ENGINEERING DESIGN REPORT

Final Engineering Design Submittal
Eldridge Municipal Landfill Interim Action
(Project No. EC-0015)

Prepared for
City of Bellingham, Public Works
210 Lottie Street
Bellingham, WA 98225

Prepared by

Herrenkohl Consulting LLC
321 Summerland Road
Bellingham, WA 98229

Wilson Engineering, LLC
805 Dupont Street, Suite 7
Bellingham, WA 98225

June 24, 2011

CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

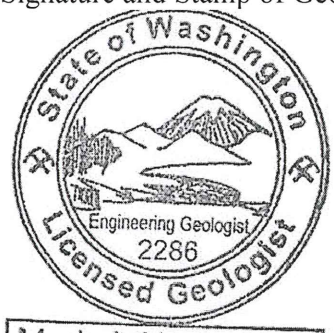
bgs	below ground surface
BMPs	best management practices
BTC	Bellingham Technical College
CAP	Cleanup Action Plan
CHASP	Construction Health and Safety Plan
Creek	Little Squalicum Creek
cy	cubic yard
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
EPA	U.S. Environmental Protection Agency
HASP	Health and Safety Plan
MTCA	Model Toxics Control Act
mg/kg	milligrams per kilogram
NAVD88	North American Vertical Datum 1988
Oeser	Oeser Company
Park	Little Squalicum Park
RI/FS	remedial investigation and feasibility study
RLs	remediation levels
RTP	reconnaissance test pit (sample name prefix)
SEPA	State Environmental Protection Act
SWPPP	Stormwater Pollution Prevention Plan
TCP	Toxics Cleanup Program
TEE	Terrestrial Ecological Evaluation
TP	test pit (sample name prefix)
USCS	Unified Soil Classification System
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act

CERTIFICATION

Engineer Design Report
Eldridge Municipal Landfill Interim Action

I, Mark J. Herrenkohl, a licensed engineering geologist in the State of Washington, certify that I have reviewed the geosciences portions of this document.

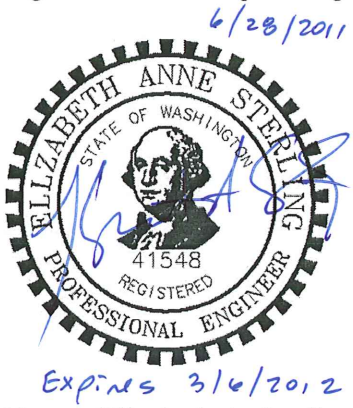
Signature and Stamp of Geologist:



Name: Mark J. Herrenkohl Date: June 24, 2011

I, Elizabeth A. Sterling, a licensed civil engineer in the State of Washington, certify that I have reviewed the engineering portions of this document.

Signature and Stamp of Engineer:



Name: Elizabeth A. Sterling Date: June 24, 2011

1 INTRODUCTION

The purpose of this Engineering Design Report (EDR) is to provide a narrative discussion of the methods and assumptions used in developing the design of the Eldridge Municipal Landfill interim action in Bellingham, Washington. This EDR is one part of an overall final design submittal package which also contains design plans, specifications, and associated documents. The interim action is being conducted under an amendment to Agreed Order No. DE 8073 between the City of Bellingham (City) and the Washington State Department of Ecology (Ecology).

As described in the amended Agreed Order, the proposed interim action includes removal of stockpiled contaminated soils and the excavation of municipal refuse and contaminated soils from the Eldridge Municipal Landfill Site (Site). The mixed soil and refuse will be transported to a Subtitle D landfill for disposal. The excavation will be backfilled with clean soil and vegetated. The approximate area of the excavation is 13,000 ft^2 for a total *in situ* volume of impacted soil and waste removal of approximately 2,700 cy (plus the 500 cy from the stockpile). The calculated volume of impacted soil assumes an average depth of 4 ft below ground surface (bgs) with an allowable over-excavation of 0.5 ft. The actual depth of excavation will be determined through performance monitoring.

Following this introduction, the report has been organized into seven sections:

- Section 2 provides a summary of the existing conditions including site use and the nature and extent of contamination
- Section 3 presents a general description of the selected interim action required by the amended Agreed Order
- Section 4 presents information on the engineering design including a summary on excavation, disposal, fill, vegetation, and wetland restoration methods
- Section 5 presents information on compliance monitoring and contingencies
- Section 6 provides an opinion on probable cost for the interim action and wetland restoration
- Section 7 presents the schedule for interim action completion
- Section 8 provides references.

Figures and tables are provided after the report text. This report is supplemented by five appendices and two attachments:

- Appendix A – Construction Permits (available at later date)

- Appendix B – Geotechnical Evaluation
- Appendix C – Performance Monitoring and Contingency Response Plan (available at later date)
- Appendix D – Health and Safety Plan
- Appendix E – Wetland Restoration Plan
- Appendix F – Access Agreement Between Bellingham Technical College and City of Bellingham

- Attachment 1 – Design Plans
- Attachment 2 – Design Specifications

2 EXISTING CONDITIONS

The Site is an historic municipal solid waste landfill located along the southeastern portion of Little Squalicum Park (Park), Bellingham, Washington. The Site covers an area of approximately 19,000 ft^2 (~0.4 acres) and is bordered by a small gravel access road to the north, Bellingham Technical College (BTC) parking lots to the east, a slope and the BTC campus to the south, and the recently constructed BTC/Birchwood stormwater channel (part of EPA's Little Squalicum Creek Removal Action) to the west. The general location and layout of the Site is shown on Figures 1 and 2.

The current ground surface of the landfill Site consists predominantly of silty sand and gravel of variable thickness, underlain by layers of municipal refuse and debris (refer to test pit logs in Appendix B). The waste and debris were observed to a depth of approximately 4 ft bgs over much of the area. A short summary of the site use and nature and extent of contamination is provided in the following subsections.

2.1 SITE USE AND LANDFILLING HISTORY

In the mid- to late-1930's the City had used a portion of the Park as a "sanitary landfill" for burning and burying local municipal waste hauled by a garbage collection contractor. The landfill was operated for only a few years before operations ceased. The boundaries of the landfill were delineated and documented in the draft Remedial Investigation/Feasibility Study (RI/FS) report and estimated to be approximately 19,000 ft^2, with an approximately 6,000 ft^2 area removed and stockpiled as part of an independent action by the City in support of the construction of the BTC/Birchwood stormwater channel (Herrenkohl Consulting 2011). The types of municipal garbage observed during the Site investigations consisted of glass bottles, metal scraps, drywall, rust, charcoal, ash and ceramics. Few of the waste materials are currently exposed at the surface, but are largely covered by soil fills (Herrenkohl Consulting 2011, Integral 2008).

In the 1960s, sand and gravel were extensively mined in the ravine including areas near the landfill Site (Integral 2008). After mining, the land was leased to Mt. Baker Plywood for raw log storage during the early 1970s. The untreated logs were transported by trucks to and from the ravine via the beach. Since the 1980's, the Site has been used by the City for recreation as part of Little Squalicum Park.

2.2 NATURE AND EXTENT OF SITE CONTAMINATION

The nature and extent of Site contamination is preliminarily described in the draft RI/FS report (Herrenkohl Consulting 2011). The results of previous Site investigations indicate the landfill debris and soils contain metals (arsenic, cadmium, copper, lead, mercury, zinc) and pentachlorophenol at levels determined to pose a threat to human health and the environment.

The highest concentrations of heavy metals were detected in landfill soils from 2 ft to 4 ft bgs. Pentachlorophenol was detected in landfill surface soils (the upper 2 ft).

The interim action includes excavation of municipal solid waste and contaminated soils above Site remediation levels (RLs) with disposal at a Subtitle D landfill. This will eliminate exposure to human and ecological receptors by direct contact. In addition, the interim action will likely significantly reduce contact of hazardous substances remaining in soil with groundwater, surface water and sediments, thus reducing or eliminating the leaching pathway.

3 INTERIM ACTION

The interim action includes removal of the stockpiled contaminated soils and the excavation of the upper four feet (plus allowable over-excavation) of soil and municipal wastes from the Site. The mixed soil and municipal wastes will be transported to a Subtitle D landfill for disposal. The excavation will be stabilized, backfilled with clean soil, and vegetated by hydroseeding. As shown in Figure 2, the approximate area of the excavation based on the previous Site characterization is 13,000 ft^2 for a total volume of impacted soil/waste removal of approximately 2,700 cy (~4,700 tons[1]) (plus the 500 cy or 900 tons stockpiled onsite) including allowable over-excavation. Additional excavation may be required if landfill debris is observed beyond the estimated landfill boundaries or if performance monitoring indicates that additional excavation is required to achieve soil RLs.

The soil RLs for the Site are as follows:

- Arsenic: 10 mg/kg (to be confirmed in consultation with Ecology)
- Cadmium: 45 mg/kg, based on direct human contact
- Copper: 50 mg/kg, based on the site-specific terrestrial ecological evaluation (TEE)
- Lead: 50 mg/kg, based on the TEE
- Mercury: 0.1 mg/kg, based on the TEE
- Zinc: 86 mg/kg, based on natural background
- Pentachlorophenol: 2.5 mg/kg, based on direct human contact

The point of compliance for each of the proposed Site RLs, all of which are based on direct contact with soil for either human or ecological receptors, is 15 ft bgs[2].

RLs will be used during construction to assess performance as described in Section 5.

[1] Assumes 1.75 tons per cubic yard of material excavated with no expansion factor.
[2] Some of the direct contact RLs were adjusted up to natural background concentrations per WAC 173-340-740(5)(c).

4 REMEDIATION DESIGN

This section describes the development of the interim action remedial design elements. As described in the previous section, the interim action involves excavating municipal refuse and contaminated soil and disposal at a Subtitle D landfill. Once removal is complete, the excavation will be stabilized by placement of clean fill and vegetated by hydroseeding[3]. In addition, a 750 ft^2 depressional wetland will be created within the project area. Additional information on the remediation design is provided in sections below and referenced appendices and attachments.

4.1 REFUSE AND CONTAMINATED SOIL EXCAVATION AND DISPOSAL

Excavation and transport will be accomplished by standard techniques and equipment including excavators, loaders, haul trucks and containers. The field personnel, though, need to be health and safety trained under the Washington Industrial Safety and Health Act (WISHA) to perform work dealing with municipal refuse and contaminated soils.

Two Subtitle D landfills have been identified as being able to accept the wastes and contaminated soil from the Site. The Roosevelt Regional Landfill facility in Klickitat County, Washington and the Chemical Waste Management facility in Arlington, Oregon can accept all Site soils as long as the leachability of the metals in soils does not exceed threshold levels (e.g., 5 mg/L for lead), and there are no free liquids in the soil. If metals concentrations exceed leaching threshold criteria and there are free liquids, stabilization pre-treatment procedures will be required (e.g., solidification). Transport of the soils to the landfills would be accomplished through Regional Disposal Company and Recycling and Disposal Services, respectively. Selection of the landfill will be the responsibility of the selected construction contractor.

Once performance monitoring has been completed as described in Section 5, the excavation will be stabilized by placement of clean fill and hydroseeded. In addition, a 750 ft^2 wetland will be created within the project area as described in Section 4.4 and Appendix E.

Table 1 presents a compilation of the key design criteria and assumptions pertinent to refuse and soil excavation and stabilization activities. The basis for information is discussed in the following sections, and elsewhere throughout the report including associated appendices and attachments.

[3] Hydroseeding includes application of grass seed, fertilizer, and mulch.

Table 1. Key Design Criteria and Assumptions	
Estimated Total Projected Excavation Volume, Including Stockpile Material and Allowable Over-Excavation (*In Situ* Volume with No Expansion Factor)	3,200 cy (5,600 tons)
Allowable Over-Excavation Depth	0.5 ft
Assumed Excavation Cut Slope	1H:1V to 2H:1V – location specific, cut slope shoring and slope protection may be necessary prior to backfill
Average Excavation Material Gradation	Municipal Refuse: bottles, ash, ceramics, metals debris, other miscellaneous Soil (varies): predominately well-graded gravels or gravel-sand mixtures with little to no fines (GW) and gravel-sand-fines mixtures (GM)
Excavation Equipment	Excavators, Loaders, Haul Trucks and Containers Supplied by Landfill (equipment selected by construction contractor)
Excavation Production Rate	500 cy/day
Backfill Production Rate	500 cy/day
Construction Schedule	12 hours/day, 5 days/week
Estimated Construction Period	20 days

4.1.1 Conventions

A summary of terminology and conventions specific to the construction activities is presented below:

- Project Datum – All elevations are referenced to North American Vertical Datum 1988 (NAVD88). All descriptions of site locations, including grading plan are referenced in state plane coordinate system [North American Datum Washington North 1983/1998 (NAD83/98)].

- Excavation Stationing Coordinates – Layout and control of the excavation will be specified in terms of an offset stationing system located approximately 25 ft from the

assumed northern boundary of the landfill. The property line with BTC, plastic protective liner installed at the slope crest of the BTC/Birchwood storm channel, and toe of slope will delineate the layout and control of the excavation for east, west, and south boundaries, respectively.

- Required (or Specified) Excavation Depth – The required excavation depth represents the minimum depth of excavation that must be accomplished over the footprint area of the landfill in order to satisfy the interim cleanup objectives for the project. The required excavation depth is reported in terms of elevation (ft, NAVD88).

- Allowable Over-Excavation Depth – The construction contract will require that the contractor remove all municipal refuse and contaminated soil to the required excavation depth, but will also require 0.5 ft of allowable over-excavation to ensure that all refuse and impacted soil is removed. No payment will be made for additional excavation beyond the allowable overdepth unless performance monitoring indicates a requirement for additional removal.

4.1.2 Excavation Layout and Construction Sequencing

There are three components to the excavation layout including the Stockpile Area, Excavation Area 1, and Excavation Area 2 (Figure 3). A description of each is provided below followed by the planned construction sequencing for the Site cleanup. Additional details are presented in Attachments 1 and 2.

Stockpile Area – Approximately 500 cy (900 tons) of soil and refuse excavated during construction of the BTC/Birchwood storm channel in 2010. During construction of the BTC/Birchwood storm channel, refuse and impacted soils were excavated and stockpiled on 30 ml plastic for transport and disposal at a later time. Based on confirmation sampling results of soils (Herrenkohl Consulting 2011), excavated materials contain metals concentrations above RLs.

Excavation Area 1 – Approximately 7,000 ft^2 area delineated during the Little Squalicum Park RI (Integral 2008). The estimated volume of this excavation area is 1,450 cy (2,500 tons) including allowable over-excavation. Area 1 will be excavated based on station coordinates and prescribed offset as described in Section 4.1.1. The extent of contamination will be confirmed by performance monitoring (Section 5).

Excavation Area 2 – Approximately 6,000 ft^2 area without previous characterization but assumed to contain miscellaneous refuse and contaminated soil based on data collected from Integral (2008) and construction of BTC/Birchwood storm channel in 2010. The estimated volume of this excavation area is 1,250 cy (2,200 tons) including allowable over-excavation. Area 2 will be excavated based on assumed station coordinates and prescribed offset but with excavation limits determined in the field by the engineer. The extent of contamination will also be confirmed by performance monitoring (Section 5).

Construction operations will be sequenced in a manner that minimizes impact to water quality during excavation activities. This will be accomplished by first removing refuse and soil from the area with the greatest accumulation of these materials observed during previous investigations (Excavation Area 1) and working towards the new BTC/Birchwood storm channel (east to west). The 500 cy stockpile and Excavation Area 2, located closest to the storm channel will be excavated last in the construction sequence.

4.1.3 Stormwater Pollution Prevention Plan

Construction stormwater pollution prevention elements for the Site are provided in the stormwater pollution prevention plan (SWPPP) (refer to C3.1 through C3.4 in Attachment 1). The SWPPP includes information on: clearing limits, construction access, controlling flow rates, installing sediment controls, stabilizing soils, protecting slopes, protecting drain inlets, stabilizing channels and outlets, controlling pollutants, controlling dewatering, maintaining best management practices (BMPs), and managing the project until completion. A brief summary of some stormwater pollution prevention elements are provided below.

Buffer zones will be established before construction begins around delineated wetlands and drainage swales and channels. Silt fencing and other sediment control measures will be installed to protect the BTC/Birchwood storm channel, Wetland A, the wetland area located east of the Site, and areas surrounding the access road and construction vehicle turnaround/holding area. The total disturbed area during construction is estimated at 0.85 acres. Storm drain inlets operable during construction along Site access routes will be protected so that stormwater runoff does not enter the conveyance system without being filtered or treated to remove sediment. Orange fencing will be installed to mark clearing limits along the south slope area.

Although groundwater levels are expected to be at the lowest levels during the summer and early fall, groundwater seepage and/or the groundwater table maybe encountered during excavation. The contractor should be able to control excavation water with sumps/pumps and perimeter ditches and limiting the size of the excavation area. Excavation de-watering will not be discharged into adjacent clean areas, allowed to enter storm drain systems or the BTC/Birchwood storm channel. Additional measures may be necessary (e.g., collection of waters, testing, and proper disposal) if water is more than 1 to 2 ft above the base of the excavation.

More details of these and other SWPPP elements for the project are provided in Attachments 1 and 2.

4.1.4 Site Access and Stockpiling Plan

An existing quarry spall road from the BTC parking lot will be the primary access route to and from the Site (Figure 3 and refer to Attachment 1). An access agreement has been established between the City and BTC (City of Bellingham 2011 – Appendix F). The road will be improved and widened for haul truck loading and unloading, and include a construction vehicle turnaround/holding area. Widening the road will facilitate loading and unloading of trucks while

allowing access for other vehicles on the road such as haul trucks servicing the EPA/Oeser cleanup in other portions of Little Squalicum Park.

Excavated refuse and contaminated soils will be stockpiled within the landfill excavation areas for rehandling and loading haul trucks. The number and location of stockpiles may change as needed by the contractor.

4.1.5 Soil Cleanup Plan, Grading Plan and Profiles

The soil cleanup plan, grading plan and profiles are provided in Attachment 1 (C5.1 through C5.4). Eight cross-sectional profiles present the projected landfill surface and existing grade, additional excavation for side-slopes, bottom of landfill, over-excavation subgrade (0.5 ft), and finished grade. Areas not to be disturbed during project construction are also shown.

4.1.6 Temporary Slopes

Some excavation will occur near the base of existing slopes to the east and south of the Site. Overall stability of excavated slopes will be maintained by limiting the proximity of equipment storage and soil stockpiling from the edges of excavated side slopes. There are also limitations on how long excavated slopes can remain exposed before backfilling is required. During the excavation, the following should be considered by the contractor regarding temporary slopes in these areas (Appendix B):

- Along the property line with BTC (east), the slope of the excavation should be no steeper than 1.5H:1V. If steeper (1H:1V), the contractor may need to provide cut slope shoring and slope protection prior to backfilling these areas.

- Along the toe of the southern slope, the excavation should be limited to about 4 ft maximum cut, with backfill completed as soon as possible. If significant sloughing is encountered during excavation, additional protection measures may be taken to protect the slope. This may include excavating in alternating slots of 10 to 15 ft wide, leaving the soil between as a buttress. After backfilling each slot with clean soil, the remaining slots of impacted soil can be excavated to complete the cleanup.

- Additional geotechnical field evaluation may be required during construction if groundwater seepage is present during excavation at the toe of the slope or if the excavation is greater than 4 ft.

4.1.7 Off-Site Disposal

Excavated contaminated soils and landfill wastes will be disposed of at a permitted off-site facility in accordance with applicable state and federal requirements. The contractor will be responsible for selecting the soil disposal facility, obtaining the necessary disposal permits, and meeting state and federal requirements for transport and disposal of the wastes. The City will

approve the contractor's proposed choice of disposal facilities as a requirement of the contractor's pre-construction submittals.

Trucks hauling contaminated materials from the Site will remain covered from leaving the Site until they off-load at the designated facility.

4.2 SITE STABILIZATION

Site stabilization including placement of clean fill, suitable drainage, wetland restoration, and revegetation will be required once the municipal waste and contaminated soil are excavated from the Site. There are local sources of clean fill materials which could be transported by dump truck to the Site for placement. A particular soil gradation (i.e., grain size) will be required to meet compaction, infiltration, and drainage requirements for the filled area and wetland area (refer to Appendix B). At a minimum, the imported soil should meet the requirements of *Standard Specifications* 9-03.14(3) for Common Borrow. To ensure that contaminated soils are not brought to the Site, imported soil generally meeting granular fill [*Standard Specification* 9-03.14(1) Gravel Borrow or 9-03.14(2) Select Borrow] from local pits will likely be used as backfill, rather than random fill materials.

The remedial excavation will be backfilled with gravel followed by 4-inches of topsoil (except for restored wetland – refer to Section 4.3) to approximately match existing site grades. Specifications of the backfill materials proposed for the Site are provided in Attachment 2 (Sheet C6.1). Permanent slopes should not be steeper than 2H:1V. Soil will be placed and compacted in accordance with the earthwork procedures outlined in Appendix B and Attachment 2.

Where lower permeability backfill is required (as outlined in Appendix E) to reduce surface water losses to infiltration, borrow materials should have a minimum fines content of 30 percent with a plasticity index greater than 5 percent.

Once clean fill placement has been completed, the Site will be hydroseeded.

4.3 WETLAND RESTORATION

A 750 ft^2 depressional wetland will be impacted by the landfill cleanup. To offset this wetland impact, a 750 ft^2 depressional wetland will be created within the project area (Figure 3). The created wetland will be planted with native plant species common to the area and mimic the impacted wetland in form and fauna[4]. As described in Section 4.2 and Appendix B, backfill for the wetland restoration area should have a minimum fines content of 30 percent with a plasticity index greater than 5 percent. Six inches of compacted, low-permeable soils will be covered with 9-inches of topsoil before planting (refer to C7.1 in Attachment 1). Additional details on the wetland restoration are provided in the wetland restoration plan (Appendix E).

[4] Timing of the wetland planting will be determined by the City with assistance from the field engineer.

5 MONITORING AND CONTINGENCY

Compliance monitoring will be conducted during and following the remedial construction work at the site, in accordance with WAC 173-340-410. The three types of compliance monitoring to be conducted include the following:

- Protection Monitoring to confirm that human health and the environment are adequately protected during the construction period of the interim action;
- Performance Monitoring to confirm that the interim action has attained RLs and other performance standards; and
- Confirmation Monitoring to confirm the long-term effectiveness of the interim action once performance standards have been attained.

5.1 PROTECTION MONITORING

Protection monitoring will address worker health and safety for activities related to construction of the interim action, as well as protection of the general public. Worker health and safety is addressed through a project health and safety plan (HASP) (Appendix D)[5]. The HASP addresses potential physical and chemical hazards associated with Site activities consistent with the requirements of WAC 173-340-810, and field monitoring to confirm that potential exposure to chemical hazards do not exceed health-based limits. Anticipated potential physical hazards include working in proximity to heavy equipment, heat stress or cold stress, and vehicular traffic. Anticipated potential chemical hazards include exposure to Site contaminants through various exposure pathways (i.e., direct contact, inhalation, and ingestion).

It is anticipated that the health and safety measures implemented to protect worker safely will also adequately protect the general public. The use of best management practices (e.g., dust control measures) will also assure protection of public health.

5.2 PERFORMANCE MONITORING

Performance monitoring activities are documented in the Performance Monitoring and Contingency Response Plan (Appendix C). Performance monitoring and contingency responses will be implemented for the Site in accordance with WAC 173-340-410. The objective of the monitoring is to confirm that RLs have been achieved by the interim action for the Site. The monitoring plan contains information on the number of samples and required testing, the trigger for contingency response actions, and the justification for discontinuing monitoring.

[5] A Construction HASP (CHASP) shall be completed by the contractor for protection of its workers during construction activities.

Performance monitoring will include the collection and chemical analysis of soil samples from the bottom and sidewalls of the excavation to confirm metals and pentachlorophenol concentrations are below the remediation levels. Although there are no RLs for PAHs, selected samples will be analyzed for these chemicals. An additional sample from each bottom and sidewall location will be collected and archived (frozen) for possible future analysis.

Construction contingency responses are outlined in Appendix C.

5.3 CONFIRMATION MONITORING

A confirmation monitoring plan will be prepared and implemented at a later date. The scope of the confirmation monitoring may include groundwater, surface water, or sediment monitoring.

6 OPINION OF PROBABLE COST

The designer's Opinion of Probable Construction Cost is summarized in Table 2. Quantities and volumes of construction materials were determined from the project design plans and specifications (Attachments 1 and 2). Unit costs were developed from a combination of information provided by the City and local contractors, and from experience with other local projects.

The unit cost of soil and refuse disposal is particularly significant in this overall cost estimate. The $60/ton unit rate for excavation, transport and disposal is based on recent discussions with the Regional Disposal Company (RDC) solid waste landfill located in Roosevelt, Washington. Excavated material is expected to be transported from the project site by truck to a transfer station in Ferndale to the RDC facility in Roosevelt by rail. Other solid waste facilities may also be considered during procurement.

The unit cost of fill materials are based on an assumed local upland source of the materials (borrow).

A 15 percent contingency has been applied to the cost estimate to account for current unknowns in the final design and possible quantity increases in the field during construction. The current total estimate cost for construction is approximately $830,000.

