



September 25, 2019

Shelley Metcalfe, MEL, P.Ag.  
Section Head, Issues & Major Projects  
Environmental Protection Division  
Ministry of Environment and Climate Change Strategy

Via email: [shelley.metcalfe@gov.bc.ca](mailto:shelley.metcalfe@gov.bc.ca)

**Re: Cobble Hill Landfill Final Closure Construction  
Detailed Construction Plan and Extension Request**

Please find attached the Detailed Construction Plan, whereby Cobble Hill Holdings formally requests that the completion date for final construction be extended until August 31<sup>st</sup>, 2020 for the following reasons.

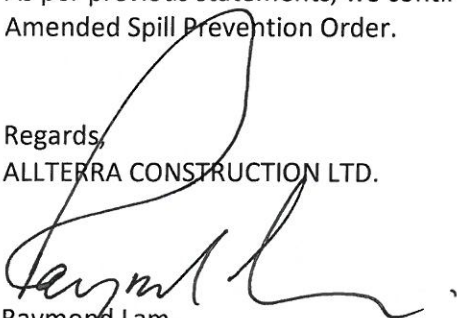
The 2019 Updated Final Closure Plan was developed assuming that a detailed construction activity work plan would be prepared in March 2019 and construction activities would commence on or before June 1<sup>st</sup>, 2019; however, conditional approval of the plan was not received until June 26<sup>th</sup>, 2019.

Given that approvals were not received per the originally planned schedule, some aspects of the construction work will not be completed in the 2019 construction period as initially planned. This is due to the availability of common fill material, subcontractor schedules and winter weather conditions that are not favourable for placing and compacting fill material. All reasonable efforts will be made to complete the closure works in a timely manner; however, the quality of work shall not be jeopardized by attempting construction during inclement weather.

Cobble Hill Holdings and others, have used the time between the issuance of the June 26<sup>th</sup>, 2019 conditions of approval and the issuance of this Detailed Construction Plan to compile background information, liaise with laboratories and subcontractors, confirm details with Ministry of Environment and Climate Change Strategy staff (including correspondence on August 8<sup>th</sup>, 2019 regarding QMP requirements and Environmental Monitoring details), and develop plans and reports required before the commencement of construction activities is allowed.

As per previous statements, we continue to formally protest the inclusion of Allterra as a Named Party in the Second Amended Spill Prevention Order.

Regards,  
ALLTERRA CONSTRUCTION LTD.

  
Raymond Lam  
General Manager

**COBBLE HILL LANDFILL  
FINAL CLOSURE CONSTRUCTION  
DETAILED CONSTRUCTION PLAN**

Cobble Hill Holdings Ltd.  
COBBLE HILL LANDFILL FINAL CLOSURE CONSTRUCTION 2019

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## 1. INTRODUCTION

This plan includes a detailed summary / plan of the works to be performed to complete Final Closure at the Cobble Hill Landfill (CHL). Lines of communication and important contact personnel are identified, detailed site reporting and records management are included, and quality management planning is outlined in a separate Quality Management Plan. An updated schedule of work has been included in Table 1. Figure 1 outlines a site plan for the landfill.

### 1.1 Schedule Considerations

The 2019 Updated Final Closure Plan was developed assuming that a detailed construction activity work plan would be prepared in March 2019 and construction activities would commence on or before June 1<sup>st</sup>, 2019; however, conditional approval of the plan was not received until June 26<sup>th</sup>, 2019.

Given that approvals were not received per the originally planned schedule, some aspects of the construction work will not be completed in the 2019 construction period as initially planned. This is due to the availability of common fill material, subcontractor schedules and winter weather conditions that are not favourable for placing and compacting fill material. All reasonable efforts will be made to complete the closure works in a timely manner; however, the quality of work shall not be jeopardized by attempting construction during inclement weather.

Cobble Hill Holdings and others, have used the time between the issuance of the June 26<sup>th</sup>, 2019 conditions of approval and the issuance of this Detailed Construction Plan to compile background information, liaise with laboratories and subcontractors, confirm details with Ministry of Environment and Climate Change Strategy staff (including correspondence on August 8<sup>th</sup>, 2019 regarding QMP requirements and Environmental Monitoring details), and develop preliminary plans and reports. Further reporting, as required, will be completed in Fall/Winter 2019. Cobble Hill Holdings formally requests that the completion date for final construction be extended until August 31<sup>st</sup>, 2020.

