SṈIDȻEŁ Resiliency Project

Annual Operating Plan 2022

Tod Inlet, Gowlland Tod Provincial Park

Partnership Agreement Holder:	PEPÁḴEN HÁUTW Food Systems Education Foundation
Partnership Number (with BCParks):	PA2019-13
Operating Year:	2022
Date completed:	Dec 17, 2021

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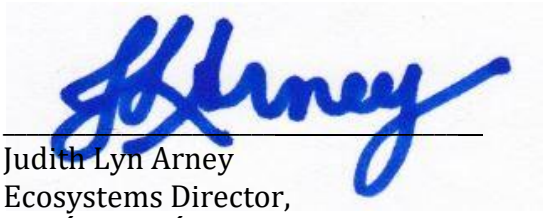
Submitted to BC Parks by:



Judith Lyn Arney
Ecosystems Director,
PEPÁḴEN HÁUTW Foundation

Approved by BC Parks:

Part 1: Partnership Engagement Summary

Name of Agreement Holder: PEPÁḴEN̲ HÁUTW̲ Food Systems Education Foundation

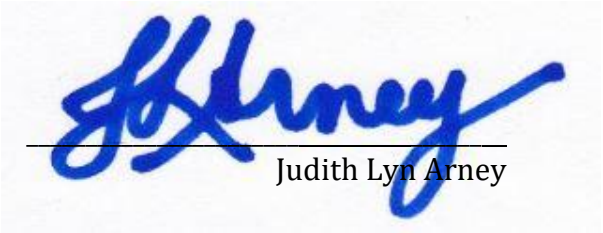
Contract number: PA2019-13

Date Form Completed: Dec 17 2021 For Calendar Year: 2022

Total number of individuals who performed Services during 2021 calendar year under age 85 and not "employees" of your organization.	Total number of hours of Services performed by all the individuals.
218	868

I hereby confirm that the information contained in this Engagement Summary is true and correct as of the date this report was prepared.

Signed by an authorized representative of the Agreement Holder:



Judith Lyn Arney

Part 2: Key Personnel

Group Contacts:	Name	Position	Contact #
Main Contact	Judith Lyn Arney	PEPÁḴEN HÁUTW̱ Ecosystems Director	[redacted]
Alternate	Sarah Jim	PEPÁḴEN HÁUTW̱ Senior Crew	[redacted]
Alternate	PEPAḴIYE Cooper	PEPÁḴEN HÁUTW̱ Programs Director	[redacted]

Key Personnel:	Duties / Responsibilities
Judith Lyn Arney	PEPÁḴEN HÁUTW̱ - BC Parks coordination, SRP restoration planning, restoration, crew coordination, education
Sarah Jim	SRP restoration planning, restoration, education
PEPAḴIYE Cooper	PEPÁḴEN HÁUTW̱ Program Director, restoration, education
Earl Claxton Jr	PEPÁḴEN HÁUTW̱ Program Elder, education

Part 3: 2021 Work Summary

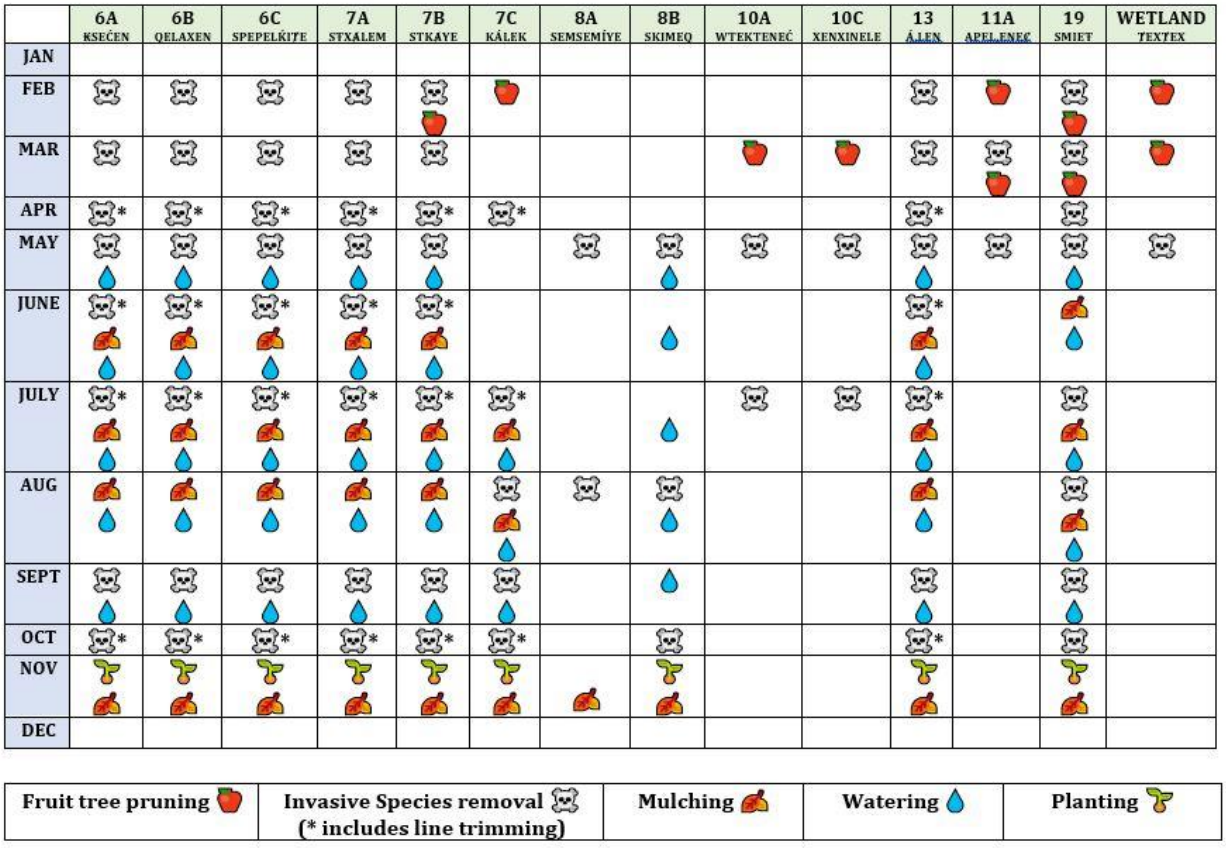
We started off our year with similar safety protocols as we had all through 2020, with very few volunteers coming on an individual basis and no student and volunteer group days at all. However by summertime most of our crew had been vaccinated against covid19 and restrictions started to ease, so we began inviting groups back to join us at SṈIDȻEŁ! As always, this infusion of energy and support is a huge benefit to our work on many levels. First, of course, the benefit to the ecosystems of SṈIDȻEŁ is clear as we can cover much more ground with a group of 10-30 people compared to a staff crew of 3 or 4. Additionally and important, connecting with student and volunteer groups gives us the opportunity to share and demonstrate the significance of cultural resurgence and restoration work. We share specifically about this special place but also in the hopes that others are inspired to start or deepen their own learning journeys and take meaningful action in their home communities.

We were also able to move forward with our soil remediation plans, and our colleagues at the Compost Education Centre did soil testing, set up experimental soil remediation plots, and provided us with recommendations for supporting soil health and the safety of workers on site.

Finally we were also able to protect some of our more vulnerable restoration areas through constructing split rail fencing at the back of the beach and around our native pollinator beds! 2021 was a highly productive year at SṈIDȻEŁ and we are pleased that we were able to accomplish as much as we did during challenging times.

3.1 Ecosystem Restoration

SN̲IDȻEŁ Resiliency Project: Restoration Work Plan 2021



We were able to follow our work plan fairly closely this year, especially with the added support of student and volunteer groups since summertime. We didn't do any fruit tree pruning as we were still fairly short staffed in the late winter/early spring during the pruning season. Starting line trimming earlier in the year was greatly beneficial to keeping invasive cover manageable during the warmer months of typically vigorous growth. We also didn't do mulching until autumn as we were waiting for results from the experimental soil plots as to best treatment options for the lower sites, which are the focus of our mulching efforts due to the site being exposed and exhibiting some poor soil characteristics in general (for example, much of the soil on 7B appears to be fill or at least have very little organic topsoil). Our mulching approach will be further explained in section 3.2 of this report on Soil Remediation.

Our new watering system, developed in 2020, worked very well this year. During the "heat dome" in late June and throughout the long hot dry spell of summer, we maintained a good watering schedule for our recently planted species. Sadly we did see a few losses (approximately 10 plants across various sites, mostly alder), probably due to the extreme heat, however for the most part our planted species did quite well.

Our autumn plantings were concentrated in the beach area and our pollinator beds, supported by the construction of new split rail fencing. We added leaf mulch donated by Linda Petite from the Horticulture Centre of the Pacific at the time of planting the pollinator beds, and some grand fir mulch to the beach plantings brought by our friend Nathan Fisk at Fort Rodd Hill who also donated many of the KEXMIN transplants and seeds.