Table 2. Opinion of Probable Construction Cost

Bid Item No.	Unit Measure	Bid Item Description	Quantity	Unit Price	Extended Price
1	LS	Mobilization (10% Construction Cost)	1	$ 60,380	$ 60,380
2	LS	Stormwater Permit	1	$ 4,000	$ 4,000
3	LS	Spill Prevention, Control, & Countermeasures Plan	1	$ 1,000	$ 1,000
4	LS	Temporary Traffic Control	1	$ 3,000	$ 3,000
5	Hour	Labor for Traffic Control	160	$ 50	$ 8,000
6	LS	Construction Survey	1	$ 8,000	$ 8,000
7	LS	Temproary Erosion & Sediment Control	1	$ 5,000	$ 5,000
8	LF	Barrier Fencing	800	$ 4	$ 3,200
9	LF	Environmental Control Fencing	600	$ 4	$ 2,400
10	LF	Straw Wattles	550	$ 5	$ 2,750
11	EA	Catch Basin Insert	8	$ 60	$ 480
12	ACRE	Clearing and Grubbing	1	$ 10,000	$ 10,000
13	SY	Stabilized Construction Turnaround/Pullout	700	$ 18	$ 12,600
14	CY	Excavation & Embankment, Including Haul	150	$ 25	$ 3,750
15	Ton	Landfill Excavation, Including Haul & Disposal at Subtitle D Landfill	4,630	$ 60	$ 277,800
16	Ton	Stockpile Removal, Including Haul & Disposal at Subtitle D Landfill	875	$ 50	$ 43,750
17	Ton	Allowable Over-Excavation, Including Haul & Disposal at Subtitle D Landfill	810	$ 60	$ 48,600
18	Gallon	Excavation Dewatering - Pumping, Storage & Disposal	36,000	$ 0.50	$ 18,000
19	EA	Pothole Potential Landfill Sites	25	$ 1,200	$ 30,000
20	SY	Construction Geotextile for Separation	700	$ 2	$ 1,400
21	Ton	Quarry Spalls - Access Road Enhancement	240	$ 12	$ 2,880
22	Ton	Gravel Backfill - Pull Out & Landfill Excavation Backfill	4,450	$ 15	$ 66,750
23	Ton	Topsoil, Type A	620	$ 50	$ 31,000
24	Ton	Low Permeability Soil - Constructed Wetland Liner	31	$ 45	$ 1,395
25	ACRE	Seeding, Fertilizing, & Mulching	1	$ 4,000	$ 4,000
26	LS	Plant Selection, Establishment & Mulching	1	$ 4,000	$ 4,000
27	FA	Minor Changes	1	$ 10,000	$ 10,000
		SUBTOTAL ESTIMATED CONSTRUCTION COST			**$ 664,100**
		CONTINGENCY (15%)			$ 99,600
		SUBTOTAL			**$ 763,700**
		SALES TAX (8.7%)			$ 66,442
		TOTAL ESTIMATED CONSTRUCTION COST			**$ 830,100**
OTHER COSTS					
		Contract Administration by City of Bellingham (5%)			$ 33,200
		Construction Oversight, Monitoring and Completion Report			$ 85,000
		Compliance Monitoring			TBD

Table 2. Opinion of Probable Construction Cost

Assumptions:

Placement of topsoil to a 4-in depth over 100% of the disturbed site.
Expansion factor (uncompacted to bank) of 1.15 utilized.
Assumed material densities:

- Landfill Material = 1.75 tons/CY
- Clean Excavation = 1.85 tons/CY
- Topsoil = 1.35 tons/CY
- Quarry Spalls = 1.60 tons/CY
- Low Permeability Soil = 1.90 tons/CY

Mobilization assumed to be 10% of the balance of the construction costs.
Assumed 4 weeks of traffic flagger time (160 hrs).

7 SCHEDULE

The design and implementation of the interim action for the Site will be completed over a period of approximately 4-6 months. The expected schedule for design and implementation of the landfill soil interim action is described below. The actual dates are dependent on a signed, amended Agreed Order between the City and Ecology (Figure 4).

- **Engineering Design and Permitting** –Upon review by the City and Ecology, the draft (90%) engineering design report was followed by this final engineering design report. The final engineering design report with plans and specifications is expected by the end of June 2011.

  Permit applications [e.g., Joint Aquatic Resource Permits Application (JARPA)] were completed in May 2011. Permits are required before construction can begin.

- **Cleanup Construction** –The start of construction will be early to mid-August 2011. Construction must be completed when access to the BTC campus is available (before September 20). Wetland plantings will occur after September 20.

Compliance Monitoring – Confirmation of RLs will take place during construction as described in the performance monitoring plan. A contingency response may include the removal of additional soil above RLs.

Confirmation monitoring will be performed at a later date. The scope of the confirmation monitoring may include groundwater, surface water, or sediment monitoring.

Construction As-Built and Completion Report – Cleanup construction as-built and the Completion Report are expected to be completed by December 2011.

Additional details on the schedule for the interim action are presented in Figure 4.

8 REFERENCES

City of Bellingham. 2011. Access Agreement between Bellingham Technical College and the City of Bellingham. June 16, 2011.

Herrenkohl Consulting. 2011. Draft Remedial Investigation and Feasibility Study Report, Eldridge Municipal Landfill Site, Bellingham, Washington. Prepared for the City of Bellingham, Public Works, Bellingham, Washington. Prepared by Herrenkohl Consulting LLC of Bellingham, Washington with assistance from Integral Consulting, Inc. of Seattle, Washington. February 2011.

Integral. 2008. Draft Final. Little Squalicum Park Remedial Investigation Report, Bellingham, Washington. Prepared for the Washington State Department of Ecology, Bellingham, WA and City of Bellingham, Parks & Recreation and Public Works Departments, Bellingham, Washington. Prepared by Integral Consulting Inc., Bellingham, Washington. December 2008.

MTCA. Model Toxics Control Act (Chapter 173-340). Prepared by the Washington State Department of Ecology, Toxics Cleanup Program. Last Updated November 2007.

USEPA. 2010. Action Memorandum for a Non-Time-Critical Removal Action at the Little Squalicum Creek Area of The Oeser Company Superfund Site, Bellingham, Washington. CERCLIS ID - WAD008957243. Prepared for Daniel Opalski, Director Office of Environmental Cleanup, U.S. Environmental Protection Agency, Region 10, Seattle, WA. Prepared by Howard Orlean, Superfund Project Manager, Site Cleanup Unit 3, Office of Environmental Cleanup, U.S. Environmental Protection Agency, Region 10, Seattle, WA. Approved July 2, 2010.

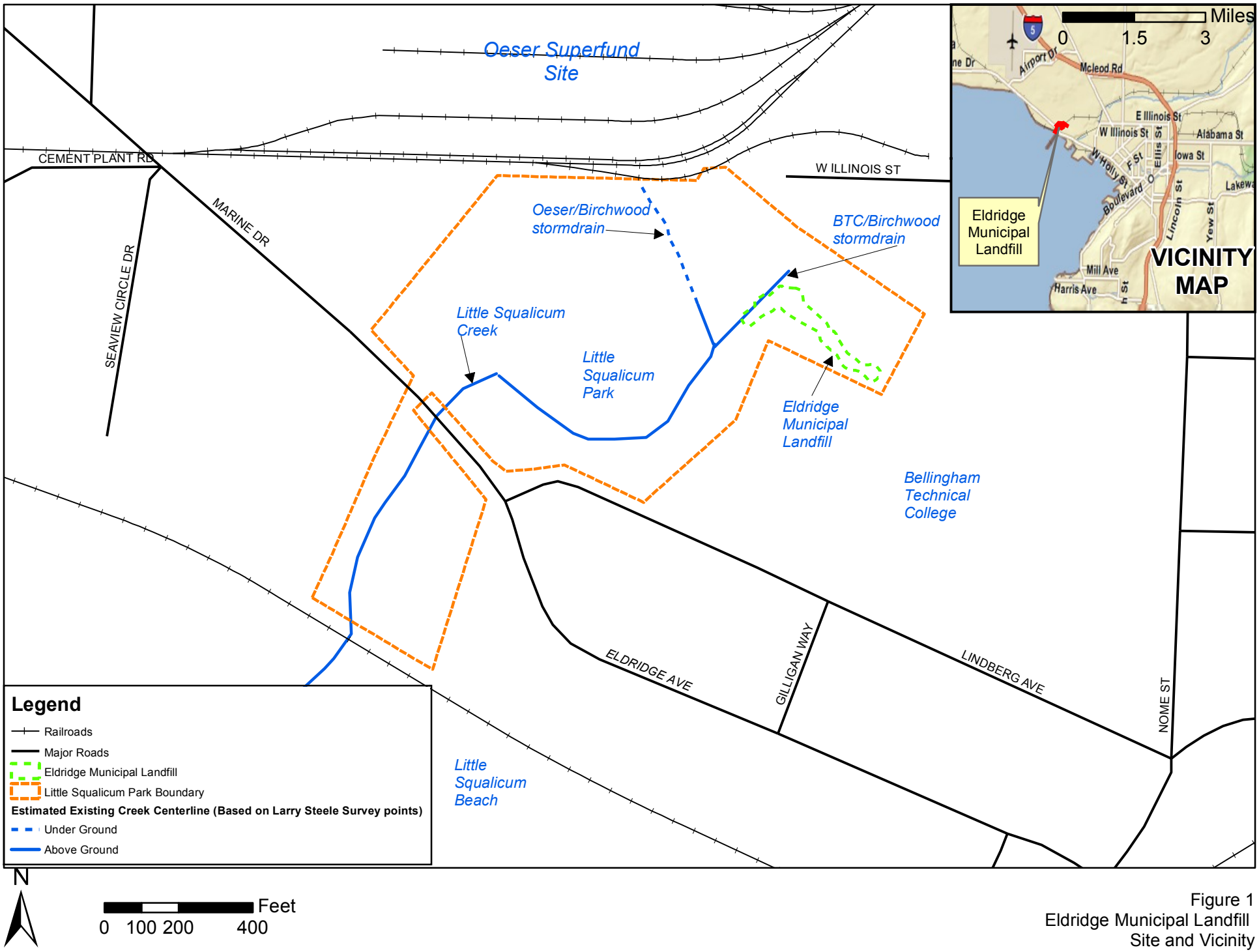
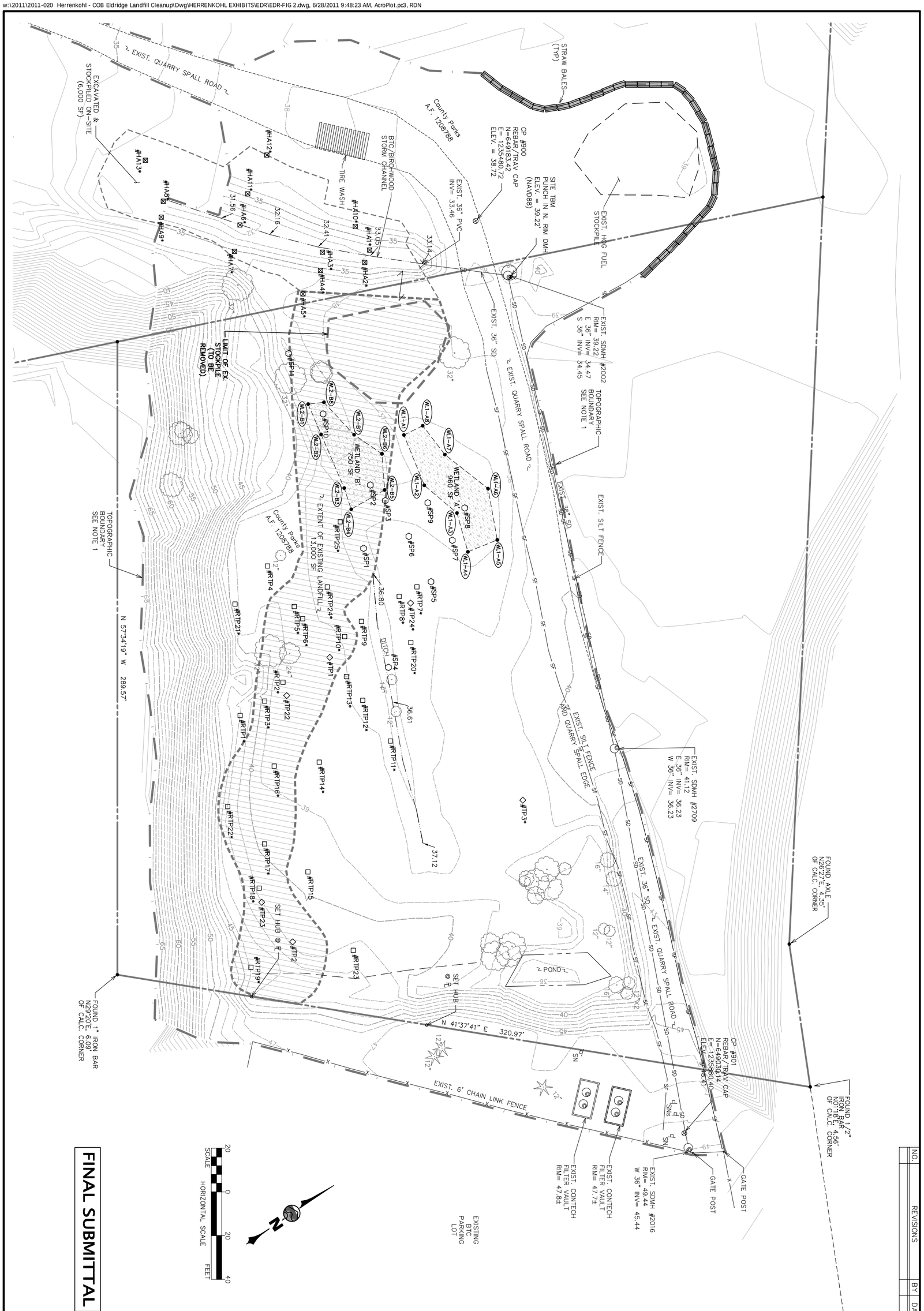


Figure 1
Eldridge Municipal Landfill
Site and Vicinity
Bellingham, WA

w:\2011\2011-020 Herrenkohl - COB Eldridge Landfill Cleanup\Dwg\HERRENKOHL EXHIBITS\EDR\EDR-FIG 2.dwg, 6/28/2011 9:48:23 AM, AcroPlot.pc3, RDN



FINAL SUBMITTAL

NO.	REVISIONS	BY	DATE

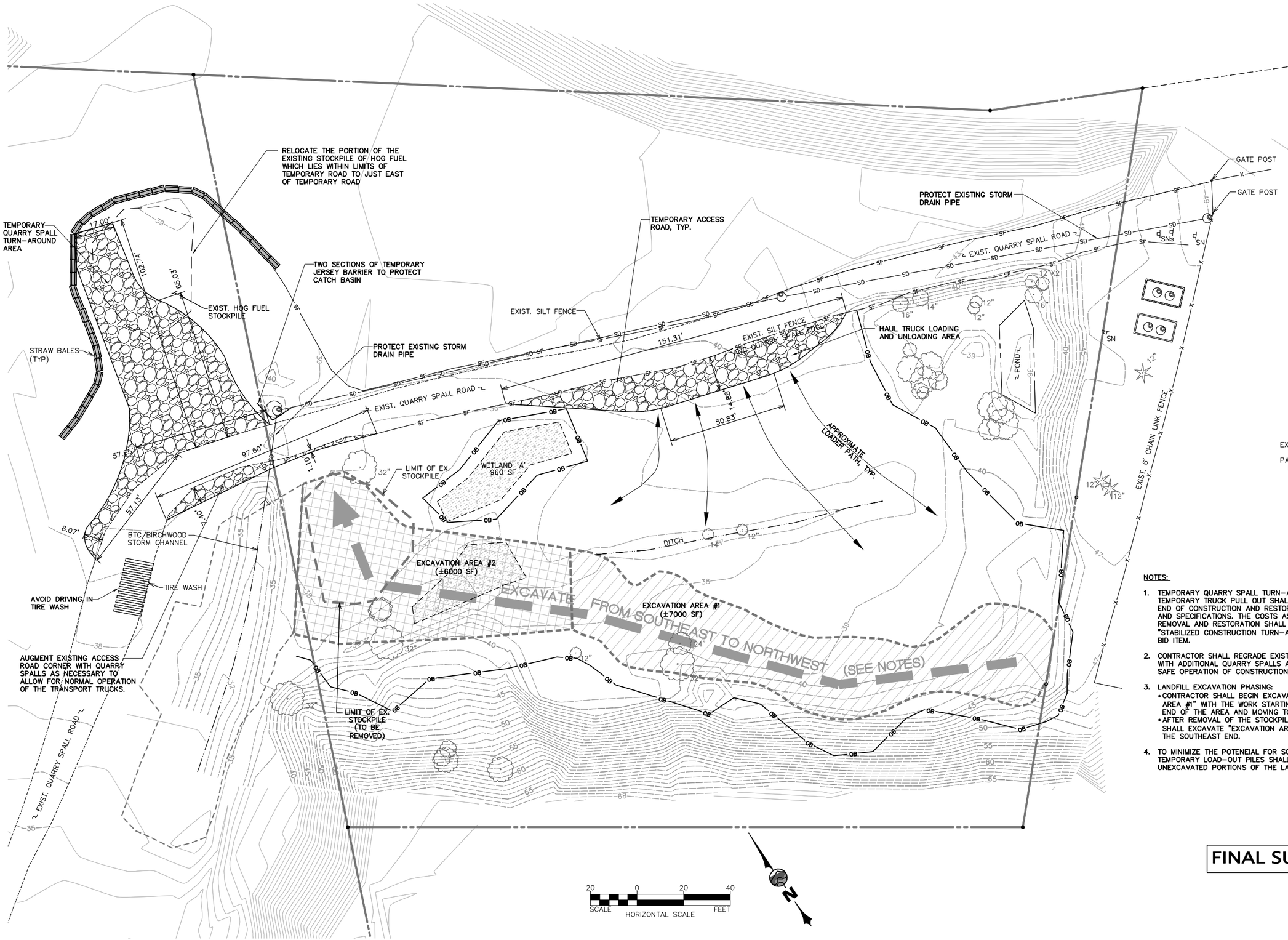
SHEET	DATE	CITY OF BELLINGHAM	DESIGNED BY
FIG. 2	06/24/2011		EAS
OF	SCALE	BELLINGHAM WASHINGTON	DRAWN BY
*	AS SHOWN	ELDRIDGE MUNICIPAL LANDFILL INTERIM ACTION	JGS
	JOB NUMBER	EXISTING CONDITIONS	CHECKED BY
	2011-020		

ELIZABETH ANNE STERLING, STATE OF WASHINGTON, 41548, REGISTERED PROFESSIONAL ENGINEER

Wilson SURVEY/ENGINEERING

WILSON ENGINEERING, LLC
805 DUPONT STREET
BELLINGHAM, WA 98225
(360) 733-6100 • FAX (360) 647-9061
www.wilsonengineering.com

NO.	REVISIONS	BY	DATE



NOTES:

1. TEMPORARY QUARRY SPALL TURN-AROUND AREA AND TEMPORARY TRUCK PULL OUT SHALL BE REMOVED AT THE END OF CONSTRUCTION AND RESTORED PER THE PLANS AND SPECIFICATIONS. THE COSTS ASSOCIATED WITH THEIR REMOVAL AND RESTORATION SHALL BE INCLUDED IN THE "STABILIZED CONSTRUCTION TURN-AROUND AND PULLOUT" BID ITEM.
2. CONTRACTOR SHALL REGRADE EXISTING ACCESS ROAD WITH ADDITIONAL QUARRY SPALLS AS NECESSARY FOR SAFE OPERATION OF CONSTRUCTION VEHICLES.
3. LANDFILL EXCAVATION PHASING:
   - CONTRACTOR SHALL BEGIN EXCAVATION IN "EXCAVATION AREA #1" WITH THE WORK STARTING AT THE SOUTHEAST END OF THE AREA AND MOVING TO THE NORTHWEST.
   - AFTER REMOVAL OF THE STOCKPILE, THE CONTRACTOR SHALL EXCAVATE "EXCAVATION AREA #2" STARTING AT THE SOUTHEAST END.
4. TO MINIMIZE THE POTENEIAL FOR SOIL CONTAMINATION, TEMPORARY LOAD-OUT PILES SHALL BE LOCATED ON UNEXCAVATED PORTIONS OF THE LANDFILL ONLY.

FINAL SUBMITTAL

WILSON ENGINEERING, LLC
805 DUPONT STREET
BELLINGHAM, WA 98225
(360) 733-6100 • FAX (360) 647-9061
www.wilsonengineering.com
Wilson SURVEY/ENGINEERING

ANNE ELIZABETH STERLING — STATE OF WASHINGTON — 41548 — REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY	DRAWN BY	CHECKED BY
EAS	RCW/BAH	

CITY OF BELLINGHAM
BELLINGHAM WASHINGTON
ELDRIDGE MUNICIPAL LANDFILL INTERIM ACTION
PROJECT SEQUENCING, SITE ACCESS, AND STOCKPILING PLAN

DATE	SCALE	JOB NUMBER
06/24/2011	AS SHOWN	2011-020

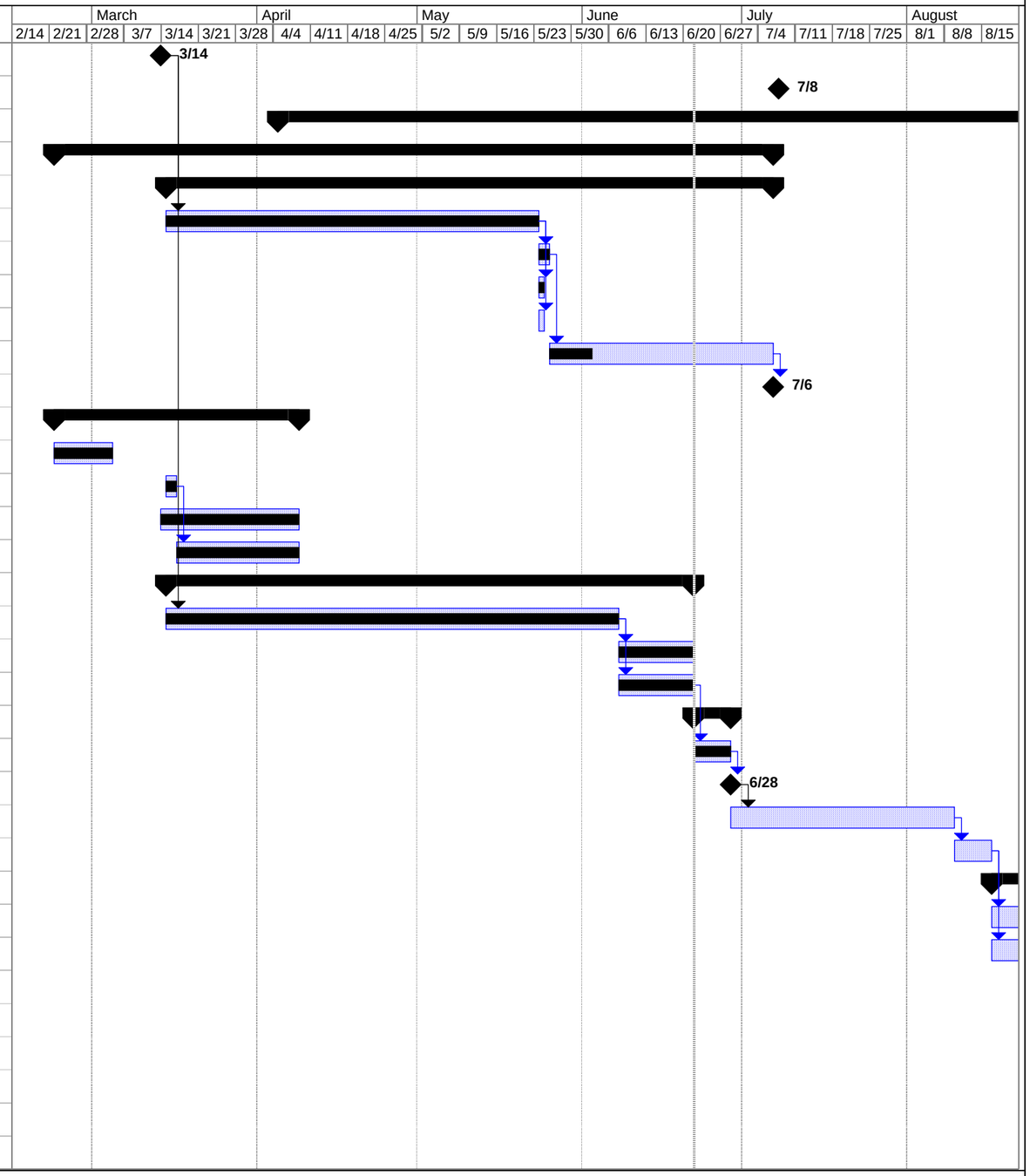
SHEET FIG. 3 OF *

w:\2011\2011-020 Herrenkohl - COB Eldridge Landfill Cleanup\Dwg\HERRENKOHL EXHIBITS\EDR\EDR-FIG 3.dwg, 6/28/2011 9:48:34 AM, AcroPlot.pc3, RDN

Figure 4 - Draft Project Schedule - Eldridge Municipal Landfill Interim Action

Duration in Work Days - Monday through Friday

ID	Task Name	Duration	Start	Finish	Predecessors
1	**City Notice to Proceed**	1 day	Mon 3/14/11	Mon 3/14/11	
2	**Amendment to Agreed Order Signed**	0 days	Fri 7/8/11	Fri 7/8/11	
3	**TASK 1. MONTHLY PROGRESS REPORTS**	**221 days**	**Tue 4/5/11**	**Tue 2/7/12**	
15	**TASK 4. ENGINEERING DESIGN CLEANUP**	**97 days**	**Tue 2/22/11**	**Wed 7/6/11**	
16	**TASK 4a. Permitting**	**82 days**	**Tue 3/15/11**	**Wed 7/6/11**	
17	Permit Application Preparation and City Review	50 days	Tue 3/15/11	Mon 5/23/11	1
18	JARPA Application Submitted	2 days	Tue 5/24/11	Wed 5/25/11	17
19	SEPA DNS	1 day	Tue 5/24/11	Tue 5/24/11	17
20	BTC Access Permit (City Completes)	1 day	Tue 5/24/11	Tue 5/24/11	17
21	Agency Review of Permit Applications	30 days	Thu 5/26/11	Wed 7/6/11	18
22	Issue of Project Permits	0 days	Wed 7/6/11	Wed 7/6/11	21
23	**TASK 4b. Pre-Design Data Collection**	**34 days**	**Tue 2/22/11**	**Fri 4/8/11**	
24	Wetland Delineation and Report	9 days	Tue 2/22/11	Fri 3/4/11	
25	Brush Cutting/Clearing of Site	2 days	Tue 3/15/11	Wed 3/16/11	
26	Wetland Restoration Plan	20 days	Mon 3/14/11	Fri 4/8/11	
27	Surveying of Site (boundaries and ground-truth)	17 days	Thu 3/17/11	Fri 4/8/11	25
28	**TASK 4c. 90% Pre-Final Construction Plans and Specifications**	**71 days**	**Tue 3/15/11**	**Tue 6/21/11**	
29	Client Draft Plans and Specs including Ancillary Documents	61 days	Tue 3/15/11	Tue 6/7/11	1
30	**Client Review of Draft Documents**	**10 days**	Wed 6/8/11	Tue 6/21/11	29
31	**Ecology Review of Draft Documents**	**10 days**	Wed 6/8/11	Tue 6/21/11	29
32	**Task 4d. Final Construction Plans and Specifications**	**5 days**	**Wed 6/22/11**	**Tue 6/28/11**	
33	Revise based on City and Ecology Comments	5 days	Wed 6/22/11	Tue 6/28/11	31
34	Issue Final Construction Plans including Ancillary Documents	0 days	Tue 6/28/11	Tue 6/28/11	33
35	**SELECTION OF CLEANUP CONSTRUCTION CONTRACTOR**	30 days	Wed 6/29/11	Tue 8/9/11	34
36	**PRE-CONSTRUCTION MEETING**	5 days	Wed 8/10/11	Tue 8/16/11	35
37	**TASK 5. CONSTRUCTION OVERSIGHT AND MANAGEMENT**	**95 days**	**Wed 8/17/11**	**Tue 12/27/11**	
38	Construction Oversight	20 days	Wed 8/17/11	Tue 9/13/11	36
39	Performance Monitoring	20 days	Wed 8/17/11	Tue 9/13/11	36
40	Draft Construction As-Builts	30 days	Wed 9/14/11	Tue 10/25/11	38
41	Client Draft Construction Completion Report	30 days	Wed 9/14/11	Tue 10/25/11	38
42	Client Review of Draft Construction Report	10 days	Wed 10/26/11	Tue 11/8/11	41
43	Ecology Draft Construction Completion Report	5 days	Wed 11/9/11	Tue 11/15/11	42
44	Ecology Review of Construction Completion Report	20 days	Wed 11/16/11	Tue 12/13/11	43
45	Final Construction Completion Report including As-Builts	10 days	Wed 12/14/11	Tue 12/27/11	44