## 2. DETAILED SUMMARY OF WORKS

As outlined in the 2019 Updated Final Closure Plan, and as per the conditions of approval (provided in the June 26<sup>th</sup>, 2019 Letter from Minister Heyman), the following works will be completed during closure. Based on the current availability of fill material and concerns with completing construction works during fall/winter months, the final closure construction will be completed by August 31<sup>st</sup>, 2020.

Works planned for 2019, including pre-construction activities, include:

- Soil Importation
  - o Import and Stockpile Common Fill
  - o Import and stockpile Growing Medium
- Laboratory Testing on Soil and Liner
  - o Liner Testing – Integrity from Exposure
  - o Liner Testing – Shear Strength Confirmation on Friction Sand
- Other Pre-Construction Analysis and Reporting
  - o Prepare Updated Stability Analysis Report
  - o Prepare Updated Environmental Monitoring Plan

- Decommission Monitoring Well MW-4 (as per the Updated Final Closure Plan)
- Install New Shallow Monitoring Wells (MW19-01 and MW19-02)
- Install New SB-4 East of PEA (Per Amendment #1 to Updated Final Closure Plan)

Construction activities planned for 2020 include:

- Leachate / Leak Detection / Seepage Blanket Infrastructure
  - Install Toe Drainage Soak Away Trench
  - Cut Liner and Install / Weld Piping for Cleanouts
  - Inspect Leak Detection Layer
  - Extend Cleanouts
  - Extend Seepage Blanket Wells
  - Repair Liner & Liner Boots around Leachate / Leak Detection Pipe Cleanouts
- Construction of Soil Stabilizing Buttress and Associated Works
  - Place and Compact Common Fill Soil Stabilizing Wedge
  - Place Growing Medium
  - Hydroseed and Erosion Protection
- Earthworks on Slope
  - Coarse Sand Layer (Liner Interface)
  - Drainage Layer (Gravel)
- PEA Liner Works
  - Liner Inspection
  - Cut and Open Crest Liner
  - Relocate SMA Soil and Compact on PEA Crest
  - Reseal, Repair and Replace Liner as Necessary
- Earthworks on Crest
  - Install Crest Drainage Layer
  - Install Crest Subsoil Layer
  - Place Growing Medium Layer
  - Hydroseed and Erosion Protection
- Storm Water Management
  - Excavate and Shape Ditches
  - Ditch Liner Aggregates
  - Riprap and Erosion Control
- Site Clean-up, Roadways, Erosion Protection

## **2.1 Pre-Construction Activities**

### **2.1.1 Soil Importation and Stockpile**

Common fill and growing medium materials will be imported to the site and stockpiled in locations identified by the QP. The Common Fill and Growing Medium materials shall be stockpiled outside of the final soil stability wedge footprint during pre-construction.

As outlined in the Updated Final Closure Plan, a full-time construction supervisor will be onsite at all times during soil import events managing all haul trucks and earthmoving equipment to make certain all operators are working in a safe manner. Daily safety meetings are to be conducted during all active

construction days onsite prior to work commencement to discuss daily activities, outline safety concerns and will be documented in daily site reports.

### **2.1.2 Laboratory Testing on Soil and Liner**

To address comments from GHD and provide further information on soil stability and liner integrity, additional testing and analysis is planned. This includes testing of the existing geomembrane liner for Oxidative Inductive Time and 2% Modulus (as recommended by Solmax). Additional shear strength testing will also be completed for the friction sand and smooth geomembrane.

### **2.1.3 Other Pre-construction Analysis and Reporting**

Additional preconstruction activities are planned throughout the 2019 period, including: preparing an updated stability analysis report (based on the results of the shear strength testing); preparing an updated Environmental Monitoring Plan based on the installation of two new shallow monitoring wells; and decommissioning monitoring well MW-4 (prior to the soil stability wedge proceeding to this area). An additional Seepage Blanket Monitoring Well (SB-4) will also be installed.