SṈIDĆEŁ Plantings November 2021

site	plantings
6b pollinator bed	seed: Red Columbine *Aquiliegia formosa*, Large Leaved Lupine *Lupinus polyphyllus ssp. pallidipes*, Seablush *Plectritis congesta*, KEXMIN *Lomatium nudicaule* transplants: Douglas' aster *Symphyotrichum subspicatum*, California aster *Symphyotrichum chilense*, Fireweed *Chamerion angustifolium ssp angustifolium*, Pearly Everlasting *Anaphalis margaritacea*, Woolly sunflower *Eriophyllum lanatum*, Self Heal *Prunella vulgaris ssp lanceolata*
8b pollinator bed	seed: Farewell to Spring *Clarkia amoena*, Broad leaved shootingstar *Primula hendersonii*, Red Columbine *Aquilegia Formosa*, Miner's lettuce *Claytonia perfoliata*, White fawn lily *Erythronium oregonum*, Yellow monkey flower *Erythranthe guttata*, Graceful cinquefoil *Potentilla gracilis var. gracilis*, Large Leaved Lupine *Lupinus polyphyllus ssp. pallidipes*, Seablush *Plectritis congesta* transplants: Douglas' aster *Symphyotrichum subspicatum*, California aster *Symphyotrichum chilense*, Fireweed *Chamerion angustifolium ssp angustifolium*, Pearly Everlasting *Anaphalis margaritacea*, Woolly sunflower *Eriophyllum lanatum*, Self Heal *Prunella vulgaris ssp lanceolata*
19 pollinator bed	seed: Western St John's wort *Hypericum scouleri,* Goldenrod *Soilidago lepida* transplants: Mountain sneezeweed *Helenium autumnale var. grandiflorum,* Hardhack *Spirea douglasii*
SÁSU (beach)	seed: KEXMIN *Lomatium nudicaule* transplants: KEXMIN *Lomatium nudicaule*, Entire leaved gumweed *Grindelia stricta*, Sea Thrift *Armeria maritima*, Black twinberry *Lonicera involucrata*

3.2 Soil Remediation

We moved forward with the soil remediation research and planning with Compost Education Centre that we had planned in 2020. Alexis Horgan and Danielle Stevenson from the Compost Education Centre set up soil plots on sites 7a and 7b, conducted soil testing, and analyzed the results. They provided us with both the technical results of their work as well as a summary of what those results meant both in terms of soil contamination and safety protocols for our staff and volunteers (Appendices V-VII). In brief, there were low to moderate levels of lead, arsenic and zinc found in the soil plots on sites 7a & 7b. These levels are not dangerous for people working on these sites provided they are not inhaling or ingesting the soils, however we are cautious not to include very young children in the work on these sites as direct ingestion of soil could be harmful. Volunteers and staff were informed of this risk when we work on these sites; we have also included the statement of risk in our volunteer record book available every work day for anyone to review.

At this time our best option for soil remediation is to add mulch on top of contaminated soils. We understand from our colleagues at CEC that this method will help to bind and dilute the heavy metals in the soils at SN̓IDȻEŁ to prevent significant uptake by plants and support increased soil health in this area. We began mulching first around our planted species in autumn, using fish bark mulch purchased from Macnutt Ltd. This mulch was the closest available approximation to the soils of natural forest floor we could find.

3.3 Beach Fence & Pollinator Bed Construction

Last autumn we planted some KEXMIN at the back of the SÁSU (beach) and were so excited to see the first shoots coming up in spring! Unfortunately the beach area becomes so active over the year that these plantings were compromised, particularly by dogs and kids playing in the sand.

Our native pollinator beds were also struggling, mostly because their borders were not well defined on our restoration sites. Our restoration sites are quite large, with many invasives on the herbaceous level while most of our planted species being at the shrub or tree level. The native pollinator beds often got lost in the profuse invasive cover on our sites.

To address both of these issues we decided to build fencing to protect our most vulnerable plantings. Nate Williams subcontracted with us and attained some beautiful salvaged cedar logs, which we split into rails, brought down to the inlet and put together ourselves! The results are quite lovely, providing protection and giving us more opportunity to do hands on education with the smallest of the important plants that dwell at SṈIDȻEŁ.

3.4 Student & Volunteer Groups

We were so grateful for the added energy of student and volunteer groups joining us this year! In June we began to open up to group work days and connect with many different groups from around the region. These include:

- Living Lab Network & Summer Youth Program
- Swan Lake Nature Sanctuary
- Lifecycles Project Society
- UBC Law, Learning on the Land
- Pacific Rim College
- Habitat Acquisition Trust
- Parks Canada
- Camosun College Early Childhood Education Dept
- Fort Rodd Hill Historic Site
- UVic Restoration Student Network
- UVic Public Health & Safety Dept
- Stelly's Secondary School
- Good Food Gathering Conference
- W̱SÁNEĆ Leadership Secondary School (through our program at the Tribal School)

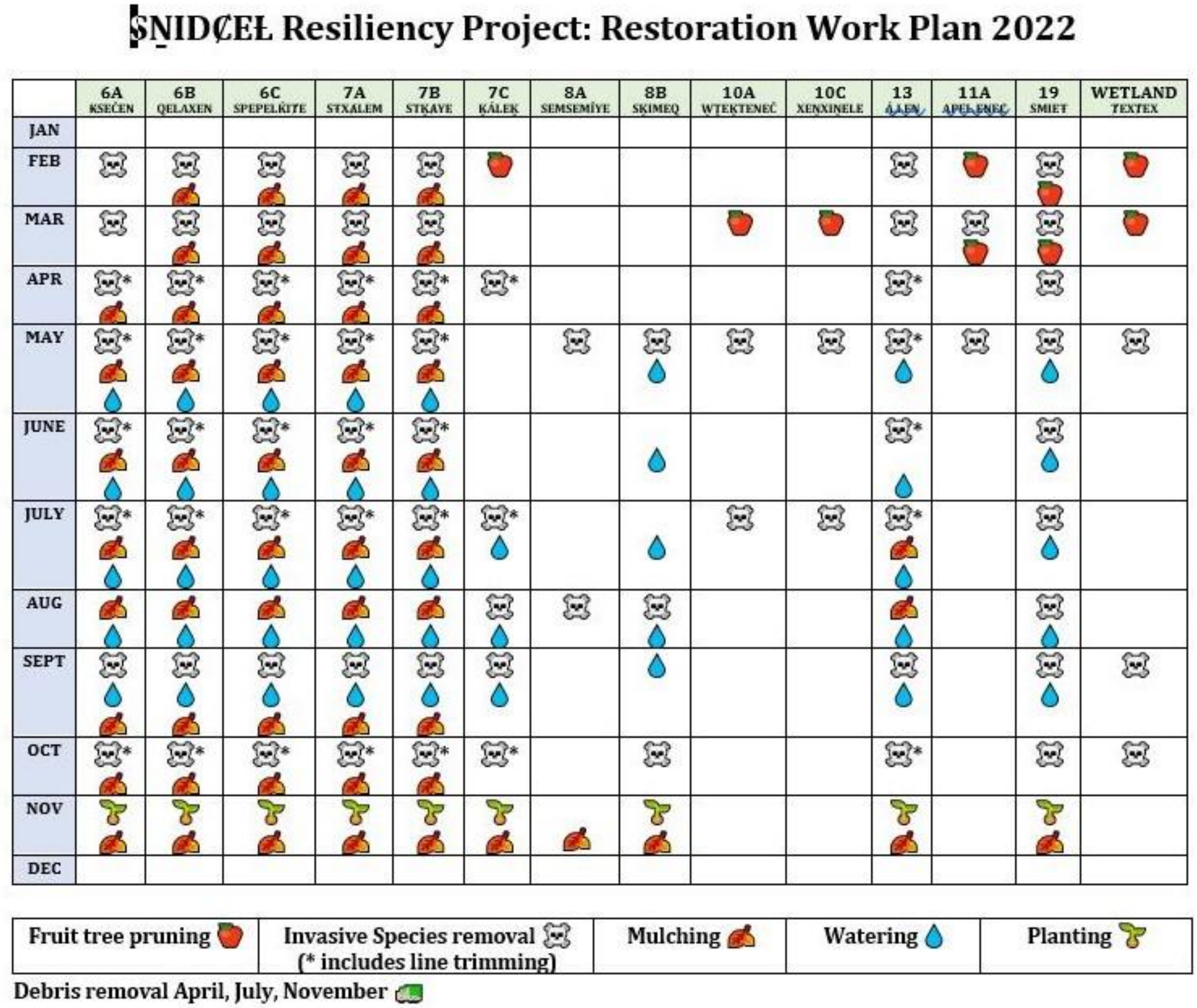
We also had a few dedicated individuals join us on our scheduled work days from February onwards through the year. Tracey Murphy and Steve Schalm volunteered all through the winter and spring and both later became staff members! The UBC Law students came out first on the Sept 30 National Day of Truth & Reconciliation, and many students continued to join us regularly throughout the autumn months. Two of these students, Sebastian Cooper & Xilonen Hanson Pastran, extensively researched legal questions we had about SṈIDȻEŁ from both a colonial law and a W̱SÁNEĆ law perspective.

While our work on the land often appears to be focussed on the mechanics of ecosystem restoration, the layers run very deep as to what this work really means to people and place. The core tenets in our approach to ecosystem restoration involve supporting W̱SÁNEĆ cultural resurgence, building cultural awareness for both indigenous and non-indigenous peoples, analyzing privilege and positionality, and taking *action* to counter the devastating impacts of colonization and capitalism. Doing this in community has so much meaning. Frequently we hear people say that during a work day at SṈIDȻEŁ they really connected to the land, to their own sense of responsibility, to the depth of W̱SÁNEĆ connection to place, and finally to each other. In the closing circle of one of our last groups of the year, one person said, “this day has changed my life”.

We are grateful to be able to support the many layers of change needed to truly heal the land in community.

Part 4: 2021 Work Plan

4.1 Ecosystem Restoration



INVASIVE REMOVAL
From February to May/June and September to November, invasive removal will generally consist of digging out invasive plants with the objective of removing as much of the whole plant (including roots) as possible. Each site will receive comprehensive 'sweeps' where the most aggressive invasive plants and patches are removed first, with an emphasis on clearing invasives away from the planted species. This process is greatly accelerated by volunteer groups and classes as well as concentrated crew hours.

During the summer months (June/July to August), the main objective is to prevent invasive species from flowering and protect planted species from being overtaken by invasive plants. Often the soil becomes too dry to effectively remove roots in summer, therefore every attempt will be made to simply remove as much of the invasive plant as possible and generally clear each site of vigorous invasive growth.