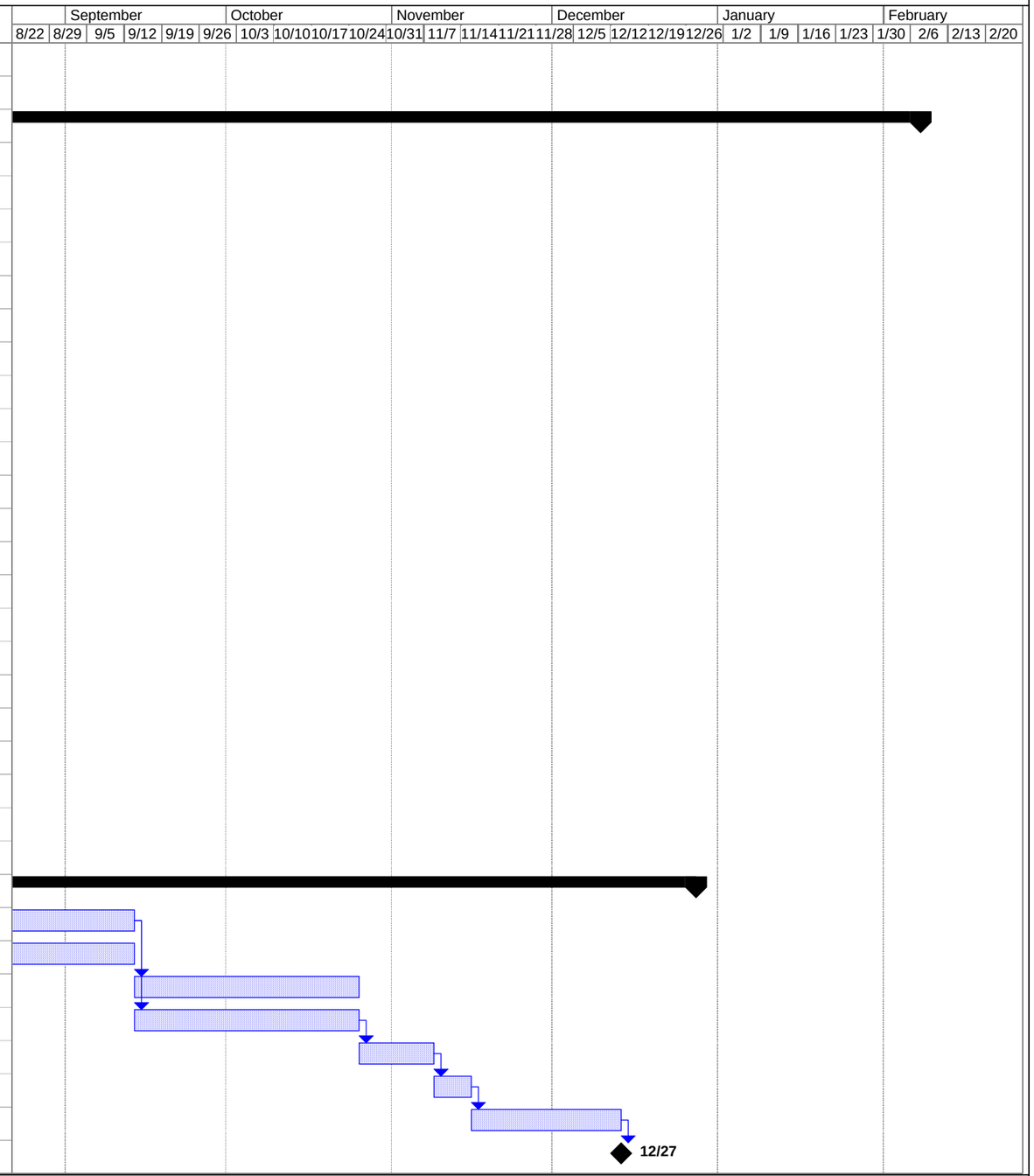
Project: Draft Project Schedule_Eldrid
Date: Wed 6/22/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

Figure 4 - Draft Project Schedule - Eldridge Municipal Landfill Interim Action

Duration in Work Days - Monday through Friday

ID	Task Name	Duration	Start	Finish	Predecessors
1	**City Notice to Proceed**	1 day	Mon 3/14/11	Mon 3/14/11	
2	**Amendment to Agreed Order Signed**	0 days	Fri 7/8/11	Fri 7/8/11	
3	**TASK 1. MONTHLY PROGRESS REPORTS**	**221 days**	**Tue 4/5/11**	**Tue 2/7/12**	
15	**TASK 4. ENGINEERING DESIGN CLEANUP**	**97 days**	**Tue 2/22/11**	**Wed 7/6/11**	
16	**TASK 4a. Permitting**	**82 days**	**Tue 3/15/11**	**Wed 7/6/11**	
17	Permit Application Preparation and City Review	50 days	Tue 3/15/11	Mon 5/23/11	1
18	JARPA Application Submitted	2 days	Tue 5/24/11	Wed 5/25/11	17
19	SEPA DNS	1 day	Tue 5/24/11	Tue 5/24/11	17
20	BTC Access Permit (City Completes)	1 day	Tue 5/24/11	Tue 5/24/11	17
21	Agency Review of Permit Applications	30 days	Thu 5/26/11	Wed 7/6/11	18
22	Issue of Project Permits	0 days	Wed 7/6/11	Wed 7/6/11	21
23	**TASK 4b. Pre-Design Data Collection**	**34 days**	**Tue 2/22/11**	**Fri 4/8/11**	
24	Wetland Delineation and Report	9 days	Tue 2/22/11	Fri 3/4/11	
25	Brush Cutting/Clearing of Site	2 days	Tue 3/15/11	Wed 3/16/11	
26	Wetland Restoration Plan	20 days	Mon 3/14/11	Fri 4/8/11	
27	Surveying of Site (boundaries and ground-truth)	17 days	Thu 3/17/11	Fri 4/8/11	25
28	**TASK 4c. 90% Pre-Final Construction Plans and Specifications**	**71 days**	**Tue 3/15/11**	**Tue 6/21/11**	
29	Client Draft Plans and Specs including Ancillary Documents	61 days	Tue 3/15/11	Tue 6/7/11	1
30	**Client Review of Draft Documents**	**10 days**	Wed 6/8/11	Tue 6/21/11	29
31	**Ecology Review of Draft Documents**	**10 days**	Wed 6/8/11	Tue 6/21/11	29
32	**Task 4d. Final Construction Plans and Specifications**	**5 days**	**Wed 6/22/11**	**Tue 6/28/11**	
33	Revise based on City and Ecology Comments	5 days	Wed 6/22/11	Tue 6/28/11	31
34	Issue Final Construction Plans including Ancillary Documents	0 days	Tue 6/28/11	Tue 6/28/11	33
35	**SELECTION OF CLEANUP CONSTRUCTION CONTRACTOR**	30 days	Wed 6/29/11	Tue 8/9/11	34
36	**PRE-CONSTRUCTION MEETING**	5 days	Wed 8/10/11	Tue 8/16/11	35
37	**TASK 5. CONSTRUCTION OVERSIGHT AND MANAGEMENT**	**95 days**	**Wed 8/17/11**	**Tue 12/27/11**	
38	Construction Oversight	20 days	Wed 8/17/11	Tue 9/13/11	36
39	Performance Monitoring	20 days	Wed 8/17/11	Tue 9/13/11	36
40	Draft Construction As-Builts	30 days	Wed 9/14/11	Tue 10/25/11	38
41	Client Draft Construction Completion Report	30 days	Wed 9/14/11	Tue 10/25/11	38
42	Client Review of Draft Construction Report	10 days	Wed 10/26/11	Tue 11/8/11	41
43	Ecology Draft Construction Completion Report	5 days	Wed 11/9/11	Tue 11/15/11	42
44	Ecology Review of Construction Completion Report	20 days	Wed 11/16/11	Tue 12/13/11	43
45	Final Construction Completion Report including As-Builts	10 days	Wed 12/14/11	Tue 12/27/11	44



Project: Draft Project Schedule_Eldrid
Date: Wed 6/22/11

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

APPENDIX A

CONSTRUCTION PERMITS

(To Be Provided Later)

APPENDIX B

GEOTECHNICAL ENGINEERING

GeoEngineers
600 Dupont Street
Bellingham, Washington 98225
360.647.1510

April 28, 2011

Herrenkohl Consulting, LLC
321 Summerland Road
Bellingham, Washington 98229

Attention: Mark J. Herrenkohl, LEG

Subject: Geotechnical Engineering Services
Eldridge Municipal Landfill Cleanup Project
Bellingham, Washington
File No. 0356-123-00

INTRODUCTION

We are pleased to present our letter report of "Geotechnical Engineering Services – Eldridge Municipal Landfill Cleanup Project, Bellingham, Washington." Our geotechnical services were completed in general accordance with the scope of services for the project as defined in our Subcontractor Agreement with Herrenkohl Consulting, LLC. Our services were authorized via email by Mark Herrenkohl on April 1, 2011, Preliminary results of our evaluation were discussed with you as information became available.

PROJECT DESCRIPTION

The Eldridge Municipal Landfill Cleanup Project will be completed for the City of Bellingham (City) and consists of cleanup of municipal solid wastes and contaminated soils in Little Squalicum Park in Bellingham, Washington. Little Squalicum Park and the project site are located northeast of Bellingham Technical College (BTC), as shown in the Vicinity Map, Figure 1. We understand that the site was operated as a landfill in the mid- to late-1930s and has resulted in a shallow thickness of impacted soil in the approximate footprint shown in Figure 2. The project will consist of excavation and off-site disposal of potentially impacted soils, followed by site stabilization including backfill, drainage improvements, and revegetation. The drainage improvements may include enhancement of surface water features such as creation of connected channels and improved wetland areas.

The purpose of our services is to provide geotechnical recommendations for the excavation, backfill and site stabilization aspects of the project. Evaluation of surface water design elements will be completed in future project phases as necessary, and are not included in this letter.

SITE CONDITIONS

Surface Conditions

The project site is located along the base of a ravine. The present topography was created in-part from historical gravel mining operations. The foot print of the cleanup area is in the southeast portion of the park (Figure 2), and is relatively level at about Elevation 37 to 40 feet. A slightly deeper storm channel was recently created during previous cleanup activities west of the project site. A relatively steep slope, up to about 1.3H:1V (horizontal:vertical), is present south of the cleanup area, with slopes extending 20 to 25 feet up to BTC property. BTC parking is also located at the eastern margin of the cleanup area.

Portions of the site have been recently cleared of extensive blackberries and other low-lying vegetation. Some grassy areas remain in areas identified as wetlands. Some existing medium to large diameter deciduous trees are present within the footprint of the cleanup. Low-lying brush and vines, and small trees are present on the slope to the south.

Subsurface Conditions

Subsurface soil conditions were explored by Herrenkohl Consulting by completing various test pit and hand auger explorations during site characterization activities. The locations of the explorations are shown in Figure 2. Explorations were shallow, typically ranging from about 2 to 6.5 feet below ground surface. A summary table of Reconnaissance Test Pit (RTP) Survey Results is provided attached with this report (Attachment A). Test pit logs from 2005 (TP-1 through TP-3) and 2006 (TP-22 through TP-24) are also included in the attachment.

Soil Conditions

Landfill materials encountered in the test pit and hand auger explorations were generally described as mixed sand, gravel, silt and clay, and landfill debris consisting of metal, glass (bottles), brick, concrete, asphalt, ash, and other materials. Where encountered, the landfill debris typically extended to depths of about 4 feet below ground surface (bgs), and a maximum of about 5 feet bgs. Where noted in the logs, native soil underlying the landfill debris consisted of silty sandy gravel, and gravel and sand with silt.

Based on our nearby explorations at BTC near the top of the slope to the south, the slope is likely underlain at shallow depths by generally granular sand that is a glacial outwash deposit. Some surficial fill soils and colluvium are likely present on the surface of the slope.

Groundwater Conditions

The groundwater table is located at a shallow depth below ground surface. Low areas of the site and surrounding area have standing water during much of the year. Groundwater was encountered in most test pits at depths from 1.5 to 5 feet bgs. Water level should be expected to fluctuate with season, precipitation, and other factors.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on our evaluation, we conclude that the proposed remedial excavation at the site is feasible with conventional procedures and equipment. We recommend that construction occur during the summer/early fall months to minimize impacts of surface and groundwater. Our evaluation of geologically hazardous areas and summary of earthwork recommendations are provided in the following sections.

Geologically Hazardous Areas

The following paragraphs address geologically hazardous areas at the site based on Bellingham Municipal Code (BMC) definition (16.55.420 – Designation of Specific Hazard Areas). Geologically hazardous areas that require evaluation include areas susceptible to erosion hazard, landslide hazard, seismic hazard, or mine hazard. Designation as a hazard area does not imply that a specific hazard exists, rather that the area meets specific criteria that makes the area more susceptible to the hazard and requires further evaluation to meet code requirements prior to site development.

All four hazards are present at or near the project site based on the COB Geologic Hazard Areas Map Folio and code definition.

Seismic hazard and mine hazard (primarily surface subsidence) will not be impacted by the proposed cleanup and stabilization actions and are not addressed further in this letter. Temporary erosion hazard and landslide hazard will be adequately addressed by construction practices that minimize these temporary construction risks, and are discussed below. No long-term change in site geologic hazard risk will result from the proposed cleanup and stabilization actions.

Erosion Hazard

Some of the landfill materials and the native outwash sands have a high erosion potential, particularly when disturbed. However, provided that proper earthwork practices are used and best management practices (BMPs) incorporated into the grading plans, we conclude that the erosion hazard will be adequately mitigated during the project. Stormwater should be prevented from flowing uncontrolled across disturbed areas during construction. Temporary erosion control measures should be used during construction depending on the weather, location, soil type, and other factors. Temporary erosion protection (e.g., straw, plastic, or rolled erosion control products [RECPs]) may be necessary to reduce sediment transport until vegetation is established or permanent surfacing applied. Appropriate BMPs should be incorporated into the temporary erosion and sediment control plan by the civil engineer. All finished slopes should be protected and/or vegetated before the rainy season. In our opinion, provided these construction practices are followed, the erosion hazard at the site can be adequately mitigated during and subsequent to construction, and the project does not significantly increase risk to adjacent critical areas or properties.

Landslide Hazard

The proposed cleanup will require temporary excavation near the toe of steep slopes that are defined as potentially unstable. Excavation in these areas will be limited to about 4 feet or less, will occur within primarily landfill soils and only slightly into native soils, and remedial excavation will not extend a

significant distance upslope. All remedial excavation will be backfilled upon completion of the work. Nearby structures at BTC are set back from the crest of the slope at least 20 feet. We provide recommendations for managing temporary excavations and constructing permanent slopes in the Earthwork section of this report. Based on our evaluation, the proposed remedial cleanup activities and stabilization do not present a landslide hazard risk and will not have an adverse effect on slope stability at the site or adjacent properties.

Earthwork

We recommend that all earthwork activities be completed in general accordance with the most recent version of the WSDOT *Standard Specifications* (herein after referred to as *Standard Specifications*).

Excavation

The excavations will primarily occur within loose mixed fill and landfill refuse. The material can be excavated using conventional earthmoving equipment. Depending on the actual required depth of refuse encountered, some of the remedial excavations could encounter groundwater, the extent of which will be highly dependent on the time of year the excavation is completed. Groundwater considerations are discussed further in a subsequent section of this report. All excavations should be performed in accordance with local, state and federal regulations.

Temporary Slopes

As discussed, temporary excavations will largely occur in relatively level areas of the site and be limited in depth to about 4 feet. When required for the protection of workers (i.e. temporary excavations over 4 feet), the Washington State Administrative Code (WAC) 296-155, Part N requires temporary slopes at 1.5H:1V or flatter for the “Type C” fill soils present at the site. Temporary slopes in wet/saturated sand will be susceptible to sloughing, raveling and "running" conditions. Flatter slopes will very likely be necessary to maintain excavation stability if seepage is present in the cut slope, possibly in conjunction with dewatering.

It should be expected that unsupported cut slopes will experience some sloughing and raveling if exposed to surface water. Berms, hay bales or other provisions should be installed along the top of the excavation to intercept surface runoff to reduce the potential for sloughing and erosion of cut slopes during wet weather.

Based on the expected limits of the remedial excavation, some excavation may occur near the base of existing slopes to the west and south. We make the following recommendations regarding temporary slopes:

- We recommend that the remedial excavation adjacent to the BTC parking lot, at the west end of the site, be no steeper than 1.5H:1V and be offset a minimum of 2 feet from the edge of pavement to avoid undercutting the existing asphalt. If dense native outwash sand is encountered, it may be possible to use temporary slopes at 1H:1V. However, this should not be attempted without approval of the geotechnical engineer in the field and absent erosion protection because of the high erosion potential of the native soils.
- Where the remedial excavation extends to the toe of the slope to the south, we recommend that the excavation be limited to about 4 feet maximum cut. The contractor should monitor the

excavation regularly for stability, and the excavation should be backfilled as soon as practical. If significant sloughing is encountered during excavation, additional protection measures may be necessary to protect the slope. A feasible approach to excavation in this area may be to conduct the excavation in alternating slots 10 to 15 feet wide, leaving the soil between as a buttress. After backfilling each slot with clean soil, the remaining slots of impacted soil can be excavated to complete the cleanup excavation.

- If seepage is present during excavation at the toe of the slope, or if excavation greater than 4 feet is required in this area, we recommend additional geotechnical evaluation during construction to determine if additional mitigation measures are appropriate.

In our opinion, the contractor will be in the best position to observe subsurface conditions continuously throughout the construction process and to respond to the soil and groundwater conditions encountered. Construction site safety is generally the sole responsibility of the contractor, who also is solely responsible for the means, methods, and sequencing of the construction operations and choices regarding temporary excavations. We are providing this information only as a service to our client. Under no circumstances should the information provided below be interpreted to mean that GeoEngineers, Inc. is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

Permanent Slopes

The remedial excavation will be backfilled to approximately match existing site grades. We recommend that permanent slopes be no steeper than 2H:1V. This assumes that the soil is placed and compacted in accordance with the earthwork procedures outlined in the following sections of this report.

Wet Weather Earthwork

During wet weather, the site soils will become disturbed and trafficability will be very difficult with rubber tired equipment. We provide the following wet weather considerations:

- Construction activities should be scheduled so that the length of time that soils are left exposed to moisture is reduced to the extent practical.
- The ground surface in and around the work area should be sloped so that surface water is directed to a sump or discharge location. The ground surface should be graded such that areas of ponded water do not develop.
- The site soils should not be left un-compacted and exposed to moisture. Sealing the surficial soils by rolling with a smooth-drum roller prior to periods of precipitation will reduce the extent to which these soils become wet or unstable.
- Limiting construction traffic over unprotected soil and by limiting the size and type of construction equipment used.
- Providing haul roads for wet weather construction. It is our experience that 12 to 24 inches of sand and gravel are necessary to support repeated construction traffic. Use of a geotextile separation fabric between the subgrade and granular fill will improve haul road performance.

Backfill and Compaction

The remedial excavation will be backfilled with imported soil. At a minimum, the imported soil should meet the requirements of *Standard Specifications* 9-03.14(3) for Common Borrow. To ensure that contaminated soils are not brought to the site, it is our understanding that imported soil generally meeting granular fill (*Standard Specification* 9-03.14(1) Gravel Borrow or 9-03.14(2) Select Borrow) from local pits will likely be used as backfill, rather than random fill materials.

Where lower permeability backfill is desired to reduce surface water losses to infiltration, such as at constructed stream channel or wetland areas, we recommend a minimum fines content of 30 percent with plasticity index greater than 5 percent. Locally derived glaciomarine drift soils (which are primarily silt and clay) will typically meet this requirement.

At a minimum, excavation backfill should be placed in lifts not exceeding 12 to 18 inches in loose thickness, and tracked in place with a dozer. If it is desired to reduce the potential for uneven post-construction settlement, we recommend that the backfill be compacted to a maximum dry density (MDD) of at least 85 to 90 percent based on ASTM D 1557. If the soils are placed along the slope with a completed face geometry of 2H:1V, we recommend that the fill be placed to at least 90 percent MDD and benched or terraced into the existing hillside.

Reuse of Site Soil

It is our understanding that all onsite soils removed for the remedial excavation will be considered potentially impacted and will be disposed of off-site. No reuse of site soil is planned at this time.

Groundwater Considerations

The proposed remedial excavation will involve excavation that will likely encounter zones of groundwater seepage and/or the groundwater table. Groundwater was encountered during previous test pit explorations as shallow as 2 feet bgs. Groundwater will be at the lowest during the summer and into the early fall, however, groundwater may be encountered even during seasonal lows. Given the relatively shallow planned depth of excavation, where groundwater is nominally at or near the base of the excavation, we expect the contractor will likely be able to control excavation water with sumps/pumps and perimeter ditches and limiting the size of the excavation area. If water is more than 1 to 2 feet above the base of the excavation, significant seepage will be encountered and additional measures may be necessary.

The site is an environmental cleanup. Any groundwater pumping and discharge should completed be in accordance with appropriate environmental compliance requirements established for the project.

Limitations

We have prepared this letter report for use by the Herrenkohl Consulting, LLC and other members of the design team for use in design of the proposed Eldridge Landfill Cleanup Project in Bellingham, Washington.

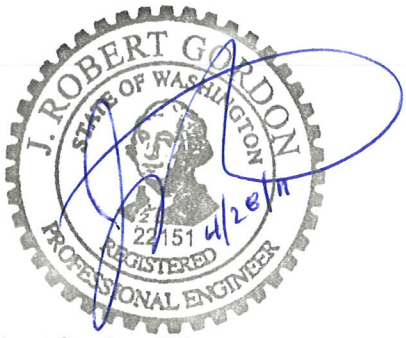
Within the limitation of scope, schedule and budget, our services have been executed in accordance with generally accepted geotechnical practices in the area at the time the report was prepared. No warranty or other conditions, expressed or implied, should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

Please refer to Attachment B titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.

We trust this letter suits your current needs. Please call if you have questions.

Sincerely,
GeoEngineers, Inc.



Sean W. Cool, PE
Geotechnical Engineer

J. Robert Gordon, PE
Principal

SWC:JRG:ims
https://projects.geoengineers.com/sites/00356-123-00/Final/LetterReport

Attachments:

- Figure 1 – Vicinity Map
- Figure 2 – Preliminary Site Plan
- Attachment A – Results of Field Explorations by Others
- Attachment B - Report Limitations and Guidelines for Use

Two copies submitted

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Vicinity Map

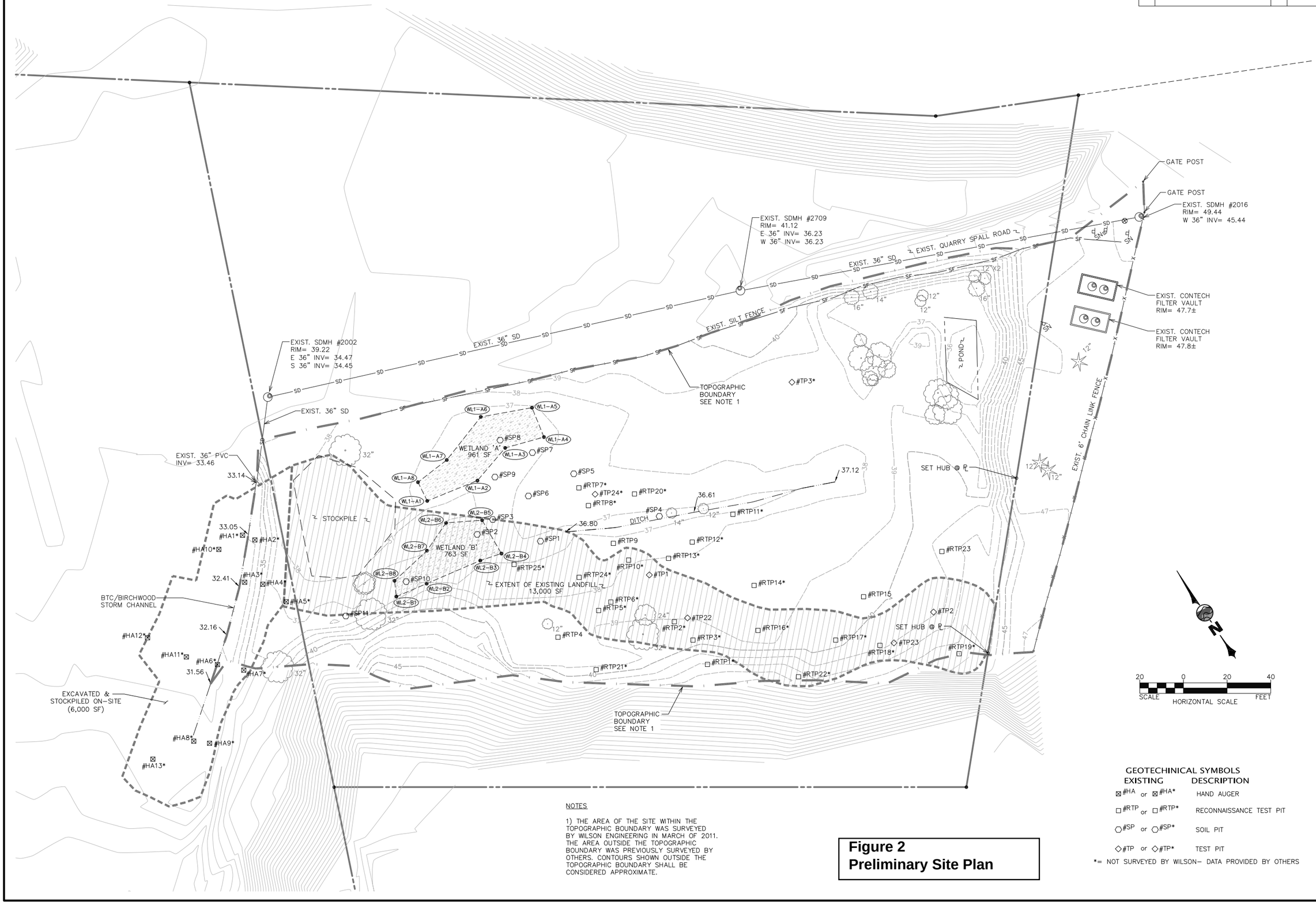
Eldridge Municipal Landfill Cleanup Project
Bellingham, Washington

GeoEngineers

Figure 1

Office: BELL Path: P:\00356-123\00\working\35612300 VM F1.mxd SWC:MS 04/28/2010

NO.	REVISIONS	BY	DATE



NOTES

1) THE AREA OF THE SITE WITHIN THE TOPOGRAPHIC BOUNDARY WAS SURVEYED BY WILSON ENGINEERING IN MARCH OF 2011. THE AREA OUTSIDE THE TOPOGRAPHIC BOUNDARY WAS PREVIOUSLY SURVEYED BY OTHERS. CONTOURS SHOWN OUTSIDE THE TOPOGRAPHIC BOUNDARY SHALL BE CONSIDERED APPROXIMATE.

