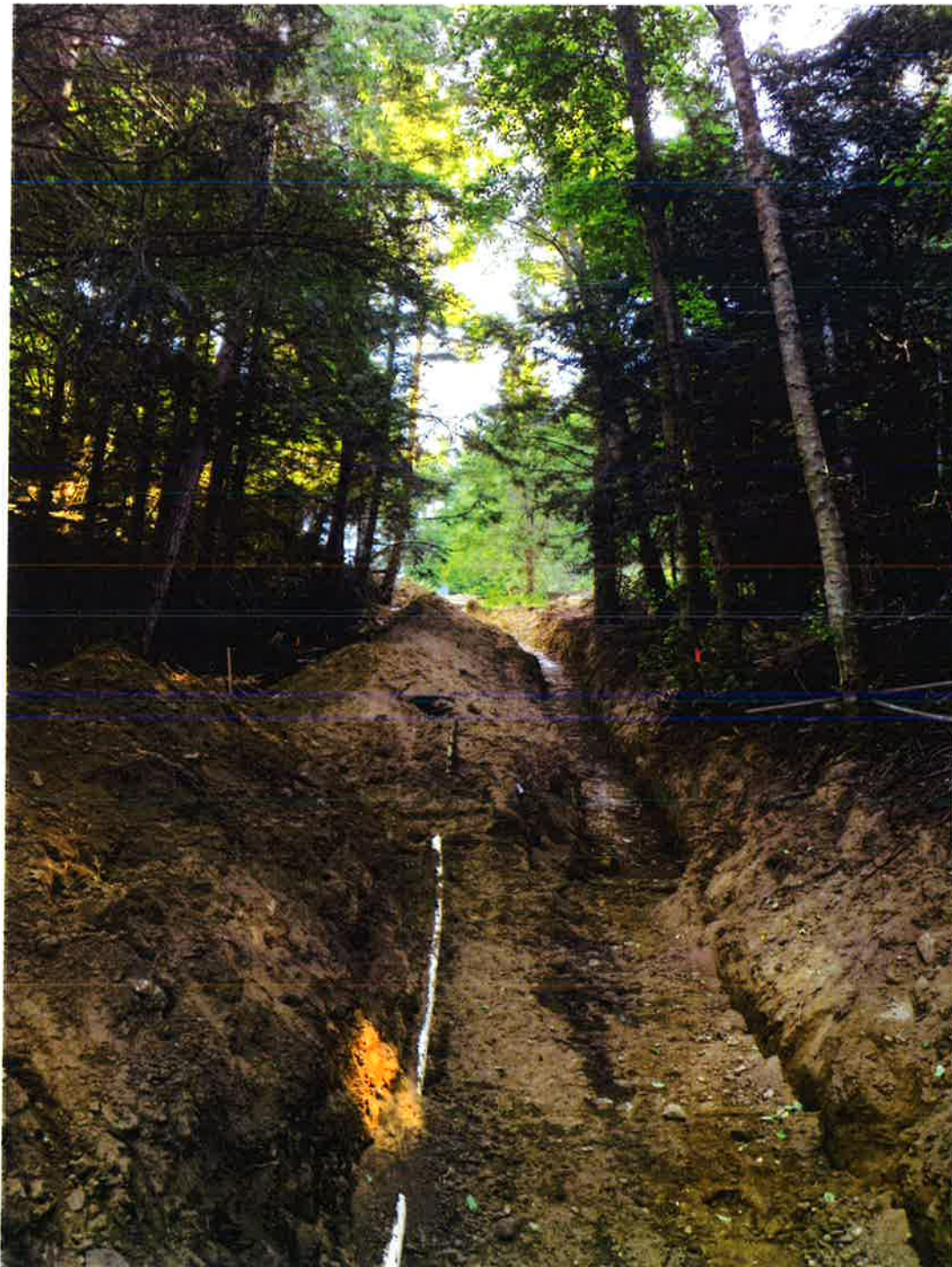
**Progress Overview**

- Finished diversion trench for RPID lines June 17<sup>th</sup>.
- Contractor's QEP came on site at direction of CRD to complete nesting survey on AI's property, and complete nesting survey for trees at existing outlet.
- Removed nesting trees on AI's property and at existing outlet fill location.
- Finished clearing & grubbing lower portion of AI's property.

**Pictures** - (Taken morning of Tues June 25. Reflective of conditions as at June 21<sup>st</sup>, as no work completed June 24<sup>th</sup>)



ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Weekly Progress Report  
Contract 16-1856C  
Completed RPID diversion trench.





ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Weekly Progress Report  
Contract 16-1856C

Completed clearing & grubbing on Al's property.



ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C

TO: Ben Martin, Capital Regional District  
FROM: Ben Robinson, Advanced Energy Systems Management Corp.  
DATE: August 30, 2019  
SUBJECT: Progress Report – August 26-30

**Progress Overview**

- RPID Phase 2 – finished trenching, base bedding, trench dam, and placed pipe under Jim's direction.
- Set bridge abutments.
- Garth led site meeting.
- Continued landscaping only, as RPID manhole was not delivered as expected.
- Finished rock stack wall and boulder wall.
- Drained pond to 83.85m.
- Larger rocks added to steep section of riprap channel per Jim's instructions.

**Pictures** - (Taken August 30<sup>th</sup>)



ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C  
**Pond drained to 83.85**



**RPID Phase 2 – Bottom**





ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C  
RPID Phase 2 – Top



Landscaping





ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C  
**Larger Rocks Added to Steep Section of Riprap Channel**





ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C

TO: Ben Martin, Capital Regional District  
FROM: Ben Robinson, Advanced Energy Systems Management Corp.  
DATE: September 6, 2019  
SUBJECT: Progress Report – September 3-6

**Progress Overview**

- RPID Phase 2 – manhole received and set. Scott completed tie in for RPID. Backfilled trench and manhole.
- Finished riprap channel through landscape area.
- Ben, Garth and landscape designer at site meeting.
- Started excavation for 900mm culvert. Pipe delivery delayed due to supplier trucking, so postponed breach of embankment.
- FN monitors on site to observe excavation.
- Plugged old 150mm, 100mm and 50mm pipes.

**Pictures** - (Taken Sept 6<sup>th</sup>)

ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C  
**North of Dam Embankment**



**Top of Dam Embankment**





ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C  
**South of Dam Embankment**



**Landscaping Area**





ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C

TO: Ben Martin, Capital Regional District  
FROM: Ben Robinson, Advanced Energy Systems Management Corp.  
DATE: September 13, 2019  
SUBJECT: Progress Report – September 9-13

### Progress Overview

- Met with Jim on Tuesday to finalize hydrant design.
- Installed 18m of 900mm culvert (final 2m connected to headwall expected next week).
- Road re-established by end of day Wednesday for residents on other side of embankment.
- Lane lowering complete.
- Started on fire turn-around.
- Stone stairs complete in landscaping area.
- Started seeding.
- Started channel connecting 900mm and 600mm culverts (need more riprap to complete).
- Completed rock headwalls on south side of 900mm culvert and north side of 600mm culvert.
- FN monitors on site to observe excavation.

