Soil Evaluation Report

Ritchie Brothers – Lewis County

Prepared for: Ritchie Bros. Properties
Contact: Scott Lennon
9500 Glen Lyon Parkway
Burnaby BC, Canada V5J OC6
(801) 455-9005

March 2010

Reviewing Agency

Jurisdiction: Lewis County, Washington
Project Number: Pending
Project Contact: Mike Hamling, R.S.
(360) 740-1365

Project Location

N. Military Road, Winlock, WA
Tax Parcel No. 014860011000

Project Engineer

Prepared by: RB Engineering, Inc.
PO Box 923
Chehalis, WA 98532
(360) 740-8919
(360) 740-8912 Fax
Licensed Engineer: Robert W. Balmelli PE
RBE Project: 08098
File Number: g:\rbengr\projects\2008\08098\Soils\08098.Soil Evaluation.doc

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Purpose

The purpose of this soil evaluation is to determine the type, structure and the depth of suitable soils for a commercial onsite septic system for the proposed Ritchie Brothers Lewis County Auction Facility.

Scope

On March 18, 2010, RB Engineering (RBE) conducted two onsite soil evaluations in the area of the proposed septic system drain field. The evaluation included excavating and logging soil properties for suitability of an onsite septic system.

USDA Soil Analysis

RBE staff reviewed the onsite soils information provided by NRCS. Appendix A includes copies of the site map and soil descriptions that make up the property geology. The site proposed for the septic system consists of Prather silty clay loam. The NRCS data and the onsite soil logs verified this classification.

Method of Evaluation

Evaluations of the site were field determined by site topography and required setbacks from site features such as proposed buildings, property lines and wetlands. A total of 2 soil test pits were excavated and evaluated for determining suitability for an onsite septic disposal area. This evaluation analyzes soil properties by depth, texture, structure, color and evidence of any layer or soil horizon restrictive to downward movement of water. This analysis will determine the type of system best suited for this site.

Required Septic System Disposal Method

Pressure Distribution Trench with Sand Filter Pre-Treatment
This system is needed when the suitable soil depth is not sufficient to provide the required final treatment needed to properly dispose wastewater within the drainfield.

Or

Mound System
An onsite sewage system consisting of a septic tank, pump chamber and mound disposal component. The mound is composed of coarse sand placed on top of native soils with the wastewater dispersal components placed within the mound.

Recommended Disposal Method and Preliminary Sizing

Based on the soils results, a pressure distribution trench disposal area with pre-treatment from a sand filter is recommended for treatment and disposal of residential type sewage from the proposed facility restrooms. Based on typical average daily flows from similar facilities owned by Ritchie Brothers, the system will need to be sized for approximately 700 gpd with sufficient surge tanks for Auction Day Event Peak Flows. Auction flows will be metered out over the following months between Auctions. There will be 4 to 5 Auctions per year.

Preliminary Sand Filter Area Design Criteria:

Sand Filter Loading Rate -	0.8 Gal/SF/Day, Class 6
Bed Type -	Intermittent Sand Filter
Gallons per Day -	700 Gal/Day

$$\frac{700 \text{ Gal/Day}}{0.8 \text{ Gal/Day/SF}} = 875 \text{ SF of Sand Filter Area}$$

Using a 30 ft x 30 ft sand filter system. 30 FT x 30 FT = 900 SF

Preliminary Absorption Disposal Area Design Criteria:

Soil Classification -	Prather Silty Clay Loam
Soil Loading Rate -	0.2 Gal/SF/Day, Class 6
Trench Type -	3 Foot Wide Trench
Gallons per Day -	700 Gal/Day
Septic Tank Vol. -	1.5 x 700 = 1050 gallon tank

$$\frac{700 \text{ Gal/Day}}{0.2 \text{ Gal/Day/SF}} = 3500 \text{ SF of Drain Field Area}$$

Using 3 foot wide trench system $\frac{3500 \text{ SF}}{3 \text{ Ft}} = 1166$ LF of Drain Field.