MULCHING

BARK MULCH

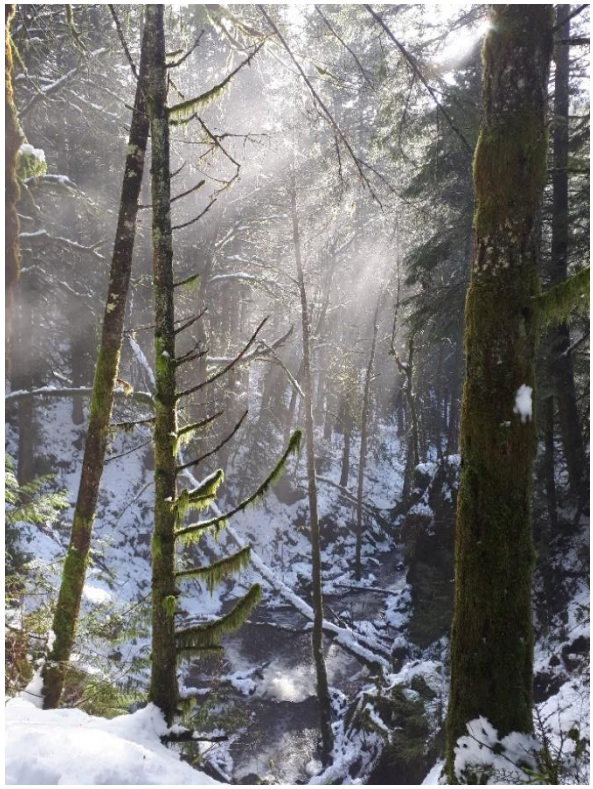
We intend to bring in approximately up to 100 yards of partially decomposed fish bark mulch (current source: MacNutt Ltd) throughout the year to help suppress invasives from planted species and contribute to soil remediation efforts (see section 4.2 on Soil Remediation). This mulch will be applied around planted species first, ensuring the mulch does not touch or cover the stems of the plants. Then a broader layer of bark mulch can be applied across each lower site to enrich these contaminated soils.

LEAF MULCH

Leaf mulching is an important part of restoring the microbiota of each restoration site. Specifically alder and maple leaves can be raked up from the roadways around the inlet in autumn and gathered onto tarps, then spread out over sites as thickly as possible given the amount of leaves available. Priority will be given to the newer sites with the most exposed soil (6c, 7a, 7b, 10c, 13, 19); if there are more leaves available the remaining sites can also receive a mulch layer. If leaf mulch is limited, concentrate the leaf mulch around the planted species.

FRUIT TREE PRUNING

We have a great interest in the fruit trees at SN̓IDȻEŁ. It seems they are mostly apple trees but we may have also seen some plum trees too. In spring 2018 we flagged all of the flowering fruit trees we could access in order to mark them for pruning in the late winter/early spring of future years. In Jan/Feb 2022 we will have guests from the Lifecycles Project Society Fruit Tree Project visit us for at least two pruning days and hope to benefit form their expertise regarding the care of these older fruit trees.



WATERING

We will continue to use our water system developed in 2020 (see Water Cistern & Watering System in 2020 Work Summary). Plants require watering for approximately 3 years after being planted on site. Although this is subject to annual weather conditions, generally watering begins in late May/early June and continues until early September. In cool spring or autumn conditions, watering can be done on all sites once or twice a week, while in warm summer months watering will be done on all sites three times a week.

FLAGS

All plants which will require water through the spring and summer of 2021 are flagged in blue and red ribbon. Blue flagging only indicates plants planted before 2020, many of which no longer require water but still need to be identified so they can be continuously kept clear of invasive species over the course of the year. Planted species that have grown tall enough to be seen above

the dense invasive cover of spring and summer, and no longer require water, will have their flags removed. Exceptions to this flagging system are the new beach and pollinator beds, which we will water for two years after each set of plantings.

DEBRIS REMOVAL
The most convenient method for debris removal is to contact Randy from the Metal Salvage place on West Saanich Rd (adjacent to the Tribal School) 250-880-0963. Piles are currently near the shoreline across from site 7a, by the switchback up top at site 7b, and by the Benvenuto gate on site 19. Debris removal ideally takes place after each spring, summer and autumn restoration season.

Sometimes metal, recycling, and garbage is found on the restoration sites (especially site 19) and will be taken away by crew annually and disposed of at the Hartland facility, metal salvage yard or by residential municipal pickup after transport to a pickup location.

NATIVE PLANT PROPAGATION
We will be developing a propagation plan for SȻIDȻEŁ in January as we continue to add plants to the restoration sites. Cuttings will be done in the dormant season and seed collection through the summer and early autumn month for autumn seeding. Native plants we propagate fo the SȻIDȻEŁ Resilience Project will be cared for at the PEPÁȻEȻ HÁUTW̱ Native Plant Nursery until they are planted at SȻIDȻEŁ.

4.2 Soil Remediation

Over the past year PEPÁȻEȻ HÁUTW̱ has been working with the Compost Education Centre to do soil remediation planning for the contaminated soils at SȻIDȻEŁ. Alexis Hogan, CEC Executive Director, provided us with the technical reports from soil samples she took in 2020 (see Appendix V). Danielle Stevenson followed up with a summary of the report findings and a statement of risk for staff & volunteers to review and understand prior to working in the contaminated areas (Appendix VI & VII). Fortunately the levels of lead, arsenic and zinc are designated 'low to moderate', so the risk for youth and adults working on the affected sites is extremely low. We will not include young children in the work on these sites as they may actually ingest the soil, which could be harmful.

As mentioned in section 3.2, we determined with CEC that adding a mulch layer to these sites was the most practical and cost effective method to remediate the soils at this time. We plan to continuously bring in the fish bark mulch over the course of the year and apply it in a thick layer across the sites (pending the impact statement from BC Parks).

CEC will be expanding the soil testing across SȻIDȻEŁ to determine the extent of the contamination across the area. Since SȻIDȻEŁ has always been a place where W̱SÁNEĆ people gather native plants as food and medicines, we are also interested in testing the fruits and harvestable parts of plants in

the area to understand more about how soil contamination may be affecting these traditional resources.

4.3 Signage

We would like to develop signage at SṈIDȻEŁ to increase education and awareness of the restoration work at SṈIDȻEŁ as well as the W̱SÁNEĆ connection here. We will be working through 2021 to design and print 5-10 signs that will promote a greater understanding by the public of our work and the importance of SṈIDȻEŁ to the W̱SÁNEĆ community. We will be consulting and collaborating with Tsartlip First Nation, W̱SÁNEĆ Leadership Council, W̱SÁNEĆ community members, and BC Parks on sign development.

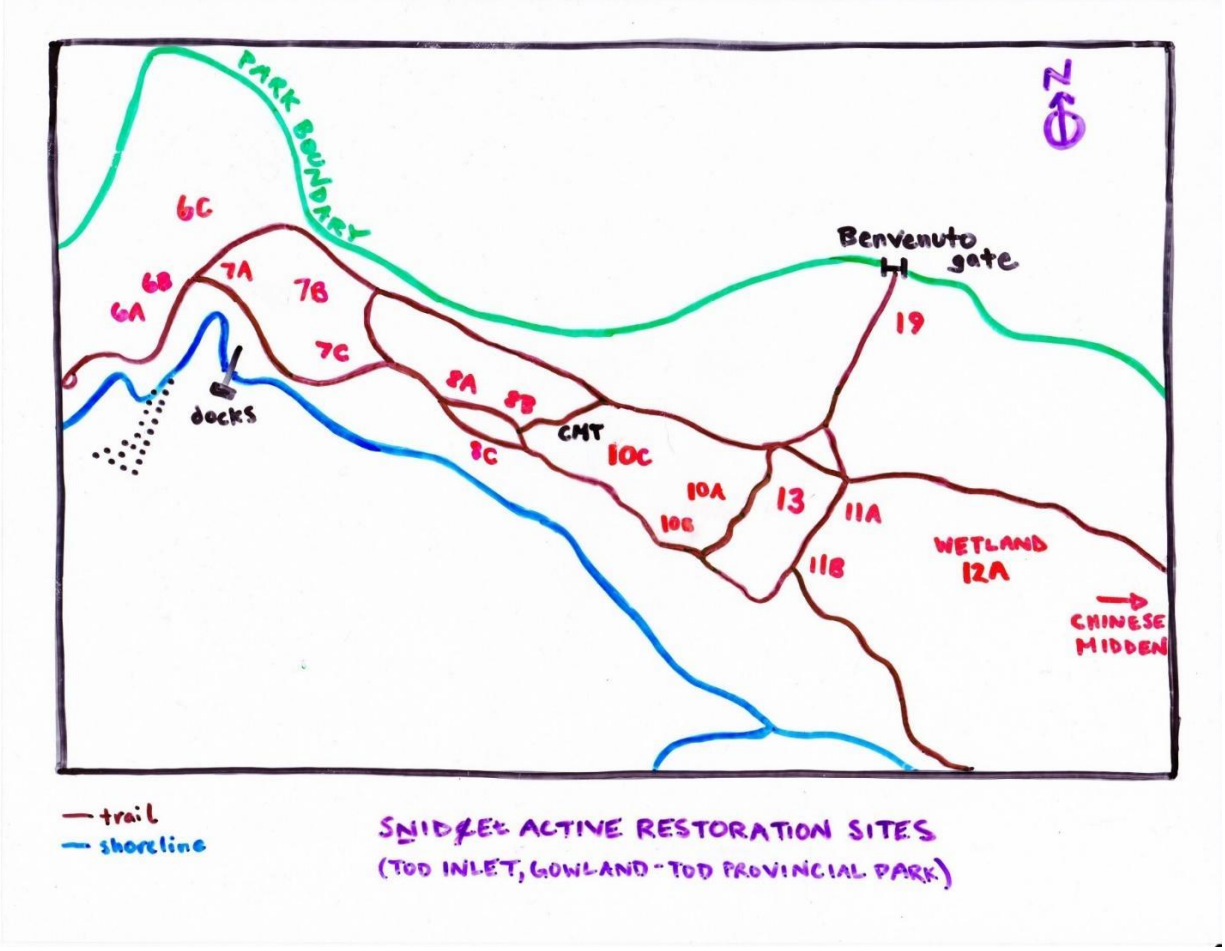
4.4 Student & Volunteer Groups

We look forward to inviting groups back again in 2022! We have posted our covid19 protocols on our website (Appendix III) for group leaders and participants to review prior to joining us. We have regular classes scheduled through our PEPÁḴEṈ HÁUTW̱ Program from ŁÁU,WELṈEW̱ Tribal School and W̱SÁNEĆ Leadership Secondary School. We have already been contacted by a number of middle and secondary schools as well as adult volunteer groups and classes from local universities and colleges to book their groups in 2022.

