ANACORTES PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
P.O. BOX 547, ANACORTES, WA 98221
(360) 293-1920 EXT. 246 / (360) 293-1938
Jeff Beltramini, Engineering Tech II

March 11, 2010

Ms. Polly Dubbel
Skagit County Public Health Department
700 S 2nd Avenue, #301
Mount Vernon, WA 98273

Re: City of Anacortes - A Avenue Landfill

Dear Ms. Dubbel,

It is my understanding, based on a May 26, 2009 meeting with Jim Wiggins of ATSI, Inc., that due to the age of the A Ave landfill, Skagit County determined it is not feasible to hold the A Avenue landfill to today's capping standards. However, specific requirements have been identified to be addressed and completed in order to implement an acceptable closure plan. Subsequent meetings between Skagit County, ATSI, and the City held on-site at the landfill on October 14 and October 19, 2009 helped to identify options and further clarify acceptable closure requirements. Actions taken by the City of Anacortes to address these requirements are as follows:

- Aqua-Terr Systems, Inc. ATSI was hired as a consultant to draft a 10-year closure plan for the landfill.
- Public safety hazards created by pieces of debris in the uplands and wetlands, which were not deeply buried, were removed from the site.
- The existing topography of the landfill was modified by the placement of additional fill and graded to a 5% slope in order to prevent standing water, increase surface water runoff, reduce permeability, and facilitate rapid runoff from the landfill into adjacent undisturbed land (Figures 1, 2, 3, and 4).
- Two soil samples were taken prior to compaction in order to help determine permeability of soils used in the capping process. A recommended permeability specification of 1.0×10^{-5} was met as shown in (Figure 5).
- A maintenance path was constructed to allow for the mowing of the cap twice annually for 10 years to prevent trees and shrubs from growing.
- The cap was covered with a final layer of 6 inches of topsoil to enable the establishment of a hydroseeded grass covering.
- Fencing adjacent to the new cap was constructed and will be maintained in order to limit public access into this landfill area.

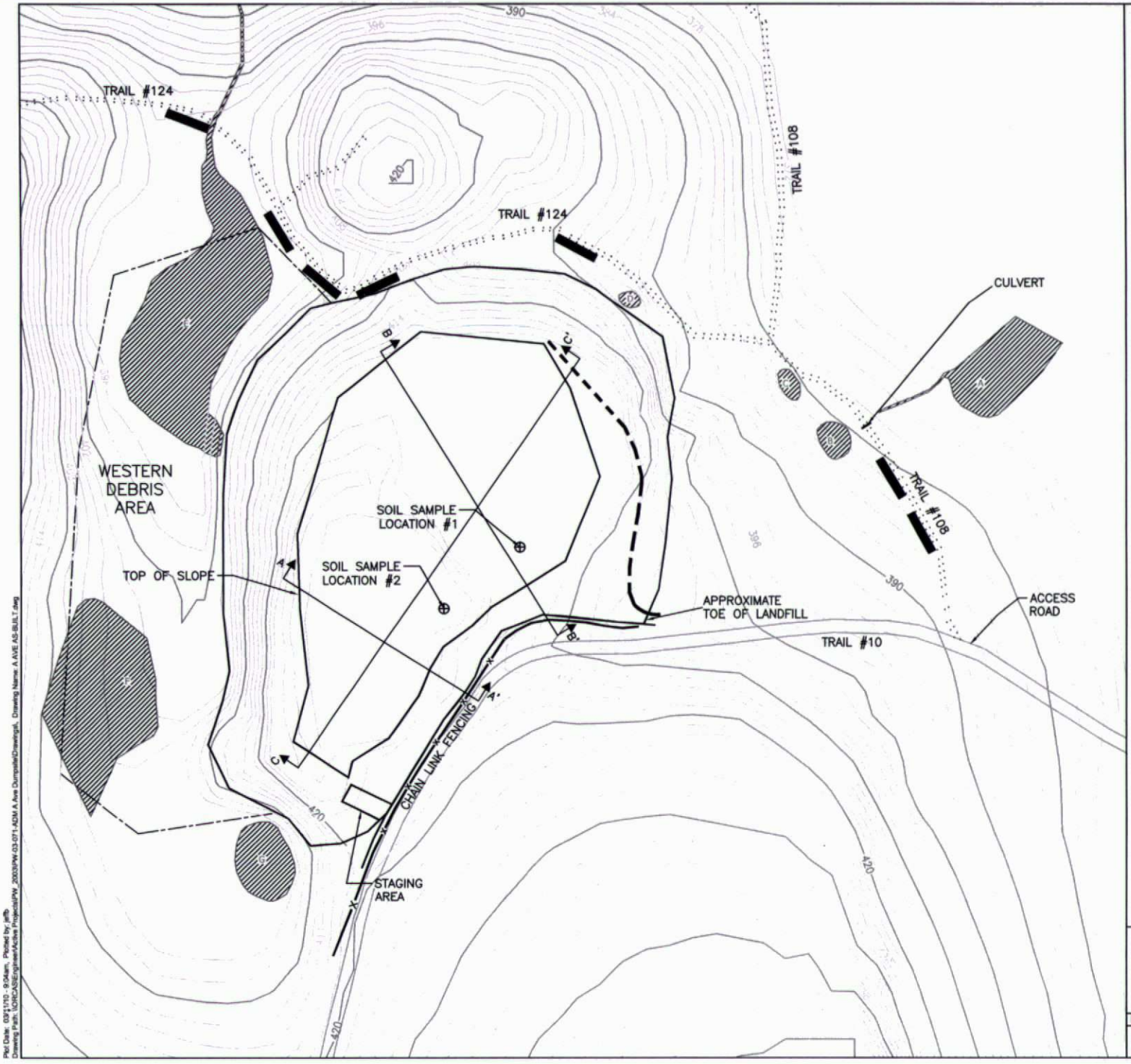
- Log barriers and obnoxious natural barriers (small woody debris) were placed at discrete areas with preexisting paths or other identified access points to create a natural looking deterrence to public access into the landfill area.
- As-builts of the cap are provided (Figures 1, 2, 3, and 4), as well as pre and post construction photographs (Figures 6-13).