Figure 2
Preliminary Site Plan

GEOTECHNICAL SYMBOLS

EXISTING	DESCRIPTION
⊠#HA or ⊠#HA*	HAND AUGER
□#RTP or □#RTP*	RECONNAISSANCE TEST PIT
○#SP or ○#SP*	SOIL PIT
◇#TP or ◇#TP*	TEST PIT

*= NOT SURVEYED BY WILSON- DATA PROVIDED BY OTHERS

WILSON ENGINEERING, LLC
805 DUPONT STREET
BELLINGHAM, WA 98225
(360) 733-6100 • FAX (360) 647-9061
www.wilsonengineering.com
Wilson SURVEY/ENGINEERING

DESIGNED BY | DRAWN BY JGS | CHECKED BY

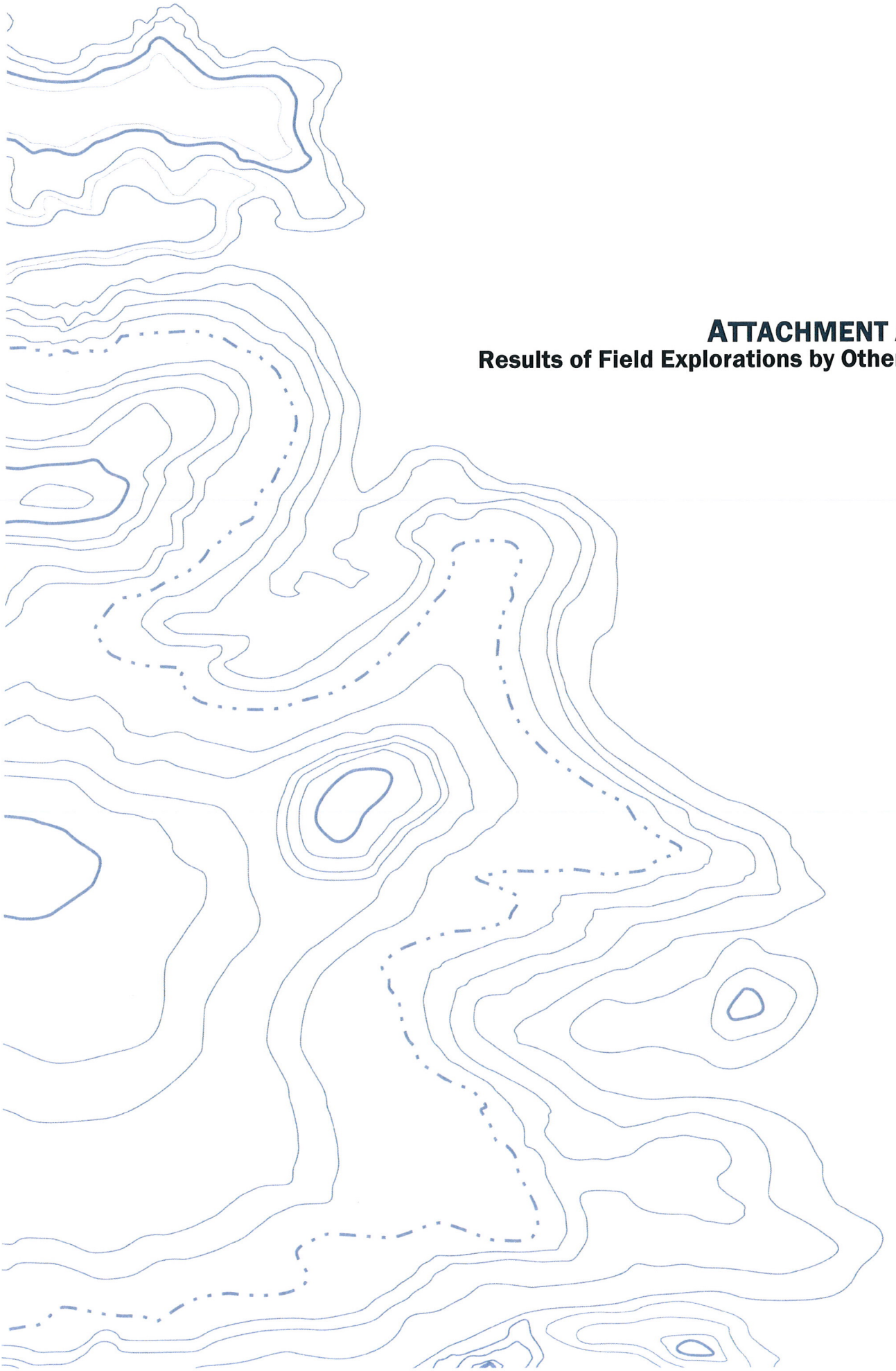
CITY OF BELLINGHAM

BELLINGHAM WASHINGTON
ELDRIDGE MUNICIPAL LANDFILL PROJECT
PLAN

DATE 3-25-2011 | SCALE AS SHOWN | JOB NUMBER 2011-020

SHEET 1 OF 1

W:\2011\2011-020 Herrenkohl - COB Eldridge Landfill Cleanup\Dwg\110220SV00.dwg, 4/1/2011 11:29:02 AM, JGS



ATTACHMENT A
Results of Field Explorations by Others

APPENDIX A

HISTORICAL LANDFILL BOUNDARY SURVEY AND TEST PIT LOGS

The historical landfill was delineated by excavating 25 small reconnaissance test pits (RTP) approximately 2 to 6.5 ft deep and the width of the track-hoe bucket (approximately 18 in.). Each test pit was excavated using a mini track-mounted excavator.

The excavated material was examined by a field geologist for the presence of municipal garbage and debris. The reconnaissance test pits were initially excavated on 50 ft centers around Test Pit TP-01. Additional test pits were excavated at the discretion of the field geologist to delineate the lateral extent of the historical landfill, including the area around Test Pits TP-1 and TP-2. Field notes were taken with regard to whether or not municipal garbage or debris was encountered, but the soils were not logged or collected for chemical analysis from the reconnaissance test pits. Observations from the reconnaissance test pits are provided in Table A-1. Photographs of selected reconnaissance test pits are also provided below.

Once each reconnaissance test pit was completed, it was backfilled and a labeled stake was placed at the location indicating whether or not the landfill was encountered. Each location was surveyed by a licensed land surveyor. Based on the results of the reconnaissance test pit survey, three test pits (TP-22, TP-23, and TP-24) were excavated for the collection of samples for analysis.

Table A-1. Reconnaissance Test Pit Survey Results

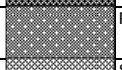
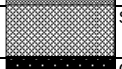
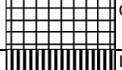
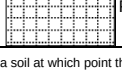
Recon. Test Pit No.	Depth Excavated (ft bgs)	Depth Subsurface Municipal Garbage/Debris Observed (ft bgs)	Subsurface Municipal Garbage/Debris Description	Notes
RTP-1	5	None observed.	None observed.	Test pit located on a shelf that is a few feet higher in elevation than TP-01.
RTP-2	2.5	0.5–2.5	Bottles (22 recovered intact), rust, charcoal.	
RTP-3	3	2–3	Metal and glass debris.	Orange soil at bottom of test pit
RTP-4	3	None observed.	None observed.	
RTP-5	3	Not noted.	One broken bottle observed.	Groundwater at 2.5 ft bgs.
RTP-6	3	Approx 2.5	Rust, possible ash, a small amount of metal, two bottles, and one brush.	Groundwater at 2.5 ft bgs.

Table A-1. Reconnaissance Test Pit Survey Results

Recon. Test Pit No.	Depth Excavated (ft bgs)	Depth Subsurface Municipal Garbage/Debris Observed (ft bgs)	Subsurface Municipal Garbage/Debris Description	Notes
RTP-7	3	Not noted.	One small piece of glass and metal.	Groundwater at 2-2.5 ft bgs.
RTP-8	3	None observed.	None observed.	Groundwater at 2.3 ft bgs.
RTP-9	3	None observed.	None observed.	Groundwater at 2 ft bgs.
RTP-10	3	Not noted.	One small bottle, trace of glass and metal.	Orange layer observed at 1.5 ft bgs.
RTP-11	3	None observed.	None observed.	Groundwater observed at 2 ft bgs.
RTP-12	3	None observed.	None observed.	Groundwater observed at 1.8 ft bgs.
RTP-13	3.5	None observed.	None observed.	Groundwater observed at 3 ft bgs.
RTP-14	3	None observed.	None observed.	Groundwater observed at 2.5 ft bgs.
RTP-15	4	Not noted.	One piece of black slag observed.	Groundwater observed at 4 ft bgs.
RTP-16	4	1.8–4	Orange soil, ash, bottles (12 intact), brick, mirror, ceramics, metal.	Groundwater observed at 4 ft bgs.
RTP-17	4.5	Not noted. Orange soil and ash observed at approx. 3–3.5 ft bgs.	Bottles (seven intact), ceramics, metal, melted glass, ash, and orange soil.	Groundwater observed at 4.5 ft bgs.
RTP-18	3.5	2.5–3.5	Mostly metal debris, with some glass (including one intact bottle).	Groundwater observed at 3.5 ft bgs. Orange soil/ash layer 2.8–3 ft bgs. Slight diesel/oil-like odor observed.
RTP-19	5	2.8–5	Glass (10 intact bottles), some metal.	Orange soil and rust observed 1.8 to 5 ft bgs.
RTP-20	3	None observed.	None observed.	Groundwater observed at 3 ft bgs.
RTP-21	4.5	None observed.	None observed.	Groundwater observed at 3 ft bgs.
RTP-22	6.5	3.0–4.5	Drywall, ash, and metal.	

Table A-1. Reconnaissance Test Pit Survey Results

Recon. Test Pit No.	Depth Excavated (ft bgs)	Depth Subsurface Municipal Garbage/Debris Observed (ft bgs)	Subsurface Municipal Garbage/Debris Description	Notes
RTP-23	4.7	0–3.5	Some asphalt and one red brick.	Organic-rich silt observed at 4 ft bgs (native).
RTP-24	2.4	None observed.	None observed.	Organic-rich silt observed at 2 ft bgs (native).
RTP-25	2	0–1.5	Three small pieces of glass.	Organic-rich silt observed at 1.5 ft bgs (native).

Major Divisions		Symbols		Typical Names
Coarse Grained Soils (More than 1/2 of soil >No. 200 sieve size)	**Gravels** (More than 50% coarse fraction > no. 4 sieve	GW		Well-graded gravels or gravel-sand mixtures, little to no fines
		GP		Poorly-graded gravels or gravel-sand mixtures, little to no fines
		GM		Silty gravels, gravel-sand-silt mixtures
		GC		Clayey gravels or gravel-sand-clay mixtures
	Sands (Less than 50% coars fraction > no. 4 sieve)	SW		Well-graded sands or gravel-sand mixtures, little to no fines
		SP		poorly-graded sands or gravelly sands, little to no fines
		SM		Silty sands, sand-silt mixtures
		SC		Clayey sands, sand-clay mixtures
Fine Grained Soils (More than 1/2 of soil <No. 200 sieve size)	**Silts & Clays** Liquid limit* less than 50%	ML		Inorganic silts and very fine sands, silty or clayey fine sands or clayey silts with slight plasticity
		CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy or silty clays, lean clays
		OL		Organic silts and organic silty clays of low plasticity
	Silts & Clays Liquid limit* greater than 50%	MH		Inorganic silts, micaceous or ditomaceous fine sand or silty soils, elastic silts
		CH		Inorganic clays of high plasticity, fat clays
		OH		Organic clays of medium to high plasticity, organic silty clay, organic silts
Highly Organic Soils		Pt		Peat or other highly organic soils

*Liquid limit represents the moisture contnet (in percent) of a soil at which point the soil no longer behaves like a plastic and starts to behave like a liquid.

Boring Log Symbols

Sample Interval

Groundwater, First Observed

Groundwater, Static

Sample Types

SS	Split Spoon
G	Grab
ST	Shelby Tube
GS	Geoprobe Sampler

Sheen Types

NS	No Sheen Observed
SS	Slight Sheen observed (Spotty coverage of sheen pan, no
MS	Moderate Sheen (Full Coverage)
HS	Heavy Sheen (Full Coverage, Irredescent)

Sample Moisture

Dry	No Moisture, dry to touch
Moist	Damp but no visible moisture
Wet	Visible free water

Sample Plasticity (Fine-Grained Soils)

Non-Plastic - Cannot be rolled at any moisture content

Low - Barely rolled, lump cannot be formed when drier than plastic limit

Medium - Easily rolled, lump crumbles when drier than plastic limit

High - Easily rolled yet takes considerable time to reach the plastic limit, lump can be formed without crumbling when drier than the plastic limit

Partical Size Range (Course-Grained Soils)

Gravel - Fine, Course

Sand - Fine, Medium, Coarse

Integral Consulting, Inc.
2817 NE 22nd Avenue
Portland, Oregon 97212
503-284-5545
503-284-5755 (Fax)

Based on Unified Soil Classification System and ASTM Standard D2487 and D2488

integral consulting inc.

integral consulting inc.

1201 Cornwall Avenue, Suite 208
Bellingham, WA 98225
(360) 756-9296 FAX (360) 756-7914

TEST PIT NUMBER	TP-1
PROJECT	Little Squalicum Park RI/FS
LOCATION	Bellingham, Washington
PROJECT NUMBER	C075-02
LOGGED BY	M. Herrenkohl, P.E.G.
DATE	November 9, 2005

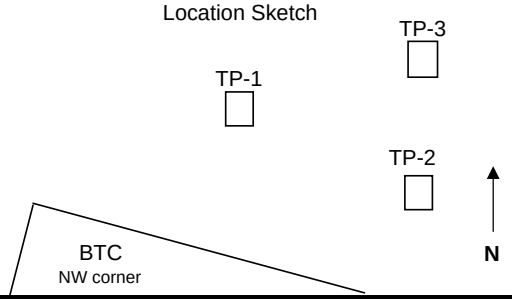
SAMPLE INFORMATION						Depth (ft)	STRATA	DESCRIPTION
Sample ID	Sample Time	FID (ppm)	Sheen		Sample Depth (ft)			USCS group name, color, grain size range, minor constituents, plasticity, odor, sheen, moisture content, texture, weathering, cementation, geologic interpretation, etc.
LSP0059	1435	1.4	NS		0-1		GM/SM	Sandy gravel w/fines, light brown, some earthworms observed (fill).
LSP0060*	1440				0-1			
LSP0061	1450	3.3	NS		1-2		Debris	Black layer, burnt garbage ash, metal debris, bones (fill).
						2--		
LSP0062	1455	2.3	LS		2-3		Debris	Orange (rusted) with white (ash) layer, garbage odor (fill).
							Debris	Black layer simlar to above with metal parts, bottles, and glass (fill).
LSP0063	1447	2.8	LS		3-4		Debris	Orange layer, clays/sand/gravel matrix, similar to above with less debris (fill).
						4--		
LSP0064	1445	9.5	NS		4-5		GM	Silty sandy fine to coarse gravel w/clay, gray (10 YR 6/1 - 5/1), 65-70% gravel.
*Duplicate								Bottom of test pit at 5' bgs.

ADDITIONAL NOTES / SKETCHES

Samples collected from west and south side walls.
Materials encountered from 1' to 4' bgs appear to be municipal landfill materials in a soil matrix with a "garbage odor".
Landfill materials decreasefrom 3-4' bgs, and are absent below 4' bgs.

EXCAVATING CONTRACTOR	Wilder Construction
EXCAVATION METHOD	Backhoe - John Deere 310
SAMPLING EQUIPMENT	Stainless Steel Spoon/Shovel/Bowl
COORDINATES	Northing: 649016.90 ft
	Easting: 1235609.38 ft
SURFACE ELEVATION	38.24 ft
DATUMS	Horizontal: NAD 83/91
	Vertical: NAVD 88

Location Sketch



integral consulting inc.

1201 Cornwall Avenue, Suite 208
Bellingham, WA 98225

(360) 756-9296 FAX (360) 756-7914

TEST PIT NUMBER	TP-2
PROJECT	Little Squalicum Park RI/FS
LOCATION	Bellingham, Washington
PROJECT NUMBER	C075-02
LOGGED BY	M. Herrenkohl, P.E.G.
DATE	November 10, 2005

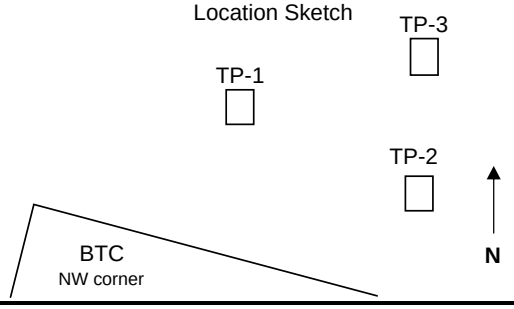
SAMPLE INFORMATION						Depth (ft)	STRATA	DESCRIPTION
Sample ID	Sample Time	FID (ppm)	Sheen		Sample Depth (ft)			USCS group name, color, grain size range, minor constituents, plasticity, odor, sheen, moisture content, texture, weathering, cementation, geologic interpretation, etc.
LSP0065	0830	**	NS		0-1		GM	Sand/gravel/clay/silt matrix, reddish dark brown (5YR 3/2) , no odor (fill).
LSP0066*	0840				0-1			
LSP0067	0850	**	NS		1-1.6		Debris	Black ash/burned materials mixed into similar matrix observed above.
LSP0071	1000	**	NS		1.6-2.9	2--	Debris	Rust zone with metal debris in a silty sand matrix, some white material of unkown source and large piece of concrete.
LSP0070	0950	**	NS		2.9 - 3.7		GM	Clayey sandy gravel w/silt, dark brown (7.5 YR 3/2) (fill).
LSP0069	0940	**	LS		3.7- 4.2	4--	Debri	As above, mixed with black ashy material (fill).
LSP0068	0855	**	NS		4.2- 5.3		G	Gravel w/fines, tan to light brown (10 YR 5/2 - 5/3) (Fill?)
*Duplicate							—	
**Problems calibrating PID/FID								Bottom of test pit at 5.3 ft bgs.

ADDITIONAL NOTES / SKETCHES

Large 1 ft x 1 ft concrete "block" observed at approximately 2 - 2.5 ft bgs.
Chrome stripping from car was observed at approximatley 2 ft bgs.
No municipal waste was observed in the test pit.

EXCAVATING CONTRACTOR	Wilder Construction
EXCAVATION METHOD	Backhoe - John Deere 310
SAMPLING EQUIPMENT	Stainless Steel Spoon/Shovel/Bowl
COORDINATES	Northing: 648930.22 ft
	Easting: 1235708.04 ft
SURFACE ELEVATION	40.61 ft
DATUMS	Horizontal: NAD 83/91
	Vertical: NAVD 88

Location Sketch



integral consulting inc.
1201 Cornwall Avenue, Suite 208
Bellingham, WA 98225
(360) 756-9296 FAX (360) 756-7914

TEST PIT NUMBER	TP-3
PROJECT	Little Squalicum Park RI/FS
LOCATION	Bellingham, Washington
PROJECT NUMBER	C075-02
LOGGED BY	M. Herrenkohl, P.E.G.
DATE	November 10, 2005

SAMPLE INFORMATION						Depth (ft)	STRATA	DESCRIPTION
Sample ID	Sample Time	FID (ppm)	Sheen		Sample Depth (ft)			USCS group name, color, grain size range, minor constituents, plasticity, odor, sheen, moisture content, texture, weathering, cementation, geologic interpretation, etc.
LSP0075	1300	**	NS		0-1		CL	Silty clay with gravel and sand to gravely silty clay with sand, dark brown,
								(7.5 YR 3/4), (fill).
LSP0074	1250	**	NS		1-2			Sand and gravel content increasing with depth.
						2--		
LSP0073	1240	**	NS		2-3		GM	Clayey silty sandy gravel, dark brown (7.5 YR 3/2), fines decreasing with depth.
							GM/GP	Grading to sandy gravel w/ silt, grayish brown (10YR 5/2), 80% gravel, 20% sand,
LSP0072	1230	**	NS		>3		—	>5% fines (Native?).
								Bottom of test pit at 3 ft bgs.
						4--		
**Problems calibrating PID/FID								
No obvious odors								

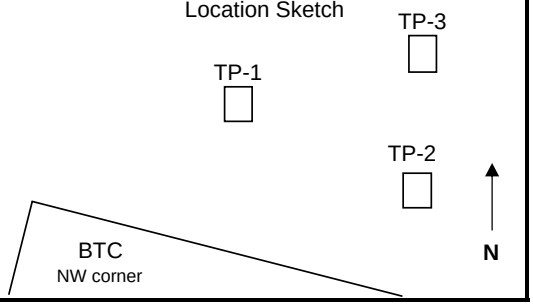
ADDITIONAL NOTES / SKETCHES

Scrap metal (rusted bucket) observed at ~1 ft bgs.

Note: This station was moved 54 ft 060° (magnetic north) from its surveyed location. N 48.7672°, W 122.51147°.

EXCAVATING CONTRACTOR	Wilder Construction
EXCAVATION METHOD	Backhoe - John Deere 310
SAMPLING EQUIPMENT	Stainless Steel Spoon/Shovel/Bowl
COORDINATES	Northing: 649053.78 ft
	Easting: 1235712.67 ft
SURFACE ELEVATION	38.42 ft
DATUMS	Horizontal: NAD 83/91
	Vertical: NAVD 88

Location Sketch



integral consulting inc.

1201 Cornwall Avenue, Suite 208
Bellingham, WA 98225

(360) 756-9296 FAX (360) 756-7914

TEST PIT NUMBER	TP-22
PROJECT	Little Squalicum Park RI/FS
LOCATION	Bellingham, Washington
PROJECT NUMBER	C075-02
LOGGED BY	Eron Dodak, R.G.
DATE	January 31, 2006

SAMPLE INFORMATION					Depth (ft)	STRATA	DESCRIPTION
Sample ID	Time	PID/FID	Sheen	Sample Depth			USCS group name, color, grain size range, minor constituents, plasticity, odor, sheen, moisture content, texture, weathering, cementation, geologic interpretation, etc.
LSP0105	0950	5.8/0	NS	0-0.5		GW	Sandy gravel w/ silt, dark brown (7.5 YR 3/2), fine to 3" dia. gravel
(1015 for VOC sample)						SM/ ML	(40%), sand (30%), silt (30%), no garbage, moist, no odor (fill).
LSP0106	0940	6.0/0	NS	0.5-1.7			Silty sand/sandy silt w/gravel, v. dark gray (7.5 YR 3/1), 15% bottles/metal,
LSP0107	0930	10.2/0	NS	1.7-2.2	2--	GW ▼	10% charcoal, 30% silt, 30% sand, 15% gravel, moist, no odor (fill).
(1040 for VOC sample)							Gravel w/ sand, reddish brown (5 YR 4/4), 15% bottles/glass, 30% sand,
							55% gravel, moist to wet, no odor (fill).
					4--		
						—	Bottom of test pit at 4.5' bgs. Sampled to 2.2' bgs.

ADDITIONAL NOTES / SKETCHES

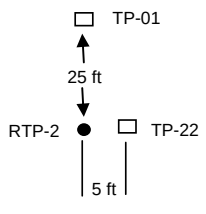
Water seeping into excavation at 2.2 ft bgs.

Glass pieces, intact bottles, metal debris encountered from 0.5' to 4.5' bgs (bottom of test pit).

A total of 31 intact bottles were removed from test pit (13 were collected for identification).

EXCAVATING CONTRACTOR	Wilder Construction
EXCAVATION METHOD	Track Hoe
SAMPLING EQUIPMENT	SS Spoons/bowls
COORDINATES	Northing: 648990.85 ft
	Easting: 1235612.97 ft
SURFACE ELEVATION	38.70 ft
DATUMS	Horizontal: NAD 83/91
	Vertical: NAVD 88

Location Sketch



integral consulting inc.