We have decided to start charging fees for our Learning on the Land programs on a conditional basis. Youth programs (middle and secondary school) will cost $200/2 hour program. Adult programs will cost $350/4 hour program. We will waive these fees for indigenous and volunteer groups without access to institutional financial support. These fees are to be paid directly to the PEPÁḴEṈ HÁUTW̱ Foundation.

Our programs begin with an opening circle where participants are welcomed according to W̱SÁNEĆ protocol, grounded in place and introducing themselves, so we can start our work in a good way. Then we orient participants to the work of the day and spend our time together learning with each other and healing the land, which usually includes a lunch break at the beach or the Snoopy Tree. We finish our day with a closing circle in which participants share how the day impacted them. These closing connections are often very moving and we are very grateful to provide a space for deep levels of reflection.

Part 5: Restoration Site Descriptions



LOWER SITES

SITE 6A - ȾSEĆEN

Established 2006 by BCCC. This site requires ongoing clearing of invasives, especially in summer.

PLANTED	INVASIVE
Red-flowering currant *Ribes sanguinem* Tall Oregon-grape *Mahonia aquifolium* Bigleaf Maple *Acer macrophyllum* Nootka rose *Rosa nutkana* Western redcedar *Thuja plicata* Douglas fir *Pseudotsuga menziesii* Black cottonwood *Populus balsamifera ssp. Trichocarpa* Oceanspray *Holodiscus discolor* Swordfern *Polystichum munitum* Evergreen huckleberry *Vaccinium ovatum*	Broad-leaved peavine *Lathyrus latifolius* Butterfly bush *Buddleia* Clematis *Clematis armandi* Grass spp.

SITE 6B - QELAXEN

Established Feb 2011. This site was recently the dump site for the contaminated soil from the marine restoration project in Feb 2017. The open soil area was seeded with the seed mix provided by Saanich Native Plants; this area will need to be monitored for invasive sprouts to give the seed mix the best chance for a high rate of germination. There has also been a pollinator plant bed planted at this site near the trail, marked by its border of rocks. This site is the proposed location of the soil remediation project initiated by the Compost Education Centre (details TBD).

PLANTED	INVASIVE
Oceanspray *Holodiscus discolor* Thimbleberry *Rubus parviflorus* Arctic lupin *Lupinus arcticus* Yarrow *Achillea millefolium* Swordfern *Polystichum munitum* SNP seed mix (wildflower: yarrow, pearly everlasting, California brome, blue wildrye, fireweed, woolly sunflower, large-leaved avens, Canada goldenrod, Douglas' aster, graceful cinquefoil, great camas, self-heal) Pollinator bed: red columbine, KEXMIN, nodding onion, yarrow, seablush, spring gold, camas	Broad-leaved peavine *Lathyrus latifolius* Himalayan blackberry *Rubus discolor* Queen Anne's Lace *Daucus carotus* Butterfly bush *Buddleia* Clematis *Clematis sp.* Grass spp.

SITE 6C – SPEPELḰIṮE

Cleared by excavator Mar 2016. This site has an upper and lower section on either side of the mature cottonwood stand. The soil here is littered with cement chunks and some metal protruding from the ground so please take care when moving through this site. There are some very healthy willows at the back of the site which, together with the vigorous cottonwood, indicates a lot of moisture in the ground despite the craggy appearance of the soil here. This site must be consistently cleared of invasives, especially in the summer months. We will be considering a planting plan for autumn 2020 to fill in gaps from the autumn 2018 plantings.

PLANTED	INVASIVE
Black cottonwood *Populus balsamifera ssp. Trichocarpa* Red osier dogwood *Cornus stolonifera* Douglas fir *Psuedotsuga menziesii* Oceanspray *Holodiscus discolor* Bigleaf maple *Acer macrophyllum* Red alder *Alnus rubra* Thimbleberry *Rubus parviflorus* Snowberry *Symphoricarpus albus* Swordfern *Polystichum munitum* Pacific willow *Salix lasiandra*	Himalayan blackberry *Rubus discolor* Broad-leaved peavine *Lathyrus latifolius* Butterfly bush *Buddleia sp.* Canada thistle *Cirsium arvense*

SITE 7A – ST̓X̱ALEM

Cleared by excavator Feb 2016. *Please note the presence of poison hemlock on this site*. Poison hemlock is extremely toxic when ingested; it is distinguished from Queen Anne's lace by the purplish blotches on its stem. This plant must be removed wherever it is found especially before it goes to seed. The occurrence of poison hemlock is mostly near the foot bridge on the bottom section of the site and along the slope beside cottonwood grove. There are also lovely native horsetails (*Equisetum arvense*) growing in the section alongside the mature cottonwoods near the foot bridge. There is also clematis invasion near the top edge of the site (adjacent to the path).

PLANTED	INVASIVE
Black cottonwood *Populus balsamifera ssp. Trichocarpa* Red osier dogwood *Cornus stolonifera* Douglas fir *Psuedotsuga menziesii* Oceanspray *Holodiscus discolor* Red alder *Alnus rubra* Red flowering currant *Ribes sanguinem* Bigleaf maple *Acer macrophyllum* Western redcedar *Thuja plicata* Thimbleberry *Rubus parviflorus* Snowberry *Symphoricarpus albus* Blackcap raspberry *Ribes leucodermis* Salmonberry *Rubus spectabilis* Grand fir *Abies grandis*	Himalayan blackberry *Rubus discolor* Broad-leaved peavine *Lathyrus latifolius* Butterfly bush *Buddleia sp.* Clematis *Clematis sp.* Canada thistle *Cirsium arvense* **Poison Hemlock *Conium maculatum** Oxeye daisy *Leucanthemum vulgare*

***poisonous, handle with caution**

ECOTONE SITES

SITE 7B – STḴ̓AYE

Cleared by excavator Feb 2016. This site extends across the plateau of land above the docks and down the slope leading to the dock area. There is a lot of native trailing blackberry *(Rubus ursinus*) over by the slope towards the docks and spreading across the site which is nice, but will need to be pointed out to volunteer groups.

PLANTED	INVASIVE
Red osier dogwood *Cornus stolonifera* Douglas fir *Psuedotsuga menziesii* Oceanspray *Holodiscus discolor*	Himalayan blackberry *Rubus discolor* Broad-leaved peavine *Lathyrus latifolius* Butterfly bush *Buddleia sp.*

Red alder *Alnus rubra* Red flowering currant *Ribes sanguinem* Bigleaf maple *Acer macrophyllum* Swordfern *Polystichum munitum* Snowberry *Symphoricarpus albus* Red flowering currant *Ribes sanguinem* Pollinator bed: mock orange, cottonwood	Clematis *Clematis sp.* Canada thistle *Cirsium arvense* Oxeye daisy *Leucanthemum vulgare*

SITE 7C - ḴÁLEḴ

Established 2006 by BCCC. There were some meadow species planted before 2010 here, however the site is definitely an ecotone forest site. This site does not usually require much oversight, just sometimes planted species can be checked to make sure they are not being overwhelmed by invasive cover. The bank below this site, adjacent to the new mural site and between the roadway and the beach, is considered part of this site.

This site is also adjacent to the new toolshed location, to be built in January-February 2020. We may consider doing some plantings around the new toolshed in the autumn.

PLANTED	INVASIVE
Garry oak *Quercus garryana* (survival unlikely) Camas *Camassia spp.* Seablush *Plectritis congesta* Oceanspray *Holodiscus discolor* bank: snowberry *Symphoricarpus albus* red flowering currant *Ribes sanguinem* thimbleberry *Rubus parviflorus*	Broad-leaved peavine *Lathyrus latifolius* Teasle *Dipsacus sp.* Grass spp.

SITE 8A – SEMSEMÍYE

Established 2006 by BCCC. The back of this site is vulnerable to invasion and can be monitored and invasive species removed, especially around planted species. Morning glory is particularly vigorous here and will wrap its way up plants; please remove morning glory from plants as often as needed. There have been observations of active ground bee nests on this site in 2018 and 2019; please take good care when working around this section.

PLANTED	INVASIVE
Douglas fir *Psuedotsuga menziesii* Bigleaf maple *Acer macrophyllum* Red alder *Alnus rubra* Oceanspray *Holodiscus discolor* Western redcedar *Thuja plicata*	Himalayan blackberry *Rubus discolor* Broad-leaved peavine *Lathyrus latifolius* Morning glory *Convolvulus sepium* English bluebell *Hyacinthoides non-scripta* Common burdock *Arctium minus* Canada thistle *Cirsium arvense*

SITE 8B – SḴIMEQ

Established 2006 by BCCC. This site is similar to 8a in that it requires little maintenance, however the back of the site in particular is still vulnerable to invasion. This site has expanded to include the cleared section on the other side of the path leading to the culturally modified trees (CMTs). This site can be kept clear of invasives especially around the planted species. Again morning glory is really pernicious especially at the back of the site and should be removed as much as needed. There is a pollinator bed planted at this site which will require watering through the summer months.

PLANTED	INVASIVE

Tall Oregon-grape *Mahonia aquifolium* Red alder *Alnus rubra* Bigleaf maple *Acer macrophyllum* Douglas maple *Acer glabrum* Red-flowering currant *Ribes sanguinem* Baldhip rose *Rosa gymnocarpa* Hybrid rose *Rosa sp.* Oceanspray *Holodiscus discolor* Garry oak *Quercus garryana* Douglas fir *Psuedotsuga menziesii* Hairgrass *Deschampsia cespitosa* Gummy gooseberry *Ribeslacustre* Pollinator bed: red columbine, KEXMIN, nodding onion, yarrow, seablush, spring gold, camas	Tall Oregon-grape *Mahoniaaquifolium* Red alder *Alnusrubra* Bigleaf maple *Acer macrophyllum* Douglas maple *Acer glabrum* Red-flowering currant *Ribes sanguinem* Baldhip rose *Rosa gymnocarpa* Hybrid rose *Rosa sp.* Oceanspray *Holodiscus discolor* Garry oak *Quercus garryana* Douglas fir *Psuedotsuga menziesii* Hairgrass *Deschampsia cespitosa* Gummy gooseberry *Ribeslacustre*

Sites 8A & 8B are on either side of the iconic bigleaf maple we call “the Snoopy Tree”.