Drainfield Needed - 12 – 100 FT long x 3 FT wide trenches. This is equal to an area 110 FT x 100 FT.

Reserve Area Needed – 12 – 100 FT long x 3 FT wide trenches. This is equal to an area 110 FT x 100 FT.

Based on the above calculations the proposed site has sufficient area to meet necessary setbacks and provide a main drain field area and reserve area.

Soil Evaluation Logs

Prepared by: Robert Balmelli PE

Project Site: Ritchie Brothers Lewis County

Date Soils Logged: March 18, 2010

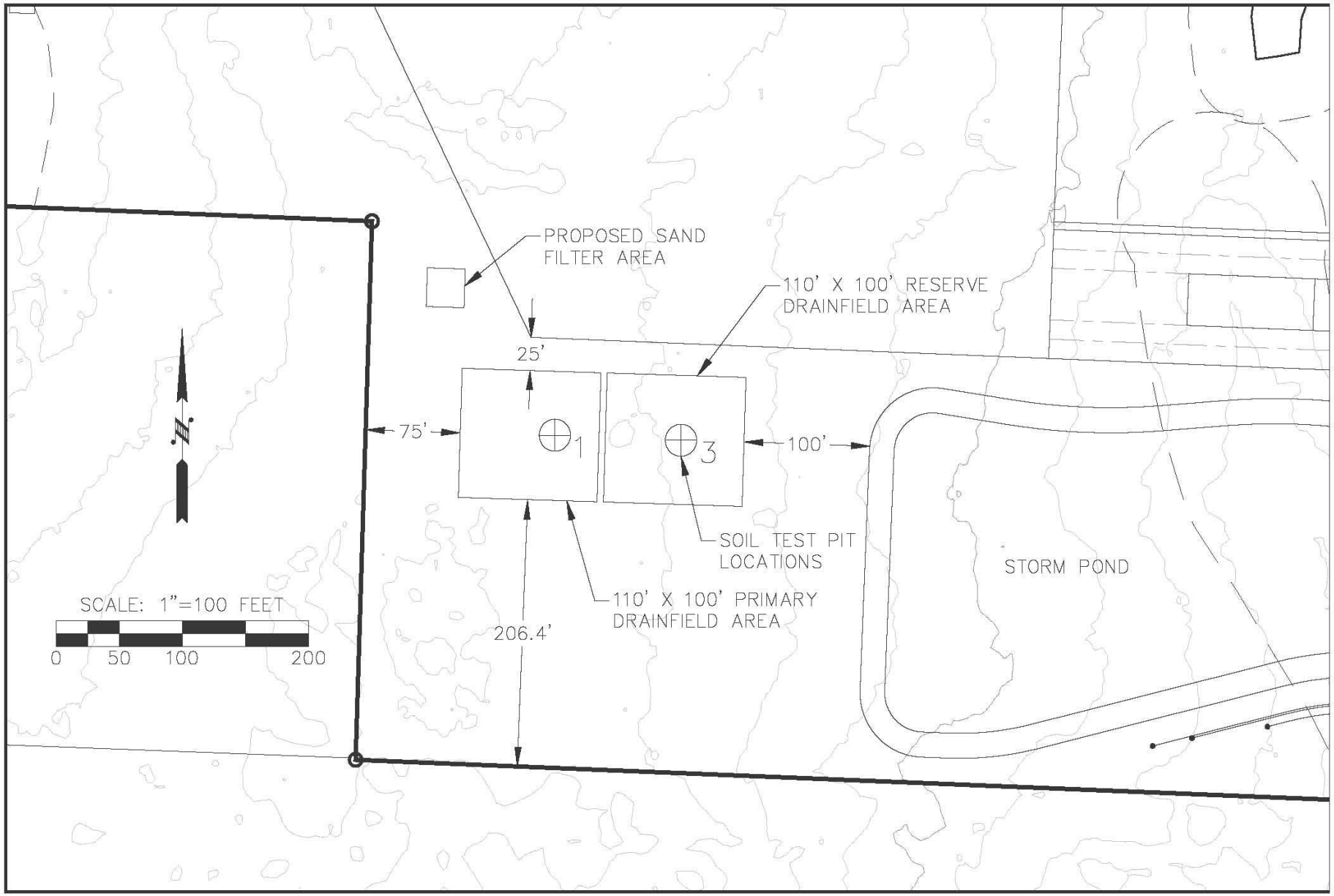
Soil Pit #1

0”	-	12”	Dark Brown Silt Loam – Friable
12”	-	24”	Light Brown Silty Clay Loam
24”+	-		Light Brown Silty Clay Loam – Fine Mottling

Soil Pit #2

0”	-	11”	Dark Brown Silt Loam – Friable
12”	-	25”	Light Brown Silty Clay Loam