1201 Cornwall Avenue, Suite 208
Bellingham, WA 98225

(360) 756-9296 FAX (360) 756-7914

TEST PIT NUMBER	TP-23
PROJECT	Little Squalicum Park RI/FS
LOCATION	Bellingham, Washington
PROJECT NUMBER	C075-02
LOGGED BY	Eron Dodak, R.G.
DATE	January 31, 2006

SAMPLE INFORMATION					Depth (ft)	STRATA	DESCRIPTION
Sample ID	Time	PID/FID	Sheen	Sample Depth			USCS group name, color, grain size range, minor constituents, plasticity, odor, sheen, moisture content, texture, weathering, cementation, geologic interpretation, etc.
LSP0108	1210	2.6	NS	0-2.0		ML	Sandy Silt w/ gravel, brown (10 YR 4/2), ~15% sand, 25% fine to 8" dia.
							gravel, ~60% silt, moist, no odor, no garbage observed (fill).
							Sandy silt w/ gravel, very dark gray brown (10 YR 3/2), ~15% debris (glass,
LSP0104	1155	2.4	NS	2.0-3.5	2--		bottles, metal), ~25% sand, ~25% fine to 3" gravel, ~35% silt, moist, no odor (fill).
							Mixture of gravel w/ sand, silt, and debris, reddish brown (5 YR 4/4), orange stained,
LSP0110	1145	3	NS	3.5 - 4.0		GW	~30% debris (glass, metal), v. moist, no odor (fill).
LSP0111	1140	3.2	NS	4.0	4--	ML	Organic-rich silt w/ gravel, black (5 YR 2.5/1), slight sulfur odor, moist (native).
LSP0112	1310	6.0	NS	4.5-5.0		SW ▼	Sand w/ gravel, dark gray (7.5 YR 4/1), 15-25% F-C gravel, trace silt, v. moist to
						—	wet, no odor (native).
							Bottom of test pit at 5.2 ft bgs.

ADDITIONAL NOTES / SKETCHES

Metal and glass debris observed from 2.5 ft to 4 ft bgs.

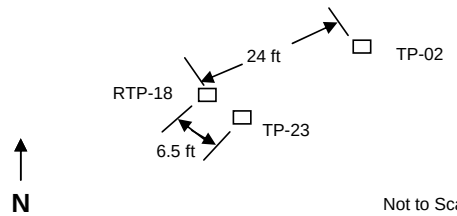
Water seeping into excavation at 5.2 ft bgs.

A total of 16 intact bottles were removed from test pit (13 were collected for identification).

No diesel odor observed (diesel odor was observed in RTP-18).

EXCAVATING CONTRACTOR	Wilder Construction
EXCAVATION METHOD	Track Hoe
SAMPLING EQUIPMENT	SS Spoons/bowls
COORDINATES	Northing: 648928.50 ft
	Easting: 1235685.09 ft
SURFACE ELEVATION	40.59 ft
DATUMS	Horizontal: NAD 83/91
	Vertical: NAVD 88

Location Sketch



integral consulting inc.
1201 Cornwall Avenue, Suite 208
Bellingham, WA 98225
(360) 756-9296 FAX (360) 756-7914

TEST PIT NUMBER	TP-24
PROJECT	Little Squalicum Park RI/FS
LOCATION	Bellingham, Washington
PROJECT NUMBER	C075-02
LOGGED BY	Eron Dodak, R.G.
DATE	January 31, 2006

SAMPLE INFORMATION					Depth (ft)	STRATA	DESCRIPTION
Sample ID	Time	PID/FID	Sheen	Sample Depth			USCS group name, color, grain size range, minor constituents, plasticity, odor, sheen, moisture content, texture, weathering, cementation, geologic interpretation, etc.
LSP0113	1410	4.8/0	NS	0-1.5		ML	Silt with gravel, dark brown (7.5 YR 3/2), ~15% fine to corase gravel, ~5-10% sand, trace roots, moist, no odor (fill?). No debris/garbage encountered.
LSP0114	1415	5.8/0	NS	1.5	2--	GW	Gravel w/ sand, gray (10 YR 5/1), 35% sand, 5-10% silt, fine to 4" dia gravel, wet, no odor (native). No debris/garbage encountered.
					4--		Bottom of test pit at 3.2 ft bgs.

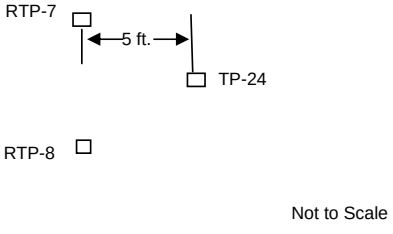
ADDITIONAL NOTES / SKETCHES

Standing water in test pit at 1.5 ft bgs.

Excavated to 3.2 ft bgs; could not excavate deeper due to sluffing gravel.

EXCAVATING CONTRACTOR	Wilder Construction
EXCAVATION METHOD	Track Hoe
SAMPLING EQUIPMENT	SS Spoons/bowls
COORDINATES	Northing: 649061.59 ft
	Easting: 1235609.45 ft
SURFACE ELEVATION	38.00 ft
DATUMS	Horizontal: NAD 83/91
	Vertical: NAVD 88

Location Sketch



Photographic Log of 2006 Sampling
Eldridge Municipal Landfill RI/FS & CAP

Small track excavator used to excavate test pits. Reconnaissance test pit RTP-13 is shown in the photo.

Bottles and metal debris recovered from test pit TP-22.

Photographic Log of 2006 Sampling
Eldridge Municipal Landfill RI/FS & CAP

TP-22 Sampling at 1.7-2.2 ft bgs

Photographic Log of 2006 Sampling
Eldridge Municipal Landfill RI/FS & CAP

TP-22 West Sidewall

TP-22 South Sidewall

Photographic Log of 2006 Sampling
Eldridge Municipal Landfill RI/FS & CAP

TP-23 Sampling at 4 ft bgs

Photographic Log of 2006 Sampling
Eldridge Municipal Landfill RI/FS & CAP

TP-23 South Sidewall at 5 ft bgs

Photographic Log of 2010 Confirmation Sampling
Eldridge Municipal Landfill RI/FS & CAP

Confirmation sampling locations at base of new BTC/Birchwood channel and eastern sidewall/slope.

Confirmation sampling locations from western sidewall/slope of BTC/Birchwood Channel.

Stockpile covered with surrounding silt fence.

Appendix A

ATTACHMENT B
Report Limitations and Guidelines for Use

ATTACHMENT B
REPORT LIMITATIONS AND GUIDELINES FOR USE

This attachment provides information to help you manage your risks with respect to the use of this report.

Report Use and Reliance

This report has been prepared for Herrenkohl Consulting, LLC and their authorized agents and regulatory agencies. GeoEngineers structures our services to meet the specific needs of our clients. No party other than Herrenkohl Consulting may rely on the product of our services unless we agree to such reliance in advance and in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client authorized via e-mail on April 1, 2011,-and generally accepted geotechnical practices in this area at the time this report was prepared. Use of this report is not recommended for any purpose or project except the one originally contemplated.

This report should not be applied for any purpose or project except the one originally contemplated. If important changes are made to the project or property after the date of this report, we recommend that GeoEngineers be given the opportunity to review our interpretations and recommendations, and then we can provide written modifications or confirmation, as appropriate.

Information Provided by Others

GeoEngineers has relied upon certain data or information provided or compiled by others in the performance of our services. Although we used sources that are believed to be trustworthy, GeoEngineers cannot warrant or guarantee the accuracy or completeness of information provided or compiled by others.

Conditions Can Change

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Professional Judgment

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are less exact than other engineering and natural science disciplines. By necessity, GeoEngineers uses its professional judgment in arriving at our conclusions and recommendations. GeoEngineers includes these explanatory "limitations' provisions in our reports to help reduce the risk of misunderstandings regarding the inexact nature of our professional services. Please confer with GeoEngineers if you need to know how these 'Report Limitations and Guidelines for Use' apply to your project or site.

APPENDIX C

PERFORMANCE MONITORING PLAN

(To Be Provided Later)

APPENDIX D

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

Eldridge Municipal Landfill Interim Action
Bellingham, WA

Prepared for
City of Bellingham, Public Works
210 Lottie Street
Bellingham, WA 98225

Prepared by

Herrenkohl Consulting LLC
321 Summerland Road
Bellingham, WA 98229

June 24, 2011

CONTENTS

ACRONYMS AND ABBREVIATIONS

Ca	carcinogen
COCs	chemicals of concern
CRZ	contamination reduction zone
Decon	decontamination
DI	deionized
EZ	exclusion zone
HA	hand auger borings
HASP	health and safety plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HS	hollow-stem auger borings
IDLH	immediately dangerous to life and health
IP(ev)	ionization potential
OSHA	Occupational Safety and Health Administration
P	poison
Park	Little Squalicum Park
PEL	permissible exposure level
PPE	personal protective equipment
R	reactive
REL	recommended exposure limits (NIOSH)
RI/FS	remedial investigation/feasibility study
SCa	suspected carcinogen
SM	Archeological boundary survey
SS	surface and/or subsurface
SSHO	site safety and health officer
STEL	short-term exposure level
SW	surface water
SZ	support zone
TP	test pits using a backhoe
WISHA	Washington Industrial Safety and Health Act

HEALTH AND SAFETY APPROVAL

This health and safety plan has been reviewed and approved for site inspections, hand auger borings, hollow-stem auger borings, test pit excavations, surface water sampling, groundwater sampling, and archaeological boundary surveying at the Eldridge Municipal Landfill site in Bellingham, Washington.

_____. _____.

Project Manager Date

_____. _____.

Corporate Health and Safety Officer Date

HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT

I have reviewed the health and safety plan prepared by Herrenkohl Consulting, dated June 24, 2011 for the Eldridge Municipal Landfill Site (the Site) fieldwork. I understand the purpose of the plan, and I consent to adhere to its policies, procedures, and guidelines while an employee of Herrenkohl Consulting or its subcontractors.

Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date
Employee signature	Company	Date

1 INTRODUCTION

This site health and safety plan (HASP) provides the general health and safety provisions to protect workers from potential hazards during field activities associated with the interim action at Eldridge Municipal Landfill Site in Bellingham, Washington. This HASP applies to the employees of Herrenkohl Consulting and its subcontractors while conducting the following field activities at the site:

- Site Inspections and oversight
- Surface water sampling
- Hand auger borings
- Hollow-stem auger borings
- Test pit excavations
- Groundwater sampling
- Archeological boundary survey.

It is Herrenkohl Consulting's policy to provide a safe and healthful work environment. No aspect of the work is more important than protecting the health and safety of all workers.

Herrenkohl Consulting cannot guarantee the health or safety of any person entering this site. Because of the potentially hazardous nature of this site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards that may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury and illness at this site. The health and safety guidelines in this plan were prepared specifically for this site and should not be used on any other site without prior evaluation by trained health and safety personnel.

A copy of this HASP will be with the field crew during field activities. All individuals performing fieldwork must read, understand, and comply with this plan before undertaking field activities. Once the information has been read and understood, the individual must sign the Acknowledgment Form provided above, which become part of the project file.

This plan may be modified at any time based on the judgment of the Herrenkohl Consulting site safety and health officer (SSHO) in consultation with the Corporate Health and Safety Officer and Herrenkohl Consulting project manager. Any modification will be presented to the onsite team during a safety briefing and will be recorded in the field notebook.

1.1 ORGANIZATION

This HASP covers seven field activities including site inspections and oversight tasks; surface water sampling; hand auger and hollow-stem auger borings; test pit excavations; groundwater sampling; and archeological boundary survey. A brief description of each task is provided in the Work Zones and Task Descriptions section. Specific health and safety guidelines associated

with each task are discussed in the Task-Specific Safety Procedure section. General health and safety guidelines associated with all activities at the Site (e.g., physical and chemical hazard evaluation) are grouped together.

1.2 ROLES AND RESPONSIBILITIES

All personnel and visitors on this site must comply with the requirements of this HASP. The specific responsibilities and authority of management, safety and health, and other personnel on this site are detailed in the following paragraphs.

1.2.1 Site Safety and Health Officer (SSHO) / Site Supervisor

The SSHO and Supervisor have full responsibility and authority to develop and implement this HASP and to verify compliance. They report to the Project Manager and are onsite or readily accessible to the site during all work operations. They have the authority to halt site work if unsafe conditions are detected and are responsible for assessing site conditions and directing and controlling emergency response activities. The specific responsibilities of the SSHO are:

- Managing the safety and health functions on this site
- Serving as the site's point of contact for safety and health matters
- Assessing site conditions for unsafe acts and conditions and providing corrective action
- Executing the sampling and analysis plan and schedule
- Ensuring that all Herrenkohl Consulting employees and subcontractors know and follow the HASP
- Ensuring that daily work schedules and tasks are appropriate for the required levels of effort and weather conditions
- Confirming local emergency response phone numbers and locations
- Conducting and documenting the initial and daily health and safety briefings
- Evaluating and modifying the level of protective apparel and safety equipment, as necessary, based on site conditions
- Ensuring that the field team observes all necessary decontamination procedures.

If the Site Supervisor determines that site conditions are unsafe, he or she has the authority to suspend field operations until the problem is corrected. The Site Supervisor can modify HASP procedures in consultation with the SSHO. Any changes must be documented in the field logbook and field staff must be immediately informed of the change. The project manager and corporate health and safety officer must be notified of any changes to the HASP within 12 hours.

1.2.2 Site Workers

Site workers are responsible for complying with this HASP, using the proper personal protective equipment (PPE), reporting unsafe acts and conditions, and following the work and safety and health instructions of the Project Manager and SSHO. All site workers have the authority and are encouraged to suspend field operations and leave the environment if they feel conditions have become unsafe.

1.3 REGULATORY FRAMEWORK

Workplace health and safety regulations within the state of Washington, with a few exceptions, are covered by the Washington Industrial Safety and Health Act (WISHA), which is administered by the Washington State Department of Labor and Industries. WISHA is the state equivalent of the federal government's Occupational Safety and Health Administration (OSHA). This site HASP follows both WISHA (Chapter 49.17 Revised Code of Washington) and federal OSHA HAZWOPER (29 CFR 1910.120) regulations.

1.4 SITE BACKGROUND

The Eldridge Municipal Landfill Site consists of approximately 0.5 to 1 acres within Little Squalicum Park and the City of Bellingham, Washington. The land within and in the vicinity of the study area has been used for a number of operations since the land was developed in the 1850's including dairy farming and ranching, cement manufacturing, sugar processing, plant nursery, sand and gravel mining, raw log storage, and utility pole manufacturing and treating. A complete description of the background of the site is presented in the Remedial Investigation/Feasibility Study (Herrenkohl Consulting 2011) for the site. Specific current information on the site is given below.

- **Owners/Lessee:** Whatcom County/City of Bellingham
- **Current Site use:** Little Squalicum Park includes trails and open areas
- **Historical Site uses:** In the mid- to late-1930's, a municipal landfill was operated by the City. In the 1960's, portions of the Site were mined for sand and gravel. In the 1970's, Mt. Baker Plywood used this area of the Park for raw log storage.
- **Hazardous waste site:** No (Oeser Company to the north of Park is an EPA Superfund site)
- **Industrial waste site:** No (Oeser Company to the north of Park is an EPA Superfund site)
- **NPDES discharge:** No (Oeser Company to the north of Park has a NPDES permit for process wastewater and surface water discharges)
- **Topography:** Varies from flat to relatively steep slopes within the former sand and gravel quarry

- **Site access:** Several locations around the Park, main entrances at Bellingham Technical College parking lot and the corner of Lindbergh Avenue and Eldridge Avenue
- **Site activity:** Public access
- **Nearest drinking water/sanitary facilities:** Drinking water used by residents in surrounding neighborhood is public water. No drinking water wells in area.
- **Nearest telephone:** Cell phone coverage is available across most of the site

1.5 PROJECT MANAGER AND OTHER KEY CONTACTS

Title	Name (Affiliation)	Work Telephone	Home/Cell Telephone
Project Manager	Mark Herrenkohl	(360) 319-0721	(360) 647-6980
Project Engineer	Elizabeth Sterling	(360) 733-6100 x221	(360) 510-8944
Client/Facility contact	Sam Shipp	(360) 778-7942	--

1.6 DEFINITIONS

Contamination Reduction Zone	Area between the exclusion and support zones that provides a transition between contaminated and clean zones (CRZ).
Exclusion Zone	Any portions of the site where hazardous substances are present, or are reasonably suspected to be present, and pose an exposure hazard to personnel (EZ).
HAZWOPER	Hazardous Waste Operations and Emergency Response standard, as described in 29 CFR 1910.120.
Support Zone	All areas of the site outside the exclusion and contaminant reduction zones (SZ).
WISHA	Washington Industrial Safety and Health Act, as described in Chapter 49.17 Revised Code of Washington.

2 CHEMICAL HAZARD EVALUATION

Potentially hazardous chemicals known to exist at the Site in soil are pentachlorophenol and metals associated with previous operations at or in the vicinity of the site. The chemicals of concern, applicable chemical properties, and exposure routes are presented in the following sections.

Chemical Properties

Chemical of Concern	Soil Concentration (Site maximum or expected)	OSHA PEL or NIOSH REL*	OSHA STEL or NIOSH STEL*	OSHA IDLH	Odor Threshold	IP(eV)	Carcinogen or Other Hazard
Arsenic	13 mg/kg	0.002 mg/m^3	----	5 mg/m^3	Odorless	----	Ca, P
Cadmium (dust)	10 mg/kg	0.005 mg/m^3	----	9 mg/m^3	----	----	Ca
Copper (dust)	409 mg/kg	1 mg/m^3	----	100 mg/m^3	Odorless	----	----
Lead	3,970 mg/kg	0.050 mg/m^3	----	100 mg/m^3	Odorless	----	SCa, P
Mercury	1.62 mg/kg	0.05 mg/m^3	----	10 mg/m^3	Odorless	----	P
Pentachlorophenol	0.350 mg/kg	0.5 mg/m^3 (skin)	----	2.5 mg/m^3	Benzene-like odor	----	SCa
Zinc	3,060 mg/kg	----	----	----	----	----	----

Notes:

--	none established or not applicable
*	NIOSH REL or STEL listed if lower then OSHA PEL or STEL
Ca	carcinogen
P	poison
IDLH	immediately dangerous to life and health
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure level
REL	recommended exposure limits (NIOSH)
IP(eV)	ionization potential
SCa	suspected carcinogen
SS	surface and/or subsurface soil
STEL	short-term exposure level

Chemical Characteristics and Exposure Routes

The following table summarizes the chemical characteristics and potential chemical exposure routes at the Site. The following abbreviations are used to denote the type of fieldwork:

SI Site Inspection

SW Surface water sampling

HA Hand auger borings

HS Hollow-stem auger borings

TP Test pits using a backhoe or excavator

GW Groundwater sampling

SM Archeological boundary survey (if required)

	Likely	Possible	Unlikely
Potential chemical exposure routes at the site:			
Inhalation		X (TP)	X (SI, SW, HA, HS, GW, SM)
Ingestion			X (SI, SW, HA, HS, TP, GW, SM)
Skin absorption		X (SW, HA, HS, TP, GW, SM)	X (SI)
Skin contact		X (SW, HA, HS, TP, GW, SM)	X (SI)
Eye contact		X (SI, SW, HA, HS, TP, GW, SM)	

Chemical characteristics:

	Likely	Possible	Unlikely
Corrosive			X (site chemicals)
Ignitable			X (site chemicals)
Reactive			X (site chemicals)
Volatile			X (site chemicals)
Radioactive			X (site chemicals)
Explosive			X (site chemicals)
Biological agent			X (site chemicals)
Particulates or fibers		X (site chemicals)	
If likely, describe:	None.		

3 PHYSICAL HAZARD EVALUATION

The following table presents possible physical hazards that are expected to be present during field activities. The following abbreviations are used to denote the type of fieldwork:

SI Site Inspection and Oversight

SW Surface water sampling

HA Hand auger borings

HS Hollow-stem auger borings

TP Test pits using a backhoe

GW Groundwater sampling

SM Archeological boundary survey

	Yes	No	Proposed Safety Procedure
Uneven terrain/tripping	**X** (SI, SW, HA, HS, TP, GW, SM)		Use caution, wear properly fitting shoes or boots, keep work area orderly
Heat stress	**X** (SI, SW, HA, HS, TP, GW, SM)		Follow heat stress information (Attachment B) **Note:** potential for heat stress will depend on season
Cold/hypothermia	**X** (SI, SW, HA, HS, TP, GW, SM)		Keep warm and dry, bring changes of clothes, and do not work in extreme conditions without proper equipment or training. Follow cold stress information (Attachment B). **Note:** potential for cold/hypothermia will depend on season
Drowning		**X** (SI, SW, HA, HS, TP, GW, SM)	Water onsite is shallow.
Falling objects	**X** (SI, HS, TP)	**X** (SW, HA, GW, SM)	Wear hard hat, stay away from overhead hazards
Noise	**X** (SI, HS, TP)	**X** (SW, HA, GW, SM)	Wear ear protection when working around heavy equipment and other noise sources

	Yes	No	Proposed Safety Procedure
Excavations	**X** (SI, TP)	**X** (SW, HA, HS, GW, SM)	Do not enter excavations greater than 4 ft in depth without evaluation by a qualified person and implementing applicable trenching and excavation safeguards as required by law
Heights		**X** (SI, SW, HA, HS, TP, GW, SM)	Use fall protection (harness, lanyard, or proper railings) when working above 6 ft
Heavy equipment	**X** (SI, TP, HS)	**X** (SW, HA, GW, SM)	Stay back from operating equipment, wear safety vests and hard hats, coordinate with operator
Material handling	**X** (SI, SW, HA, HS, TP, GW, SM)		Lift properly, seek assistance if necessary; do not overfill coolers or boxes
Compressed air equipment		**X** (SI, SW, GW, HA, HS, TP, GW, SM)	Equipment must be equipped with pressure release valves, drains, and gauges
Confined spaces		**X** (SI, SW, HA, HS, TP, GW, SM)	No entry allowed without proper training and completed entry permit
Adverse weather	**X** (SI, SW, HA, HS, TP, GW, SM)		Seek shelter during electrical storms; work in adverse weather conditions only with proper training and equipment
Work in remote areas		**X** (SI, SW, HA, HS, TP, GW, SM)	Use buddy system, carry radio and/or cellular phone; bring sufficient equipment in case of accident or injury (first aid kit, shelter if appropriate)
Biohazard		**X** (SI, SW, HA, HS, TP, GW, SM)	Avoid contact with potential biological or infectious materials; wear gloves, coveralls, and respirator, as appropriate; wash hands and face as soon as possible after contact and before eating or drinking

	Yes	No	Proposed Safety Procedure
Plant/animal hazards	**X** (SI, SW, HA, HS, TP, GW, SM)		Know local hazards and take appropriate precautions
Drill Rigs/ Excavators/ Heavy Equipment	**X** (SI, HS)	**X** (SW, HA, TP, GW, SM)	Avoid all pinch points, do not run in electrical storms, stay a safe distance (25 ft) from power lines, level rig

Note: If confined space entry is required, personnel must first obtain a confined space entry permit. Herrenkohl Consulting personnel are not trained or authorized for confined space entry.

Summary of potential physical hazards posed by proposed site activities:

Activity	Potential Hazard
Site Inspection and Oversight	Uneven terrain/tripping, heat stress, cold/hypothermia, drowning, material handling, adverse weather
Surface Water Sampling	Uneven terrain/tripping, heat stress, cold/hypothermia, drowning, material handling, adverse weather
Hollow-stem auger borings	Uneven terrain/tripping, heat stress, cold/hypothermia, drowning, noise, material handling, falling objects, adverse weather
Hand auger borings	Uneven terrain/tripping, heat stress, cold/hypothermia, material handling, adverse weather
Test pit excavations	Uneven terrain/tripping, heat stress, cold/hypothermia, noise, material handling, falling objects, adverse weather
Groundwater Sampling	Uneven terrain/tripping, heat stress, cold/hypothermia, drowning, material handling, adverse weather
Archeological boundary survey	Uneven terrain/tripping, heat stress, cold/hypothermia, drowning, material handling, adverse weather

4 PERSONAL PROTECTIVE EQUIPMENT AND SAFETY EQUIPMENT

The following sections address personal protective equipment (PPE) and safety equipment required for completing the field activities.

4.1 PERSONAL PROTECTIVE EQUIPMENT

Based on the hazards identified above, the following table identifies the personal protective equipment required for the site activities.

	Level of Protection	
Task	**Initial**	**Contingency**
Hollow-stem auger borings	Modified D	Leave Site, assess situation
Hand auger borings	D	Modified D (Leave Site, assess situation)
Site Inspection and Oversight	D	Modified D (Leave Site, assess situation)
Surface water sampling	D	Modified D (Leave Site, assess situation)
Test Pits	D	Modified D (Leave Site, assess situation)
Groundwater Sampling	D	Modified D (Leave Site, assess situation)
Archeological boundary survey	D	Modified D
Sample processing	D	Modified D
Other activities (list)		

Each level of protection will incorporate the following personal protective equipment:

Level D:	X	Long pants and shirt or work coveralls. Hard hat if there is overhead hazard, latex or nitrile gloves, work boots and eye protection. Hearing protection as needed.
Level Modified D:	X	Same as Level D with addition of rain gear or chemical protective coveralls (coated Tyvek or equivalent) and steel-toed rubber boots.
Level C:		Same as Level D with chemical protective coveralls **[coated tyvek]**, gloves **[latex or nitrile]**, and half face or full-face air purifying respirator with **[Particulate] cartridge.**

4.1.1 Respirator and Respirator Cartridge Information

Is there potential for a respirator to be donned during fieldwork? **No**

4.2 SAFETY EQUIPMENT

The following safety equipment will be onsite during the proposed field activities.

Air Monitoring (check the items required for this project)

☐	PID/FID	☐	Air sampling pumps
☐	CG/O_2 meter	☐	Miniram
☐	H_2S meter	☐	Radiation meter
☐	Detector pump and tubes	☐	Other: _____

First Aid Kit (mandatory, including adhesive band-aids, gauze, tape, gloves, CPR shield, triangle bandage)

(check additional items required for the site)

X	Emergency blanket	X	Sunscreen
X	Insect repellent	☐	Other: _____

Other (check the items required for this project)

[X]	Eyewash	[ ]	Fit test supplies
[X]	Drinking water	[X]	Fire extinguisher (drill rigs and backhoes)
[ ]	Stopwatch for monitoring heart rate	[ ]	Windsock
[ ]	Thermoscan thermometer for heat stress monitoring	[X]	Cellular phone
		[ ]	Radio
[ ]	Survival kit	[X]	Global positioning system
[ ]	Personal flotation device	[ ]	Other: _____
[ ]	Cool vests		

5 AIR MONITORING

No air monitoring will be performed during site inspection, hand augering, archeological boundary surveying, hollow-stem auger drilling, groundwater sampling, or surface water sampling activities. The chemicals of concern (COCs) at the site are generally not volatile (i.e., metals and pentachlorophenol). There is a chance for the COCs to become airborne in a dust form during these activities because the work may be conducted in dry soils. If dust becomes a problem at the Site, soils should be sprayed with water for dust control. If conditions are encountered that appear to be a health and safety risk, employees will evacuate the site and discuss the situation with the project manager and the Herrenkohl Consulting corporate health and safety officer. Air monitoring equipment will be available on site if required.