### Pictures

ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C  
**South of Dam Embankment Directly after 900mm Culvert Installation**



**North of Dam Embankment Directly after 900mm Culvert Installation**



ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C  
**Starting on Channel Between 900mm and 600mm Culverts**



**Landscaping Area after Stairs Completed**





ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C

TO: Ben Martin, Capital Regional District  
FROM: Ben Robinson, Advanced Energy Systems Management Corp.  
DATE: September 24, 2019  
SUBJECT: Progress Report – September 16-21

**Progress Overview**

- Finalized riprap in channel connecting 900mm and 600mm culverts
- Installed headwall
- Installed pipe and intake for hydrant
- Placed topsoil

**Pictures**

ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C  
Landscape area with topsoil



Fall rye mix starting to grow





ADVANCED ENERGY SYSTEMS MANAGEMENT CORP.  
Gardom Pond Dam Decommissioning – Progress Report  
Contract 16-1856C  
**Headwall and hydrant intake**



**South of dam embankment**





**JOINT WORKS AGREEMENT**

**THIS AGREEMENT** dated for reference this      day of                      , 2017.

**BETWEEN:**

**CAPITAL REGIONAL DISTRICT**  
as holder of Water Licence C109506

625 Fisgard Street  
Victoria, BC V8W 1R7

(the "**Regional District**")

**AND:**

**TERENCE CHANTLER AND KATHLEEN LIGHTMAN**  
as holders of Water Licence C109507

6602 Harbour Hill Drive  
Pender Island, BC V0N 2M1

**AND:**

**SARA STEIL**  
as holder of Water Licence C109510

6604 Harbour Hill Drive  
Pender Island, BC V0N 2M1

**AND:**

**KENT ALLAN AND GLORIA ROSE** *ALLAN*  
as holders of Water Licence C111318

103 – 533 Walter's Edge Crescent  
West Vancouver, BC V7T 0A2

**AND:**

**WILLIAM HUGHES**  
as holder of Water Licence C109511

2838 West 38<sup>th</sup> Avenue  
Vancouver, BC V6N 2W9

**AND:**

**N-TWA EQUIPMENT LTD.**  
as holder of Water Licence C111639

570 Blackburn Road  
Sall Spring Island, BC V8K 2W1

(collectively, the "**Licensees**")

**WHEREAS:**

- A. The Gardom Pond dam and spillway were constructed in approximately 1978.
- B. For the purposes of this Agreement, the Licensees assume that the water licenses are valid and that the Licensees, as water license holders, are jointly responsible for the condition of Gardom Pond dam under the *Water Sustainability Act* and Regulations under that Act.
- C. The Ministry of Forests, Lands and Natural Resources has requested that the Licensees address certain dam safety deficiencies at the Gardom Pond dam.
- D. The Licensees have mutually agreed to decommission the Gardom Pond dam in accordance with the Project Charter dated June 27, 2017, attached to this Agreement as Schedule "A", as modified by this Agreement.
- E. The parties have been advised that grant funding in the amount of up to a maximum of \$460,000 is being made available for the decommissioning of the Gardom Pond dam from Emergency Management British Columbia. (The "Grant Funding")
- F. This Agreement is necessary to identify the sharing of responsibilities and costs of decommissioning the Gardom Pond dam.

**IN CONSIDERATION** of the promises and the covenants contained in this Agreement, and other good and valuable consideration, the Licensees agree as follows:

**1.0 SUBJECT PROPERTIES**

- 1.1 The following properties are subject to water licenses to divert and to store water at Gardom Pond:
  - (a) LOT 12, SECTION 12, PENDER ISLAND, COWICHAN DISTRICT, PLAN VIP53931 ("LOT 12");
  - (b) LOT 4, SECTION 12, PENDER ISLAND, COWICHAN DISTRICT, PLAN VIP53931 ("LOT 4");
  - (c) LOT 5, SECTION 12, PENDER ISLAND, COWICHAN DISTRICT, PLAN VIP53931 ("LOT 5");
  - (d) LOT 6, SECTION 12, PENDER ISLAND, COWICHAN DISTRICT, PLAN VIP53931 ("LOT 6");
  - (e) LOT 7, SECTION 12, PENDER ISLAND, COWICHAN DISTRICT, PLAN VIP53931 ("LOT 7"); and

- (f) LOT A, SECTION 12, PENDER ISLAND, COWICHAN DISTRICT, PLAN 38342, EXCEPT PLANS VIP53931, VIP59764, VIP65348 AND VIP 65349 ("LOT A"),

(collectively, the "**Subject Properties**").

- 1.2 Each of the Licensees holds a water licence by virtue of being the owner of one of the Subject Properties.

## **2.0 IDENTIFICATION OF WORKS**

- 2.1 The works that are the subject of this Joint Works Agreement include:

- (a) the Gardom Pond embankment dam located on Lot 6;
- (b) the dam spillway located within Lot 7, Lot 12, and 6610 Harbour Hill Drive; and
- (c) the reservoir located within Lots 4, 5, 6, 7, 12 and Lot A,

all as marked on the Location Map attached to this Agreement as Schedule "B"

(the "**Joint Works**").

## **3.0 OWNERSHIP OF JOINT WORKS**

- 3.1 The Joint Works are deemed to be jointly owned by the Licensees.
- 3.2 For the purposes of this Agreement, each Licensee's proportion of ownership of the Joint Works will be considered to be equal to the ratio of water volume authorized by that Licensee's Water Licence, to the total water volume authorized for Gardom Pond, as shown on the Water Licences Report attached to this Agreement as Schedule "C" (the "**Licensee Proportions**").
- 3.3 The Licensees agree that any liability that may arise from the decommissioning, construction, maintenance, use, operation or failure of the Joint Works shall be shared among the Licensees in accordance with the Licensee Proportions.

## **4.0 DECOMMISSIONING THE JOINT WORKS**

- 4.1 The Licensees mutually agree:
  - (a) to decommission the Joint Works (the "**Project**") in substantial accordance with the Project Charter, which forms part of this Agreement and is attached as "Schedule A"; and
  - (b) to pay the capital costs of the Project, after any contribution from the Community Works Fund or any other public funding that may be obtained,



including the Grant Funding, and each Licensee shall pay the amount corresponding to its Licensee Proportions.

- 4.2 Failure to pay any required costs will result in that Licensee's suspension of usage of the Joint Works. Upon completion of the Project and payment in full to the Regional District of all of the Licensees' contributions under this Agreement, the Licensees' obligations under this Agreement are ended.
- 4.3 For certainty, the Regional District is authorized on behalf of the Licensees to carry out the Project.
- 4.4 The Regional District shall notify and consult the Licensees about the following:
- (a) any change in budget above the estimated \$500,000 in capital costs to complete the Project;
  - (b) any material change in the amount of the expected Grant Funding; and
  - (c) any significant change to the scope of the Project resulting in a cost that would exceed the amount of the contingency.

## **5.0 LICENSEES' DESIGNATE**

- 5.1 The Licensees designate the General Manager, Parks & Environmental Services for the Regional District, or the successor to that position (the "General Manager"), to receive, provide and retain information and records in relation to the dam on behalf of the Licensees and in accordance with Section 22 of the *Dam Safety Regulation*.

## **6.0 MEETINGS**

- 6.1 Any Licensee may request a meeting of the Licensees upon giving two weeks notice in writing to all other Licensees.
- 6.2 All matters to be determined at a meeting shall have a quorum of at least 2/3 of the Licensees and be decided by a 2/3 majority of the Licensees represented at the meeting.
- 6.3 If a Licensee cannot attend a meeting referred to in section 6.1, the Licensee may authorize a representative to attend on his or her or its behalf upon 3 days' written notice to the other Licensees identifying the name of the representative.
- 6.4 A notice of representation is valid only for the one meeting specified in the notice.
- 6.5 For certainty, each person listed on the first page of this Agreement is a Licensee.

## **7.0 WITHDRAWAL FROM AGREEMENT**

- 7.1 It is expressly acknowledged among the Licensees that abandonment, cancellation or transfer of a water licence shall not relieve the Licensee of its obligations under this Agreement, unless that Licensee obtains the written consent of the remaining Licensees, approving such withdrawal from the Agreement.

## **8.0 NOTICE**

- 8.1 Any notices hereunder or documents or deliveries required hereby may be served to the Licensees by personal delivery or registered mail from within the Province of British Columbia to the addresses listed in this Agreement or at such other address as the Licensees may from time to time notify in writing. Any delivery or service as aforesaid, which is made by registered mail shall be deemed to have been received when actually delivered.