## **2.2 Construction Activities**

### **2.2.1 Leachate / Leak Detection / Seepage Blanket Infrastructure**

Leachate collection pipe and leak detection pipe cleanouts will be installed at both the east and west ends of the existing collection systems within the north toe of the PEA to allow for future maintenance of the collection systems if necessary. This will involve careful cutting of the PEA to allow for tie-in to the existing infrastructure. During the installation of these cleanouts, the QP will inspect the leak detection layer to the extent possible to assist in verifying the conclusion that the basal liner is performing appropriately and operating as designed, as requested by GHD Task 5 Item 7. Once installed, the leachate / leak detection clean-outs will be extended in length along the side slope of the PEA towards the crest and the liner will be appropriately repaired by the Liner contractor. The eastern clean-out will be extended to the top of the PEA, as per GHD Task 5 Item 8. GHD Item 8 also suggests that an access road will be required to access the cleanout with equipment (due to the long length of the clean-out); however, SHA does not recommend providing an access road across the crest of the PEA at this time.

As outlined by GHD Task 5 Item 6, the leachate conveyance valve will need to be accessible within the soil stabilizing wedge. Access will be maintained by installing a 300 mm diameter (or approved equivalent) valve chamber as the soil wedge is installed. This will allow for future access to the valve by using a valve key placed into the chamber from the top of the chamber opening. The valve chamber will be within less than 10m from the north slope access road once construction is complete.

The three seepage blanket monitoring wells installed in 2017 will be vertically extended with PCV fittings and risers as the soil stabilizing wedge is constructed. Care will be taken when placing and compacting the common fill around the wells to ensure the infrastructure is not damaged. Once the stabilizing wedge is completed to design contours, permanent protection (such as large boulders or debris) will be placed around the wells and locking caps will be installed.

As per GHD Task 5 Item 5, SHA confirms that Seepage Blanket Monitoring Well locations in Figure 10-1 are correct based on as-built surveys completed during the 2017 Minor Construction Works. As such, only SB-2 and SB-3 will require vertical extensions during construction of the soil stabilizing wedge.

### **2.2.2 Earthworks at PEA Toe and on PEA Slopes**

As outlined in the design drawings, the toe drainage soak-away trench will be installed along the toe of the PEA. Care will be taken during excavation to make certain the 1.0-m thick secondary clay basal liner's integrity is maintained between the primary basal geomembrane and the PEA Toe Drainage Soak Away Trench to contain a potential leak from the secondary clay basal liner system (per GHD Task 2 Item 18). This trench should be backfilled with coarse aggregate & covered with geotextile prior to the stabilizing wedge progressing towards the toe of the landfill.

A 50mm sand friction layer will be applied on top of the existing liner on the slopes, followed by a gravel drainage layer over top to maintain appropriate friction forces and promote drainage of infiltrated surface water above the existing liner. The Quality Management Plan provides further details on the drainage gravel specifications.

As shown in the design drawings, common fill will be used in the soil stabilizing wedge to reduce overall slopes to approximately 5H:1V. The liner interface and drainage layers will be applied in thin horizontal lifts as the lifts of the soil wedge progress vertically along the outer slopes. A 12 oz. non-woven geotextile will be placed over top of the sand friction layer to minimize migration of the sand layer and an 8 oz. geotextile filter layer will be placed overtop of the drainage layer to maintain the desired hydraulic conductivity. These geosynthetic layers will be installed concurrently with the soil wedge and drainage layers.

Growing medium will be applied as the final layer in the slope stabilizing works, followed by an application of hydroseed. Large boulders or other debris should be placed around protruding infrastructure (i.e. clean-outs and groundwater wells) to protect the infrastructure in the long term.

### **2.2.3 Construction of Structural Stability Wedge**

Common fill will be placed and compacted as per the design drawings. The fill will be placed in 300-500 mm lifts track-compacted during placement by heavy construction equipment. Construction of the stabilizing wedge shall be completed concurrent to other construction works at the site. The footprint of the stabilizing wedge shall maintain at least an 8-metre buffer from the toe of the PEA until the toe drainage soak-away trench is completed, the additional shallow seepage blanket well (SHA SB-4) is complete and the leachate and leak detection pipe clean-outs have been extended. As construction of the wedge progresses, the friction sand interface layer will be installed as well as the gravel drainage layers and accompanying non-woven geotextiles. Existing and new seepage blanket wells will also be extended (vertically) as the wedge construction proceeds towards the location of the wells. Additional details are provided in Section 2.2.2, 2.2.4, and 2.2.6.

