

Appendix A

Wetlands Delineation Data Tables

List of all Identified Plant Species at Borehole Sites

Westfield NJ

Common Name	Scientific Name	Indicator Status	B1 Presence	B2 Presence	B3 Presence	B4 Presence	B5 Presence	B6 Presence	B7&8 Presence
Sweet Gum	Liquidambar styraciflua	FAC	X	X	X	X	X		X
Beech Tree	Fagus grandifolia	FACU							
Eastern Red Cedar	Juniperus virginiana	FACU	X						
Biltmore Ash	Fraxinus americana	FACU							
Norway Maple	Acer platanoides	Upland							
Sycamore Tree	Platanus occidentalis	FACW							
Surgar Maple	Acer saccharum	FACU							
Catalpa	Catalpa speciosa	FACU				X			X
Japanese Barberry	Berberis thunbergii	FACU		X					
Black Cherry	Prunus serotina	FACU		X				X	X
Poison Ivy	Toxicodendron radicans	FAC	X	X			X	X	X
Virginia Creeper	Parthenocissus quinquefolia	FACU	X	X			X		X
Winter Grape	Vitis vulpina	FAC							
English Ivy	Hedera helix	FACU							
Red Oak	Quercus rubra	FACU	X				X		
Honeysuckle Vine	Lonicera japonica	FACU							
Water Smartweed	Persicaria amphibia	OBL			X				
Shallow Sedge	Carex lurida wahlen sedge	OBL			X	X		X	X
Wool Grass	Scirpus cyperinus	OBL							
Common Fleabane	Erigeron philadelphicus	FAC			X			X	
Soft Rush	Juncus effusus	OBL			X	X		X	X
Sweet Pepperbush	Clethra alnifolia	FAC			X				
Jewelweed	Impatiens capensis	FACW				X		X	X
Healall	Prunella vulgaris	FAC				X			
Seedbox	Ludwigia alternifolia	OBL				X			
Queen Anne's Lace	Daucus carota	FACU						X	
Mimosa	Mimosa pudica	FACU						X	
Evening Primrose	Oenothera	FACU						X	
Common Ragweed	Ambrosia artemisiifolia	FACU						X	
Rough Fruited Cinquefoil	Potentilla recta	FACU						X	
Wild Lettuce	Lactuca virosa	FACU						X	
Green Ash	Fraxinus pennsylvanica	FACW						X	X
Indian Tobacco	Lobelia inflata	FACU							X
Wild Rose	Rosa acicularis	FACU							X
Bush Honey Suckle	Diervilla	FACU							X
Yellow Woodsorrel	Oxalis stricta	FACU							X
Rice Cut Grass	Lesssia oryzoides	OBL							X
Red Maple	Acer rubrum	FAC							X

Westfield Borehole Site 4 - Moisture Content Analysis

Site: Westfield

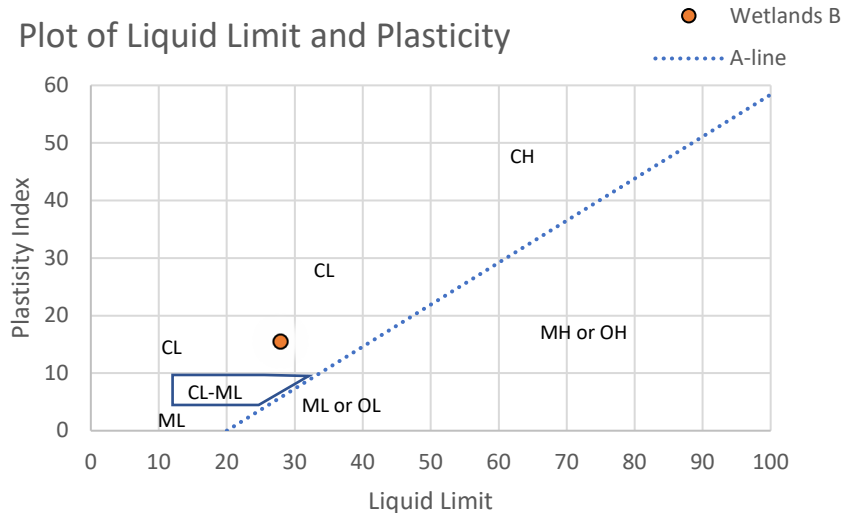
Dry at 105 °C (221 °F).