## **9.0 GENERAL PROVISIONS**

- 9.1 Where there is conflict between the body of this Agreement and the Project Charter, this Agreement shall take precedence.
- 9.2 This Agreement shall enure to the benefit of and be binding upon the Licensees and their respective successors and permitted assigns, including but not limited to any persons who acquire title to one of the Subject Properties and shall be secured by registration of a covenant under section 219 of the *Land Title Act* against the titles to each of the Subject Properties other than Lot 12, Section 12, Pender Island, Cowichan District, Plan VIP53931, owned by the Regional District, in the form substantially as attached as Schedule "D" to this Agreement before the Regional District commences the Project.
- 9.3 Prior to selling a Subject Property, a Licensee shall:
- (a) inform any potential purchaser of this Agreement;
  - (b) inform the potential purchaser that this Agreement will be binding on the new owner; and
  - (c) ensure that the potential purchaser agrees in writing, by way of modification to this Agreement, to be bound by the terms and conditions of this Agreement, including this Article 9.0.
- 9.4 This Agreement shall be governed by, construed and interpreted in accordance with the laws of the Province of British Columbia.
- 9.5 Time is of the essence of this Agreement.
- 9.6 In the event of a dispute between the Parties regarding this Agreement or the Project, that the Parties cannot otherwise resolve, the Parties shall proceed as follows:

- (a) the Parties shall act in good faith to appoint a mutually acceptable person to mediate the dispute within sixty (60) days of the appointment of the mediator, the costs of which shall be divided equally between the two disputing sides to the dispute. If there are more than two positions represented by the disputing parties, then the costs of the mediation shall be divided equally among all licence holders participating in the mediation; and
- (b) if mediation under (a) is not successful, then the dispute shall be submitted to arbitration under the *Arbitration Act* for determination by a single arbitrator mutually acceptable to the Parties and each Party shall bear their own costs of such arbitration.

9.7 Upon the later of:

- (a) the completion of the Project; and
- (b) the Regional District securing cost recovery of the cost of the Project from the Licencees, other than the Regional District by:
  - (i) adoption by the board of the Regional District of an establishing bylaw for the service that secures said cost;
  - (ii) payment in full by the Licencees, other than the Regional District, of said cost; or
  - (iii) by a combination of subparagraphs (i) and (ii),

the Regional District shall support an application to the Comptroller of Water Rights to release or transfer all rights under existing water licenses other than the licence held by the Regional District to the Regional District in accordance with section 27 of the *Water Sustainability Act* (British Columbia).

The headings to the clauses in this Agreement have been inserted as a matter of convenience and for reference only and in no way define, limit or enlarge the scope or meaning of this Agreement or any provision of it.

**IN WITNESS WHEREOF** the Licensees hereto have executed this Agreement.

**HOLDER OF WATER LICENCE C109506:** )  
**CAPITAL REGIONAL DISTRICT** by its )  
 authorized signatories: )

  
 Name: LARISA HUTCHESON  
 Name: GM, PARKS & ENV. SERVICES  
CRD

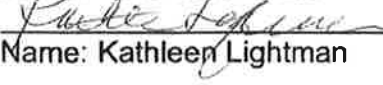
June 29, 2018  
 Date



**HOLDERS OF WATER LICENCE C109507:** )

  
\_\_\_\_\_ )

Name: Terence Chantler )

  
\_\_\_\_\_ )

Name: Kathleen Lightman )

JUNE 6 2018 )

JUNE 6, 2018 )

Date )

**HOLDERS OF WATER LICENCE C109510:** )

  
\_\_\_\_\_ )

Name: Sara Steil )

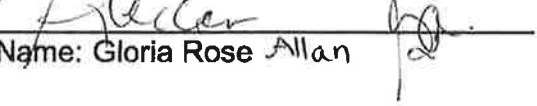
JUNE 6, 2018 )

Date )

**HOLDERS OF WATER LICENCE C111318:** )

  
\_\_\_\_\_ )

Name: Kent Allan )

  
\_\_\_\_\_ )

Name: Gloria Rose Allan )

JUNE 6 / 2018 )

Date )

**HOLDER OF WATER LICENCE C109511:** )

  
\_\_\_\_\_ )

Name: William Hughes )

JUNE 18 / 2018 )

Date )

HOLDER OF WATER LICENCE C109510: )  
N-TWA EQUIPMENT LTD. by its authorized )  
representative: )

  
Name: Norman Twa )

  
Date )



Making a difference...together

Gardom Pond Dam Decommissioning Project  
Contract 16-1856C

Archaeological Chance Find Training Meeting  
Minutes

Thursday, June 6, 2019 @ 9:30 am  
Gardom Pond Dam Site, Pender Island, BC

---

1. **Attendance:**

- CRD - Ben Martin, Project Manager
- Advanced Energy Systems Corp. – Ben Robinson, Owner
  - Justin Robinson, Staff
  - Zachary Robb, Staff
  - Joe Gisler, Staff
- Tysecum First Nation – Simon Smith, Monitor
  - James Jimmy, Monitor
- Golder – Cam Robertson, Archaeologist
  - Nicole Westre, Archaeologist

2. **Administration**

a. **Chance Find Training Procedure**

Contractor personnel and Tysecum Monitors were on site to attend the training session provided by Golder. A copy of the Chance Find Training Procedure is attached for reference.

**Actions:**

- Contractor to post a copy of the training procedure at site (at the site office)

3. **Project Contact List**

<b>Skylark Management Corp</b>	<b>Ben Robinson, Site Superintendent (Owner)</b>	<b>P: 1-604-970-3467</b>	<b>E: ben@skylarkmanagement.ca</b>
	Dan Robinson, Owner Liam Robinson, Owner		
<b>JE Anderson</b>	<b>Jim Buchanan, Engineer of Record</b>	<b>P: 1-250-758-4631</b>	<b>E: jim@jeanderson.ca</b>



Island Stream & Salmon Enhancement	Kathy Riemer, QEP	P: 1-250-537-7580	E: salmonkathy@gmail.com
CRD	Ben Martin, Project Manager	O: 250-360-3242 C: 250-208-6697	bmartin@crd.bc.ca
RPID	Riley Tate, Coordinator	P: 1-604-379-2677	E: tater1@telus.net
Main Road South Island	John Bradley	P: 250-629-3431	E: n/a
Islands Trust	Robert Kojima, Planning	P: 250-405-5159	E: rkojima@islandstrust.bc.ca
Pender Fire Department	Charlie Boyte, Fire Chief	P: 250-537-0166	E: chief@penderfire.ca
6618 Razor Point Road	Alan Harper, Owner	P: 250-629-3112	E: a.harper200@hotmail.com
6608 Harbour Hill Drive	Bill Hughes, Water License Holder	P: 1-604-261-7123	E: bhughes@shaw.ca
6606 Harbour Hill Drive	Kent & Gloria Allen, Water License Holder	P: 1-604-328-5621	E: kgallan@shaw.ca
6604 Harbour Hill Drive	Steil's Estate, Water License Holder c/o Browne Associates	P: 250-598-1888	E: nikki@browneassociates.ca
6602 Harbour Hill Drive	Terry Chantler & Kathleen Lightman, Water License Holders	P: 250-629-8309	E: tchantler@shaw.ca & kathleenlightman@shaw.ca
Lot REM A	Norman Twa, Water License Holder	P: 250-537-9319	E: normantwa@yahoo.com
Gardom Pond Park	John Chapman, Pender Island Parks & Recreation Commission	P: 250-629-6274	E: john.chapman@shaw.ca
Gardom Lane Maintenance Society	Reg Smith, President	P: 250-629-6881	E: smithsonpender@shaw.ca

Meeting adjourned at noon. Please inform CRD if there are any errors or omissions to these minutes otherwise they will stand as an accurate representation of the meeting.