6 HEALTH AND SAFETY TRAINING AND EMERGENCY PLANNING

6.1 HEALTH AND SAFETY TRAINING

State and federal laws establish training requirements for workers at uncontrolled hazardous waste sites (including areas where accumulations of hazardous waste create a threat to the health and safety of an individual, the environment, or both).

6.1.1 Training Requirements

Herrenkohl Consulting and subcontractor personnel will be required to complete the following training requirements prior to working at the site.

Task	No Training	24-hour	40-hour	8-Hour Supervisor	First Aid/ CPR	Medical Monitoring
Field Scientists						
Site Inspection			X			
Surface Water Sampling			X	X*	X**	
Hand auger borings			X	X*	X**	
Hollow-Stem Auger Borings			X	X*	X**	
Test Pits			X	X*	X**	
Groundwater Sampling			X	X*	X**	
Archeological Surveys			X			
Contractors						
Excavators			X			
Drillers			X			

Comments

*At least one person onsite must be OSHA HAZWOPER supervisor trained.
**At least one person onsite must be first aid/CPR trained.

6.1.2 Medical Monitoring

OSHA and WISHA require medical monitoring for personnel potentially exposed to chemical hazards in concentrations in excess of the PEL for more than 30 days per year and for personnel who must use respiratory protection for more than 30 days per year.

Will personnel working at this site be enrolled in a medical monitoring program? Yes _____ No X

6.2 SITE SAFETY MEETINGS

Site safety meetings must be held before beginning new tasks or when new staff enter the site. Site safety meetings should be held at a minimum of once a week and should be held daily on large projects. Additional meetings will be held anytime health and safety concerns are raised by any of the personnel. Attendance and topics covered are to be documented in the field logbook.

6.3 EMERGENCY PLANNING

In case of any emergency affecting the site, all affected personnel must immediately evacuate the work area and report to the site safety officer at the following predetermined location.

DESIGNATED ASSEMBLY LOCATION:

Bellingham Technical College Parking Lot (Entrance to Little Squalicum Park).

In case of injury, field personnel should take precautions to protect the victim from further harm and notify local or facility emergency services. In remote areas, it will be necessary to have first aid-trained personnel on the field team. The victim may require decontamination prior to treatment—requirements will vary based on site conditions.

Emergency medical care will be provided by:

- [X] Local emergency medical provider (i.e., fire department)
- [ ] Facility emergency medical provider
- [X] First aid-trained field staff (for remote areas only)

Local Resources	Name	Telephone	Notified Prior to Work (Yes/No)?
Fire	Bellingham Fire Department	911	No
Police	City of	911	No

Local Resources	Name	Telephone	Notified Prior to Work (Yes/No)?
	Bellingham Police Department		
Ambulance		911	No
Hospital	St Joseph Hospital	360-734-5400	No
Site phone	Field cell phone	To be announced	N/A

Directions to hospital: Consult the map provided in Attachment A. From Nome Street, start out going EAST on West Illinois Street to Patton Street. Turn LEFT on Patton Street which becomes Pinewood Avenue. Turn RIGHT on Cedarwood Avenue which becomes Birchwood Avenue. Turn RIGHT on Squalicum Parkway. End at Peace Health St. Joseph Hospital (2901 Squalicum Parkway, Bellingham, WA).

Corporate Resources	Name	Work Telephone	Home Telephone
Herrenkohl Consulting Health and Safety Officer	Mark Herrenkohl	(360) 319-0721	(360) 647-6980

In case of serious injuries, death, or other emergency, the Herrenkohl Consulting health and safety officer must be notified immediately. To contact the Herrenkohl Consulting health and safety officer (or delegate), try calling the phone numbers listed above.

Other Resources	Agency Name/Location	Telephone
Local Fed OSHA office	OSHA/Bellevue Area Office	(206) 553-7520
State OSHA equivalent	Washington Industrial Safety and Health Act (WISHA)	(800) 423-7233

7 WORK ZONES AND TASK DESCRIPTIONS

Site control measures in work zones and task descriptions are listed below for each type of field activities. A full task description is presented in the DAR for the Site.

7.1 SITE INSPECTION AND OVERSIGHT

Site inspectors will be onsite during construction activities to provide project quality assurance/quality control.

Exclusion zone: The area immediately around the construction activities will be marked with orange traffic cones or caution tape (the distance from equipment will be determined in the field).

Contamination reduction zone (CRZ): N/A. All activities will occur within the exclusion zone.

Support zone: N/A. All activities will occur within the exclusion zone.

Controls to be used to prevent entry by unauthorized persons: Staff will police the area for people approaching the exclusion zone. All people will be instructed to remain outside of the marked area.

7.2 SURFACE WATER SAMPLING

Surface water samples may be collected for compliance monitoring by immersing the sample containers directly into the water or by peristaltic pump.

Exclusion zone: The area immediately around the sampling activities (at the shoreline) will be marked with orange traffic cones (distance to-be-determined in the field).

Contamination reduction zone (CRZ): N/A. All activities will occur within the exclusion zone.

Support zone: N/A. All activities will occur within the exclusion zone.

Controls to be used to prevent entry by unauthorized persons: Sampling staff will police the area for people approaching the exclusion zone. All people will be instructed to remain outside of the marked area.

7.3 HOLLOW-STEM AUGER BORINGS

Soil borings may be advanced within the Site using a track-mounted hollow-stem auger drill rig.

Exclusion zone: The area immediately around the drilling activities will be marked with orange traffic cones (distance to-be-determined in the field).

Contamination reduction zone (CRZ): N/A. All activities will occur within the exclusion zone.

Support zone: N/A. All activities will occur within the exclusion zone.

Controls to be used to prevent entry by unauthorized persons: Sampling staff will police the area for people approaching the exclusion zone. All people will be instructed to remain outside of the marked area.

7.4 HAND AUGER BORINGS

Shallow (1 ft deep) hand auger borings will be advanced at ~30 locations within the excavation for performance monitoring.

Exclusion zone: The area immediately around the hand augering activities will be marked with orange traffic cones (distance to-be-determined in the field).

Contamination reduction zone (CRZ): N/A. All activities will occur within the exclusion zone.

Support zone: N/A. All activities will occur within the exclusion zone.

Controls to be used to prevent entry by unauthorized persons: Sampling staff will police the area for people approaching the exclusion zone. All people will be instructed to remain outside of the marked area.

7.5 TEST PITS

Test pits may be advanced in the vicinity of the Site to further evaluate the extent of municipal refuse and contaminated soil.

Exclusion zone: The area immediately around the excavating activities will be marked with orange traffic cones (distance to-be-determined in the field).

Contamination reduction zone (CRZ): N/A. All activities will occur within the exclusion zone.

Support zone: N/A. All activities will occur within the exclusion zone.

Controls to be used to prevent entry by unauthorized persons: Sampling staff will police the area for people approaching the exclusion zone. All people will be instructed to remain outside of the marked area.

7.6 GROUNDWATER SAMPLING

Groundwater samples may be collected for compliance monitoring by bailer or peristaltic pump.

Exclusion zone: The area immediately around the sampling activities will be marked with orange traffic cones (at an approximate 6 ft radius around the groundwater sampling location).

Contamination reduction zone (CRZ): N/A. All activities will occur within the exclusion zone.

Support zone: N/A. All activities will occur within the exclusion zone.

Controls to be used to prevent entry by unauthorized persons: Sampling staff will police the area for people approaching the exclusion zone. All people will be instructed to remain outside of the marked area.

7.7 ARCHEOLOGICAL BOUNDARY SURVEY

Shallow (0.5-1 ft deep) holes may be excavated with a hand shovel within the Site boundaries to evaluate and identify potential archaeological deposits.

Exclusion zone: The area immediately around the sampling activities will be marked with orange traffic cones (distance to-be-determined in the field).

Contamination reduction zone (CRZ): N/A. All activities will occur within the exclusion zone.

Support zone: N/A. All activities will occur within the exclusion zone.

Controls to be used to prevent entry by unauthorized persons: Sampling staff will police the area for people approaching the exclusion zone. All people will be instructed to remain outside of the marked area.

8 DECONTAMINATION

To prevent the distribution of contaminants outside the exclusion zone and to prevent the cross-contamination of samples, the following procedures will be used to decontaminate sampling equipment. In addition, personal hygiene guidelines should be followed to prevent personnel from coming into contact with contaminants during or after leaving the site.

8.1 DECONTAMINATION PROCEDURES

The procedures are broken into two categories of fieldwork, soil sampling/archeological surveying and surface water sampling.

8.1.1 Soil Sampling

After the soil sampling has been completed at each station, the exclusion zone will become the Contamination Reduction Zone. The hollow-stem augers and sampling equipment will be decontaminated prior to moving to a new station. All excess soil cuttings will be returned to the location where they were collected.

All non-disposable components of the soil sampling equipment (e.g., split spoon sampler, etc.), or other equipment used to collect soil samples that contacts the soil will be decontaminated using the following steps:

- Potable water rinse
- Alconox/Liquinox detergent wash
- Potable water rinse
- Deionized (DI) water rinse
- Air dry.

Decontamination wastewaters (i.e., wash and rinse waters) will be poured directly on the ground surface near the processing area.

Gross contamination will be cleaned from PPE prior to removal from personnel and will be placed in a garbage bag for proper disposal at a solid waste landfill.

8.1.2 Surface Water and Groundwater Sampling

After the surface water and groundwater sampling is completed, the exclusion zone will become the CRZ. The sampling equipment will be decontaminated prior to moving to the next sample station.

All sampling equipment that is used in surface water sampling will be decontaminated using the following steps:

- Potable water rinse
- Alconox/Liquinox detergent wash
- Potable water rinse
- DI water rinse
- Air dry

Decontamination wastewaters will be poured on the ground near the processing area.

8.2 PERSONAL HYGIENE

The following personal hygiene practices will be used at the site to reduce exposure to chemicals.

- Long hair will be secured away from the face so it does not interfere with any activities.
- All personnel leaving potentially contaminated areas will wash their hands, forearms, and faces prior to entering any clean areas or eating areas.
- Personnel leaving potentially contaminated areas will shower (including washing hair) and change to clean clothing as soon as possible after leaving the site.

No person will eat, drink, or chew gum or tobacco in potentially contaminated areas. Drink containers and drinking of replacement fluids for heat stress control will be permitted only in areas that are free from contamination. Smoking is prohibited in all areas of the site because of the potential for contaminating samples and for health and safety reasons.

9 REFERENCES

Herrenkohl Consulting. 2011. Draft Remedial Investigation and Feasibility Study Report, Eldridge Municipal Landfill Site, Bellingham, Washington. Prepared for the City of Bellingham, Public Works, Bellingham, Washington. Prepared by Herrenkohl Consulting LLC of Bellingham, Washington with assistance from Integral Consulting, Inc. of Seattle, Washington. February 2011.

Washington Industrial Safety & Health Act. 2010. Chapter 296-800 Washington Administrative Code. July 2010 Edition.

ATTACHMENT A

SITE MAP AND HOSPITAL ROUTE

mapquest

Trip to:
St Joseph Hospital
2901 Squalicum Pkwy
Bellingham, WA 98225
(360) 734-5400
2.31 miles
6 minutes

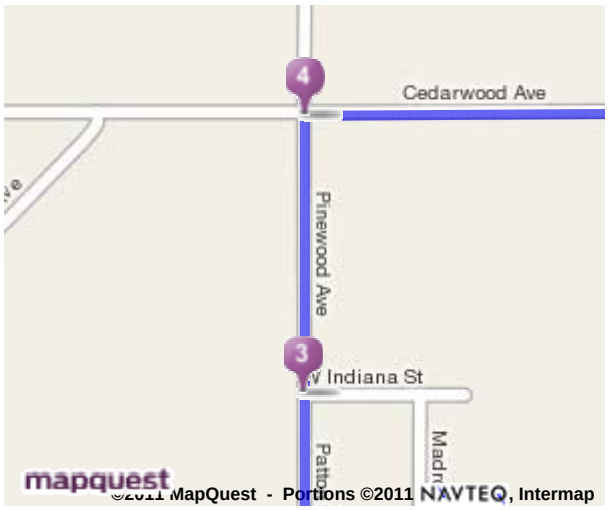
Notes

Hospital Route from the Eldridge Municipal Landfill Site

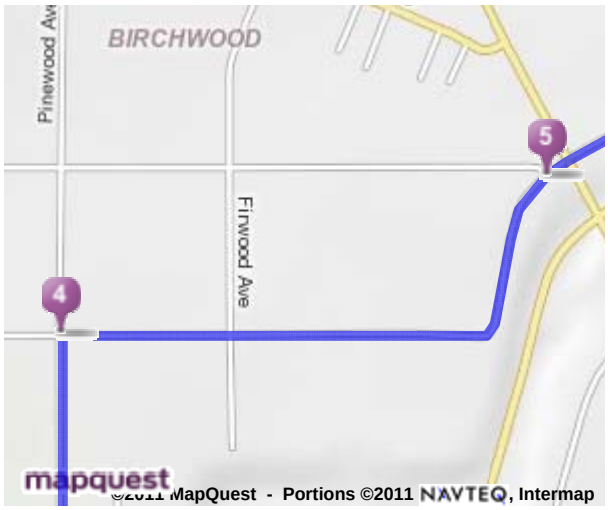
		Miles Per Section	Miles Driven
A	**W Illinois St & Nome St** Bellingham, WA 98225 		
	1. Start out going EAST on W ILLINOIS ST toward PATTON ST. 	**Go 0.06 Mi**	0.06 mi
	2. Take the 1st LEFT onto PATTON ST. *If you reach MADRONA ST you've gone a little too far*	**Go 0.09 Mi**	0.1 mi

↑	3. PATTON ST becomes PINEWOOD AVE.	**Go 0.1 Mi**	0.3 mi

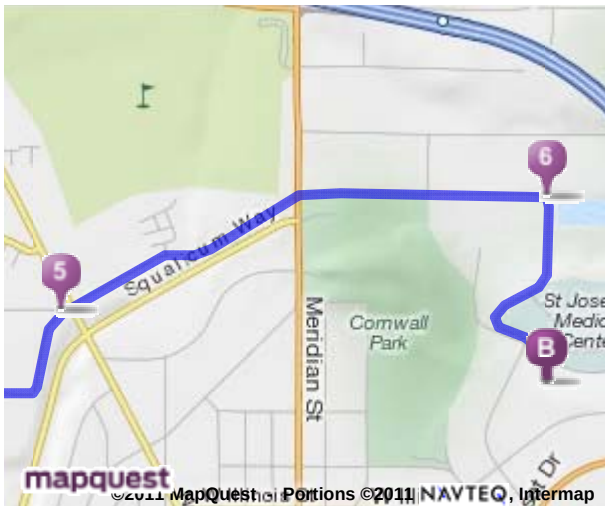
↱	4. Turn RIGHT onto CEDARWOOD AVE. *If you reach BIRCHWOOD AVE you've gone about 0.1 miles too far*	**Go 0.6 Mi**	0.9 mi



↑	5. CEDARWOOD AVE becomes BIRCHWOOD AVE.	**Go 1.0 Mi**	1.9 mi

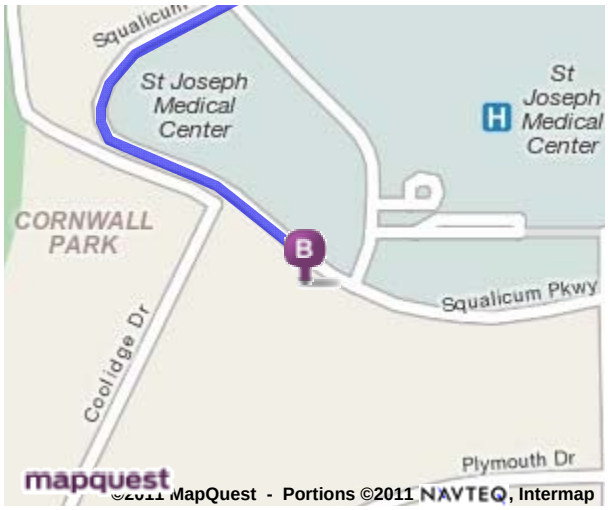


	6. Turn RIGHT onto SQUALICUM PKWY. *SQUALICUM PKWY is 0.2 miles past ORCHARD PL*	**Go 0.4 Mi**	2.3 mi

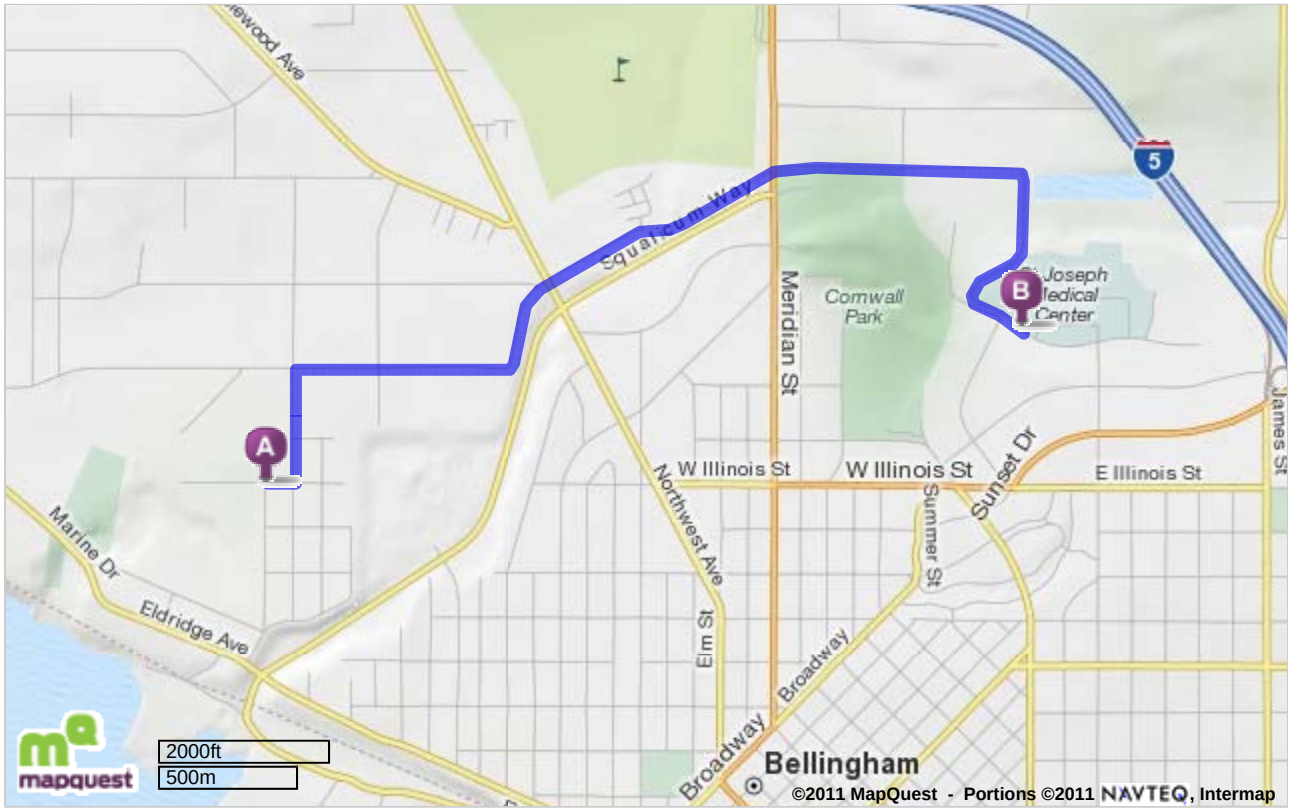


	7. 2901 SQUALICUM PKWY is on the LEFT. *If you reach ELLIS ST you've gone about 0.1 miles too far*		2.3 mi

B	**St Joseph Hospital** 2901 Squalicum Pkwy, Bellingham, WA 98225 (360) 734-5400	**2.3 mi**	**2.3 mi**


Squalicum
St Joseph Medical Center
St Joseph Medical Center
CORNWALL PARK
B
Squalicum Pkwy
Coolidge Dr
Plymouth Dr
mapquest
©2011 MapQuest - Portions ©2011 NAVTEQ, Intermap

Total Travel Estimate: **2.31 miles - about 6 minutes**



All rights reserved. Use subject to License/Copyright

Directions and maps are informational only. We make no warranties on the accuracy of their content, road conditions or route usability or expeditiousness. You assume all risk of use. MapQuest and its suppliers shall not be liable to you for any loss or delay resulting from your use of MapQuest. Your use of MapQuest means you agree to our Terms of Use

ATTACHMENT B

HEAT STRESS AND COLD STRESS INFORMATION

HEAT EXHAUSTION

What happens to the body:

Headaches, dizziness, or light-headedness, weakness, mood changes, irritability or confusion, feeling sick to your stomach, vomiting, fainting, decreased and dark-colored urine, and pale, clammy skin.

What should be done:

- Move the person to a cool shaded area. Don't leave the person alone. If the person is dizzy or light-headed, lay him on his back and raise his legs about 6-8 inches. If the person is sick to his stomach, lay him on his side.
- Loosen and remove heavy clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if he is not feeling sick to his stomach.
- Try to cool the person by fanning him. Cool the skin with a cool spray mist of water or wet cloth.
- If the person does not feel better in a few minutes call for emergency help (ambulance or call 911.)

(If heat exhaustion is not treated, the illness may advance to heat stroke.)

HEAT STROKE - A Medical Emergency

What happens to the body:

Dry, pale skin (no sweating); hot red skin (looks like a sunburn); mood changes; irritability, confusion, and not making any sense; seizures or fits, and collapse (will not respond).

What should be done:

- Call for emergency help (i.e., ambulance or 911.)
- Move the person to a cool, shaded area. Don't leave the person alone. Lay him on his back and if the person is having seizures, remove objects close to him so he won't hit them. If the person is sick to his stomach, lay him on his side.
- Remove heavy and outer clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if he is alert enough to drink anything and not feeling sick to his stomach.
- Try to cool the person by fanning him or her. Cool the skin with a cool spray mist of water, wet cloth, or wet sheet.
- If ice is available, place ice packs in armpits and groin area.

How to Protect Workers

- Learn the signs and symptoms of heat-induced illnesses and what to do to help the worker.
- Train workers about heat-induced illnesses.
- Perform the heaviest work during the coolest part of the day.
- Slowly build up tolerance to the heat and the work activity (usually takes up to 2 weeks.)
- Use the buddy system (work in pairs.)
- Drink plenty of cool water (one small cup every 15-20 minutes.)
- Wear light, loose-fitting, breathable (like cotton) clothing.
- Take frequent short breaks in cool, shaded areas (allow your body to cool down.)
- Avoid eating large meals before working in hot environments.
- Avoid caffeine and alcoholic beverages (these beverages make the body lose water and increase the risk of heat illnesses.)

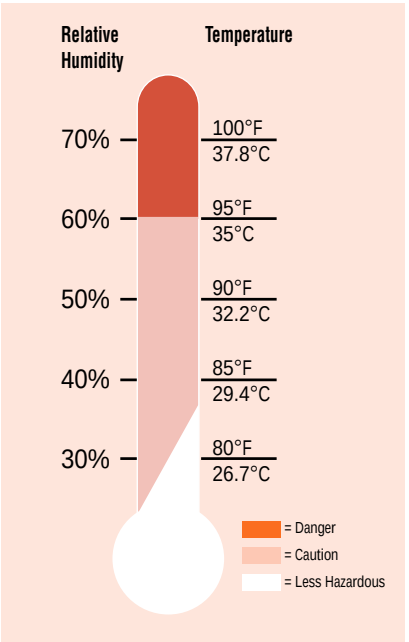
Workers are at increased risk when…

- They take certain medications. Check with your doctor, nurse, or pharmacy to see if medicines you take affect you when working in hot environments.
- They have had a heat-induced illness in the past.
- They wear personal protective equipment.

THE HEAT EQUATION

HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK = HEAT ILLNESS

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are **heat exhaustion** and **heat stroke**. If actions are not taken to treat heat exhaustion, the illness could progress to heat stroke and **death**.



Oregon Occupational Safety & Health Division
440-3333E-S(9/03)

FROSTBITE

What happens to the body:

Freezing in deep layers of skin and tissue; pale, waxy-white skin color; skin becomes hard and numb; usually affects fingers, hands, toes, feet, ears, and nose.

What to do: (land temperatures)

- Move the person to a warm, dry area. Don't leave the person alone.
- Remove wet or tight clothing that may cut off blood flow to the affected area.
- **Do not** rub the affected area because rubbing damaged the skin and tissue.
- Gently place the affected area in a warm water bath (105°) and monitor the water temperature to **slowly** warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast, causing tissue damage. Warming takes 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm. **Note:** If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.

How to Protect Workers

- Recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.
- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.
- Train workers about cold-induced illnesses and injuries.
- Select proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene.)
- Take frequent short breaks in warm, dry shelters to allow the body to warm up.
- Perform work during the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system (work in pairs.)
- Drink warm, sweet beverages (sugar water, sports-type drinks.) **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) **or alcohol**.
- Eat warm, high-calorie foods like hot pasta dishes.

Workers are at increased risk when…

- They have predisposing health conditions such as cardiovascular disease, diabetes, and hypertension.
- They take certain medications. Check with your doctor, nurse, or pharmacy and ask if medicines you take affect you while working in cold environments.
- They are in poor physical condition, have a poor diet, or are older.

HYPOTHERMIA - (Medical Emergency)

What happens to the body:

Normal body temperature (98.6°F/37°C) drops to or below 95°F/35°C; fatigue or drowsiness; uncontrolled shivering; cool, bluish skin; slurred speech; clumsy movements; irritable, irrational, or confused behavior.

