

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing ASFE Member Firm



April 13, 2017

Toll Brothers, Inc.
516 North Newtown Street Road
Newtown Square, PA 19073

Attn: Mr. Michael A. Downs, P.E.

Re: Supplemental Preliminary On-Site Wastewater Disposal Feasibility Evaluation
Crebilly Farm
Westtown Township, Chester County, Pennsylvania

Gentlemen:

In accordance with our Agreement dated July 10, 2016, Geo-Technology Associates, Inc. (GTA) has performed a supplemental preliminary on-site wastewater feasibility evaluation for the proposed residential subdivision, located on the Crebilly Farm property in Westtown Township, Chester County, Pennsylvania. The supplemental preliminary evaluation included additional test pit exploration and soil profile evaluation in all proposed effluent disposal areas indicated on the *Overall Open Space Plan (Site Plan)*, prepared by Eastern States Engineering (ESE). This letter is an addendum to GTA's Report of Preliminary On-Site Wastewater Feasibility Evaluation dated March 27, 2017 (GTA 2017). Please see GTA (2017) for additional information regarding our evaluation including with regard to soils, hydrogeology, discussion, conclusions, recommendations, limitations, etc.

GTA performed supplemental test pit exploration and soil profile evaluations at 15 locations within the five proposed wastewater disposal areas indicated on the Site Plan. Approximate test pit locations are indicated on the Supplemental Test Pit Location Plan attached to this letter. Soil profile summaries for each of the test pits are also attached. Preliminary percolation testing was also performed within selected test pits, and the results of the testing are also indicated on the attached soil profile summaries. Test pits ranged in depth from about 3 to 14 feet below the existing ground surface (ft bgs)

Encountered soil textures were generally sandy loam to loam with relatively well developed soil structure, and secondary permeability pathways associated with root and annelid activity, etc. Preliminary percolation test rates generally ranged from about 0.41 to about 10 inches per hour (in/hr). An exception was the test at TP-512-1 where the observed rate was less than 0.1 in/hr. Observed soil conditions and preliminary percolation test rates indicate that soils

3445-A Box Hill Corporate Center Drive, Abingdon, MD 21009 (410) 515-9446 Fax: (410) 515-4895

Abingdon, MD Laurel, MD Frederick, MD Waldorf, MD Sterling, VA Somerset, NJ
New Castle, DE Georgetown, DE York, PA Quakertown, PA Charlotte, NC

Visit us on the web at www.mragta.com

A-22

Toll Brothers, Inc.

Re: **Suppl. Preliminary On-Site Wastewater Disposal Feasibility Evaluation – Crebilly Farm**

April 13, 2017

Page 2

in the proposed disposal area are generally suitable for wastewater disposal via drip irrigation. Relatively shallow groundwater conditions observed at Test Pits TP-512 and TP-512-1, i.e., about 4 to 5 ft bgs, and apparent slower permeability at TP-512-1, would likely substantially limit the potential volume rate of wastewater flow via drip irrigation in the relatively small proposed disposal area associated with those test pits at the northern portion of the site. Observation of isolated free water at relatively shallow depth, e.g., in test pit TP-507, appears to be related to a potential wetting front of infiltrated rain water from the storms the previous day and likely not related to elevated groundwater table conditions.

The results of this supplemental preliminary evaluation support our conclusion in GTA (2017), i.e., “Based upon the results of this preliminary evaluation, it is our opinion that on-site wastewater disposal of the proposed flows is feasible for implementation at the site...”. As noted in GTA (2017), additional soil and hydrogeologic evaluation will be necessary to evaluate the required size and configuration of the initial system and the required area for initial system accommodation.

Thank you for the opportunity to assist you with this project. Should you have any questions or require any additional information, please contact our office at (410) 515-9446.

Sincerely,

GEO-TECHNOLOGY ASSOCIATES, INC.



Paul S. Scott, P.G.