We trust that you will find the actions taken as outlined above adequately address the requirements for an acceptable closure to the A Avenue Landfill. If we have omitted any requirements or concerns you have, please do not hesitate to contact me at (360) 293-1920.

Respectfully,

Jeff Beltramini
Engineering Tech II
City of Anacortes

A Ave Landfill
As-Built Drawings
Figures 1-4



LEGEND

- WETLAND
- HIKING TRAILS
- DRAINAGE DITCH
- NATURAL DRAINAGE
- NATURAL LOG BARRIER
- CHAIN LINK FENCE
- CROSS SECTION LOCATION

NOTES:

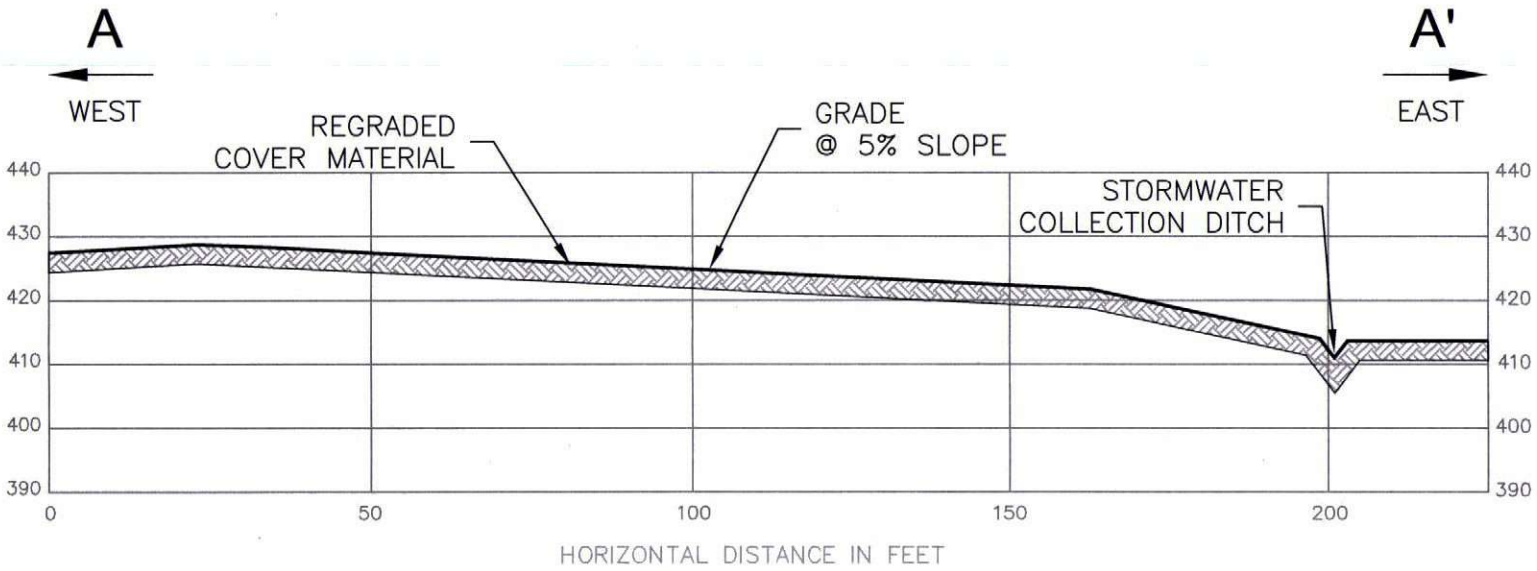
1. SURVEY INFORMATION AND BASE MAP PROVIDED BY THE CITY OF ANACORTES.
2. WETLANDS IDENTIFIED BY ATSI AND LAND SURVEYED BY CITY OF ANACORTES.