Yours truly,

**Capital Regional District**



Ben Martin, P.Eng.  
 Project Engineer  
 Environmental Engineering

Attach: Chance Find Procedure

cc: See project contact list above



**REPORT**

**Capital Regional District - Gardom Pond Project**  
*Guidelines for Archaeological Chance Find Management*

Submitted to:

**Capital Regional District**

Attn: Ben Martin, P.Eng.  
Senior Project Engineer  
Facilities Management & Engineering  
PO Box 1000, 625 Fisgard Street,  
Victoria, BC V8W 2S6

Submitted by:

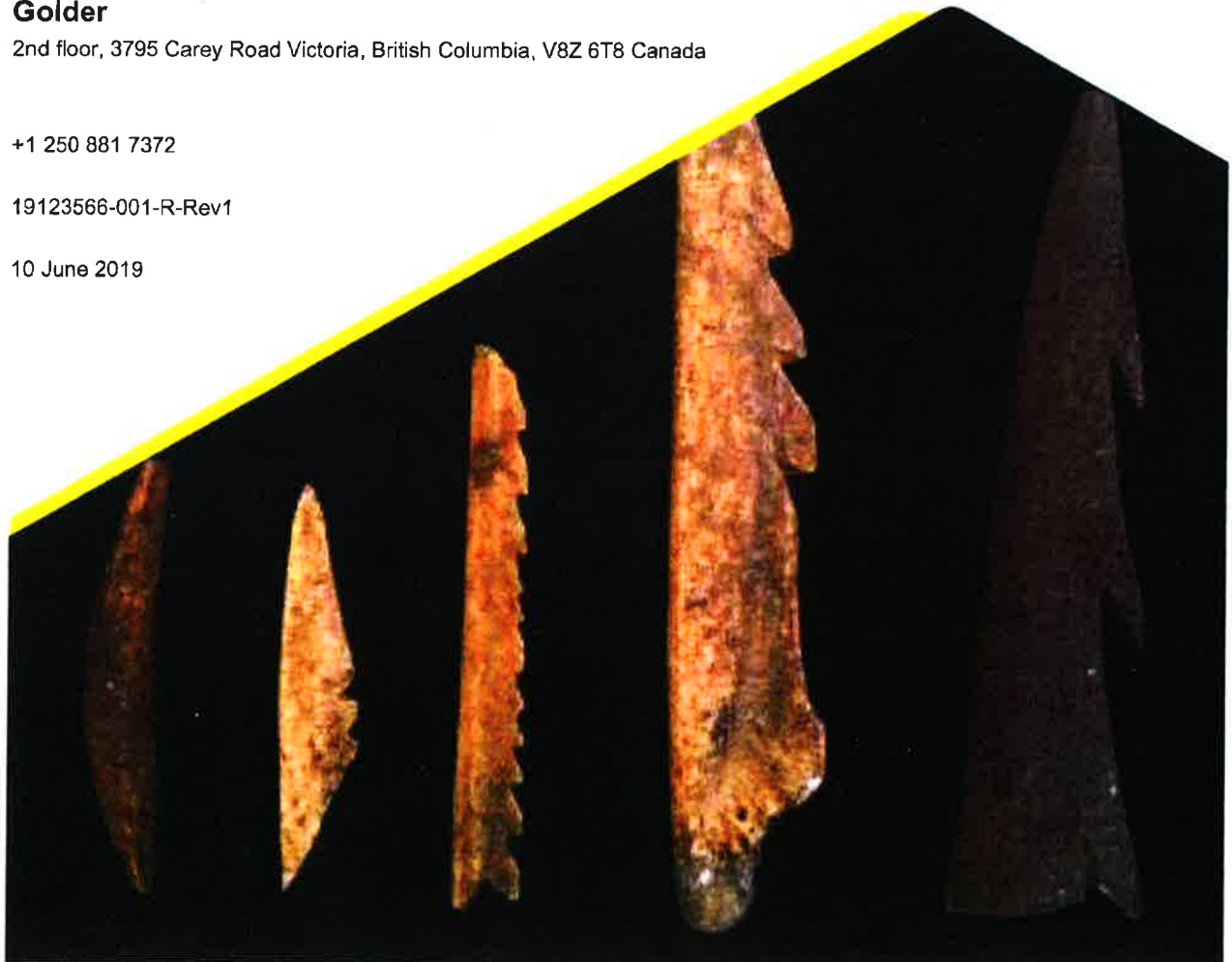
**Golder**

2nd floor, 3795 Carey Road Victoria, British Columbia, V8Z 6T8 Canada

+1 250 881 7372

19123566-001-R-Rev1

10 June 2019



## Distribution List

1 Copy - Capital Regional District

1 Copy - Advanced Energy Management Systems Corp.



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Basic Archaeological Site Identification Information

## 1.0 INTRODUCTION

Golder Associates Ltd. (Golder) is providing archaeological support for the Capital Regional District (CRD) for the Gardom Dam Project (the Project), North Pender Island (the Project area). The intent of this document is to familiarize the CRD and Advanced Energy Management Systems Corporation with typical archaeological and historical materials that may be encountered during construction activities, and to provide guidelines for the appropriate response in the event that these cultural materials are encountered.

These guidelines are designed to minimize disruption to Project scheduling while promoting the preservation and proper management of archaeological materials. A step-by-step response procedure is outlined below, and contact names and telephone numbers are provided in Appendix A. Basic archaeological site identification criteria are provided in Appendix B.

Ground disturbing work that has the potential to impact known or undocumented archaeological sites (e.g. grubbing or excavation) is regulated within the Province of British Columbia by the *Heritage Conservation Act* (HCA). All archaeological sites on provincial Crown or private land that predate AD 1846 are automatically protected under the 1996 amendments to the HCA. Certain sites, including burials and rock art sites, that have historical or archaeological value are protected regardless of age. The Archaeology Branch at the Ministry of Forests, Lands, Natural Resource Operations and Rural Development is the provincial government agency responsible for administering the HCA. Should an archaeological site be found within the Project area, a Section 12 or Section 14 HCA permit may be required to assess the site or complete the Project. For planning purposes an HCA permit typically takes from 10 to 14 weeks to obtain.

## 2.0 BACKGROUND

Pender Island has a large number of complex archaeological sites, some of which date back thousands of years. The Project area is located approximately 500 m northeast of three known archaeological sites (DeRt-59, DeRt-104, and DeRt-105). These are large Indigenous sites that contain shell midden deposits and artifacts. Excavation of natural (non-imported) sediments within the Project area has the potential to encounter archaeological and historical artifacts, faunal (animal bone) material, or human remains.

## 3.0 GENERAL GUIDELINES FOR ARCHAEOLOGICAL CHANCE FIND MANAGEMENT

Guidelines for archaeological chance find management for archaeological or historical materials and for human remains are presented separately below.

### 3.1 Guidelines for Archaeological Chance Find Management

#### 3.1.1 Initial Response by Contractor

- **Step 1:** If intact or disturbed archaeological deposits or artifacts are encountered, stop work in the immediate vicinity of the archaeological site.
- **Step 2:** Contact **Ben Martin** (CRD) (250-208-6697)
  - If Ben Martin is unavailable, contact **Steve May** (CRD) (250-507-6820)

- **Step 3:** CRD will contact the Project Archaeologist for further guidance.
  - **Cameron Robertson**, MA, RPCA (250-857-3554) is the Golder contact.
  - If Cameron Robertson is unavailable, **Nicole Westre**, MA (250-661-5349) is the alternate Golder contact.
- **Step 4:** The Project Archaeologist will advise on further action.

### 3.1.2 Initial Action

Depending on the nature of the situation, one of the following responses is likely:

- Based on a telephone description of the incident, it may be decided that there are no further concerns, allowing work to resume as planned.
- If artifacts or other archaeological material is observed, the **Project Archaeologist** may request that the **Contractor** send photographs by email. Subsurface work in the immediate area should not resume until further notice.
- If observed or recovered materials cannot be identified remotely, a field visit by an archaeologist may be recommended. In this case, the **Project Archaeologist** will notify and coordinate with the **CRD**.

### 3.1.3 Management Options

In the event that archaeological material (intact or disturbed) is present, the CRD, the Project Archaeologist and the appropriate First Nation organizations may consider the following options when deciding on how to proceed:

- **Option 1:** Avoidance through partial project redesign or relocation. This results in minimal impact to the archaeological site and is the preferred option from a cultural resource management perspective. It can also be the least expensive option from a construction perspective. An archaeological investigation may be recommended to define the archaeological site limits under a HCA permit. Monitoring may be required during investigations to verify that the avoidance measures are effective.
- **Option 2:** Salvage archaeological excavation if necessary. This option may require a site investigation permit from the Archaeology Branch before mitigation (e.g., excavation) can commence. This "data recovery" option is destructive and can delay Project activities by up to several months. Consequently, salvage or emergency extraction is not a preferred option.
- **Option 3:** Monitoring of construction activities by a project archaeologist. This option may require a site investigation permit from the Archaeology Branch. Monitoring is appropriate where project impacts cannot be predicted or evaluated before construction, especially near the margins of a known archaeological site, or in cases where deeply buried deposits are expected that cannot be accessed without the assistance of heavy machinery. Monitoring may also be appropriate where systematic data recovery has been undertaken, but where significant archaeological deposits remain.

Appropriate protection measures should be identified on a site-specific basis in consultation with the CRD and First Nations.