Vice President

PSS

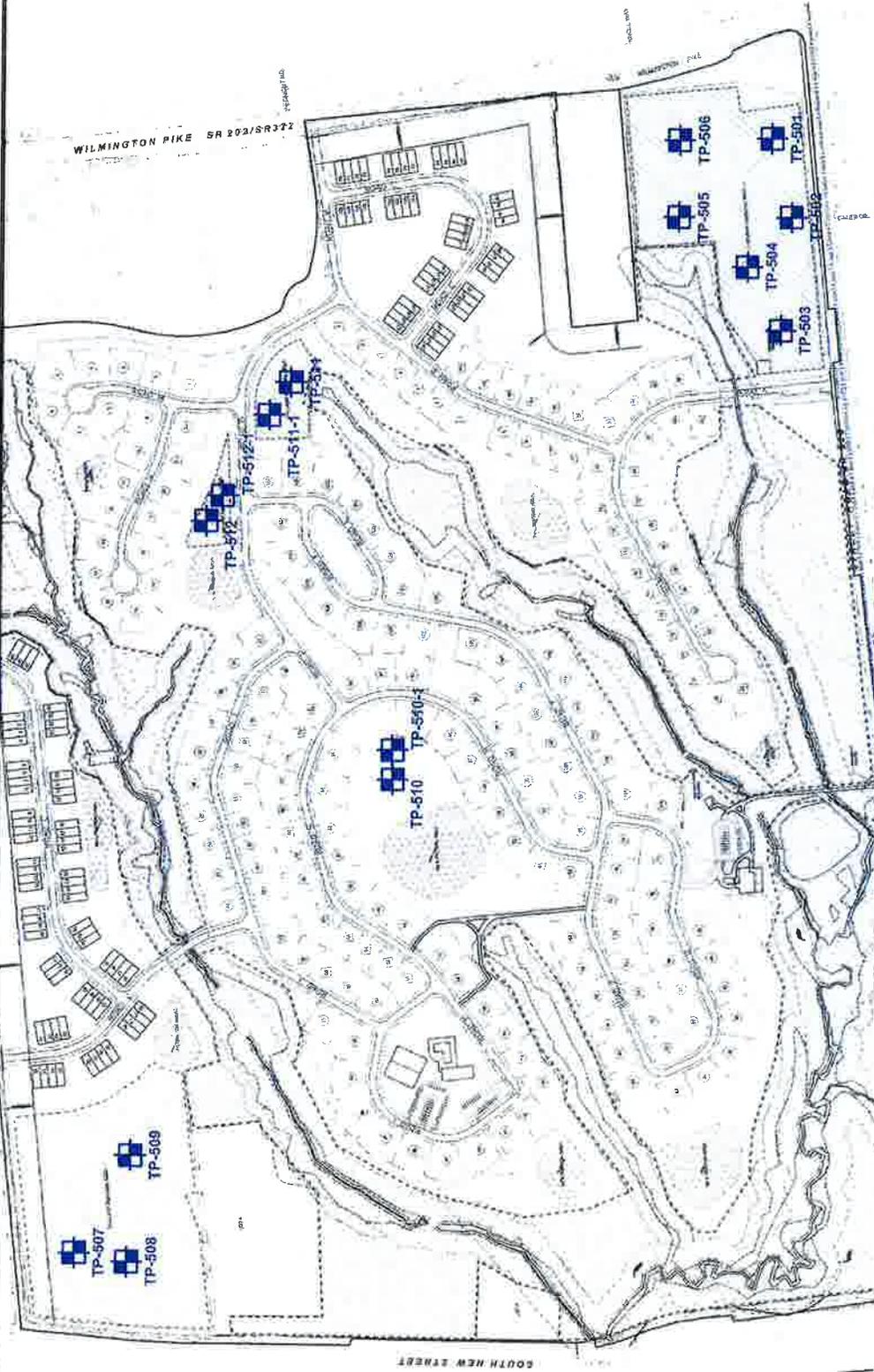
31161348

L:\Shared\Aquifer\Reports\2016 Projects\31161348 Crebilly Farm\Report\Final PDFs_sent to Toll\31161348.Crebilly Farm. ww prelim addendum.doc

Attachments:

Supplemental Test Pit Location Plan (1 sheet)

Soil Profile Summaries (3 pages)



SOURCE: PLAN ADAPTED FROM A PLAN TITLED OVERALL OPEN SPACE PLAN, CREBILLY FARM, PROVIDED BY ESE CONSULTANTS, INC., DATED OCTOBER 7, 2016

LEGEND
 APPROXIMATE LOCATIONS OF TEST PITS
 TP-501



GEO-TECHNOLOGY ASSOCIATES, INC.
 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
 3445-A BOX HILL CORPORATE CENTER DRIVE
 ABINGDON, MARYLAND 21009
 410.515.8446
 FAX 410.515.8445
 WWW.GTAREG.COM
 © 2017 GEO-TECHNOLOGY ASSOCIATES, INC.