0 50 100
APPROXIMATE SCALE IN FEET

AS-BUILT CONDITIONS & CROSS SECTION LOCATIONS
Anacortes "A" Avenue Landfill
Anacortes, Washington

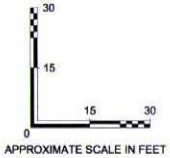
By: JRB	Date: 03/11/10	Project No. 03-071-ADM
CITY OF ANACORTES		**Figure 1**

Plot Date: 03/11/10 - 9:04am, Plotted by: jrtb
Drawing Path: \\ORCAS\Engineer\Active Projects\PW_2003\PW-03-071-ADM A Ave Dumpsite\Drawings\L_Drawing Name: A AVE AS-BUILT.dwg



CROSS SECTION A–A'

* REGRADED COVER MATERIAL COMPACTED WITH A VIBRATING ROLLER.
* FINAL LAYER IS 6" OF GRADED TOPSOIL AND HYDROSEEDED.

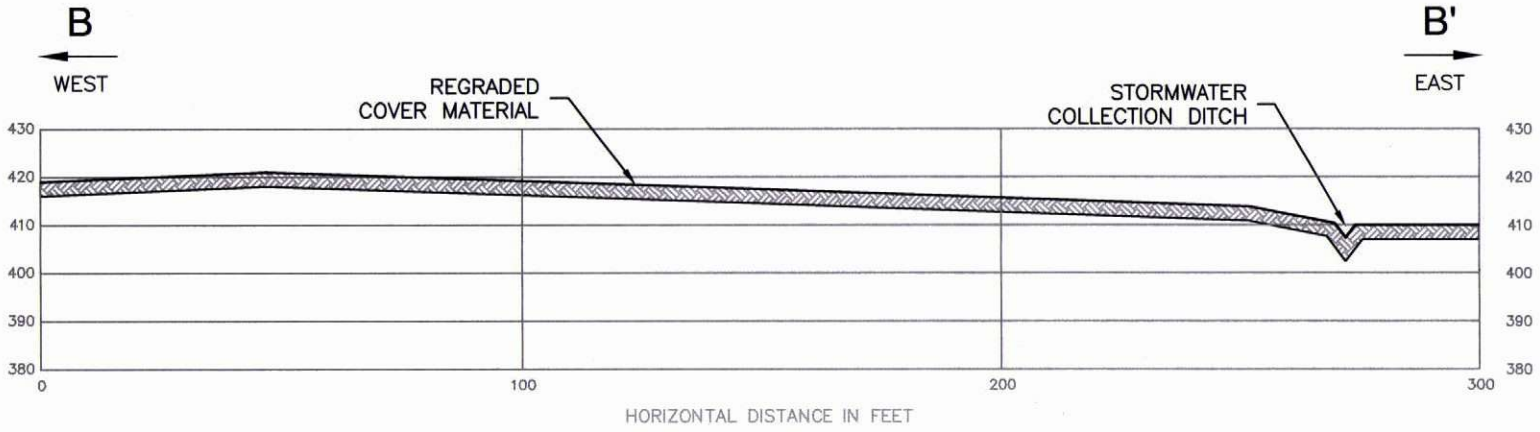


AS-BUILT
CROSS SECTION A-A'
Anacortes A Avenue Landfill
Anacortes, Washington

By: JRB	Date: 03/11/10	Project No. 09156.000

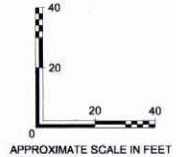
CITY OF ANACORTES

Figure 2



CROSS SECTION B–B'

* REGRADED COVER MATERIAL COMPACTED WITH A VIBRATING ROLLER.
* FINAL LAYER IS 6" OF GRADED TOPSOIL AND HYDROSEEDED.