## 3.2 Human Remains

Should known or suspected human remains be encountered during project-related activities, the following responses are required.

- **Step 1: Immediately stop work near the find and secure the area.** Do not handle the suspected human remains, and do not undertake further work that could disturb the suspected human remains. Do not move soil in the vicinity of the site, including adjacent spoil material. Be prepared to transmit detailed location information and a description of the find.
  - if the site is in a busy location or has high public visibility, assign a monitor to stand watch until the RCMP or Project archaeologist arrives, to prevent additional disturbance or removal of potential archaeological or forensic evidence
  - ensure that the suspected human remains are treated with dignity and respect by all those at the scene including limiting photography to that required by the RCMP and the Project archaeologist only
- **Step 2: Inform the CRD (Ben Martin).**
- **Step 3: CRD will contact the Project Archaeologist.** If acceptable to First Nations, photographs can be sent to the Project Archaeologist to determine if the bones are human or animal.
- **Step 4:** If it can not be determined by photographs, the **Project Archaeologist** will conduct a site visit to confirm whether the remains are human. If the remains are confirmed to be human, the **Project Archaeologist** will work with the **CRD** to contact relevant **First Nations** and will alert the **RCMP** and the **BC Coroners Service** (see Appendix A). The coroner will determine if the remains are of contemporary forensic concern or archaeological in nature. If they are of archaeological origin the CRD and Project Archaeologist will work with the First Nations to identify next steps.
- **Step 5:** Next steps will be established in consultation with First Nations and CRD. Options could include reburial of the remains at or near the original location, or respectful removal and temporary storage pending re-interment or other treatment in accordance with First Nations protocols. A permit under the Heritage Conservation Act may be required prior to any further disturbance at the location of the remains.

## 3.3 Human Remains

If Golder is asked to temporarily house ancestral human remains, they will be stored in a secure location at Golder's Victoria office. Documentation and identification of the remains will be limited to work necessary to describe the remains, and only if acceptable to First Nations.

## 4.0 CLOSURE

We trust that the information contained herein meets your present requirements. Please do not hesitate to contact the undersigned at Cameron\_Robertson@golder.com or 250-857-3554 if you have any questions or concerns regarding the above.

**IF THE CRD OR ADVANCED ENERGY MANAGEMENT SYSTEMS CORPORATION HAVE ANY CONCERNS ABOUT ARCHAEOLOGICAL DEPOSITS OR HUMAN REMAINS, THE PROJECT ARCHAEOLOGIST SHOULD BE CONTACTED FOR DIRECTION.**

**Golder Associates Ltd.**



Cameron Robertson, MA, RPCA  
*Archaeologist*



Jeff Bailey, MA, RPCA  
*Principal, Senior Archaeologist*

CR/JB/lmb

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[https://golderassociates.sharepoint.com/sites/109471/project/files/6 deliverables/issued to client\\_for wp/19123566-001-r-rev1/19123566-001-r-rev1-cfmp-10jun\\_\\_19.docx](https://golderassociates.sharepoint.com/sites/109471/project/files/6%20deliverables/issued%20to%20client_for_wp/19123566-001-r-rev1/19123566-001-r-rev1-cfmp-10jun__19.docx)

**APPENDIX A**

Contact Names and  
Telephone Numbers



---

## CONTACT NAMES AND TELEPHONE NUMBERS

### Project Archaeologists (Golder)

Cameron Robertson, MA, RPCA (Victoria) 1-250-857-3554  
Nicole Westre, MA (Victoria) 1-250-661-5349

### Capital Regional District

Ben Martin, Senior Project Engineer 1-250-360-3242 (office)  
1-250-208-6697 (cell)  
Steve May, Senior Manager 1-250-507-6820

### Tseycum First Nation

James Jimmy, Cultural Manager 1-778-584-2979  
Simon Smith Jr., Monitor and Community Representative 1-778-977-3638

### Advanced Energy Management Systems Corporation

Ben Robinson, Owner and Site Supervisor 1- 604-970-3467

### RCMP

Non-emergency line 1-250-629-6171

### BC Coroners Service

Vancouver Island Region 1-250-356-9133  
1-877-741-3707 (toll-free)

**APPENDIX B**

**Basic Archaeological Site  
Identification Information**

## BASIC ARCHAEOLOGICAL SITE IDENTIFICATION INFORMATION

Common criteria that may signal the presence of an archaeological or burial site are noted below. The list is not exhaustive, but it includes the most common site indicators that may be encountered within and in the vicinity of the Project area.

### Shell Midden

Cultural accumulations of shells, stratified in intricate white and grey layers, mixed with streaks of charcoal, ash, and other debris. Shell middens result from the successive deposition of food remains and general refuse. Shell middens were also commonly used as human burial sites.

**Look for: accumulations of layered, crushed, and whole shell possibly mixed with charcoal, black soil, and other food remains (i.e., fish bone) (Photo 1).**



**Photo 1: Shell Midden. Intact stratigraphic “layer cake” example, Vancouver Island. Note dark, charcoal-rich organic matrix and layers of crushed shellfish (© Golder Associates Ltd).**



### Waterlogged Deposits (Wet Site)

Locations containing organic artifacts (i.e., wood, bark, or plant fibre), that are preserved due to their presence in an anaerobic (oxygen free) environment. **Look for: fragmentary baskets, rope, carved wood implements (e.g., wedges, fish hooks), and similar objects eroding from intertidal silts and/or clay deposits** (Photos 2 to 5).



Photo 2: Waterlogged Basket (Cleaned)



Photo 3: Waterlogged Basket Embedded in Matrix



Photo 4: Cordage wrapped stake/wedge



Photo 5: Bentwood Fish Hook

### Artifact or Artifact Scatter

Portable object(s) manufactured or modified by human beings. These items may include chipped or ground stone objects or implements made from bone and antler (Photos 6 to 14). **Look for: obviously formed stone objects or pieces of stone that have been chipped and/or ground in a non-natural way. Bone and antler artifacts will exhibit obvious modification (i.e., cutting, shaping, incision, etc.).**



Photo 6: Chipped Stone Flakes



Photo 7: Isolated Find – leaf-shaped projectile point, Jackson Bay (© Heather Pratt).





Photo 8: Projectile Points



Photo 9: Formed Scrapers



**Photo 10: Pecked Stone Hand Mauls (Hammers)**



**Photo 11: Drilled Stone Anchor**



**Photo 12: Pecked Stone Bowl Fragments**





Photo 13: Ground Stone Abraders



Photo 14: Bone and Antler Artifacts

### Fire Altered Rock (FAR)

Heat fractured stone that results from rapid or alternate heating and cooling as in stone boiling or in campfires. FAR is typically associated with resource processing and/or food preparation. **Look for: concentrations of fractured pebbles with signs of being burnt in a fire (Photo 15).**



Photo 15: Fire Altered Rock

### Glass Artifacts (Historical)

Historical glass artifacts include glass containers, beads, buttons, fragments, window glass, and miscellaneous items. Glass containers consist of bottles, jars, bottle closures, and container fragments (Photos 16 to 18). The method of manufacturing, style, and maker's marks provide information on the origin and date of glass containers. Glass beads are commonly used in necklaces, earrings, mats, and decorative inlays (Photo 19).



Photo 16: Examples of whole and fragmentary historical glass bottles



Photo 17: Example of mould blown round bottom glass bottle





Photo 18: Examples of historical glass bottle bases



Photo 19: Photo 18: Historical glass beads



Photo 20: Historical metal, glass and shell buttons

## Metal Artifacts (Historical)

Historical metal artifacts can be used for dating purposes, particularly nails, through manufacture techniques. Other metal artifacts that can be identified include cans, coins, cannon balls, keys and figurines, buckles, buttons, brass shotgun shells, metal tools, and miscellaneous corroded metal fragments (Photos 21 to 24).



Photo 21: A collection of historical metal nails of various manufacturing techniques



Photo 22: Example of cast iron artifact, likely a claw foot from a bath tub



Photo 23: Examples of iron cannon balls



Photo 24: Copper Medallion



## Ceramic Artifacts (Historical)

Ceramics are a common artifact found at historical sites, often associated with food service, and can be classified into coarse earthenware, refined earthenware, ironware, stoneware, and porcelain (Photos 25 to 27). Ceramic pipes used for smoking tobacco were commonly made from kaolin clay, a very fine-grained clay (Photos 28 and 29). Other types of ceramics may include tiles, bricks, and pipes. Bricks often contain markings indicating the place or date of manufacture (Photo 30).