25”+	-		Light Brown Silty Clay Loam – Fine Mottling

Appendix A
Map of Test Pit Locations
Overall Facility Site Plan
NRCS Soil Data



RB Engineering CIVIL ENGINEERING – LAND PLANNING – UTILITIES P.O. Box 923 CHEHALIS, WA 98532 OFF: (360) 740-8919 FAX: (360) 740-8912	**RICHIE BROS. LEWIS COUNTY** **SOIL TEST PIT EXHIBIT**	JOB NUMBER 08098 DRAWING NAME 08098_TPEX	**FIGURE** **1**

RITCHIE BROS. LEWIS COUNTY

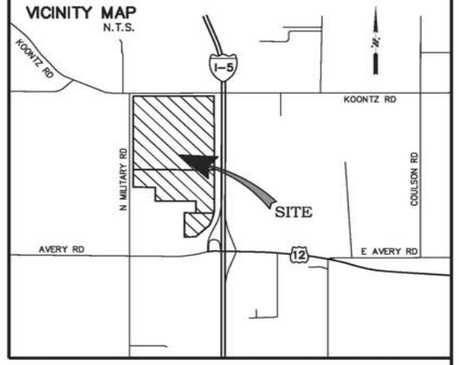
SECTION 1, TOWNSHIP 12 NORTH, RANGE 2 WEST, W.M.

LEWIS COUNTY, WASHINGTON

PROJECT INFORMATION

APPLICANT:	RITCHIE BROS. PROPERTIES SCOTT LENNON 9500 GLEN LYON PARKWAY BURNABY BC, CANADA V5J0C6 (801) 455-9005
SITE ADDRESS:	NORTH MILITARY RD/KOONTZ RD NAPAVINE, WA 98565
ZONING:	RDD-10
SITE AREA:	203.25 ACRES
FIRE DISTRICT:	FIRE DISTRICT 5

VICINITY MAP
N.T.S.