### **2.2.4 Eastern Soil Wedge**

Similar to the stabilizing wedge for the PEA (discussed above), the shear cliffs in the south east corner of the quarry will be remediated to approximately 5H:1V grades. This will return the PEA area closer

to pre-development grading and provide suitable habitat for vegetation species. The common fill should be placed in 300-500 mm lifts and track-compacted during placement with heavy construction equipment. The eastern soil wedge will receive erosion protection measures to promote rapid germination and minimize soil loss.

Monitoring well MW-4 will need to be decommissioned prior to construction of the Eastern Soil Wedge; this work will be completed following best management practices and will meet industry standards for groundwater protection.

### **2.2.5 PEA Liner Works**

The PEA liner will be visually inspected by a QP prior to earthworks on the slope or crest. To further assess the integrity of the existing liner, one sample of the existing geomembrane will be cut from the liner and submitted to a recognized laboratory for Oxidative Induction Time & 2% Modulus testing (as recommended by Solmax). Solmax recommended the frequency of sampling to be one sample for every 9,000 m<sup>2</sup>; given that the PEA is less than 9,000 m<sup>2</sup> in area, one sample will be submitted for testing. These analyses have been recommended by the liner manufacturer (Solmax). It is proposed that this testing be completed during pre-construction activities (discussed previously).

To allow for soil from the SMA to be deposited in the PEA, the existing liner will be carefully cut along the crest. The geomembrane will be folded and set aside to an area which will experience minimal traffic so as to not damage the liner. As outlined in the QMP, this work should only be undertaken under dry conditions where there is a minimal risk of precipitation. As outlined in the QMP and as recommended by GHD Task 5 Item 9, temporary tarps will be available to deploy over exposed areas should there be a risk of a heavy rain event during construction works when the PEA is open.

Soil from the SMA will be carefully loaded into trucks and transported to the PEA for disposal. Care will be taken as to not spill soil when loading the trucks, and the loading area will be kept clean to minimize contact between soil and vehicle tires. Additional details are provided in the QMP.

An earthen “bridge road” will be constructed out of clean fill to access the PEA and will comply with restrictions on vehicle travel over top of geosynthetics (as outlined in the QMP). This road will provide access for the trucks to discharge soil into the PEA. The road will be decommissioned when all transportation and travel over the PEA has ceased, unless the road has been constructed to comply with the crest closure specifications, in which case the road can remain.

Soil discharged into the PEA will be deposited at least 3 metres offset (inward) from the existing surface water ditch alignments. The final grades of the PEA shall be maintained at a minimum 4% towards the outside slopes and will be verified by a QP. A 12 oz. non-woven geotextile cushion layer will be placed overtop of the relocated soil to protect the previously removed LLDPE geomembrane barrier.

The subgrade conditions of the liner will be approved by the Liner Contractor and QP prior to liner work being undertaken at the site. The existing PEA liner will then be replaced overtop of the additional soil fill, and be rewelded and repaired (as required). It is expected that due to the increase in the volume of soil being encapsulated in the PEA, additional liner will need to be placed (as outlined in GHD Task 5 Item 9); this material will meet the requirements of the Liner Contractor’s QAQC



Manual. All pre-weld testing and qualifications should be completed to represent in-field conditions. As outlined by GHD, should the existing liner be welded to the additional liner, the existing liner should be placed beneath the additional material. A QP and the Liner Contractor will complete a final inspection of the liner system to ensure all testing and repairs are completed as per design documents.

GHD recommended in their Task 2 report that the soil wedge be constructed prior to cutting the geomembrane at the top slope to preclude potential slippage of the geomembrane down the side slope. While SHA acknowledges this recommendation, there currently is not a sufficient volume of soil at the site to complete the soil wedge in the 2019 construction window. If the wedge construction has not yet proceeded by the time that liner works are scheduled, the liner will be secured as per best management practices to prevent creeping during the SMA soil relocation

Detailed Liner QAQC including daily inspection (full-time supervision), equipment qualification, testing, documentation and reporting must be undertaken (by QP) during all aspects of liner work.

### **2.2.6 Earthworks on Crest**

The PEA liner works will be completed prior to the soil components being installed on the crest area. All appropriate inspections and approvals for the geomembrane shall be completed prior to the drainage layer installation. DRAINTUBE or Approved Equivalent (i.e. gravel-similar to slopes) will be applied as a drainage layer and will be fitted to drain the crest into the existing crest ditch system and will overlap the slope gravel drainage layer by a minimum of 1,000 mm (as per Closure Plan documentation).