Photo 25: Porcelain table setting

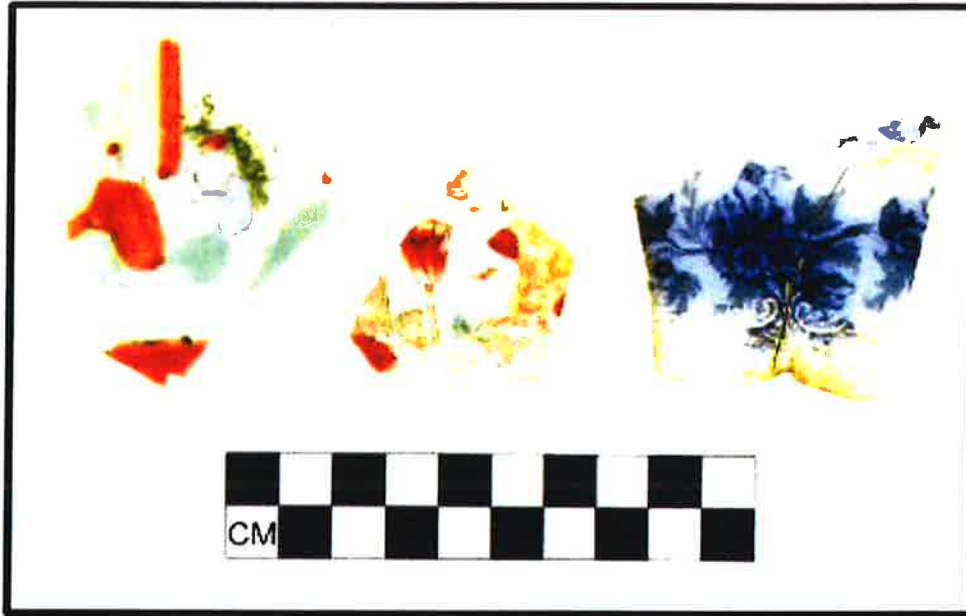


Photo 26: Examples of historical ceramic shards



Photo 27: Historical ceramic shards and containers



Photo 28 and 29: Kaolin clay pipe stem and bowl fragments, made of fine-grained clay



Photo 30: Brick with manufacturer's stamp



## Textile Artifacts (Historical)

Occasionally historical textiles will be preserved in sediments. Examples of textiles include leather objects such as shoes or belts (Photo 31).



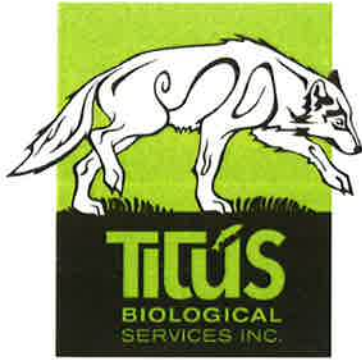
Photo 31: Example of historical leather shoe and sole recovered during excavations

## Human Remains

Look for: articulated or isolated bones or bone fragments.



[golder.com](http://golder.com)



## QEP MEMO – RWB NESTING FOLLOW UP

---

TO: Ben Robinson, Project Manager

FROM: Titus Biological Services Inc.

DATE: 16 July 2019

PROJECT: Gardom Pond Dam Decommissioning, Pender Island

---

The purpose of this QEP memo is to report on a follow up nesting bird survey for Red-winged Blackbird (RWB, *Agelaius phoeniceus*) with respect to the Gardom Pond Dam Decommissioning project, Pender Island, BC. A general site inspection, review of the water drawdown plan, and discussions on erosion and sediment control (ESC) plans were also conducted.

Titus Biological Services (Titus) was retained to assist with the environmental requirements of the project. The Titus Qualified Environmental Professional (QEP) conducted a field inspection Tuesday June 18<sup>th</sup>, 2019. The inspection was meant to follow up on a prior nesting bird survey, inspect the site, and provide erosion and sediment control (ESC) advice.

The site visit was followed by additional background research on RWB nesting habits, reported in a QEP memo on July 11, 2019<sup>1</sup>. To summarize the findings, RWB tend to be finished nesting in June, and nesting at habitats such as Gardom Pond tend to be synchronous.

### **Background**

The Gardom Pond Dam is unstable and scheduled for decommissioning. This work will involve lowering the water level of the pond approximately 2 m. RWB are

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<sup>1</sup> Titus Biological Services. 2019. QEP Memo: RWB Nesting. July 11, 2019.



known to nest at Gardom Pond, which provides good quality nesting habitat in the form of Cattails (*Typha latifolia*) surrounding the pond.

The BC *Wildlife Act*, section 34 reads as follows:

A person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys

(a) a bird or its egg

(b) the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl, or

(c) the nest of a bird not referred to in paragraph (b) when the nest is occupied by a bird or its egg.

*Wildlife Act* permits had not been obtained for this project. Although nesting bird surveys have and will be conducted for areas requiring clearing (direct impacts), the indirect impact to nests by lowering the water level was not previously addressed.

The July 11<sup>th</sup> Titus QEP memo served to summarize research on nesting habits of RWB in the Lower Mainland of BC and provide recommendations by which the project can proceed while exhibiting due diligence in regards to responsibilities under the *Wildlife Act*.

### **Impacts to Nests**

Survivorship of RWB nests has been related to height of the nest above water. Therefore, lowering the water level in Gardom Pond by 2 m would be expected to have a negative impact on active RWB nests.

Since negative impacts could not be ruled out, we examined timing of nesting.

### **Timing of Nesting**

According to the BC Conservation Data Centre<sup>2</sup>, nesting begins in most areas in April and May, sometimes in late March, and may continue into July. Egg incubation lasts 11-12 days, and young fledge in about 10 days (BC CDC, 2010).

Herbaceous wetlands dominated by Cattails with open, permanent water have been found to have highly synchronous nesting<sup>3</sup>. This is consistent with the habitat at Gardom Pond, although invasive water lily is competing with Cattails for space at the perimeter of the pond.

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<sup>2</sup> BC Conservation Data Centre. 2010. Species Summary: *Agelaius phoeniceus*, Red-winged Blackbird. BC Ministry of Environment. Accessed online on July 2, 2019 at: <http://a100.gov.bc.ca/pub/eswp/>

<sup>3</sup> Short, H.L. 1985. Habitat suitability index models: Red-winged Blackbird. *U.S. Fish and Wildlife Service Biological Report 82* (10.95) 20 pp. Accessed online on July 2, 2019 at: <https://nwr.usgs.gov/wdb/pub/hsi/hsi-095.pdf>

## **Nesting Bird Survey**

The nesting bird survey included both visually searching for nest structures and observing bird song and behaviour cues. Behaviours to note include adults carrying nesting material, food to the nest or fecal sacs away from the nest; young begging for food; and, adults flushing, giving alarm calls, distraction displays, or exhibiting agitated behaviour.

Finding nests can be difficult since most birds purposefully construct their nests in hidden locations to avoid detection and predation. Thorough and methodical surveys are therefore required.

Light conditions were good for locating nests. There was no inclement weather limiting bird detectability. Ambient temperature was between 5°C and 30°C, so surveys should not add stress to adults or cause the female to flush from the nest and endanger the survivability of eggs or nestlings. The terrain, forest type, and understory vegetation were factors influencing the duration of the surveys. Due to the narrow footprint of the Project's work area, multiple transects were not walked.

### *Site 1 – Gardom Pond at new outlet channel*

This site was the edge of Gardom Pond where the original discharge channel flowed, and where the Project will reinstate the outlet channel. The site is low and wet with a dense growth of Cattails, where RWB are known to nest. See photos below. A small section of Cattail needed to be cleared to reinstate the historic channel.

The Titus EM combed through the Cattails by hand and remained at the site for approximately 60 minutes after the survey. No nest structures were found, and no nesting activity was observed.