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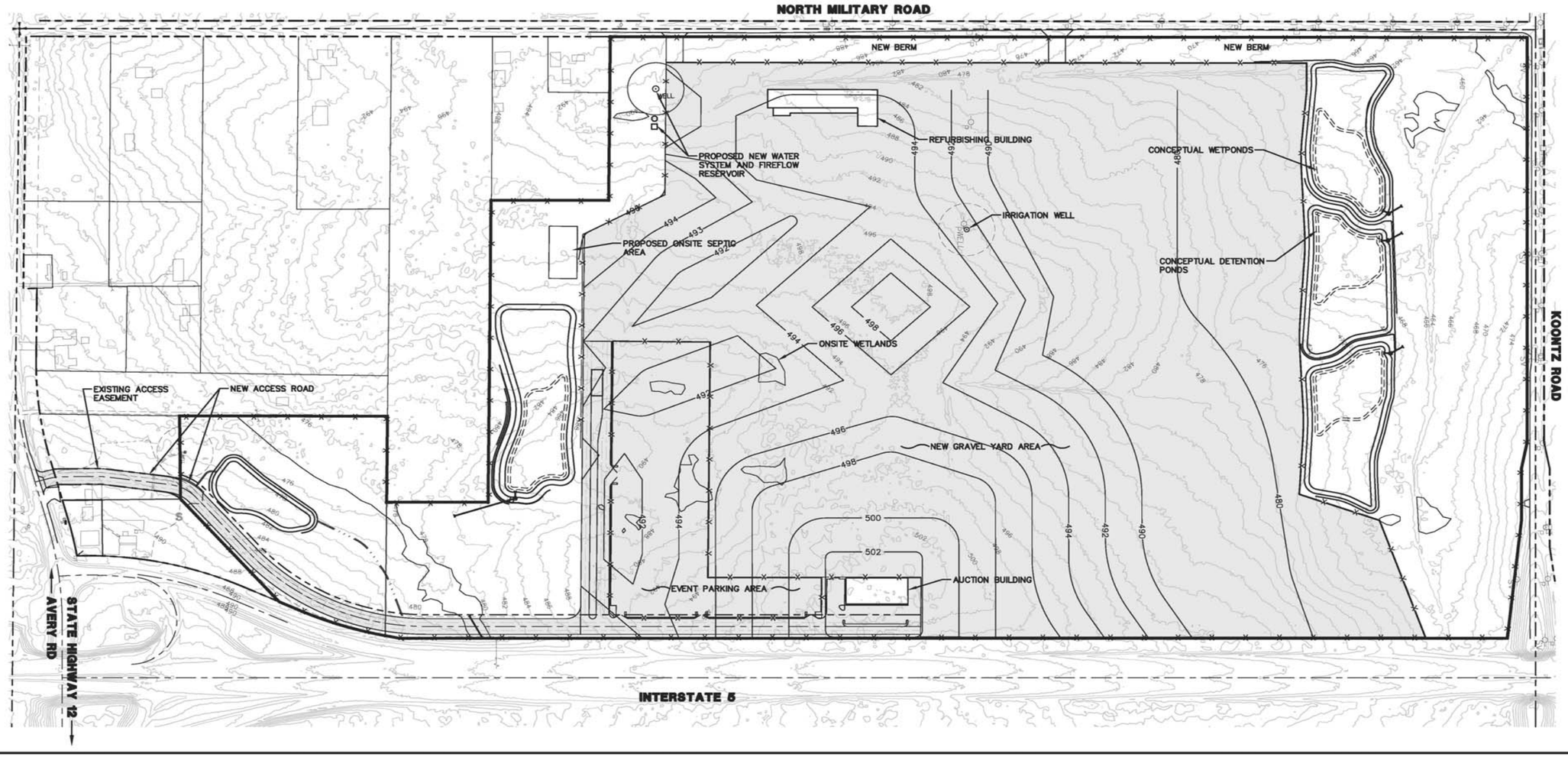

NO.	DATE	REVISION

DESIGNED BY: RWB
DRAWN BY: NJG
CHECKED BY:
DATE: 3/2/10
SCALE: 1" = 200'

RITCHIE BROS. PROPERTIES
9500 GLEN LYON PARKWAY
BURNABY BC, CANADA V5J0C6

LEWIS COUNTY WA.