SITE 10A - W̱TEḴTENEĆ

Established 2006 by BCCC. This site requires clearing invasive plants away from planted and volunteer native species. There is a good deal of Hardhack (*Spirea douglasii)* and fireweed (*Epilobium angustifolium*) on site, as well as trailing blackberry (*Rubus ursinus*). This site is one of few that has robust native species volunteering amongst the planted and invasive species so we encourage them wherever we can. This site could one day be developed into an interesting interpretive site due to numerous cement features such as staircases and foundations, in a similar manner as site 13. The priority for this site is to keep the invasive cover down and away from the small planted species (mainly three swordfern), especially at the back of the site.

PLANTED	INVASIVE
Tall Oregon-grape *Mahonia aquifolium* Bigleaf maple *Acer macrophyllum* Indian plum *Oemleria cerasiformis* Red-flowering currant *Ribes sanguinem* Douglas fir *Pseudotsuga menziesii* Western redcedar *Thuja plicata* Swordfern *Polystichum munitum* Grand fir *Abies grandis* Oceanspray *Holodiscus discolor* Red alder *Alnus rubra*	Himalayan blackberry *Rubus discolor* Broad-leaved peavine *Lathyrus latifolius* Morning glory *Convolvulus sepium* English bluebell *Hyacinthoides non-scripta*

SITE 10C – XEN̲XIN̲ELE

Cleared by excavator Feb 2016. This site was planted by W̲SÁNEĆ Leadership Secondary School students in April 2016 and April 2017. Due to its relative shade, the plants at this site are less vulnerable to drought than the more open sites. The priority at this site is the removal of invasives, especially around planted species; blackberry sprouts can be dug or cut just underneath the surface of the soil.

PLANTED	INVASIVE
Red alder *Alnusrubra* Indian plum *Oemlaria cerasiformis* Red osier dogwood *Cornus stolonifera*	Himalayan blackberry *Rubus discolor* Broad-leaved peavine *Lathyrus latifolius* Morning glory *Convolvulus sepium* English bluebell *Hyacinthoides non-scripta*

SITE 11A – APEL,ENEȻ

Established 2006 by BCCC. This site borders the wetland area at SN̲IDȻEŁ and has an interesting mix of native species with the old apple trees planted by the settler residents of Tod Village. This site requires very little maintenance but benefits greatly from at least one sweep of invasive removal per year. Note the planted blackcap raspberry on the trailside between the apple trees so it doesn't get lost.

PLANTED	INVASIVE
Red-flowering currant *Ribes sanguinem* Red osier dogwood *Cornus stolonifera* Red alder *Alnus rubra* Swordfern *Polystichum munitum* Nootka rose *Rosa nutkana* Douglas fir *Psuedotsuga menziesii* Western redcedar *Thuja plicata* Salmonberry *Rubus spectabilis* Trailing blackberry *Rubus ursinus* Blackcap raspberry *Rubus leucodermis*	Himalayan blackberry *Rubus discolor* Morning glory *Convolvulus sepium* Lemon balm *Melissa officianalis* Canada thistle *Cirsium arvense* Common hawthorn *Crataegus monogyna* Creeping buttercup *Ranunculus repens* Grass spp.

SITE 13 – Á,LEN

Cleared by excavator April 2013. This site had previously been totally invaded by Himalayan blackberry, the removal of which uncovered a number of concrete foundations of former residences dating back to the cement plant era. There is also a LOT of thistle throughout the site that can be pulled regularly in order to keep it from flowering. The southwest corner of this site has a vigorous

invasion of creeping St John's wort that has been dug out and will be planted with red flowering currant and swordfern this autumn.

This site is also seeing natural regeneration of native species such as columbine (*Aquilegia acemos*), thimbleberry (*Rubus parviflorus*) and woodland violet (*Viola odorata*). Please take good care of these little volunteer native plants.

The priority of this site is the removal of invasives. The alder sections and inside the central foundations can be cleared with a blade trimmer, however the more densely planted areas with smaller planted species need to be cleared of invasives by hand.

PLANTED	INVASIVE
Western redcedar *Thuja plicata* Douglas fir *Pseudotsugamenziesii* Salal *Gaultheria shallon* Trailing blackberry *Rubus ursinus* Red alder *Alnus rubra* Oceanspray *Holodiscus discolor* Swordfern *Polystichum munitum* Gummy gooseberry *Ribes lacustre* Blackcap raspberry *Rubus occidentalis* Red flowering currant *Ribes sanguinem* Pacific willow *Salix lasiandra* Red osier dogwood *Cornus stolonifera* Oregon grape *Mahonia aquifolia* Snowberry *Symphoricarpus albus*	Himalayan blackberry *Rubus discolor* Broadleaved peavine *Lathyrus latifolia* Morning glory *Convolvulus sepium* Canada thistle *Cirsium arvense* Lemon balm *Melissa officianalis* English ivy *Hedera helix* Creeping St. John's Wort *Hypericum calycinum*

MATURE FOREST SITES

SITE 19 - SMIET

Cleared by excavator December 2017. This site is our newest and largest site to date. Similar to site 13, there were numerous foundations of staff residences found on these sites underneath the invasive cover. There was also some evidence of squatter activity in the northeast section, and possibly a grow op in the eastern forested section (numerous garden pots, bags of soil and assorted debris was found as we cleared the area by hand).

The soils here are quite healthy and rich compared to some of the modified soils closer to the old industrial areas near the docks. Some of the site is extremely wet in the winter months and the most saturated areas were marked in blue flags in order to guide our planting plan for this site in autumn. We have already planted devil's club in the deepest and most wet section of the site (autumn 2018). The hydrology of this site is affected by the old system of ceramic pipes leading from the spring or associated waterways into the old residences form the cement plant and "Tod Inlet Village" era. We have endeavoured to track the hydrology here as best as we can given the unknown nature of this pipe system.

There are a lot of volunteer maples, oceanspray, thimbleberry, and trailing blackberry on this site, especially across the northmost section. It is great to point these ones out to volunteers.

The southwest corner of this site at the road junction has a lot of English ivy cover spreading into the forest. This ivy is a good section for invasive removal by the summer staff when time permits. There is also a lot of periwinkle near the gate.

This site is right on the edge of the actively restored areas at SN̓IDȻEŁ, ideally in the coming years we have the capacity to push the restoration efforts from this site eastward towards the last swath of major invasive cover at SN̓IDȻEŁ in the wetland section.

PLANTED	INVASIVE
Bigleaf maple *Acer macrophyllum* Red alder *Alnus rubra* Oceanspray *Holodiscus discolor* Snowberry *Symphoricarpus albus* Red elderberry *Sambucus racemose* Evergreen huckleberry *Vaccinium ovatum* Swordfern *Polystichum munitum* Devil's club *Oplopanax horridus* Red osier dogwood *Cornus stolonifera* Western redcedar *Thuja plicata* Red flowering currant *Ribes sanguinem* Pacific ninebark *Physocarpus capitatus* SNP seed mix (forest: Dewey's sedge, Siberian miner's lettuce, blue wildrye, large-leaved avens, fringecup, self-heal)(on designated site near central cedar)	Himalayan blackberry *Rubus discolor* Broadleaved peavine *Lathyrus latifolia* Morning glory *Convolvulus sepium* Canada thistle *Cirsium arvense* English ivy *Hedera helix* Creeping buttercup *Ranunculus repens* Periwinkle *Vinca minor*

OTHER RESTORATION SITES

These restoration sites are included in this document because they are part of the landscape restoration plan at SN̓IDȻEŁ, though they are not as active as the other sites.

SITE 12A: Wetland - ƫEXƫEX

There was a student project completed in December 2013 about the wetland northeast of site 13. The Creatures of Habitat program has also cleared a nice portion of the wetland area leaving an open space on its way to being populated by stinging nettle (*Urticia dioica*) going to seed on site.

We hope to build on the efforts in the wetland area on both sides of the trail; its related corridor ecosystem along the waterway (through sites 11a and 11b) is also of interest in our long term restoration efforts. This site could potentially be opened up as a major restoration area when funding and time permits.

Chinese Midden

The slope above the Chinese midden (as it connects to the main trail) has been cleared in April 2013 and 2014 by students in the Creature of Habitat program. In spring 2014 volunteers also planted swordfern on this site in order to prevent slope erosion and stabilize the bank. In spring 2015 the site was also planted with about 25 young salal (*Gaultheria shallon*) by Green Teams and SeaChange volunteers. This area is named the 'Chinese Midden' as removal of invasive species from this site inevitably unearths many artifacts from these workers' lives such as bottles and old boots. Some of these artifacts can be seen where they have been stacked along the lower walking trails running beside WEĆEĆE (Tod Creek).

The Beach - SÁSU

After the significant marine restoration work done by SeaChange Marine Conservation Society in 2017, we have planning backshore restoration plantings. SeaChange did some plantings of entire leaved gumweed (*Grindelia stricta*) with a school group in November 2019. In November 2020, our staff planted 3 flats of KEXMIN (*Lomatium* nudicaule) behind the driftwood border between the main beach and the cottonwood stand, which seems to be damanged over the year by human and dog traffic on the beach. After our new fencing was installed at the back of the beach, we planted more KEXMIN and gumweed as well as sea thrift (*Armeria maritima*) and black twinberry (*Lonicera involucrata).* We intend to transplant SŁE,QÁI (dunegrass or *Leymus mollis*) across the backshore in autumn 2022, and perhaps add to the fencing to protect these plants.

Part 6: Safety Plan

A. Emergency Protocols (Appendix I) and Safety Orientation (see Appendix II)

- Shared with all staff prior to each working season and posted in the staff toolshed for quick reference. Shared with all volunteers prior to any volunteer event.
- Additional Information: site work at SNIDȻEŁ will be cancelled in the event of high winds (over 50km/hr) or any extreme weather deemed high risk. Fire protocols will be updated for 2022.

B. Public Safety Considerations

- Additional Information: all key personnel are notified by phone when there is a public safety concern

C. Closures (trails or areas of a park): all key personnel are notified by phone or email by BC Parks

D. Accident and Emergency Management

- A First Aid Kit and a person with a current First Aid certification will be present at all projects and events.
- At least one person will have a cell phone or radio and an emergency contact list at all projects and events.