The change in RWB song and behaviour was noticeably different from the June 18<sup>th</sup> site visit. In June, RWB males could be heard calling frequently, and could easily be seen displaying their shoulder plumage and monitoring their territories. No such song or activity was observed in July. RWB song, which was the dominant birdsong heard in June, was completely absent in July. No RWB were observed at all around the pond.

## **Nesting Bird Survey Conclusions**

Based on the results of the survey, it appears that RWB nesting activity at Gardom Pond has finished for the year. This is consistent with the BC Conservation Data Centre's best information that most RWB nesting activity is completed by June, with some continuing into July (BC CDC, 2010).

Since RWB nesting tends to be highly synchronous at habitats like Gardom Pond (Short, 1985) the lack of RWB nesting activity at Site 1 can be extrapolated to the entire pond, and the assumption can be made that no RWB nesting activity at Site 1 means no RWB nesting activity at Gardom Pond.

The July 11<sup>th</sup> Titus QEP memo recommended a follow up site inspection to ensure RWB nesting activity at Gardom Pond had ceased prior to lowering the water level. This July 16<sup>th</sup> nesting bird survey provided this assurance, as no RWB nesting activity was observed. Titus recommends that water drawdown can proceed and that we believe the due diligence responsibilities to the *Wildlife Act* have been met.

### **Clearing at Site 1**

Following the RWB nesting bird survey, the contractor proceeded to clear the small area required at Site 1. The Titus QEP was on site, visually monitoring water quality with a turbidity meter on hand in case of any observed turbidity plume. No plume was observed.

The Titus QEP also monitored the Cattails as they were being removed to watch for flushing birds. None were observed. The cleared area and the stockpiled vegetation were also monitored for small mammals and amphibians. None were observed. The material beneath the cleared vegetation consisted of non-native fill. Native material was not observed in this small clearing area.

The operator left a narrow strip of vegetation at the outermost edge of the clearing area. Had a turbidity plume been created, this would have helped mitigate it and prevent sediment transport into the pond. However, this was not required. The operator proceeded slowly and carefully; no turbidity plume was observed entering the pond.

### **Water Drawdown Plan**

The water drawdown plan for the pond was discussed with the Titus QEP. Allowing the pond to drain through a fire hose and not be pumped down removes concerns about pumps and associated monitoring for fuel handling and potential for spills and other failures.

The limited volume and rate of flow that the hose can passively conduct and the ability to easily stop the flow in case any problems arise is also a benefit to this methodology.

Titus understands that the hose would discharge to the roadside ditch south of Harbour Hill Drive, along Razor Point Road. Titus recommends installing an energy dissipation structure at the hose outflow to prevent sediment mobilization and scour of the ditch. Wrapping the hose with poly or filter fabric and shredding the ends of the poly/fabric into long strips will help dissipate energy from water discharge and prevent scouring of the ditch.

Titus also recommends installing a series of check dams in the roadside ditch along Razor Point Road, downstream of the discharge. The check dams should slow the flow and help any mobilized sediment settle out of the water column prior to discharge downstream. The check dams could be composed of small riprap, or clear crush with small-to-mid-sized riprap reinforcing each check dam on the downstream side. The riprap would prevent the clear crush from washing out.

Anticipated flows are likely too strong to allow for check dams composed only of clear crush material.

Titus also recommends daily monitoring of water quality discharging at the hose outlet, and at the downstream discharge point. If water quality is not within allowable limits, the flow should be stopped and the intake should be examined to ensure it is taking in clean water from the pond. Once downstream water quality is back within allowable parameters, flow can be restarted and may have to discharge at a slower rate to give adequate time for ESC measures to function as intended (ie rate of flow may have become faster than the installed mitigation measures can handle), or ESC measures may have to be upgraded to handle the larger flows.

### Closing

We hope that this nesting bird survey, site inspection memo, and drawdown and ESC plan will meet your needs at this time. Should you have any questions or concerns, please email or call the undersigned.

Sincerely,

### TITUS BIOLOGICAL SERVICES INC.

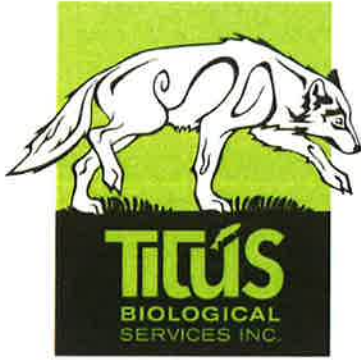


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## QEP MEMO – RWB NESTING

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TO: Ben Robinson, Project Manager

FROM: Titus Biological Services Inc.

DATE: 11 July 2019

PROJECT: Gardom Pond Dam Decommissioning, Pender Island

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The purpose of this QEP memo is to report on research on the nesting habits of the Red-winged Blackbird (RWB, *Agelaius phoeniceus*) with respect to the Gardom Pond Dam Decommissioning project, Pender Island, BC.

Titus Biological Services (Titus) was retained to assist with the environmental requirements of the project. The Titus Qualified Environmental Professional (QEP) conducted a field inspection Tuesday June 18<sup>th</sup>, 2019. The inspection was meant to follow up on a prior nesting bird survey, inspect the site, and provide erosion and sediment control (ESC) advice.

Titus was then requested to do a brief overview of the research on RWB nesting habits, to determine whether the usual nesting bird window of March 12 to August 17 is suitable in this instance. This window covers all habitat types in the Lower Mainland and Fraser Valley (nesting Zone A1), with peak nesting occurring between May 1 and July 22.

The nesting calendars provided by the Ministry of Environment and Climate Change Canada indicate that for wetland habitats in Zone A1, peak nesting intensity is from May 5 to July 15.

## Background

The Gardom Pond Dam is unstable and scheduled for decommissioning. This work will involve lowering the water level of the pond approximately 2 m. RWB are known to nest at Gardom Pond, which provides good quality nesting habitat in the form of Cattails (*Typha latifolia*) surrounding the pond.

The BC *Wildlife Act*, section 34 reads as follows:

A person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys

- (a) a bird or its egg
- (b) the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl, or
- (c) the nest of a bird not referred to in paragraph (b) when the nest is occupied by a bird or its egg.

*Wildlife Act* permits had not been obtained for this project. Although nesting birds surveys have and will be conducted for areas requiring clearing (direct impacts), the indirect impact to nests by lowering the water level was not previously addressed.

This memo serves to summarize research on nesting habits of RWB, and provide recommendations by which the project can proceed while exhibiting due diligence in regards to responsibilities under the *Wildlife Act*.

## Impacts to Nests

RWB nests, built by the female, are a basket of grasses, sedges, and mosses, lined with mud and bound to the surrounding vegetation. Nests can be from only centimeters above the water level to 4.3 m (14') high in surrounding trees or shrubs. Nesting over water reduces the likelihood of predation, and these nests are usually positioned low above the water (Cornell, 2017).

Short (1985) indicated that survivorship of RWB nests was related to height of the nest from the water, with decreased survivorship for nests 100 cm above the water compared to nests less than 20 cm above the water. Ortego and Hamilton (1978) in a study of 136 RWB nests also found that successful nests were significantly lower (closer to the water level) than unsuccessful nests.

Picman et al. (1993) suggest that deeper water areas of marshes give nesting birds greater safety, reduced complexity of predators, and reduce predators to a type that allows effective nest defence. In addition, the dense and relatively uniform cover provided by Cattails is likely to aid in concealing the nests from predators (Picman et al., 1993). According to this data, lowering the water level in Gardom Pond by 2 m would be expected to have a negative impact on active RWB nests.

Since negative impacts cannot be ruled out, we examined timing of nesting.

## Timing of Nesting

According to the BC Conservation Data Centre (BC CDC, 2010), nesting begins in most areas in April and May, sometimes in late March, and may continue into July. Nesting in July appears to be considered less common. Egg incubation lasts 11-12 days, and young fledge in about 10 days (BC CDC, 2010).

Maddox and Wiedenmann (2005) found that RWB nested almost 3 weeks earlier in Cattail than in Purple Loosestrife (*Lythrum salicaria*), a common invasive species. This result was consistent between the two sites and across the two years of this study (Maddox and Wiedenmann, 2005). Gardom Pond, as mentioned, is surrounded by Cattails. This may indicate that RWB would nest towards the earlier nesting times in their range. First-egg dates in this study ranged from May 10<sup>th</sup> to May 23<sup>rd</sup> in Cattails (Maddox and Wiedenmann, 2005).