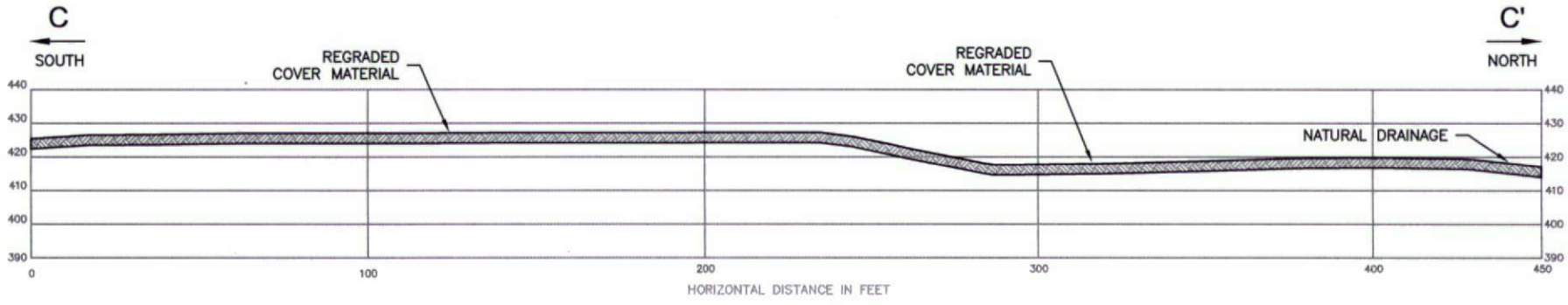


AS-BUILT
CROSS SECTION B-B'
Anacortes A Avenue Landfill
Anacortes, Washington

By: JRB	Date: 03/11/10	Project No. 09156.000

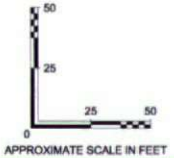
CITY OF ANACORTES

Figure 3



CROSS SECTION C–C'

* REGRADED COVER MATERIAL COMPACTED WITH A VIBRATING ROLLER.
* FINAL LAYER IS 6" OF GRADED TOPSOIL AND HYDROSEEDED.



AS-BUILT CROSS SECTION C-C'
Anacortes A Avenue Landfill
Anacortes, Washington

By: JRB	Date: 03/11/10	Project No. 09156.000

CITY OF ANACORTES

Figure 4

A Ave Landfill
Soil Sample Results
Figure 5

GEOTEST

741 Marine Drive
Bellingham, WA 98225

PHONE 360 733_7318
TOLL FREE 888 251_5276
FAX 360 733_7418

PERMEABILITY REPORT • SOILS
CONSTANT-HEAD METHOD
ASTM D5084

PROJECT: **A Avenue Landfill**
ADDRESS: **Anacortes, WA**
CLIENT **City of Anacortes**

JOB #: **10-0100**
REPORT #: **S01**
TEST DATE: **2-19-10**
LAB #: **7891**

SOIL TYPE: **Silty SAND with Gravel (SM)**
SOURCE: **Existing Landfill Cap**

TEST 1	Weight	Length	Diameter	Volume	Moisture Content	Dry Density
Initial	1.411 lbs.	2.957 in.	2.894 in.	0.0113 cf	11.3%	112.8 pcf
Final	1.460 lbs.	2.940 in.	2.891 in.	0.0111 cf	15.0%	114.4 pcf

TEST 2	Weight	Length	Diameter	Volume	Moisture Content	Dry Density
Initial	1.347 lbs.	3.130 in.	2.871 in.	0.0117 cf	12.5%	102.3 pcf
Final	1.423 lbs.	3.103 in.	2.823 in.	0.0112 cf	18.5%	107.2 pcf

TEST #	TEST DRY DENSITY (PCF)	PERMEABILITY CM/SEC
1	112.8	3.7×10^{-6}
2	102.3	1.5×10^{-5}

Comments: Field moisture-density tests ranged from 110.5 pcf to 124.6 pcf dry density within the landfill cap. It is our understanding that a maximum permeability rate of 1.0×10^{-5} cm/sec is specified.