E. COVID 19 Protocols (Appendix III): to be in effect for the duration of the pandemic

EMERGENCY CONTACTS	
Police / Fire/ Ambulance Emergency	**911**
BC Hydro (Emergencies)	1-888-769-3766
RAPP (Report All Poachers and Polluters)	1-877-952-7277
Report a Forest Fire	1-800-663-5555
Air or Marine Emergency	1-800-567-5111
Poison Control Centre	1-800-567-8911
Nearest Hospital: Saanich Peninsula Hospital	1-250-544-7676
Non-Emergency Contacts	
BC Parks Staff: Peter Woods	[redacted]
Park Facility Operator: RLC Park Services	1-250-474-1336
Local RCMP Detachment:	1-250-652-4441

Part 7: Proposed Additional Contractors

Name	**Contact Information**	**Project**	**Experience**
Compost Education Centre (Alexis Hogan & Danielle Stevenson)	office@compost.bc.ca	Soil Remediation	10 years soil remediation

Part 8: Acknowledgements

We are grateful to work in community to accomplish our work at SṈIDǨEŁ! We are in partnership with Tsartlip First Nation, W̱SÁNEĆ Leadership Council and BC Parks. The W̱SÁNEĆ School Board supports our work bringing W̱SÁNEĆ youth down to SṈIDǨEŁ to learn about restoration and cultural practices of this special place. Victoria Foundation and the Living Lab Network has provided funding to cover staff wages. BC Parks provided a Parks Enhancement Fund in Novemenr 2021 and may also provide support through the Indigenous Funds Program for soil remediation work in 2022.

The SṈIDǨEŁ Resiliency Project was first initiated under SeaChange Marine Conservation Society back in 2011, with whom we continue to collaborate and share resources for the wellbeing of SṈIDǨEŁ. Sarah Verstegen of SeaChange was key to the operations that guided the healing work at SṈIDǨEŁ for many years; this year we planted the sacred medicine plants on the beach in honour of her memory.

We raise our hands to the many generations of W̱SÁNEĆ peoples who stewarded this special place and continue to call SṈIDǨEŁ home.

Appendix I: Emergency Protocols

EMERGENCY PROTOCOL

for

SṈIDȻEL

(Tod Inlet, Gowlland Tod Provincial Park, BC)

In case of MINOR INJURY (injuries that can be treated by the First Aid person or, if further medical attention such as stitches or x-ray is needed, do not require an ambulance):

1. Stop work and observe tool safety
2. Notify First Aid person
3. Provide First Aid and document the injury

In case of SERIOUS INJURY (any injury that requires ambulance services):

1. Call 911
2. Notify First Aid Person

3. Send someone to the Benvenuto gate to meet ambulance Assure entry of ambulance and provide guidance to the location of injured person/people
4. Support administration of emergency first aid until Emergency Services arrive

IN CASE OF FIRE:
1. Call 911
2. Send someone to the Benvenuto gate (or nearest safe location) to meet Emergency Services vehicles. Assure entry of emergency vehicles and provide guidance to the location of fire or any injured people
3. Notify as many people in the area as possible
4. Evacuate the area

Safety is our first priority!
Anyone who sees anything unsafe has a responsibility to correct the hazard if possible and report the hazard or incident to staff and appropriate authorities such as 911 or the Coast Guard. Tsartlip First Nation and BC Parks must also be notified if necessary.

Appendix II - Safety Orientation Checklist

SAFETY ORIENTATION CHECKLIST	
Project: SṈIDǴEŁ Resiliency Project	
Location:SṈIDǴEŁ (Tod Inlet, Gowlland Tod Provincial Park)	
Date: Click here to enter a date	
---- Discuss with all volunteers before work begins ----	✓
Project Leader:	
First Aiders:	
Location of First Aid Kit:	
Cell phone service:	
Weather:	
Emergency vehicle access:	
Location of and quickest route to the nearest hospital:	
Check in / check out procedure:	
Working alone procedure:	
Appropriate clothing and footwear for terrain, tools and weather:	
Any injuries **must** be reported to BC Parks on the day of their occurrence	
Right to refuse unsafe work	
Hand tools in good working order	
Review safe use of hand tools	
Public Safety Concerns and Closures:	
Identify hazards, possibilities, solutions	

Appendix III: COVID 19 Protocols

PEPÁḴEṈ HÁUTW̱ Foundation
pepakenhautw.com

PEPÁḴEṈ HÁUTW̱ Foundation
COVID-19 Protocols

SEPTEMBER 2021

This document outlines the various protocols we have established as an organization to protect and support our staff as well as the wider community during the COVID-19 pandemic. We will also fully comply with protocols established by the W̱SÁNEĆ School Board when on school grounds. All protocols will be reevaluated on a regular basis as conditions evolve.

COVID-19 Vaccination Policy

Since COVID-19 virus poses a substantial health and safety risk for the employees and students of W̱SÁNEĆ School Board, and for the communities it serves, the W̱SÁNEĆ School Board has determined that, in order to protect the employees, the students and the communities, individuals working on site will be required to be vaccinated against COVID-19. "On site" refers to any facility owned or operated by the W̱SÁNEĆ School Board, or any location (including buses) in which the employee is providing services on behalf of the W̱SÁNEĆ School Board and in which the employee is interacting in person with other employees or students of the W̱SÁNEĆ School Board, or with the broader W̱SÁNEĆ community. *This COVID-19 vaccination policy will also apply to all employees of the PEPÁḴEṈ HÁUTW̱ Foundation.*

Procedures for Non-Vaccinated Employees

Employees that have not been vaccinated against COVID-19 will not be permitted to carry out any in-person front-line job duties or services in which they may be required to interact with other employees, students, or members of the public, and in particular with members of the W̱SÁNEĆ community.

VISITORS TO PH

All visitors on site must be either 1) vaccinated against COVID-19, or 2) masked at all times during their visit. Any staff member will ensure invited visitors are aware of these protocols, and confirm with all staff members before inviting visitors on a shared work day. Visitors will also need to be informed of and follow the staff protocols above.

VOLUNTEERS AT RESTORATION SITES

All volunteers arriving to any PEPÁḴEṈ HÁUTW̱ restoration sites must be either 1) vaccinated against COVID-19, or 2) masked when within 3m or otherwise interacting with any PEPÁḴEṈ HÁUTW̱ employee or W̱SÁNEĆ community member. Volunteer contacts and emergency numbers will be recorded in case notifications are required for COVID-19 exposures.

Appendix IV: Volunteer Record Form

VOLUNTEER RECORD FORM			
Project: SN̲IDǨEŁ Resiliency Project		Date:	
Name/Group Name	contact information	emergency contact	# of hours
		Total Volunteer Hours	

Appendix V: Soil Test Results April 2021

Client/Code

Compost Education Centre
*B
1216 North Park St
Victoria, BC
V8T 1C9

TEL: 250 386-9676
info@compost.bc.ca

Date 22Apr21 11:53a No. W160771
Source Garden
Type of Sample soil
No. of Samples 8

Comments Arrival temp.: 18.0C
PO 2204 B1012B

Samples: Tod Inlet/Snidcel Restoration Sites 17Apr21 10:30a - 1) Snidcel 7A Plot 1-10 2) Snidcel 7A Plot 12
3) Snidcel 7B Control 4) Snidcel 7B Plot 13 5) Snidcel 7A Plot 11 6) Snidcel 7B Plot 3 7) Snidcel 7B Plot 7
8) Snidcel 7A Plot 10 5

ELEMENTS		1 SAMPLE	2 SAMPLE	3 SAMPLE	4 SAMPLE	5 SAMPLE	6 SAMPLE	7 SAMPLE	8 SAMPLE	UNITS	SCHEDULE 4/7 -Soil Limits II Agric	III Urban	IV Resid.	V Comm.	VI Indust.
1) Aluminium	Al	15800	11500	19400	25500	18200	19600	21400	13200	ug/g					
2) Antimony	Sb	0.944	1.08	6.84	14.4	0.486	0.706	1.27	0.531	ug/g	20	20	20	40	40
3) Arsenic	As	5.95	6.65	18.3	5.06	6.71	3.09	3.60	6.69	ug/g	15 *	15			15
4) Barium	Ba	117	103	233	782	117	669	695	116	ug/g	400	400			400
5) Beryllium	Be	0.200	<0.003	0.200	0.500	0.200	0.300	0.400	0.100	ug/g	4	4	4	8	8
6) Boron	B	16.9	17.3	38.2	166	17.7	121	146	19.2	ug/g	TOTAL BORON VALUES				
7) Cadmium	Cd	0.457	0.461	0.559	0.276	0.542	0.112	0.128	0.508	ug/g	1.5 *	1.5			1.5
8) Calcium	Ca	11300	11200	15000	18500	15800	17400	17700	11100	ug/g					
9) Chromium	Cr	21.3	14.9	28.8	29.5	19.9	18.7	22.0	16.8	ug/g	60	50			60
10) Cobalt	Co	12.2	7.26	10.3	8.20	9.48	5.80	6.58	8.10	ug/g	40-50	50-40	50	300	300
11) Copper	Cu	36.0	39.0	62.0	66.0	38.0	49.0	46.0	42.0	ug/g	90 *	90			90
12) Gold	Au	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	ug/g					
13) Iron	Fe	13400	11900	13600	12000	13600	8110	11000	12000	ug/g					
14) Lanthanum	La	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	ug/g					
15) Lead	Pb	48.2	64.9	101	274	41.7	26.5	35.8	63.9	ug/g	100 *	100		100	
16) Magnesium	Mg	4060	3900	3850	3420	5370	2600	2860	3760	ug/g					
17) Manganese	Mn	579	361	386	282	574	225	268	415	ug/g					
18) Mercury	Hg	<0.010	0.232	0.138	0.083	0.062	<0.010	0.060	0.109	ug/g	15*	0.6			150
19) Molybdenum	Mo	0.800	0.600	2.30	2.50	0.400	1.50	2.00	0.600	ug/g	5-10	10-5	10	40	40
20) Nickel	Ni	15.5	13.7	23.7	36.6	14.0	25.6	28.9	14.0	ug/g	150	100	100	500	500
21) Phosphorus	P	447	400	737	775	540	764	807	458	ug/g					
22) Potassium	K	667	503	1260	1080	813	966	817	786	ug/g					
23) Scandium	Sc	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	ug/g					
24) Selenium	Se	0.210	0.213	0.458	0.164	0.170	0.132	0.143	0.208	ug/g	2	3	3	10	10
25) Silicon	Si	84.3	84.4	78.2	148	57.8	88.4	41.1	183	ug/g					
26) Silver	Ag	0.100	0.100	0.200	0.100	0.100	<0.100	<0.100	0.100	ug/g	20	20	20	40	40
27) Sodium	Na	1010	1070	1790	3420	1740	2760	2870	995	ug/g					
28) Strontium	Sr	60.0	67.0	190	831	67.0	675	796	77.0	ug/g					
29) Tin	Sn	2.00	3.00	16.3	10.5	2.40	2.10	2.70	3.60	ug/g	5-50	50-5	50	300	300
30) Titanium	Ti	503	334	822	974	517	668	619	549	ug/g					
31) Tungsten	W	0.900	1.30	2.50	1.30	1.40	0.800	0.800	1.90	ug/g					
32) Vanadium	V	46.7	36.1	60.4	66.9	47.4	50.7	54.6	40.4	ug/g	200	200	200		
33) Zinc	Zn	83.9	92.4	156	111	97.9	33.8	45.5	114	ug/g	150 *	150			150
pH		7.61	7.75	7.46	7.93	8.17	8.64	8.24	6.98	units					