JOB NO	31161348	SCALE	1"=400'	DATE	APRIL 12, 2017	DRAWN BY:	CLO	REVIEW BY:	PSS	FIGURE:	1 OF 1
--------	----------	-------	---------	------	----------------	-----------	-----	------------	-----	---------	--------

**SUPPLEMENTAL TEST PIT LOCATION PLAN
 CREBILLY FARM**

CHESTER COUNTY, PENNSYLVANIA

Crebilly Farm – Supplemental Preliminary Evaluation – Soil Profile Summaries

TP-501

0-5": Topsoil
5-13": Brown sandy loam,
13-48" Light brown sandy clay loam, some gravel
Total Depth: 48"

TP-502

0-6": Topsoil
6-12": Dark brown micaceous sandy loam,
12-27": Reddish brown sandy loam,
27-34": Grey micaceous loamy sand, moist
34-48": Grey and red micaceous loamy sand, lithochromic soil coloration
Total Depth: 48"
Test Depth: 24"; Est. Rate: 8.5 in/hr

TP-503

0-6": Topsoil
6-11": Brown sandy loam,
11-20": Light brown micaceous sandy clay loam
20-31": Brown micaceous loamy sand
31-48": Reddish brown loamy sand with weathered rock fragments, lithochromic soil coloration
Total Depth: 48"

TP-504:

0-5": Topsoil
5-11": Dark brown loam,
11-25": Light brown loam, micaceous
25-32": Light brown sandy loam, micaceous
32-48": Reddish and orangish brown loamy sand, lithochromic soil coloration
Total Depth: 48"
Test Depth: 39"; Est. Rate: 0.41 in/hr

TP-505

0-6" : Topsoil
6-15": Orangish brown, micaceous sandy loam,
15-29": Dark brown micaceous loamy sand with rock fragments
29"-4': Light brown sandy loam
4-11': Light brown sandy loam, with weathered rock fragments
11-14': Brown sandy loam, with weathered rock fragments
Total Depth: 14'
Test Depth: 26"; Est. Rate: 10 in/hr

Crebilly Farm – Supplemental Preliminary Evaluation – Soil Profile Summaries

TP-506

0-6": Topsoil

6-16": Dark brown loam,

16-24": Light brown loam, moist

24-32": Brown micaceous sandy loam

32-48": Brown and red micaceous sandy loam, with weathered rock fragments, lithochromic soil col.

Total Depth: 48"

Test Depth: 30"; Est. Rate: 3.2 in/hr

TP-507

0-8": Topsoil

8-31" Brown sandy loam with gravel

31-42": Dark brown loamy sand, moist

Total Depth: 42"

Isolated free water seeping at approx. 32"; appears related to storm previous day

TP-508

0-9": Topsoil

9-24": Reddish brown sandy loam with gravel

24-29": Brown sandy loam with weathered rock fragments

29-40": Brown sandy loam with weathered rock fragments and cobbles, moist

Total Depth 40"

TP-509

0-7": Topsoil

7-12" Brown sandy loam

12-36": Brown loam with rock fragments

36-48": Brown loamy sand

Total Depth: 48"

Test Depth: 32"; Est. Rate: 0.82 in/hr

TP-510

0-6": Topsoil

6-12": Dark brown sandy loam

12-36": Micaceous brown sandy clay loam

Total Depth: 36"

Free water at approx. 36"; possibly related to storm previous day

TP-510-1

0-6": Topsoil

6"-3': Light brown sandy loam

3'-6': Grey loamy sand

Crebilly Farm – Supplemental Preliminary Evaluation – Soil Profile Summaries

TP-510-1 cont'd...

6'-14': Grey loamy sand with weathered rock fragments
Groundwater Seep @ 11.5'
Total Depth: 14'
Test Depth: 24"; Est. Rate: 1.9 in/hr

TP-511

0-6": Topsoil
6-13: Dark brown sandy loam
13-24": Orange-brown micaceous sandy loam
24-32": Brown sandy loam, lenses of orange sandy loam, mottled
32-38": Brown loamy sand, moist
Total Depth: 38"
Test depth: 36"; Est. Rate: 10 in/hr

TP-511-1

0-6": Topsoil
6-24": Orangish brown sandy loam
24"-6': Brown loamy sand
6-12.5': Reddish brown loamy sand with weathered rock
Total Depth: 12.5'
Groundwater Seeps @ 11'

TP-512

0-6": Topsoil
6-10" Brown sandy loam
10-18": Brown loam
18-47": Micaceous loamy sand, mottled
Groundwater @ 40"
Total Depth: 47"

TP-512-1

0-6": Topsoil
6-2': Brown sandy loam
2-7': Brown micaceous sandy loam
7-15': Orange micaceous sandy loam
Total Depth: 15'
Groundwater Seeps @ 5'
Test Depth: 2.5'; Est. Rate: <0.1 in/hr

Notes: 1. Est. percolation rates are preliminary and based on preliminary open-hole tests and not necessarily at steady state; 2. Upper approx. 48-inches of soil generally moderate sub-angular structure.