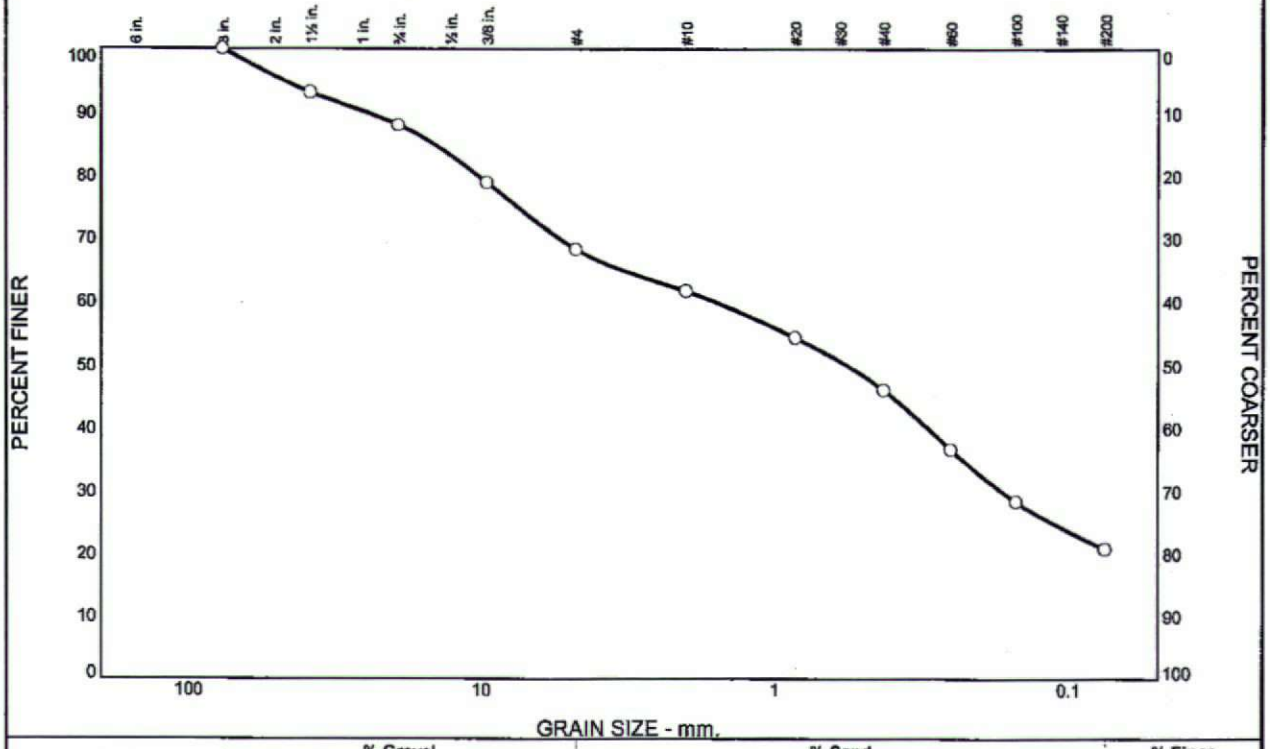
Based on the in-place density of the site soils and the results of our permeability tests, it is our opinion that the landfill cap soils meet the permeability specification requirements.

Copies: client

Submitted By:

Grant Richardson
Technical Director

Sieve Analysis Test Report - ASTM C136/C117



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0	12	20	6	16	25	21

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100		
1-1/2"	93		
3/4"	88		
3/8"	79		
#4	68		
#10	62		
#20	54		
#40	46		
#60	37		
#100	28		
#200	21		

* (no specification provided)

Material Description

Landfill Cap
silty sand with gravel

Atterberg Limits

PL= np LL= nv PI=

Coefficients

D_{90}= 24.5824 D_{85}= 14.6541 D_{60}= 1.6216
D_{50}= 0.5727 D_{30}= 0.1691 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Location: Existing Fill (Landfill Cap)
Sample Number: 7891