S. = senstive T. = typical
Schedule 9: Contaminated Sites -Generic Numerical Sediment Criteria
Schedule 4: Contaminated Sites -Soil Stds
Schedule 7: Contaminated Sites -Soil Relocation Stds,
BC Waste Management Act, Reg.17/2002, s28
* Sched 7

MB LABS LTD.
ANALYTICAL & TESTING SERVICES P.O. BOX 2103, SIDNEY, B.C. V8L 3S6 TEL: (250) 656-1334 EMAIL: info@mblabs.com

R. Bilodeau
Analytical Chemist

N. Hartmann
Sr.Analytical Chemist

Client/Code

Compost Education Centre
A. Hogan
1216 North Park St
Victoria, BC
V8T 1C9

TEL: 250 386-9676
info@compost.bc.ca

Date 19Apr21 1:45p No. W160677
Source Restoration Site
Type of Sample soil
No. of Samples 8

Comments Arrival temp.: 16.0C
Pd 1904B Batch 1012

Samples: SNIDCEL (Todd Inlet) 07Apr21 10:30a - 1) SNIDCEL Control 2) SNIDCEL 7A Plot 5 3) SNIDCEL 7A Plot 8 4) SNIDCEL 7A Plot 14

ELEMENTS		1 SAMPLE	2 SAMPLE	3 SAMPLE	4 SAMPLE	UNITS	SCHEDULE 4/7 -Soil Limits II Agric	III Urban Resid.	IV Comm.	V Indust.	VI	9 -Sediments III T.FW	V T.SW
1) Aluminium	Al	21000	21600	16500	16100	ug/g							
2) Antimony	Sb	0.408	0.469	2.73	1.44	ug/g	20	20	20	40	40		
3) Arsenic	As	10.8	15.7	16.3	8.34	ug/g	15 *	15			15	20	50
4) Barium	Ba	180	157	198	127	ug/g	400	400			400		
5) Beryllium	Be	0.200	0.200	0.200	0.200	ug/g	4	4	4	8	8		
6) Boron	B	32.1	26.1	28.0	21.9	ug/g	TOTAL BORON VALUES						
7) Cadmium	Cd	0.582	0.707	1.05	0.571	ug/g	1.5 *	1.5			1.5	4.2	5.0
8) Calcium	Ca	23600	28200	21800	19400	ug/g							
9) Chromium	Cr	18.9	16.0	15.8	17.3	ug/g	60	50			60	110	190
10) Cobalt	Co	9.51	9.04	7.98	8.11	ug/g	40-50	50-40	50	300	300		
11) Copper	Cu	42.0	55.0	51.0	49.0	ug/g	90 *	90			90	240	130
12) Gold	Au	<0.100	<0.100	<0.100	<0.100	ug/g							
13) Iron	Fe	13400	13400	12400	13000	ug/g							
14) Lanthanum	La	<0.020	<0.020	<0.020	<0.020	ug/g							
15) Lead	Pb	68.8	58.4	76.8	74.4	ug/g	100 *	100		100		110	130
16) Magnesium	Mg	8050	8870	7010	6420	ug/g							
17) Manganese	Mn	495	564	782	487	ug/g							
18) Mercury	Hg	0.058	0.142	0.088	0.108	ug/g	15*	0.6			150	0.58	0.84
19) Molybdenum	Mo	0.800	0.800	1.00	0.600	ug/g	5-10	10-5	10	40	40		
20) Nickel	Ni	16.1	13.9	17.2	14.5	ug/g	150	100	100	500	500		
21) Phosphorus	P	563	501	484	387	ug/g							
22) Potassium	K	1200	1240	720	762	ug/g							
23) Scandium	Sc	<0.050	<0.050	<0.050	<0.050	ug/g							
24) Selenium	Se	0.292	0.124	0.167	0.078	ug/g	2	3	3	10	10		
25) Silicon	Si	148	189	48.1	215	ug/g							
26) Silver	Ag	0.100	0.200	0.400	0.100	ug/g	20	20	20	40	40		
27) Sodium	Na	3020	4150	2640	2160	ug/g							
28) Strontium	Sr	157	128	134	84.0	ug/g							
29) Tin	Sn	2.40	1.90	4.80	2.60	ug/g	5-50	50-5	50	300	300		
30) Titanium	Ti	848	775	388	512	ug/g							
31) Tungsten	W	1.40	1.60	1.50	1.40	ug/g							
32) Vanadium	V	60.2	60.3	48.1	49.7	ug/g	200	200	200				
33) Zinc	Zn	132	134	157	114	ug/g	150 *	150			150	380	330
pH		7.00	7.28	6.96	7.34	units							

S. = sensitive T. = typical FW = freshwater SW = marine
Schedule 9: Contaminated Sites -Generic Numerical Sediment Criteria
Schedule 4: Contaminated Sites -Soil Stds
Schedule 7: Contaminated Sites -Soil Relocation Stds,
BC Waste Management Act, Reg.17/2002, s28
* Sched 7

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Client/Code

Compost Education Centre
A. Hogan
1216 North Park St
Victoria, BC
V8T 1C9

TEL: 250 386-9676
info@compost.bc.ca

Date 19Apr21 1:45p No. W160677 pg2
Source Restoration Site
Type of Sample soil
No. of Samples 8

Comments Arrival temp.: 16.0C
Pd 1904B Batch 1012

Samples: SNIDCEL (Todd Inlet) 07Apr21 10:30a - 5) SNIDCEL 7B Plot 2 6) SNIDCEL 7B Plot 4 7) SNIDCEL 7B Plot 6 8) SNIDCEL 7B Plot 7

ELEMENTS		5 SAMPLE	6 SAMPLE	7 SAMPLE	8 SAMPLE	UNITS	SCHEDULE 4/7 -Soil Limits II Agric	III Urban	IV Resid.	V Comm.	VI Indust.	9 -Sediments III T.FW	V T.SW
1) Aluminium	Al	19100	19000	21400	19400	ug/g							
2) Antimony	Sb	0.791	0.602	0.335	0.971	ug/g	20	20	20	40	40		
3) Arsenic	As	10.4	5.92	3.70	4.30	ug/g	15 *	15			15	20	50
4) Barium	Ba	191	466	739	579	ug/g	400	400			400		
5) Beryllium	Be	0.200	0.300	0.500	0.200	ug/g	4	4	4	8	8		
6) Boron	B	34.7	96.7	168	120	ug/g	TOTAL BORON VALUES						
7) Cadmium	Cd	0.465	0.491	0.195	0.868	ug/g	1.5 *	1.5			1.5	4.2	5.0
8) Calcium	Ca	10600	14500	19200	15100	ug/g							
9) Chromium	Cr	32.1	25.1	23.6	23.4	ug/g	60	50			60	110	190
10) Cobalt	Co	11.0	7.83	5.92	6.60	ug/g	40-50	50-40	50	300	300		
11) Copper	Cu	67.0	68.0	51.0	53.0	ug/g	90 *	90			90	240	130
12) Gold	Au	<0.100	<0.100	<0.040	<0.100	ug/g							
13) Iron	Fe	15500	11900	9230	11600	ug/g							
14) Lanthanum	La	<0.020	<0.020	<0.020	<0.020	ug/g							
15) Lead	Pb	76.3	75.5	30.0	90.3	ug/g	100 *	100		100		110	130
16) Magnesium	Mg	5550	4190	3730	3800	ug/g							
17) Manganese	Mn	560	348	266	312	ug/g							
18) Mercury	Hg	<0.010	0.016	<0.000	0.019	ug/g	15*	0.6			150	0.58	0.84
19) Molybdenum	Mo	0.900	1.30	1.60	1.20	ug/g	5-10	10-5	10	40	40		
20) Nickel	Ni	24.6	25.8	27.8	25.6	ug/g	150	100	100	500	500		
21) Phosphorus	P	392	685	882	820	ug/g							
22) Potassium	K	865	844	896	879	ug/g							
23) Scandium	Sc	<0.050	<0.050	<0.050	<0.050	ug/g							
24) Selenium	Se	0.365	0.070	<0.001	1.28	ug/g	2	3	3	10	10		
25) Silicon	Si	86.1	82.6	28.0	41.0	ug/g							
26) Silver	Ag	0.100	0.100	<0.010	0.100	ug/g	20	20	20	40	40		
27) Sodium	Na	983	1750	2800	2000	ug/g							
28) Strontium	Sr	127	390	843	527	ug/g							
29) Tin	Sn	20.5	3.20	3.00	4.30	ug/g	5-50	50-5	50	300	300		
30) Titanium	Ti	754	659	544	502	ug/g							
31) Tungsten	W	1.80	1.30	0.800	1.50	ug/g							
32) Vanadium	V	71.9	59.7	61.5	58.0	ug/g	200	200	200				
33) Zinc	Zn	153	125	44.7	153	ug/g	150 *	150			150	380	330
pH		7.08	6.95	7.14	6.95	units							