What to do: (land temperatures)

- Call for emergency help (i.e., ambulance or 911).
- Move the person to a warm, dry area. Don't leave the person alone.
- Remove wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if he is alert. **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) **or alcohol**.
- Have the person move his arms and legs to create muscle heat. If he is unable to do this, place warm bottles or hot packs in the armpits, groin, neck, and head areas. **Do not** rub the person's body or place him in a warm water bath. This may stop his heart.

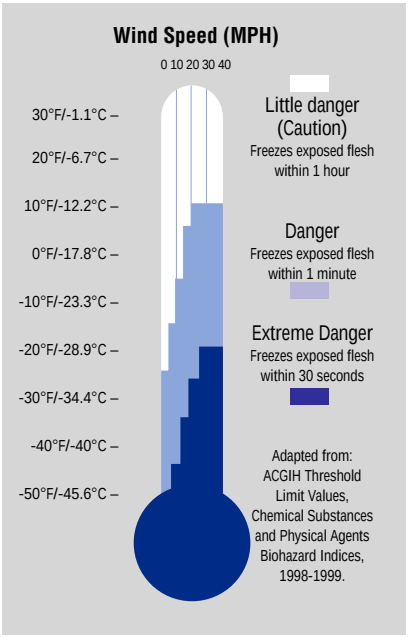
What to do: (water temperatures)

- Call for emergency help (i.e., ambulance or 911). Body heat is lost up to 25 times faster in water.
- **Do not** remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes, and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of the water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **Do not** attempt to swim unless a floating object or another person can be reached because swimming or other physical activity uses body heat and reduces survival time by about 50 percent.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.

THE COLD STRESS EQUATION

LOW TEMPERATURE + WIND SPEED + WETNESS = INJURIES & ILLNESS

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. **Hypothermia** can occur when *land temperatures* are **above** freezing or *water temperatures* are below 98.6°F/37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



Oregon Occupational Safety & Health Division
440-3336E-S (9/03)

APPENDIX E

WETLAND RESTORATION PLAN

WETLAND RESTORATION PLAN

Eldridge Municipal Landfill Interim Action
Bellingham, WA

Prepared for
City of Bellingham, Public Works
210 Lottie Street
Bellingham, WA 98225

Prepared by

Herrenkohl Consulting LLC
321 Summerland Road
Bellingham, WA 98229

June 24, 2011

CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

City	City of Bellingham, Public Works Department
Creek	Little Squalicum Creek
DCAP	draft cleanup action plan
Ecology	Washington State Department of Ecology
FAC	facultative
FACU	facultative upland
FACW	facultative wetland
NAVD88	North American vertical datum of 1988
OBL	obligate wetland
Park	Little Squalicum Park
Project	Eldridge Municipal Landfill Project
RI/FS	Remedial Investigation/Feasibility Study
Site	Eldridge Municipal Landfill Site
SOQ	statement of qualifications
USACE	U.S. Army Corps of Engineers

1 INTRODUCTION

This wetland restoration plan has been prepared by Herrenkohl Consulting LLC in support of the draft (90%) Design Analysis Report for the Eldridge Municipal Landfill Interim Action Project (Project). The Project is located in Little Squalicum Park, Bellingham, Washington (Figures 1 and 2). The purpose of this wetland restoration plan is to compensate for impacts to a wetland within the proposed cleanup project area. In preparation of this report, Herrenkohl Consulting conducted several site visits, completed a supplemental wetland delineation letter (Herrenkohl 2011), collected field data, and reviewed previous wetland evaluations within and in the vicinity of the Project Site (NES 2009, E&E 2010). Herrenkohl Consulting completed this work under contract with the City of Bellingham, Public Works Department (City).

A total of 750 square feet (ft^2) of depressional wetland will be impacted by the landfill cleanup. To offset this wetland impact, a 750 ft^2 depressional wetland will be created within the study area (Figure 3). The created wetland will be planted with native plant species common to the area and mimic the impacted wetland in form and fauna.

2 EXISTING SITE CONDITIONS

2.1 EXISTING SURFACE CONTITIONS

The study area, which includes the landfill cleanup site, the impacted wetland, and the proposed restoration site location, is approximately 0.5 acres in size. It is bound by a small gravel access road to the north, Bellingham Technical College (BTC) parking lots to the east, a hill and the BTC campus to the south, and the recently constructed BTC/Birchwood stormwater channel (part of EPA's Little Squalicum Creek Removal Action) to the west (Figure 1).

The 0.5-acre study area is mostly occupied by undeveloped park land. The area above the landfill has recently been cleared of blackberries to facilitate the Project's engineering design and planning. The vegetative communities in the study area consist of upland scrub-shrub and emergent plant communities, as well as, wetland scrub-shrub and emergent plant communities. Nearly all the vegetation in both the upland and wetland areas consists of non-native and invasive plant species, except for a few native trees.

Vegetation in the upland areas consist of mostly shrub plants with some emergent plant areas, and a few trees. Trees within the upland areas include western red cedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), red alder (*Alnus rubra*), paper birch (*Betula papyrifera*), and black cottonwood (*Populus basafimera*). Shrubs growing in the study area consist entirely of Himalayan blackberry (*Rubus armeniacus*). Herbaceous plants in the upland areas include reed-canary grass (*Phalaris arundinacea*), sword fern (*Polystichum munitum*), common tansy (*Tanacetum vulgare*), and teasle (*Dipsacus follonum*).

Vegetation in the wetland areas consist of a cross of hydrophytic plants [facultative wetland (FACW) and obligate (OBL)] and plants that can also survive in lower moisture settings [facultative (FAC) and facultative up (FACU)]. The vegetation observed within the wetland areas are described below.

2.2 WETLANDS

Two depressional wetland areas (Wetland A and Wetland B) were identified within the study area (Herrenkohl 2011). The locations of the newly mapped wetlands are presented on Figure 2.

2.2.1 Wetland A

Wetland A will not be impacted by the proposed cleanup action.

Wetland A is considered a City Category III depressional wetland that occupies an area of approximately 900 ft^2 (0.021 acres) in the upper northern portion of the study area, but outside the landfill boundaries. The wetland's classification was determined to be a PEME wetland (Palustrine, Emergent, Seasonally Flooded/Saturated) (Cowardin 1979). The total wetland area

does not meet the size requirements (1,000 square feet) or habitat score (20 points) for a jurisdictional wetland within the City (BMC 16.55.270).

Wetland A consisted mostly of an emergent plant community with sections of scrub-shrub plants. Shrubs within Wetland A consisted of Himalayan blackberry (*Rubus armeniacus*). Herbaceous plants within Wetland A consisted of reed-canary grass (*Phalaris arundinacea*), common tansy (*Tanacetum vulgare*), and teasle (*Dipsacus follonum*).

For more details please review the supplemental wetland delineation letter (Herrenkohl 2011).

2.2.2 Wetland B

Wetland B will be completely excavated during the landfill cleanup. Wetland B will be replaced according to the specifications of this restoration plan.

Wetland B is considered a City Category III depressional wetland that occupies an area of approximately 750 ft^2 (0.017 acres) in the northwestern portion of the study area and within the landfill boundaries. The wetland's classification was determined to be a PEM/SSE wetland (Palustrine, Emergent/Scrub-Shrub, Seasonally Flooded/Saturated). Similar to Wetland A, the total wetland area for Wetland B does not meet the size requirements or habitat score for a jurisdictional wetland within the City (BMC 16.55.270). While no buffers are required around this non-jurisdictional wetland, removal of the wetland triggers a required mitigation or restoration.

Wetland B consists mostly of an emergent plant community with sections of scrub-shrub plants and a single large Pacific willow tree (*Salix lucidia*). Shrubs within Wetland B consisted of Himalayan blackberry (*Rubus armeniacus*). Herbaceous plants within Wetland B consisted of reed-canary grass (*Phalaris arundinacea*), common tansy (*Tanacetum vulgare*), and teasle (*Dipsacus follonum*).

For more details please review the supplemental wetland delineation letter (Herrenkohl 2011).

2.3 DRAINAGE

The wetlands are located within the Little Squalicum Creek watershed. The hydrologic flow patterns generally indicate water flow westward toward the new BTC/Birchwood stormwater channel and Little Squalicum Creek, which empties into Bellingham Bay. Both wetlands receive the majority of their hydrology from precipitation and high groundwater tables during the wet season. Both wetlands dry out during the dry season.

2.4 AVOIDANCE AND MINIMIZATION

The landfill cleanup cannot be completed without some impacts to Wetland B. Wetland B is located on the surface of the landfill and must be excavated to facilitate the removal of

environmental contamination associated with landfill cleanup project. Avoidance and minimization are not possible within the scope of the project.

2.5 EXTENT OF DISTURBANCE

Wetland A will not be impacted by the proposed cleanup and will require an orange protective fence installed around its boundaries during construction. This fence along with instructions to the construction crew to not disturb the wetland will assure that Wetland A is protected.

Wetland B will be completely removed during the cleanup and will result in a loss of 750 ft^2 of wetland. This restoration plan will restore all of the lost wetland through wetland creation.

Both wetlands are under the jurisdictional size for a City-regulated wetland and do not have wetland buffers. Therefore, no wetland buffers will be impacted by the cleanup (BMC 16.55.270).

A summary of the wetlands and wetland impacts anticipated within the proposed clean-up site is presented in Table 1.

Table 1. Summary of Wetland Areas, Categories, Buffers, and Impacts

Critical Area	Cowardin Class	HGM Classification	Wetland Area (ft^2)	Wetland Category	Buffer (ft)	Impacts to Wetland (ft^2)
Wetland A	PEME	Depressional	~900	III	None	**0**
Wetland B	PEM/SSE	Depressional	~750	III	None	**750**

2.6 EROSION

The wetland creation site is located in close proximity to the BTC/Birchwood stormwater channel and Wetland A. The grading and excavation associated with the wetland creation project has the potential to cause erosion and siltation to enter critical aquatic areas. Use of common erosion control methods, such as a silt fence placed between the construction area and the critical areas, would prevent potential sediment from entering stream or wetland waters during construction.

3 PROPOSED RESTORATION

The goal of this restoration is to restore the impacted wetland to conditions equivalent to those prior to the removal of the Eldridge Landfill (Table 2). By following this restoration plan, the hydrological, water quality, and habitat functions will be restored to existing conditions, and the total square footage of Wetland B will be replaced.

This restoration plan will create a wetland area to the northwest of Wetland A (Figure 3). The newly created wetland will include areas of seasonal saturation and inundation. Additionally, the native planting scheme will be installed to enhance the wetland and create both habitat, hydrological, and water quality structure.

Table 2. Type of Restoration Proposed and Square Footage

Restoration Type	Restoration Ratios (Area of restoration to area of disturbance)	Impacted Area (ft^2)	Total Restoration Area (ft^2)
Creation	1:1	750	750

3.1 RESTORATION OBJECTIVES

Restoration objectives for the Project include:

- The proposed wetland creation will replace the square footage of the wetland that was destroyed during cleanup.
- Replace the habitat, water quality, and hydrological functions that previously existed at the Site.

3.2 SITE SELECTION

The location of the wetland creation area was chosen for its close proximity to the impacted wetland, similar soil conditions, and its comparable proximity to Little Squalicum Creek and Wetland A (Figure 3).

3.3 SPECIFIC MEASURES

Specific restoration measures should include:

1. Create a depression that covers 750 ft^2 in the location and shape shown in Figure 3. The wetland creation area will be over-excavated to allow a 6-inch low permeability soil liner

containing fines (minimum 30% silts and clays[1]), 9-inches of silty loam soil, and a depressional area that is 9-inches deep at its greatest depth. Figure 3 model the cross sectional profile. (See Section 4.2 for details.)

2. Replant the created wetland area with 10 native trees, 30 shrubs, and 35 to 45 emergent plant species. Specific tree, shrub, and emergent species are listed in Attachment 1.
3. Trees will be planted on 8 ft centers, shrubs will be planted on 4 ft centers, and emergent's will be on 2 ft centers. Planting density should be varied throughout the site, using spacing as an average for the entire site (Figure 4) (See Section 4.3 for details).
4. Mulch should be placed in the mitigation area to cover bare soils and to reduce potential establishment of invasive plants in the area.

Completing the above outlined measures will reestablish the natural balance between soil, hydrology, and vegetation to insure soil cohesion and provide a restored habitat. The plants listed in the attached planting guide will provide a good, healthy habitat with positive impacts to the wetland and wildlife areas.

[1] A berm embankment for detention should be constructed of soils with the following characteristics per the United States Department of Agriculture's Textural Triangle: a minimum of 20% silt and clay, a maximum of 60% sand, a maximum of 60% silt, with nominal gravel and cobble content (Ecology 2005).

4 RESTORATION INSTALLATION

4.1 SITE PREPARATION

Site preparation shall consist of excavating the appropriate wetland depression, installing a restrictive soil layer, if needed, and completing any other work necessary to prepare the area for planting. No preparation is necessary for plants that are supplied by a nursery or transplants.

4.2 EXCAVATION PLAN

The surrounding ground elevation should be graded to an elevation between 36.5 ft and 37 ft (NAVD88) (Figure 3), following the removal of the landfill materials and the re-filling of the excavation. A 750 ft^2 depression will be then be excavated in the area suggested in Figure 3, northwest of Wetland A. The wetland creation area will be over-excavated to allow for placement of 6-inches of compacted low permeability soil containing fines (minimum 30% silts and clays), 9-inches of silty loam soil, and upon completion will be a depression approximately 9-inches deep at its deepest point. The deepest point will be located on the side of the creation area closest to Wetland B and should be set a little off center and gradually rise to surrounding ground surface elevation. Cross sectional profiles of the depression are shown in Figure 3.

4.2.1 Excavation Criteria

The excavation of the wetland creation area should occur in the dry season. If excavation takes place in the rainy season or during a rain storm, appropriate erosion control measures should be implemented to prevent sediment runoff into the nearby storm channel or wetland. Care should be taken to not impact the nearby wetland (Wetland A) with heavy equipment during construction.

4.2.2 Subsurface and Liner Criteria

The wetland should be excavated approximately 15 inches below the finished grade and a 6-inch layer of low permeability soil containing silts and clays should be placed as a relatively restrictive layer. The layer should have a minimum 30% silt and clay content to reduce infiltration and prevent drainage of the wetland. If the soils present in the wetland creation area already allow for retention of water, the liner is not required. A 9-inch layer of silt loam or loamy silt should be installed on top of the clay liner as a base for plant growth. If possible this soil should be a hydric soil.

4.3 PLANTING PLAN

Planting shall consist of installing plants, and plant protective devices, and mulch. No planting shall occur until the site is prepared in accordance with this restoration plan and any and all

requirements made by U.S. Army Corp of Engineers (USACE), Washington State Department of Ecology (Ecology) or any other jurisdictional agencies have been completed, and the site has been inspected and approved by a qualified wetland scientist.

4.3.1 Source of Plant Material

All plant materials used at the restoration site shall be acquired from local or near local sources, grown in the Puget Sound lowlands, and obtained from a reputable native plant nursery preferably within Whatcom County or salvaged onsite from areas designated for disturbance. Native vegetation should be planted using species currently existing onsite or other native species suited for the project site location (see appropriate plants in Attachment 1).

4.3.2 Planting Locations

Using the plant guide in Attachment 1 and the enhancement plot plan map (Figure 4) as a reference, plants should be located in areas best suited to promote growth and produce a natural and attractive habitat area. Plants should be laid out in clusters and islands that mimic natural plant distribution. Specific attention should be paid to hydrologic, soil, and shade conditions that can contribute to the success of the plantings. The planting plan locations may vary based on actual site conditions, but the total number of plants installed and the area enhanced should not be below the suggested numbers.

4.3.3 Installation of Container and Bare Root plants

- Water all container stock and bare root plants the day before planting.
- Transplant according to the location recommendations provided in this report (Figure 4).
- Dig holes deep and wide enough to allow room for roots to spread.
- Wet hole prior to placing roots in hole.
- Place plant in hole without roots pointing up or out of hole.
- Water plant after placing soil on roots and pat down the soil to close any air holes.
- Create soil basin around plantings to help plant collect water while the plant establishes itself.
- Plant protectors should be used for all installed plants to minimize browsing by deer and rodents.

4.3.4 Mulch

Three to six inches of wood chip mulch shall be placed over the entire restoration area. Maintain three inches of separation between the plant stem and the mulch. Mulch shall be applied in such a way that avoids causing significant soil compaction and/or damage to nearby trees, shrubs, and/or herbaceous plants. Wood chip mulch should be a medium sized texture (not fine or coarse), aged for at least one year, and should be free of weeds and/or weed seeds, deleterious materials, or other foreign materials harmful to plant life. The use of mulch made from cedar and/or exclusively of bark is not acceptable.

4.4 AS-BUILT REPORT

The applicant shall submit, or arrange to have submitted, an as-built letter within 30 days of the completion of the implementation of this restoration plan to USACE, Ecology and any jurisdictional agencies that request it. At a minimum, the as-built will contain photographs of the installed restoration from enough photo point locations to adequately represent the site, a map showing all activities associated this restoration plan, and a plant plot map showing specific locations of the installed individual plant species.

4.5 RESTORATION SCHEDULE

The site excavation and mulching should occur after the completion of the cleanup excavation and preferably in the dry season. The re-vegetation should begin the late fall through early spring seasons following the completion of the depressional excavation and the approval of this restoration plan by regulatory agencies. Plantings should take place between November 1 and April 15, or according to the specific recommendations of a representative of the nursery that provides the plant materials.

5 REFERENCES

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, Office of Biological Services, Washington. DC. Publication No. FWS/OBS-79/31. 107 pp.

Herrenkohl Consulting. 2011. Supplemental Wetland Delineation for the Eldridge Municipal Landfill Site and Amendment to the Draft Little Squalicum Creek Site Wetland Delineation Report, Herrenkohl Consulting LLC, Bellingham Washington.

Ecology. 2005. Stormwater Management in Western Washington. Volume III: Hydrologic Analysis and Flow Control Analysis/BMPs. Prepared by the Washington State Department of Ecology. Revised in February 2005.

Ecology and Environment. 2010. Draft Wetland Delineation Report for Little Squalicum Creek Site Bellingham, Washington, Ecology and Environment Inc. Seattle Washington.

EPA. 2010. Action Memorandum for a Non-Time-Critical Removal Action at the Little Squalicum Creek Area of The Oeser Company Superfund Site, Bellingham, Washington. Prepared by the U.S. Environmental Protection Agency, Region 10, Seattle, Washington. July 2, 2010.

NES. 2009. Wetland Reconnaissance and Existing Conditions Report. Little Squalicum Park Master Plan. Prepared for the City of Bellingham, Parks and Recreation Department. Prepared by Northwest Ecological Services, LLC, Bellingham, Washington. October 2009.

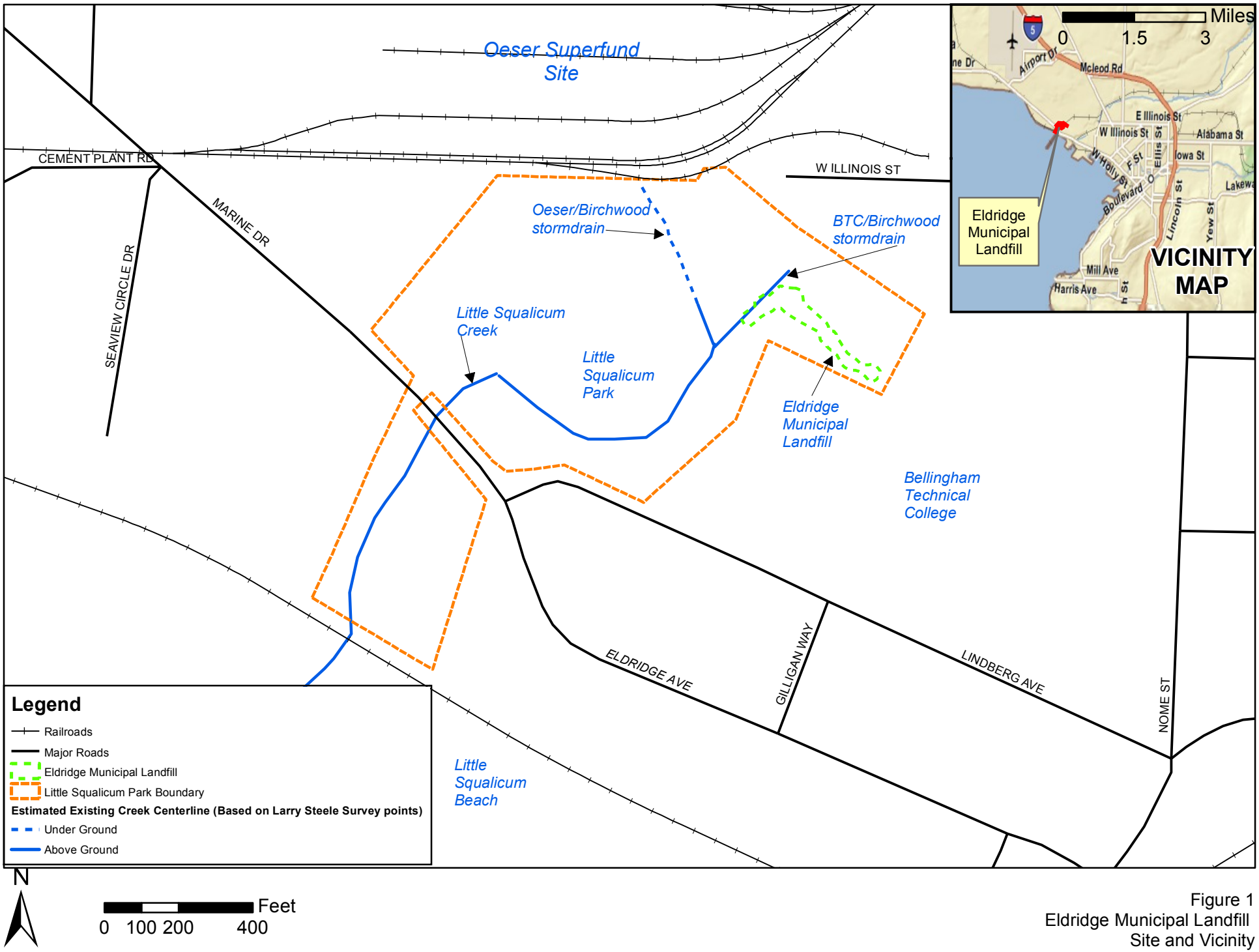


Figure 1
Eldridge Municipal Landfill
Site and Vicinity
Bellingham, WA

NO.	REVISIONS	BY	DATE

FOUND AXLE
N26°27'E, 4.35'
OF CALC. CORNER

FOUND 1/2"
IRON BAR
N01°18'E, 4.56'
OF CALC. CORNER

CP #901
REBAR/TRAV CAP
N=649030.14
E= 1235880.40
ELEV. = 48.41

GATE POST

GATE POST

EXIST. SDMH #2016
RIM= 49.44
W 36" INV= 45.44

EXIST. CONTECH
FILTER VAULT
RIM= 47.7±

EXIST. CONTECH
FILTER VAULT
RIM= 47.8±

EXIST. SDMH #2709
RIM= 41.12
E 36" INV= 36.23
W 36" INV= 36.23

EXIST. 36" SD

EXIST. QUARRY SPALL ROAD

EXIST. SILT FENCE AND QUARRY SPALL EDGE

EXIST. SILT FENCE

EXIST. HOG FUEL STOCKPILE

STRAW BALES (TYP)

EXIST. SDMH #2002
RIM= 39.22
E 36" INV= 34.47
S 36" INV= 34.45

TOPOGRAPHIC BOUNDARY SEE NOTE 1

SITE TBM
PUNCH IN N. RIM DMH
ELEV. = 39.22'
(NAVD88)

CP #900
REBAR/TRAV CAP
N=649183.42
E= 1235480.72
ELEV. = 38.72

EXIST. 36" PVC
INV= 33.46

County Parks
A.F. 1208788

BTC/BIRCHWOOD
STORM CHANNEL

TIRE WASH

EXIST. QUARRY SPALL ROAD

WETLAND 'A'
960 SF

WETLAND 'B'
750 SF

DITCH

EXTENT OF EXISTING LANDFILL
13,000 SF

LIMIT OF EX. STOCKPILE (TO BE REMOVED)

EXCAVATED & STOCKPILED ON-SITE (6,000 SF)

EXISTING BTC PARKING LOT

EXIST. 6' CHAIN LINK FENCE

POND

SET HUB @ R

N 41°37'41" E 320.97'

N 57°34'19" W 289.57'

TOPOGRAPHIC BOUNDARY SEE NOTE 1

FOUND 1" IRON BAR
N29°20'E, 6.09'
OF CALC. CORNER

NOTES

1) THE AREA OF THE SITE WITHIN THE TOPOGRAPHIC BOUNDARY WAS SURVEYED BY WILSON ENGINEERING IN MARCH OF 2011. THE AREA OUTSIDE THE TOPOGRAPHIC BOUNDARY WAS PREVIOUSLY SURVEYED BY OTHERS. CONTOURS SHOWN OUTSIDE THE TOPOGRAPHIC BOUNDARY SHALL BE CONSIDERED APPROXIMATE.