Date: 2-17-2010

GeoTest
741 Marine Drive
Bellingham, WA 98225
www.GeoTest-Inc.com

Client: City of Anacortes
Project: Anacortes Landfill Closure
Project No: 10-0100 **Report** S02-7891

Tested By: AH **Checked By:** DPB

A Ave Landfill
Pre & Post Construction Photos
Figures 6-14

Before: May 2008

After: November 2009

Figure 6

Before: May 2008

After: November 2009

Figure 7

Before: May 2008

After: November 2009

Figure 8

Before: May 2008

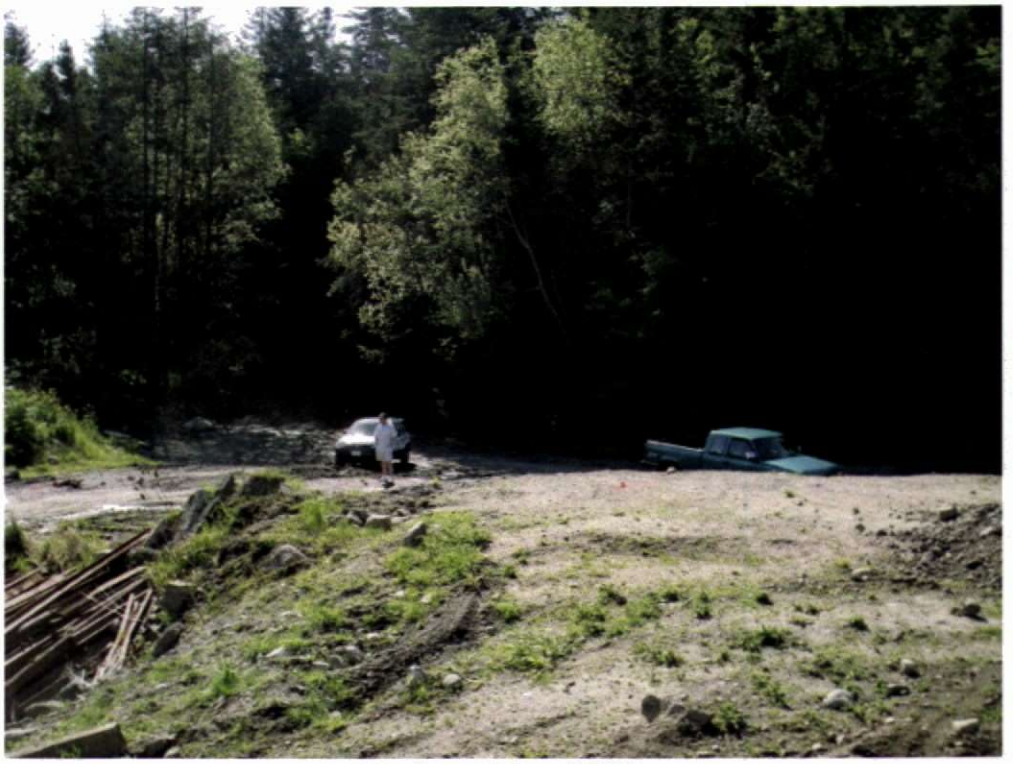
After: November 2009

Figure 9

Before: May 2008

After: November 2009

Figure 10



Before: May 2008

After: November 2009

Figure 11

Before: May 2008

After: November 2009

Figure 12

Before: May 2008

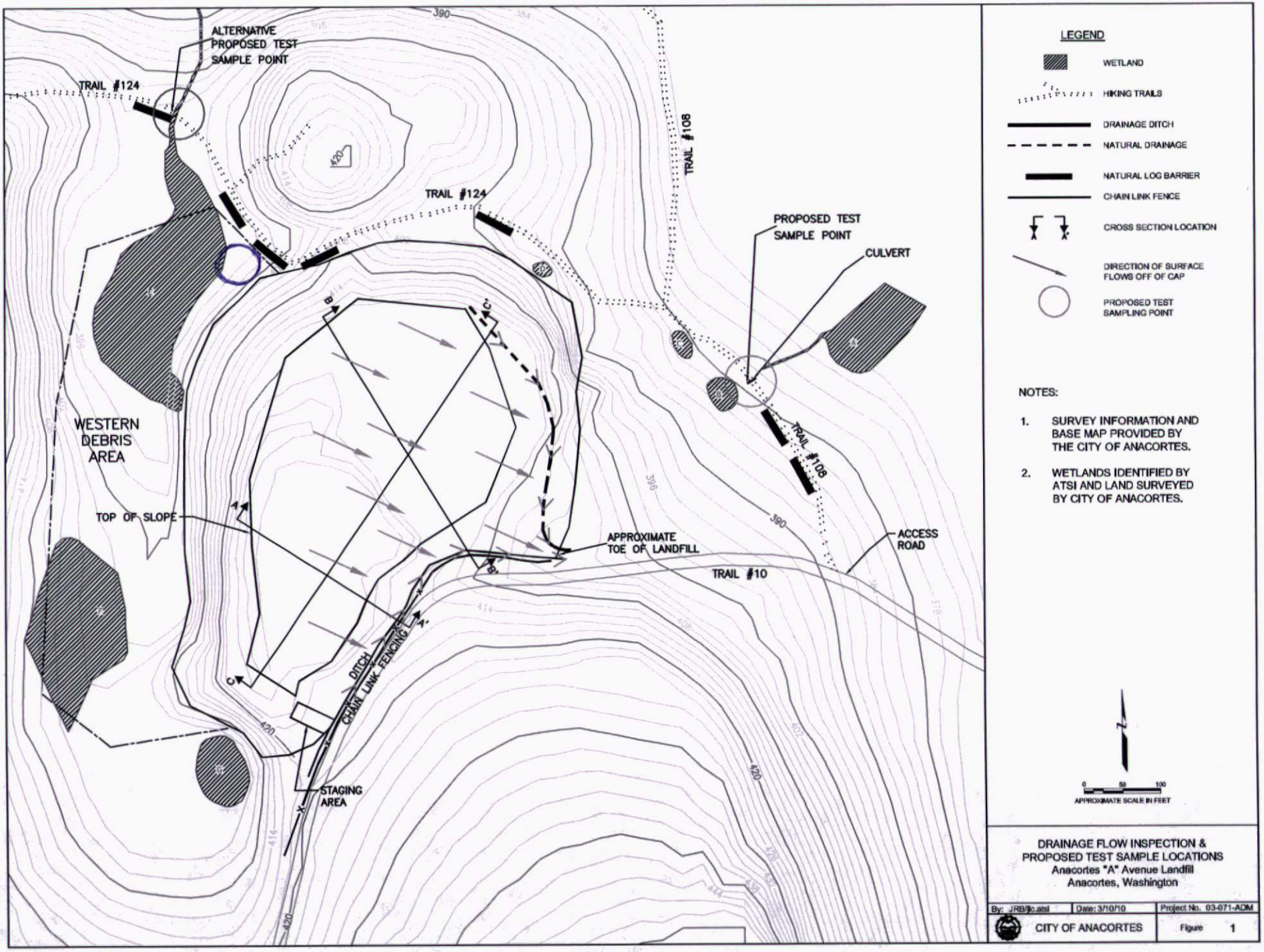
After: November 2009

Figure 13

Before: May 2008

After: November 2009