S. = sensitive T. = typical FW = freshwater SW = marine
Schedule 9: Contaminated Sites -Generic Numerical Sediment Criteria
Schedule 4: Contaminated Sites -Soil Stds
Schedule 7: Contaminated Sites -Soil Relocation Stds,
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* Sched 7

R. Bilodeau
Analytical Chemist

N. Hartmann
Sr.Analytical Chemist

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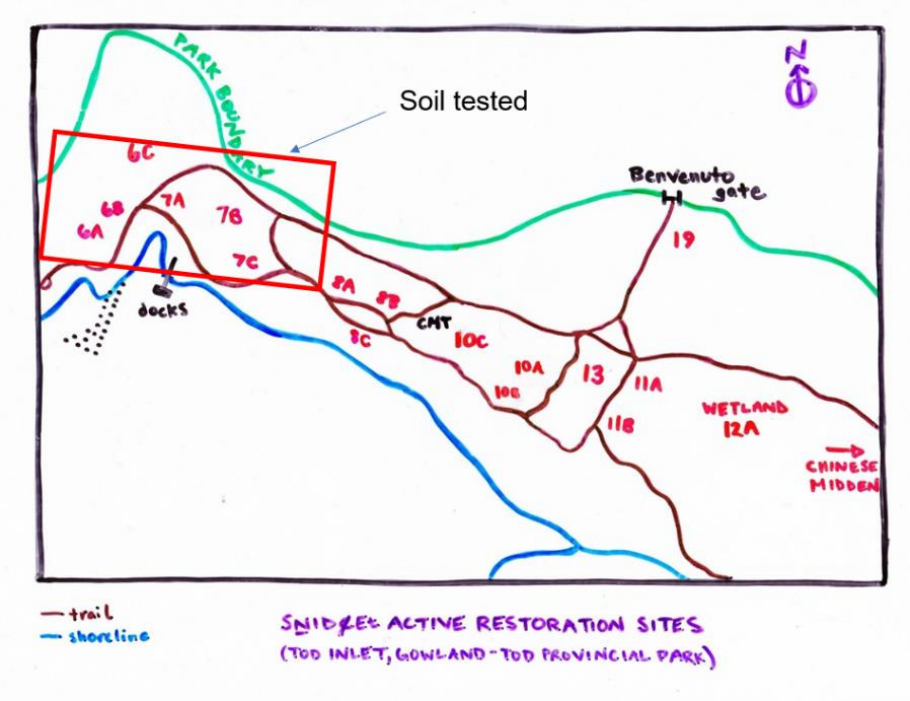
Appendix VI: Summary of Soil Test Results

Summary of technical findings from preliminary soil testing

Soil testing in the western portion of this site found concentrations of lead and arsenic, two heavy metals, slightly higher than recommended guidelines for soil under agricultural and residential use. Specifically, the soils in areas 6 and 7 (shown in the map below) were tested. Lead concentrations between 26 ug/g and 274 ug/g were found, including some samples with concentrations above the limit of 100 ug/g for agricultural and residential soils. Arsenic concentrations between 3 and 33 ug/g were found, including some soil samples with concentrations above guidelines of 15 ug/g.



These guidelines for soils are set by the Canadian Council of Ministers of the Environment for the protection of human health. Although the concentrations of lead and arsenic found in this area of the site are not much higher than the recommended soil levels, because these metals can be hazardous if humans ingest them, especially young children (younger than five years old), we wanted to share this summary of findings and information about actions we are taking to reduce the risk of exposure to metals through engaging in ecological restoration activities, learning activities and/or harvest of plants for food and medicine from this site.

Key terms

Exposure Pathways: the ways that contaminants can potentially harm people.

Direct exposure: The three main exposure routes are ingestion, inhalation, dermal.

Indirect exposure: consumption of plants with contaminated soil adhered to the surface.

Food-chain transfer: the movement of contaminants from soil to food plants and the subsequent transfer of contaminants into humans through food consumption

How people might be exposed to metals on this site specifically

Since these metals are not absorbed through the skin, the two ways people might be exposed to metals on this site are:

- Ingestion of soil accidentally (i.e.- working in soil and touching mouth; or children getting soil in their mouth)
- Consuming plants that have taken up the metals

Neither of these potential routes of exposure are very likely given how low the concentrations are in the soil. Generally, the reproductive parts of plants (fruits, seeds, nuts) are the least likely to contain metals, and plants do not uptake metals unless the concentrations are very high in the soil, which they aren't on this site.

Precautions and actions we are taking

Nonetheless, we have identified actions we will take to further reduce the possibility of any exposure occurring:

[1] a statement of risk from engaging in ecological restoration activities on site has been prepared for review and signing by volunteers and other individuals working on site for informed consent and protection of human health. At a minimum, gardening gloves should be worn and hands washed after gardening, and shoes worn while working on site should not be worn in the home.

[2] public signage has been installed with information about the soil test results and safety recommendations

[3] biological remediation of the contaminated area is underway (area 6+7)

[4] thick mulch will be applied to cover soils across the site to prevent people from coming into direct contact with the soil and reduce the likelihood that metals will move from the soil to the water or into edible plants

[5] the soil and edible and medicinal plants will be tested and monitored for metal content on a seasonable basis to ensure they are safe for people to harvest. If any are found to contain metals, the information will be shared with the community via signs and notices. Rosehip, cottonwood, yarrow, nettles and woolly sunflower are plants that will be tested.

For more information:

About soil contamination and best practices for healthy gardening: https://compost.bc.ca/healing-city-soils/

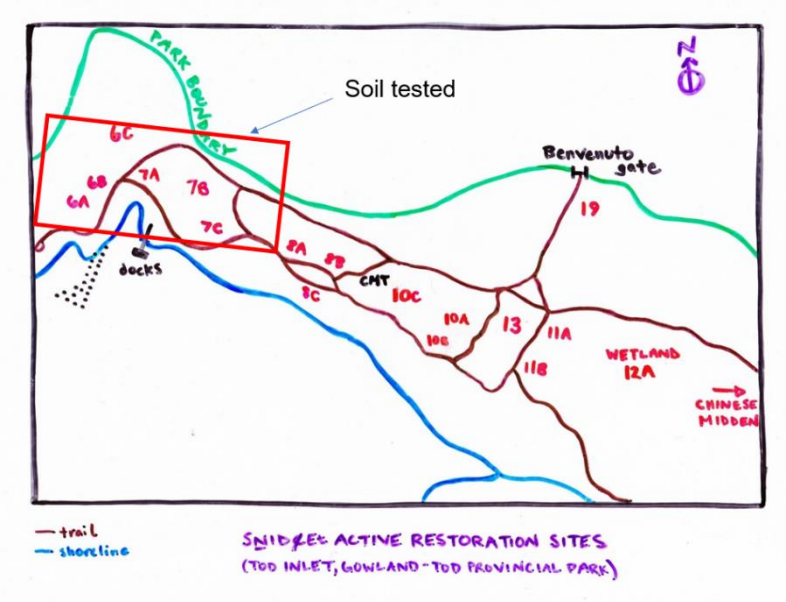
For more information about lead and arsenic toxicity: https://www.atsdr.cdc.gov/ (search each metal in their database for ToxFAQ's)

Soil metal guidelines for Canada: https://ccme.ca/en/current-activities/canadian-environmental-quality-guidelines

Appendix VII: Statement of Risk re Contaminated Soils

Statement of Risk from Engaging in Ecological Restoration Activities on this site

Soil testing in the western portion of this site found concentrations of lead and arsenic, two heavy metals, slightly higher than recommended guidelines for soil under agricultural and residential use. Specifically, the soils in areas 6 and 7 (shown in the map below) were tested. Lead concentrations between 26 ug/g and 274 ug/g were found, including some samples with concentrations above the limit of 100 ug/g for agricultural and residential soils. Arsenic concentrations between 3 and 33 ug/g were found, including some soil samples with concentrations above guidelines of 15 ug/g. These guidelines for soils are set by the Canadian Council of Ministers of the Environment for the protection of human health. Although the concentrations of lead and arsenic found in this area of the site are not much higher than the recommended soil levels, we wanted to offer more information about safety while engaging in activities on this site because these metals are highly toxic to humans.



How you may be exposed to metals through working on this site

The primary exposure risk to these metals through gardening/ ecological restoration activities on this site is through ingestion of contaminated soil particles. This is not a concern for adults, because it is uncommon for adults to ingest soil during gardening, but may be a concern for children. For children this risk is a concern during gardening due to potential direct exposure to contaminated soils. Exposure to even small amounts of lead is not safe for children, especially children under the age of 5 years old. Exposure is unlikely to occur through inhalation, and metals are not absorbed through your skin.

Key terms

Exposure Pathways: the ways that contaminants can potentially harm people.

Direct exposure: The three main exposure routes are ingestion, inhalation, dermal.

Indirect exposure: consumption of plants with contaminated soil adhered to the surface.

Food-chain transfer: the movement of contaminants from soil to food plants and the subsequent transfer of contaminants into humans through food consumption.

How to prevent exposures and protect yourself while on site

Although the risk of exposure to metals is low, and risks from exposure are low for this site (i.e.- you would need to be eating large amounts of soil over a long period of time), especially for adults, to avoid health risks, we advise you protect yourself from accidentally ingesting soil, either during gardening, by tracking soils into the home, or by eating soil particles stuck to plants by taking these precautionary steps while working on this site:

- Wear gloves while gardening
- Wash hands after gardening
- Wash plants that you harvest from the site before consuming for food or medicine
- Do not track soil from the site into your house: remove work boots or shoes before walking through your house
- Monitor young children while on site to prevent them from ingesting soil in areas 6 and 7.

For more information:

About soil contamination and best practices for healthy gardening: https://compost.bc.ca/healing-city-soils/

For more information about lead and arsenic toxicity: https://www.atsdr.cdc.gov/ (search each metal in their database for ToxFAQ's)

Soil metal guidelines for Canada: https://ccme.ca/en/current-activities/canadian-environmental-quality-guidelines