SCALE
20 0 20 40
HORIZONTAL SCALE FEET

LEGEND

SYMBOL OR HATCH	DESCRIPTION
⬡#SP or ⬡#SP*	=SOIL PIT
	= EXTENT OF LANDFILL & EXCAVATION
	=EXISTING WETLAND

*= NOT SURVEYED BY WILSON- DATA PROVIDED BY OTHERS

WILSON ENGINEERING, LLC
805 DUPONT STREET
BELLINGHAM, WA 98225
(360) 733-6100 • FAX (360) 647-9061
www.wilsonengineering.com
Wilson SURVEY/ENGINEERING

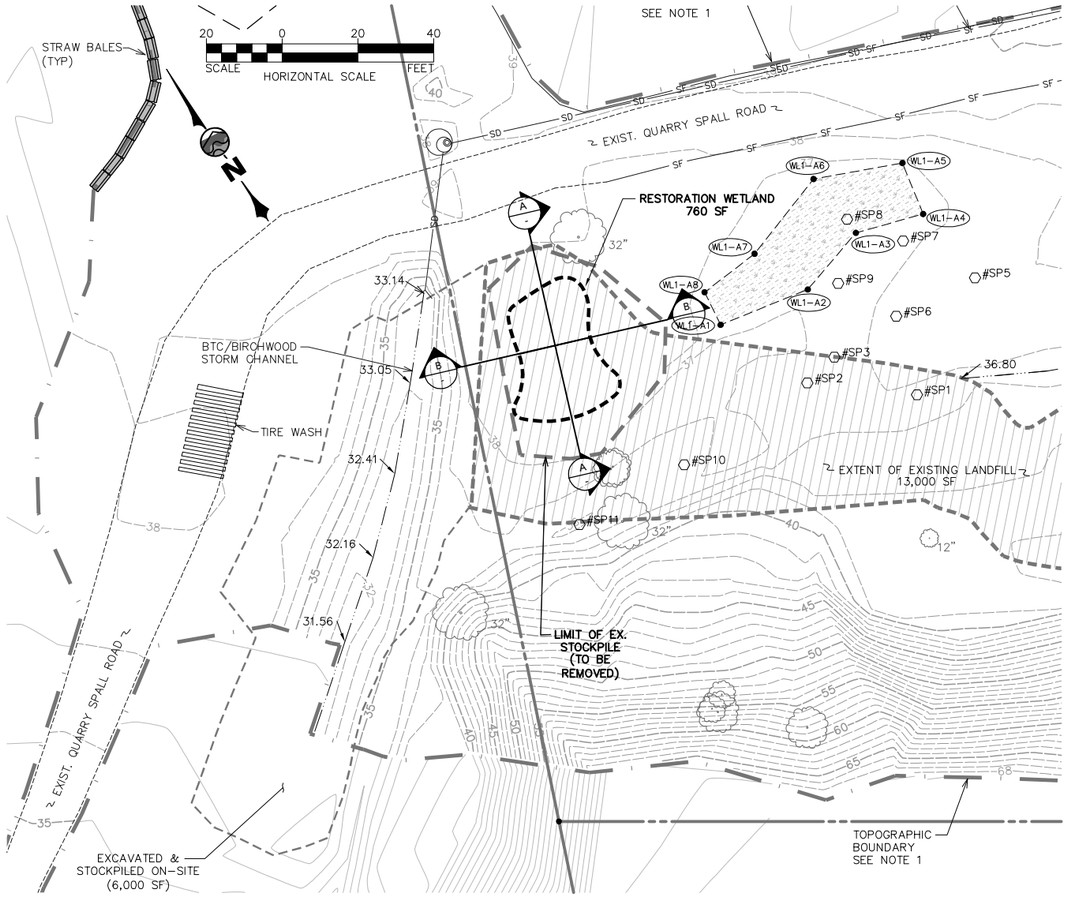
DESIGNED BY | DRAWN BY JGS | CHECKED BY

CITY OF BELLINGHAM
WASHINGTON
ELDRIDGE MUNICIPAL LANDFILL INTERIM ACTION
WETLAND DELINEATION MAP

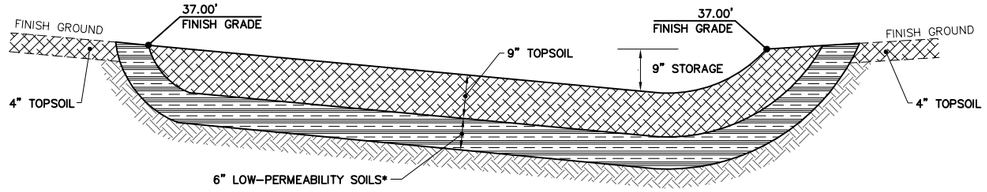
DATE 06-24-2011 | SCALE AS SHOWN | JOB NUMBER 2011-020

SHEET FIG 2 OF 1

w:\2011\2011-020 Herrenkohl - COB Eldridge Landfill Cleanup\Dwg\HERRENKOHL EXHIBIT\SFIGURE 2.dwg, 6/28/2011 9:48:10 AM, AcroPlot.pc3, RDN



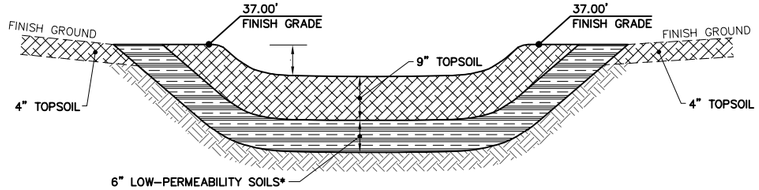
RESTORATION WETLAND – PLAN



*= MINIMUM 30% SILT & CLAY

SECTION A-A

NOT TO SCALE



*= MINIMUM 30% SILT & CLAY

SECTION B-B

NOT TO SCALE

NO.	REVISIONS	BY	DATE

WILSON ENGINEERING, LLC
805 DUPONT STREET
BELLINGHAM, WA 98225
(360) 733-6100 • FAX (360) 647-9061
www.wilsonengineering.com
Wilson SURVEY/ENGINEERING

DESIGNED BY

DRAWN BY JGS

CHECKED BY

CITY OF BELLINGHAM

BELLINGHAM WASHINGTON

ELDRIDGE MUNICIPAL LANDFILL INTERIM ACTION

PROPOSED RESTORATION PLAN

DATE 06-24-2011

SCALE AS SHOWN

JOB NUMBER 2011-020

SHEET FIG 3

OF *

w:\2011\2011-020 Herrenkohl - COB Eldridge Landfill Cleanup\Dwg\HERRENKOHL EXHIBITS\FIGURE 3.dwg, 6/28/2011 9:48:16 AM, AcroPlot.pc3, RDN

NO.	REVISIONS	BY	DATE

RESTORATION PLANTING LEGEND

- △ = PACIFIC DOGWOOD (Cornus Nuttallii)
- ☆ = PACIFIC NINEBARK (Physocarpus Capitatus)
- ○ = PACIFIC WILLOW (Salix Lasiandra)
- ✳ = LADY FERN (Athyrium Filix-femina)
- Y = SLOUGH SEDGE (Carex Obnupta)

RESTORATION PLANTING – PLAN

WILSON ENGINEERING, LLC
805 DUPONT STREET
BELLINGHAM, WA 98225
(360) 733-6100 • FAX (360) 647-9061
www.wilsonengineering.com
Wilson SURVEY/ENGINEERING

DESIGNED BY
DRAWN BY JGS
CHECKED BY

CITY OF BELLINGHAM
BELLINGHAM WASHINGTON
ELDRIDGE MUNICIPAL LANDFILL INTERIM ACTION
PROPOSED PLANTING PLAN

DATE 06-24-2011
SCALE AS SHOWN
JOB NUMBER 2011-020

SHEET FIG 4
OF *

w:\2011\2011-020 Herrenkohl - COB Eldridge Landfill Cleanup\Dwg\HERRENKOHL EXHIBITS\FIGURE 4.dwg, 6/28/2011 9:48:20 AM, AcroPlot.pc3, RDN

Attachment A. Plant Guide

Number of Plants	Common Name	Latin Name	Size and Condition	Spacing	Light	Moisture	Max. Height	Avail.	Ease
15	**Pacific dogwood**	*Cornus nuttallii*	6”-1 Gallon or BR	4’	part shade	dry - moist	60’	M	L
15	**Pacific Ninebark**	*Physocarpus capitatus*	6”-1 Gallon or BR	4’	Sun - shade	Moist - wet	13’	M	H
10	**Pacific willow**	*Salix lasiandra*	1-2 gallon or BR or LS	8’	sun - part shade	moist - wet	40’	M	H
25	**Lady fern**	*Athyrium filix-femina*	1-2 gallon or BR or LS	2’	sun - shade	moist - wet	4’	H	H
10-20 Plugs or seed	**Slough sedge**	*Carex obnupta*	Seed or Plug	N/A	sun - part shade	moist - wet	3’	M	H

Definitions found on the next page.

Definitions for plant guide:

Size and Condition: Size of stock container and/or condition of plant material

- 6" and 1 Gallon: container stock plants in 6" and 1 gallon containers, dependent on specific recommendations. Other container sizes may be recommended.
- BR: Bare root plants
- LS: Live stake plants acquired from nursery stock or from onsite
- Seed: Seeds
- Plugs: Small plugs for direct planting

Availability: How easy are the plants to find in area nurseries

- (H) High: common at most nurseries
- (M) Medium: more likely at larger nurseries
- (L) Low: Usually only found at native plant and specialty nurseries

Ease: How difficult are the plants to grow

- (H) High: large margin of error on growing conditions, relatively easy to grow
- (M) Medium: easy to grow if the specific growing conditions are met
- (L) Low: specific or uncommon requirements for survival make plant challenging to grow

Deciduous: Drops leaves at end of growing season
Evergreen: Retains leaves for more than a year
Perennial: An herbaceous plant living year to year and not dying after flowering once

Exposure: Amount of sun the plant needs

- Sun: Areas receiving at least 6 hours of sun including afternoon sun.
- Part shade: 2-6 hours of sun
- Shade: less than two hours of sun

Moisture: Amount of water the plant needs

- Dry: quick drying, well drained soils
- Moist: damp much of the year, may dry out completely during late summer, and no standing water
- Wet: very rarely or never dries out (usually wetlands)

APPENDIX F

ACCESS AGREEMENT BETWEEN BTC AND CITY

CITY OF BELLINGHAM
CONTRACT#

Contract Authorization Routing

Number (Assigned by FINANCE): 2011-0285

Kjerstie A Nelson submitted this request on

Tracking Number	KANN-8HNUFZ
Type	Contract
Dept:	PUBLIC WORKS

Contracting Party	Bellingham Technical College	Original Cont #	
Name/Project #	Access Agreement, EC-0015 Eldridge Municipal Landfill Remediation		
Termination Date	12/31/2011	If Contract is Extended, New Termination Date:	☐ Renewable ☐ See Contract Terms
City Project Mgr	Sam Shipp		

Is Notary required? No

P.O. Required? No

CERTIFICATE OF INSURANCE
○ Current Insurance Certificate on File ○ Waived
○ Attached ○ N/A

Maximum Payable $$ ☐ See Contract

Exhibits Attached: Yes

Special Instructions: NOTE TWO ORIGINALS. Please return one fully-executed duplicate original to Kjerstie Nelson, PW Engineering. Notify Kjerstie Nelson, Jeanne Tinker-Smith, Amy Butler, Amy Kraham, and Sam Shipp when document has been scanned.

√ka

6/14 Distribution: Original - Attach to Contract, Copy: Return to Originating Dept.
Modification of Contract - Attach Copy of Original Contract to Physical document

You are an Administrator of the approval process

Approval Cycle Settings

Approval conditions:	100 % approval
Routing method	Serial (one at a time)
	Grp_eRouter
Allow Approver comments	Yes
Automatically Delegate to Assistant...	● Yes ○ No
Automatically Skip Approvers...	● Yes ○ No
Days until skipped/delegated	

Notification

Access

6/20/11 Loud Texane
✓ Jean

CITY OF BELLINGHAM
CONTRACT#
2011-0285

Access Agreement between

Bellingham Technical College

and

the City of Bellingham

This agreement is made and entered into by the City of Bellingham (the "City") and Bellingham Technical College ("BTC")(collectively, the "Parties") to allow the City access through property occupied by BTC in Bellingham, WA, which is generally depicted in Exhibit A attached to this agreement ("Property").

I. Recitals

WHEREAS, the Washington State Department of Ecology ("Ecology") has determined that a partial cleanup, known as an interim action, is necessary at the Eldridge Municipal Landfill Site ("Landfill Site"), owned by Whatcom County and managed by the City under the terms of a lease agreement between the City and Whatcom County, in Bellingham, WA; and

WHEREAS, BTC owns and occupies land adjacent to the Landfill Site; and

WHEREAS, in November 2010, the City and Ecology signed Agreed Order No. DE 8073 ("Agreed Order"), which directed the City to prepare a remedial investigation and feasibility study ("RI/FS") and draft cleanup action plan ("DCAP") for the site; and

WHEREAS, in June, 2011, Ecology and the City plan to execute an Amended Agreed Order ("Agreed Order") which directs the City to perform the interim action; and

WHEREAS, the interim action will require access through BTC's property, including hauling of equipment and materials.

NOW, THEREFORE, the Parties do agree upon the following definitions and terms:

II. Definitions

A. "Property" refers to property owned by the State of Washington and occupied by the Bellingham Technical College, generally located at 3028 Lindbergh Ave., Bellingham, WA, as generally depicted in Exhibit A.

B. "Work" refers to performance of remediation required by Ecology pursuant to the Agreed Order. Work may include remediation on BTC-owned property if Ecology determines that the contaminated material extends across the property boundary line. In no event shall Work include remediation which impacts BTC's parking lot.

C. "Activities" refers to the movement of equipment, materials, persons, and vehicles through the Property as necessary to implement the Work. "Vehicles" includes trucks, service vehicles, and ancillary equipment, such as water trucks, excavators and street sweepers.

D. "Termination" means October 31, 2011. Should the Work not be completed by October 31, 2011, BTC agrees to: (1) grant access as outlined herein between 5:00 p.m. and 8:00 a.m. daily for the remainder of 2011; and (2) grant weekend access after 5:00 p.m. on Friday until 8:00 a.m. on Monday for the remainder of 2011. After December 31, 2011, the City and BTC may enter into an extension of this agreement or negotiate a separate agreement.

III. Terms and Conditions

A. Incorporation of Recital and Definitions. The aforementioned recitals and definitions are incorporated herein and made a part hereof.

B. City's Obligations.

i. Insurance. The City will obtain all liability insurance for the Activities that it, its consultants, or its contractors perform under this Agreement and will provide a certificate of insurance to BTC prior to the start of such Activities, including comprehensive general liability insurance in a minimum amount of $3,000,000 aggregated, and $1,000,000 per occurrence. As an alternative to the insurance requirements set forth in this section, the City may continue to maintain a program of self insurance and excess insurance with a minimum limit of $3,000,000 per occurrence.

ii. Restore Property. In the event that damage to or immediately adjacent to the access route through the Property occurs due to the City's performance of the Activities, the City shall promptly restore the access route through the Property and immediately adjacent areas damaged by the Activities to their original condition, upon discovery of the damage and to the satisfaction of BTC, prior to Termination of this Agreement.

1. Assessments. The City shall fund and retain a professional civil engineer licensed in the State of Washington, who has been approved by BTC, to assess the Property before and after the City's Activities ("pre-access assessment" and "post-access assessment"). Subsequent to completion of the post-access assessment, the professional engineer shall provide an estimate of the cost to repair any damage to fencing, in-ground facilities, and the pavement and curbs, or any other items associated with any access road used by the City, its employees, representatives, agents, contractors

and consultants. Whether the Property is in its "original condition" (or, alternatively, has been damaged) shall be determined by the professional engineer according to the pre-access and post-access assessments. The assessments shall include photographs and notes to document the condition of the Property.

2. Payment Option. BTC and the City may agree, upon BTC's prior written request to the City, that in lieu of restoring the Property or any portion thereof, the City deposit the estimated cost of repairs in an appropriate fund as designated by BTC.

iii. Safety Measures and Traffic Control. At all times during its Activities, the City shall provide traffic control measures to minimize congestion and accidents, including but not limited to parking protection, signs, and flaggers, in accordance with the Health and Safety Plan reviewed by Ecology or as required by BTC.

iv. Stormwater Management. In accordance with the Stormwater Pollution Prevention Plan (SWPPP) developed for the Eldridge Avenue Municipal Landfill cleanup, the City will use Best Management Practices in order to prevent damage to the Property during its performance of Activities on the Property. BMPs will be identified in the SWPPP. This includes but is not limited to eight (8) stormwater catch basins in the lower student parking lot and the access road from that lot to W. Illinois St.

C. BTC's Obligations.

i. BTC Will Provide Access to the Property. BTC grants a non-exclusive license for access to, across, and through the Property to the City, its employees, representatives, agents, contractors and consultants, and Ecology, as set forth in Exhibits A and B, for the purpose of the Activities necessary to implement the Work according to the following terms and conditions:

1. Notice. The City shall provide written notice at least five (5) calendar days in advance of the Activities.

2. Dates and Times of Access. The City may access the Property as provided in Exhibit B.

D. Indemnification.

i. The City, and its successors and assigns, agree to indemnify, hold harmless and defend BTC and its respective officers, directors, agents and employees from and against any third-party claims for any and all

losses, liabilities, claims, demands, damages, suits, causes of action, judgments, costs and expenses whatsoever, whether known or unknown (collectively the "Damages") of BTC, arising from the negligent actions or omissions of the City (or its representatives) during the period of this Agreement within the limits of the insurance acquired pursuant to Section III.B.i; provided, however, that the City shall not indemnify, defend and hold BTC harmless to the extent of the negligent actions or omissions of BTC. In the event of liability for personal injury or damages claims caused by or resulting from concurrent negligence by the City and BTC, the City's liability hereunder shall be only to the extent of the City's negligence.

ii. To the extent permitted by law, BTC, and its successors and assigns, agree to indemnify, hold harmless and defend the City and its officers, directors, shareholders, agents and employees from and against any and all third-party claims for any Damages of the City, arising from the negligent actions or omissions of BTC (or its representatives) during the period of this Agreement and incurred during the City's performance of the Activities; provided, however, that BTC shall not indemnify, defend and hold the City harmless to the extent of the negligent actions or omissions of the City. In the event of liability for personal injury or damages claims caused by or resulting from concurrent negligence by the City and BTC, liability of BTC hereunder shall be only to the extent of BTC's own negligence.

E. General Provisions.

i. No Admission of Facts or Liability. The Parties acknowledge and agree that the execution of this Agreement does not constitute an admission of facts or liability by any Party.

ii. Agreement Not Admissible as Evidence. The Parties acknowledge and agree that the Agreement shall not be admissible evidence in any proceeding without the written consent of all of the Parties, except to enforce the terms of this Agreement or as required by law or court order.

iii. No Agency Relationship. This Agreement shall not be construed to create, either expressly or by implication, the relationship of agency or partnership between the Parties. No Party, including such Party's agents, employees, contractors or attorneys, is authorized to act on behalf of any other Party in any manner related to the subject of this Agreement. No Party shall be liable for the acts, errors or omissions of the officers, agents, employees or contractors of the other Party entered into, committed, or performed with respect to or in the performance of this Agreement.

iv. Duration of the Agreement. This Agreement shall remain in full force and effect until its Termination.

v. Governing Law and Venue. This Agreement shall be construed under and in accordance with the laws of Washington. Venue lies in Whatcom County.

vi. Entire Agreement. This Agreement constitutes the entire understanding of the Parties with respect to this subject. To the extent that written or oral representations or understandings are not fully expressed in this Agreement and the referenced attachments, the Parties agree that any interpretation of this Agreement will be restricted to the Terms and Conditions herein. No change, waiver, or discharge is valid unless set forth in writing and signed by the party against whom it is sought to be enforced. Any amendment to this Agreement must be in writing and signed by all the parties who originally signed this Agreement.

vii. Severability. If any provision of this Agreement is deemed invalid or unenforceable, the remainder of the Agreement shall remain enforceable.

viii. Attorney's Fees and Litigation Costs. If any Party brings suit to recover damages under this Agreement or to otherwise enforce or interpret this Agreement and a judgment is entered, the substantially prevailing party shall be entitled to a reasonable sum as attorneys' fees, and all costs and expenses in connection with such suit, which sum shall be included in any such judgment or decree.

ix. No Third-Party Beneficiaries. This Agreement is for the sole and exclusive use of the Parties hereto, and none of the provisions of this Agreement shall be deemed to be for the benefit of any other person or entity.

x. Construction. The Parties acknowledge that this Agreement has been negotiated at arm's length and therefore that any rule of construction of contracts resolving any ambiguities against the drafting Party is waived and shall be inapplicable to this document.

xi. Separate Representation. All Parties have been represented by and relied upon their own independent legal counsel in drafting and negotiating this Agreement.

xii. Section Headings. The Section headings contained in this Agreement are exclusively for the purpose of reference, are not part of the agreement of the Parties, and shall not in any way affect the meaning or interpretation of this Agreement.

xiii. Survival of Certain Sections. The following sections of this Agreement shall remain in full force and effect upon the Termination of this Agreement: III.B.ii, III.D, and III.E.

xiv. Notice. Unless otherwise specified, any notice which a Party is required or may desire to give any other Party shall be in writing and may be delivered (a) by United States registered or certified mail, postage prepaid, or (b) by facsimile, provided that such telecopy shall be immediately followed by delivery of such notice pursuant to clause (a) above. Any such notice shall be addressed as follows (subject to the right of a Party to designate a different address by itself by notice similarly given):

1. For the City:

Sam Shipp
City of Bellingham
Department of Public Works
210 Lottie Street
Bellingham, WA 98225-1530
sshipp@cob.org

With a copy to:

Amy Kraham
City of Bellingham
Office of the City Attorney
210 Lottie Street
Bellingham, WA 98225
akraham@cob.org

2. For Bellingham Technical College:

Debra Jones, Vice President Administrative Services
Bellingham Technical College
3028 Lindbergh Avenue
Bellingham, WA 98225-1599

With a copy to:

Eve Magyar, Capital Projects Manager
Bellingham Technical College
3028 Lindbergh Avenue
Bellingham, WA 98225-1599
emagyar@btc.ctc.edu

xv. Effective Date. This Agreement shall be effective on the date of the signature of the second Party.

IN WITNESS THEREOF, the Parties state that they have read this Agreement, that they understand its contents, that they are not relying upon any representations in executing this Agreement not expressly set forth herein, and that they have hereunder set their hands freely and voluntarily as of the dates written below:

EXECUTED, this 16th day of June, 2011, for the **CITY OF BELLINGHAM:**

Daniel V. Pike, Mayor

Departmental Approval:

Ted A. Carlson, Department Head

Attest:

Finance Director

Approved as to Form:

Office of the City Attorney

STATE OF WASHINGTON)
COUNTY OF WHATCOM) ss.

I hereby certify that I know or have satisfactory evidence that Daniel V. Pike signed this instrument and acknowledge that he is authorized to sign this instrument on behalf of the City of Bellingham and that such execution is the free and voluntary act of the City of Bellingham for the uses and purposes mentioned in this instrument

DATED: 6/16/11

Signature

TORHIL S. RAMSAY NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 03-16-2014

Torhil S. Ramsay
Print Name
Title: Notary Public
My commission expires: 3/16/14

BELLINGHAM TECHNICAL COLLEGE

Debra Jones

Debra Jones, Vice President Administrative Services

6/2/11

Date

STATE OF WASHINGTON)
COUNTY OF WHATCOM) ss.

I hereby certify that I know or have satisfactory evidence that Debra Jones, the VP Admin/SVS of Bellingham Technical College, signed this instrument and acknowledge that she is authorized to sign this instrument on behalf of BTC and that such execution is the free and voluntary act of BTC for the uses and purposes mentioned in this instrument.

DATED: June 2, 2011

Ronda Laughlin

Signature

Ronda R. Laughlin

Print Name

Title: Notary Public

My commission expires: 10-24-2014

Exhibit A: Access Route (BTC Property)

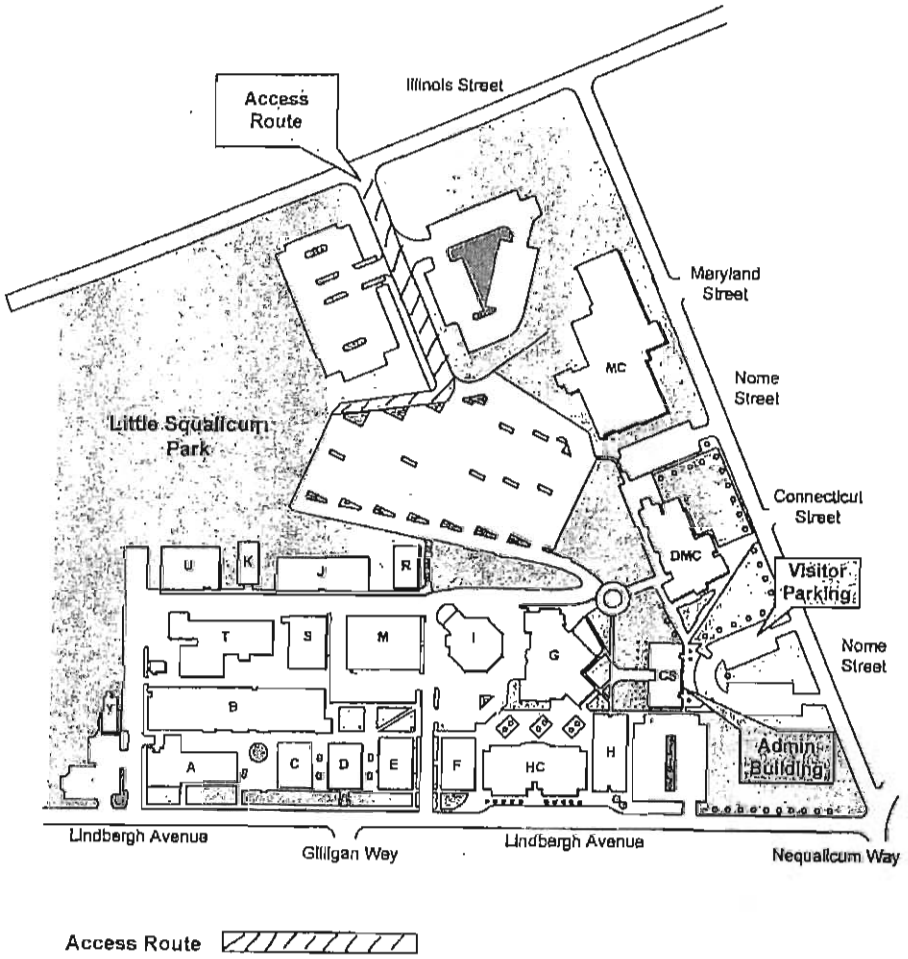


Exhibit B

Eldridge BTC Access
Hauling Restrictions 8/01/2011

August 2011						
Sun	Mon	Tues	Wed	Thur	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

September, 2011						
Sun	Mon	Tues	Wed	Thur	Fri	Sat
	1	2	3	1	2	3
4	5	6	7	8	9	10
11	12 *	13 *	14 *	15 *	16 *	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

October, 2011						
Sun	Mon	Tues	Wed	Thur	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

	No time restrictions on hauling
*	Tentitively no time restrictions on hauling, this is *subject to daily assessments by BTC regarding traffic volumes
	No hauling prior to 4:00 p.m.

ATTACHMENT 1

DESIGN PLANS

ATTACHMENT 2

DESIGN SPECIFICATIONS