Figure 14


ALTERNATIVE PROPOSED TEST SAMPLE POINT
TRAIL #124
TRAIL #124
TRAIL #108
PROPOSED TEST SAMPLE POINT
CULVERT
WESTERN DEBRIS AREA
TOP OF SLOPE
APPROXIMATE TOE OF LANDFILL
ACCESS ROAD
TRAIL #108
TRAIL #10
DITCH
CHAIN LINK FENCING
STAGING AREA
LEGEND
WETLAND
HIKING TRAILS
DRAINAGE DITCH
NATURAL DRAINAGE
NATURAL LOG BARRIER
CHAIN LINK FENCE
CROSS SECTION LOCATION
DIRECTION OF SURFACE FLOWS OFF OF CAP
PROPOSED TEST SAMPLING POINT
NOTES:
1. SURVEY INFORMATION AND BASE MAP PROVIDED BY THE CITY OF ANACORTES.
2. WETLANDS IDENTIFIED BY ATSI AND LAND SURVEYED BY CITY OF ANACORTES.
0 50 100
APPROXIMATE SCALE IN FEET
DRAINAGE FLOW INSPECTION & PROPOSED TEST SAMPLE LOCATIONS
Anacortes "A" Avenue Landfill
Anacortes, Washington
By: JRB/jc.atsi
Date: 3/10/10
Project No. 03-071-ADM
CITY OF ANACORTES
Figure 1