SHA acknowledges GHD's concerns regarding how the non-woven geotextiles will be terminated at the crest of the PEA where they meet the dRAINTUBE (GHD Task 5 Item 19); however, due to the planned construction sequence, and that the soil wedge will be constructed prior to the crest closure works, SHA does not foresee any additional stresses on the geotextiles being introduced which will require further infrastructure.

A minimum 1,500 mm subsoil will be applied on the PEA crest and will be track-compacted during placement with heavy construction equipment. Work around and over top of the geomembrane should follow the restrictions for vehicle travel outlined in the QMP.

Once the subsoil layer has been completed, a 500 mm growing medium layer will be applied. The final stage of the crest earth works will include hydroseed application. Hydroseed should be applied immediately following installation of the growing medium to promote vegetative growth prior to the fall / winter rain events.

### **2.2.7 Storm Water Management**

The final contour design at the CHL is presented in Figure 4-1 of the Updated Closure Plan. The design involves a gentle sloping dome shaped crest at approximately 345m ASL and sloping to the south, west and north to surface water ditches before grading at approximately 5H:1V down the north and east slopes to the quarry floor at an elevation of 330m ASL, approximately 15m below the crest elevation.

Any outstanding surface water ditching that is required to promote run-on diversion and run-off management will be completed once works to the PEA and soil stabilizing wedge are complete. This will include cleaning out any / all existing surface water management infrastructure as well as excavating and shaping new ditching along the closure area as shown in Figure 4-1 and Figure 8-1 of the Updated Final Closure Plan (2019). Riprap aggregate will be installed as needed and as directed by the QP.

As per the Closure Plan, the toe ditches and crest ditches will be lined with 300 mm thick rip rap and will be 0.75 m deep with 2.5H:1V side slopes. Downchutes will be lined with heavy weight non-woven geotextile and 600 mm thick Rip Rap, and will be trapezoidal in shape and have a total depth of 0.5 m, bottom width of 1.0 m and side slopes at 2.5H:1V.

At Closure the surface water management system will not interact with the proposed leachate contingency ditch given that the leachate contingency is conceptual at this time. In the event that the leachate contingency ditch is required to be installed at the site, additional surface water management works (such as additional ditching or conveyance piping) may be required so that the conveyed surface water does not interact with the leachate contingency ditch.

To address the second portion of GHD Task 5 Item 14, the existing leachate conveyance pipe has been installed subsurface and is covered with an earthen berm for protection. Surface water ditching will be installed on the north slope of the soil stabilizing wedge (and on the southside of the access road) to make certain that there is no interaction between the existing leachate conveyance piping and the proposed surface water ditching at the location where the two conveyance lines meet.

### **2.2.8 Site Clean-up, Roadways, Erosion Protection**

Prior to final inspection of the closure works, the site should be cleaned-up and any debris, unused materials and equipment should be removed from site. All final road surfaces shall be in working order.

## **3. PROJECT TEAM**

As outlined above, numerous work tasks need to be completed as part of the final closure works. In order for construction, QP signoff and ENV inspections to take place seamlessly, communication between all project team needs to be a priority.

Below is a list of the project team along with their contact information. As the construction works progress, there may be a need to update the contact personnel and contact information. This should be addressed in the bi-weekly inspection reports circulated to all project team.

### **3.1 Owner's Contacts:**

1. Cobble Hill Holdings Ltd:  
Marty Block (Primary Contact)  
1 (250) 216 9475  
Email – [marty@chholdings.ca](mailto:marty@chholdings.ca)  
Michael Kelly  
Email – [mike@chholdings.ca](mailto:mike@chholdings.ca)

### 3.2 Contractor's Contacts:

2. Allterra Construction Ltd:  
Raymond Lam (Primary Contact)  
1 (250) 508 0726  
Email – [Raymond@allterraconstruction.ca](mailto:Raymond@allterraconstruction.ca)  
  
Todd Mizuik  
1 (250) 589 4041  
Email - [Todd@allterraconstruction.ca](mailto:Todd@allterraconstruction.ca)

### 3.3 Owner's Qualified Professionals' Contacts:

3. Sperling Hansen Associates:  
Tony Sperling  
1 (604) 986 7723  
Email - [sperling@sperlinghansen.com](mailto:sperling@sperlinghansen.com)  
  
Scott Garthwaite (Primary Contact)  
1 (604) 803 7120  
Email - [sgarthwaite@sperlinghansen.com](mailto:sgarthwaite@sperlinghansen.com)

Daily site reports will be completed by CHH personnel and will include notes and photos of the onsite works and bi-weekly construction progress reports will be completed by the onsite QP (SHA or other approved QP) and circulated to the project team. The weekly progress reports will also include any changes to construction, construction schedule and inspections.