Short (1985) noted that herbaceous wetlands dominated by Cattails with open, permanent water have the optimum number of available nest sites. These sites have higher nest densities, higher nest survival rates, and highly synchronous nesting (Short, 1985). This may indicate that the Gardom Pond RWB population would be less likely to have a highly variable nesting time, with less nesting beyond July 15.

## Conclusions

RWB may be one of the most abundant native birds in North America, with variability in nesting behaviour and timing in different regions. The brief research conducted for the Gardom Pond decommissioning supports our assumption that Gardom Pond is good nesting habitat for RWB, and also seems to support that nesting is likely to be synchronous and towards the middle (preferred) range of nesting times. This would point towards nesting in April and May, with fledging in May and June.

It is the opinion of Titus that a nesting bird survey could be conducted along some representative portion of Gardom Pond prior to water level drawdown, to determine the amount of nesting activity remaining in July. If the sample area appears to have little RWB nesting activity, we believe it is fair to assume that the sample area would indicate the level of nesting activity around all of Gardom Pond. If this activity is nil or minimal, we believe that the contractor would have performed their due diligence under the *Wildlife Act* and that water drawdown would not have to be delayed further.

However, should significant nesting activity be observed in the sample portion, water level drawdown should be delayed until the RWB young have fledged, in order to meet the obligations of the *Wildlife Act*.

It is interesting to note that a portion of the research on RWB in the literature studies control measures used to reduce damage to crops by large flocks of RWB. These control measures are now a major source of mortality to RWB in some parts

of North America (Ryder, 2015). Habitat loss due to destruction of wetlands has led to the extirpation of some colonies in BC (Ryder, 2015).

Also of interest, some research showed that RWB can nest in very small wetlands (Ryder, 2015; Yasukawa and Searcy, 2019). Reducing the water level and therefore the footprint of Gardom Pond may not preclude its use by nesting RWB in future, since they tolerate small breeding areas quite well.

### **Closing**

We hope that this nesting bird survey and site inspection memo will meet your needs at this time. Should you have any questions or concerns, please email or call the undersigned.

Sincerely,

### **TITUS BIOLOGICAL SERVICES INC.**



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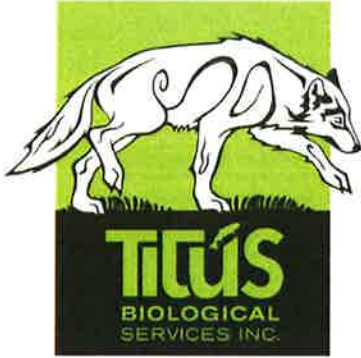


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## ENVIRONMENTAL INSPECTION MEMO

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TO: Ben Robinson, Project Manager

FROM: Titus Biological Services Inc.

DATE: 20 June 2019

PROJECT: Gardom Pond Dam Decommissioning, Pender Island

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The purpose of this memo is to report on a nesting bird survey and environmental site inspection at the Gardom Pond Dam Decommissioning project, Pender Island, BC.

The field inspection to follow up on a prior nesting bird survey by the Owner's Qualified Environmental Professional (QEP), inspect the site, and provide erosion and sediment control (ESC) advice was conducted by the Titus Environmental Monitor (EM) on Tuesday June 18<sup>th</sup>, 2019. Weather during the time of inspection was approximately 25°C, sunny with some scattered cloud.

### **Follow-up Nesting Bird Survey**

There were two trees of concern identified during the first nesting bird survey, for which the Owner's QEP requested a follow up inspection. The first tree had a visible nest structure, but no signs of nesting activity. The nest was given a tentative active designation because bird presence and breeding activity was not confirmed. The follow up inspection confirmed no nesting activity at the nest structure. The nest was determined to be inactive due to a lack of adult birds nearby and no new nesting material observed. See photos below.

The second tree was a good quality wildlife tree, with no nest structures but good habitat potential. The tree had excavated cavities present, indicating internal decay, and had a structure suitable as a hunting perch. See photos below. The

follow up inspection confirmed no nest structures and no nesting activity at the tree.

### **Additional Nesting Bird Surveys**

The nesting bird surveys included both visually searching for nest structures and observing bird song and behaviour cues. Behaviours to note include adults carrying nesting material, food to the nest or fecal sacs away from the nest; young begging for food; and, adults flushing, giving alarm calls, distraction displays, or exhibiting agitated behaviour.

Finding nests can be difficult since most birds purposefully construct their nests in hidden locations to avoid detection and predation. Thorough and methodical surveys are therefore required.

Light conditions were good for locating nests. There was no inclement weather limiting bird detectability. Ambient temperature was between 5°C and 30°C, so surveys should not add stress to adults or cause the female to flush from the nest and endanger the survivability of eggs or nestlings. The terrain, forest type, and understory vegetation were factors influencing the duration of the surveys. Due to the narrow footprint of the Project's work area, multiple transects were not walked.

#### *Site 1 – Gardom Pond at new outlet channel*

This site was the edge of Gardom Pond where the original discharge channel flowed, and where the Project will reinstate the outlet channel. The site is low and wet with a dense growth of Cattails (*Typha latifolia*), where Red-winged Blackbirds (*Agelaius phoeniceus*) are known to nest. See photos below. A small (less than 10 linear meters) section of Cattail will need to be cleared to reinstate the historic channel.

The Titus EM combed through the Cattails by hand, and remained at the site for approximately 30 minutes after the survey. No nest structures were found, and no nesting activity was observed. Nesting activity was observed in other locations in the Cattail around the pond, but the locations were >50 m from the area to be cleared and should not be of concern.

Red-winged Blackbird males are known to aggressively defend their nests, attacking much larger birds and swooping at humans who approach their nests. None of this territorial behaviour was observed during the nesting survey.

#### *Site 2 – Existing channel filling location*

A strip of trees along a ditch behind the berm require removal in order to dismantle the berm and use the berm material to fill the ditch. The area is a young coniferous forest dominated by Western Red-cedar (*Thuja plicata*) with minimal understory vegetation.

Inspecting the site with the operator, it turns out only some small diameter trees (less than 10 trees, each less than 30 cm DBH) will need to be removed. The larger diameter trees at this location can be retained, the operator can work around them. The trees to be removed were flagged for clarity. See photos below.

None of the trees inspected (small or larger diameter) had nesting bird activity or nest structures observed.

### **General Site Inspection and ESC Notes**

Titus suggests washing the newly constructed outlet channel prior to allowing it to freely discharge water. A small detention pond is proposed immediately downstream of Gardom Pond, with a rock lined channel downstream. Some sections will be culverted, under road and driveway crossings and adjacent to septic fields.

Titus recommends discharging water from the pond to clean the new channel and prevent sediment-laden water from discharging when the channel is fully activated. By installing a series of small check dams and being ready with trash pumps, the water could be allowed to enter the new channel slowly and be monitored for turbidity. Turbid water could be pumped to vegetated areas until fines from construction of the channel are flushed out and discharge water meets water quality parameters.

The design of the new discharge channel calls for embedded boulders and some sinuosity to the channel. Titus recommends using the embedded boulders (which should be 75% embedded for long term stability) as weirs where needed to direct flows, and help ensure that heavy flows are not putting undue pressure on certain sections of the channel banks.

Selected site photographs follow:





**Photo 1.** Tree with visible nest structure – the first of two trees being re-assessed during this follow-up nesting bird survey. The nest structure is circled with yellow.



**Photo 2.** Closer view of nest structure in first tree.





**Photo 3.** Wildlife tree with potential high quality nesting locations – the second of two trees re-assessed during the follow-up nesting bird survey.



**Photo 4.** The second tree was suitable as a hunting perch.





**Photo 5.** The second tree had excavated cavities present.



**Photo 6.** The second tree had excavated cavities present.





**Photo 7.** Gardom Pond cattails at the second nesting bird survey location.





**Photo 8.** Small diameter trees flagged for removal at the final nesting bird survey location.

We hope that this nesting bird survey and site inspection memo will meet your needs at this time. Should you have any questions or concerns, please email or call the undersigned.

Sincerely,

**TITUS BIOLOGICAL SERVICES INC.**

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