SITE PLAN

RB Engineering
CIVIL ENGINEERING - LAND PLANNING - UTILITIES
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OKEHAVEN, WA 98532
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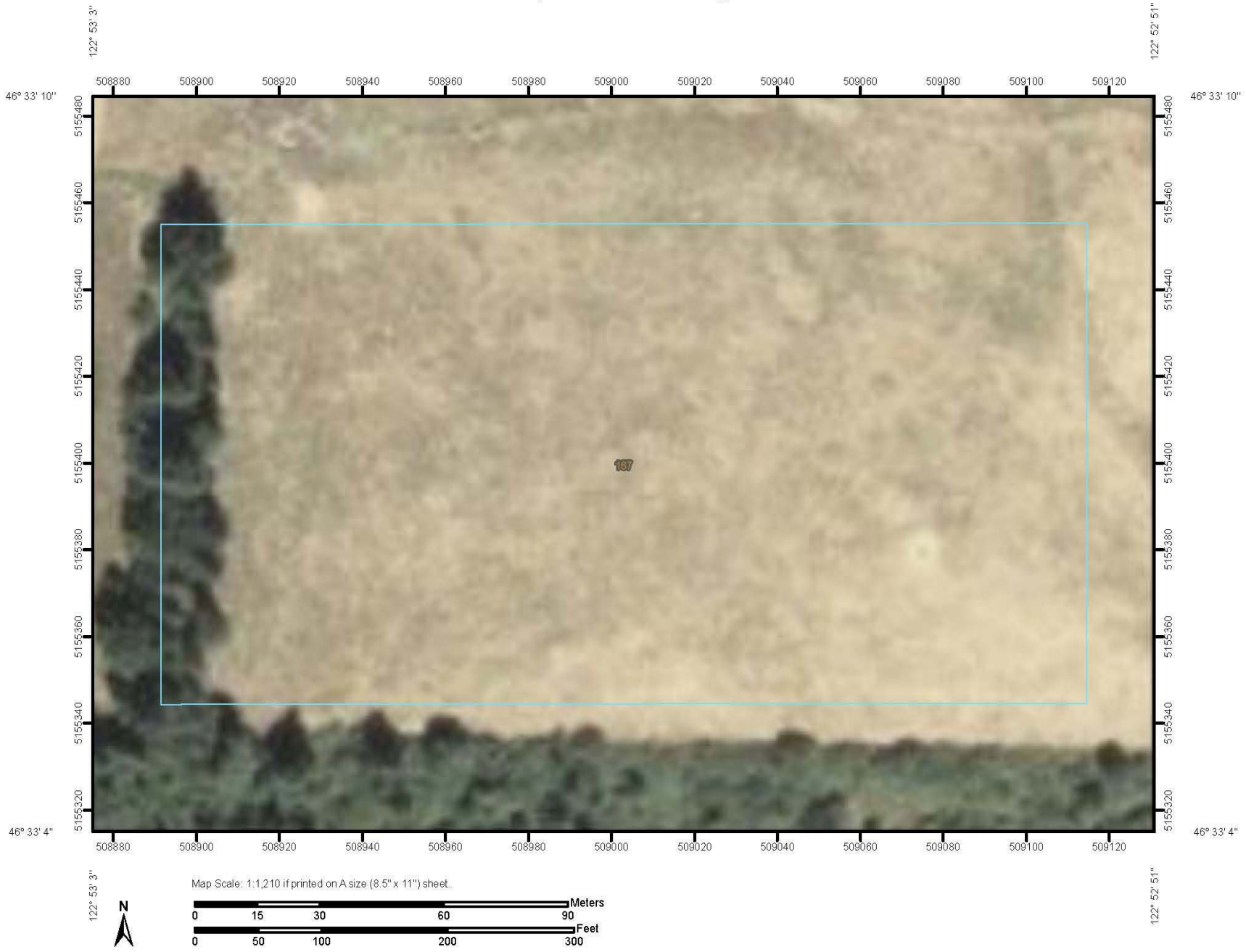
FAX: (360) 740-9812

JOB NUMBER 08098
DRAWING NAME 08098_PSP1

1 OF 1

Soil Map—Lewis County Area, Washington
(Ritchie Brothers Lewis County)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:1,210 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lewis County Area, Washington
Survey Area Data: Version 7, Sep 22, 2009

Date(s) aerial images were photographed: 7/23/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Lewis County Area, Washington (WA641)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
167	Prather silty clay loam, 0 to 5 percent slopes	6.1	100.0%
Totals for Area of Interest		**6.1**	**100.0%**