### 3.4 Qualifications

A Qualified Professional will be present onsite, at varying frequencies, for all portions of construction. For all critical tasks identified below, SHA representatives will be continuously onsite. For non-critical tasks, a QP approved by the ENV will be present onsite, at varying frequencies; this QP may be a representative of SHA or of an approved local firm (to be determined). All proposed QP's will submit an approval request to the ENV accompanied by a signed Declaration of Competency and Conflict of Interest Disclosure Statement prior to undertaking QP responsibilities at the site.

The Qualifications of SHA staff members are discussed further below. Should any additional members of SHA staff be added to the list of QP's the approval process discussed previously will be followed.

#### Critical Tasks:

1. PEA Liner Works
2. Earthworks on Slope or Crest within 2-meters of PEA
3. Leachate / Leak Detection / Seepage Blanket Infrastructure

#### SHA Staff :

**Dr. Tony Sperling, Ph.D., P.Eng. (Senior Engineer):** Tony is the President and Chief Engineer of Sperling Hansen Associates. Tony holds a Bachelor of Applied Science in Geotechnical Engineering, a Master's of Applied Science in Mining Engineering, and a Doctorate in Geological Engineering. As a Landfill design specialist, he has provided state of the art landfill engineering services relating to

design, operation, leachate management and closure for over 27 years. He completed over 1,000 geotechnical assessments, design and operations plans and closure plans and closure construction, landfill expansion, waste management and feasibility studies for over 160 landfills. He was adjunct Professor at University of British Columbia and is a Lecturer at BCIT and SWANA courses. Tony is the only Certified SWANA – MOLO Instructor in B.C. He is also a Director of SWANA B.C. Pacific Chapter, and Co-Chair of the Training Committee.

Should there be any events during construction that require senior engineering support, Tony will be available to assist.

**Scott Garthwaite, AScT. (Senior Civil Technologist):** Scott holds a Diploma in Civil Engineering from the British Columbia Institute of Technology. Scott has 12 years of experience working directly on landfill construction projects in British Columbia. Scott’s main responsibilities at SHA include project management and coordination, construction contract administration, landfill design, organics and residual waste management, and QA/QC inspections. Scott is SHA’s senior QA/QC technician and has taught courses related to landfill development and closure at BCIT, BCQLO, SIWMA, and abroad.

Scott will complete QA/QC inspections for all critical tasks described above. For non-critical work, Scott will complete weekly site visits or coordinate QP from an approved local firm. Scott will be the primary contact for SHA during the construction period.

As requested in the Conditions for Approval letter, Table -1 (Schedule) also includes a column which specifies which QP will be conducting which task.

#### **4. RECORDS MANAGEMENT**

All construction records and as-builts for the project will be completed by CHH personnel throughout the course of the Final Closure Construction. Records and As-builts include all survey pick up for completed above ground and below ground works. The project QP (SHA) will review and approve all as-builts and records for submission to ENV.

Records will also include all testing, changes made in the field, daily inspection reports and reports from ENV and their External Monitors (GHD Limited).

#### **5. SCHEDULE**

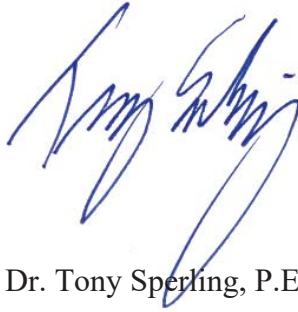
The attached Table 1 – 2019 Closure Works Construction Schedule, outlines the construction tasks and the proposed commencement and completion dates. The 2019 Closure Works Construction Schedule will be updated and submitted at the beginning of every quarter, i.e. every three months. If dates to specific work tasks change during construction, an update will be provided on a bi-weekly basis and circulated to the project team. **A minimum of 48 hours notice will be provided to the ministry of any changes to the work plan prior to the work being undertaken on site.**

Construction works are currently planned for weekdays only; Monday through Friday from approximately 7:00am to 5:00pm. If work must be carried into the weekends based on contractor and sub-contractor availability, notice will be provided to all parties by mid-week prior to weekend activities and at least 48 hours in advance of the work being undertaken.

Yours truly,



Scott Garthwaite, AScT



Dr. Tony Sperling, P.Eng.



*September 27, 2019*

**SPERLING HANSEN ASSOCIATES**

Table 1 - Proposed Construction Schedule

Task	Start Date	End Date	QP Present
<b>Pre-Construction:</b>			
<b>Soil Importation and Stockpile</b>			
Import and stockpile common fill outside of final soil stability wedge footprint	1-Oct-19	Q3 2020	N/A
Import and stockpile growing medium outside soil stability wedge footprint	1-Oct-19	Q3 2020	N/A
<b>Laboratory Testing on Soil and Liner</b>			
Liner Testing - Integrity from Exposure (OIT and Modulus)	Q3 2019	Q4 2019	N/A
Liner Testing - Shear Strength Confirmation on Friction Sand	Q3 2019	Q4 2019	N/A
<b>Other Pre-Construction Analysis and Reporting</b>			
Prepare Updated Stability Analysis Report	Q3 2019	Q4 2019	N/A
Prepare Updated Environmental Monitoring Plan (based on new information from drilling)	Q4 2019	Q4 2019	N/A
Install new shallow monitoring wells (MW19-01 and MW19-02)	Q4 2019	Q4 2019	Yes
Decommission MW-4	Q4 2019	Q4 2019	Yes
Install new SB-4 east of PEA	Q4 2019	Q4 2019	Yes
<b>Construction:</b>			
<b>Leachate /Leak Detection / Seepage Blanket Infrastructure</b>			
Install Toe Drainage Soak Away Trench	Q1 2020	Q2 2020	Yes
Cut liner and install/weld piping for cleanouts	Q1 2020	Q2 2020	Yes
Inspect leak detection layer	Q1 2020	Q2 2020	Yes
Extend Clean-outs	Q1 2020	Q3 2020	Yes
Extend Seepage Blanket Wells	Q1 2020	Q3 2020	Yes
Repair Liner - Liner Boots around Leachate / leak Detection Pipe Cleanouts	Q1 2020	Q2 2020	Yes
<b>Construction of Soil Stabilizing Buttress &amp; Associated Works</b>			
Place and Compact Common Fill Soil Stabilizing Wedge	Q4 2019	Q3 2020	Yes
Place Growing Medium	Q1 2020	Q3 2020	Yes
Hydroseed and Erosion Protection	Q2 2020	Q3 2020	Yes
<b>Earthworks on Slope</b>			
Coarse Sand Layer (Liner Interface) - Concurrent with Soil Stabilizing Buttress	Q1 2020	Q3 2020	Yes
Drainage Layer (Gravel)	Q1 2020	Q3 2020	Yes
<b>PEA Liner Works</b>			
Liner Inspection	Q1 2020	Q3 2020	Yes
Cut and Open Crest Liner	Q2 2020	Q3 2020	Yes
Relocate SMA Soil and compact on PEA crest	Q2 2020	Q3 2020	Yes
Reseal, Repair and Replace Liner as necessary	Q2 2020	Q3 2020	Yes
<b>Earthworks on Crest</b>			
Install Crest Drainage Layer	Q2 2020	Q3 2020	Yes
Install Crest Subsoil Layer	Q2 2020	Q3 2020	Yes
Place Growing Medium Layer	Q2 2020	Q3 2020	Yes
Hydroseed and Erosion Protection	Q2 2020	Q3 2020	Yes
<b>Storm Water Management</b>			
Excavate and Shape Ditches	Q2 2020	Q3 2020	Yes
Ditch liner aggregates	Q2 2020	Q3 2020	Yes
RipRap & Erosion Control	Q2 2020	Q3 2020	Yes
<b>Site Clean Up, Roadways, Erosion Protection, etc.</b>			
	Q3 2020	Q3 2020	Yes
<b>Construction QAQC</b>			
Inspection schedule based on Complexity of Work Being Complete			
<b>Project Wrap Up and Reporting</b>			
	Q3 2020	Q4 2020	N/A