Do not add "Wet" samples to oven while other samples are drying. Drying samples will absorb moisture from the "Wet" sample.

Samples are "Dry" when the weight is constant for two consecutive readings.

Sample ID	Collection Date	Drying Tin Mass (g)	Drying Date 1	Drying Time 1 (24 hr clock)	Initial/Wet Mass (Mass 1)(Including Tin Weight) (g)	Initial/Wet Mass (Mass 1)(Without Tin Weight) (g)	Initials	Drying Date 2	Drying Time 2 (24 hr clock)	Drying Mass (Mass 2)(Including Tin)(g)	Drying Mass (Mass 2)(Without Tin Weight)(g)	Initials	Drying Date 3	Drying Time 3 (24 hr clock)	Drying Mass (Mass 3)(Including Tin)(g)	Drying Mass (Mass 3)(Without Tin Weight)(g)	Wet Mass - Dry Mass (g)	Moisture Content
1	7/31/2019	2.868	8/5/2019	13:50	170.527	167.659	DN	8/8/2019	14:30	138.388	135.520	DN	8/15/2019	10:33	138.34	135.472	32.187	23.76%
2	7/31/2019	2.881	8/5/2019	13:51	196.067	193.186	DN	8/8/2019	14:37	159.139	156.258	DN	8/15/2019	10:35	159.096	156.215	36.971	23.67%
3	7/31/2019	2.891	8/5/2019	13:53	189.265	186.374	DN	8/8/2019	14:37	152.448	149.557	DN	8/15/2019	10:40	152.409	149.518	36.856	24.65%
4	7/31/2019	2.891	8/5/2019	13:55	172.134	169.243	DN	8/8/2019	14:38	139.272	136.381	DN	8/15/2019	10:42	139.245	136.354	32.889	24.12%
5	7/31/2019	2.879	8/5/2019	13:57	197.549	194.670	DN	8/8/2019	14:38	160.102	157.223	DN	8/15/2019	10:33	160.048	157.169	37.501	23.86%
6	7/31/2019	2.834	8/5/2019	13:59	168.029	165.195	DN	8/8/2019	14:39	135.839	133.005	DN	8/15/2019	10:34	135.231	132.397	32.798	24.77%
7	7/31/2019	2.859	8/5/2019	14:02	166.908	164.049	DN	8/8/2019	14:44	135.947	133.088	DN	8/15/2019	10:35	135.915	133.056	30.993	23.29%
8	7/31/2019	2.856	8/5/2019	14:03	182.522	179.666	DN	8/8/2019	14:43	146.935	144.079	DN	8/15/2019	10:36	146.845	143.989	35.677	24.78%
9	7/31/2019	2.893	8/5/2019	14:05	179.358	176.465	DN	8/8/2019	14:32	144.173	141.280	DN	8/15/2019	10:39	144.112	141.219	35.246	24.96%
10	7/31/2019	2.855	8/5/2019	14:07	190.986	188.131	DN	8/8/2019	14:33	153.382	150.527	DN	8/15/2019	10:42	153.348	150.493	37.638	25.01%
11	7/31/2019	2.830	8/5/2019	14:09	161.422	158.592	DN	8/8/2019	14:34	132.094	129.264	DN	8/15/2019	10:38	132.008	129.178	29.414	22.77%
12	7/31/2019	2.850	8/5/2019	14:14	163.379	160.529	DN	8/8/2019	14:33	131.423	128.573	DN	8/15/2019	10:42	131.385	128.535	31.994	24.89%
13	7/31/2019	2.836	8/5/2019	14:16	197.140	194.304	DN	8/8/2019	14:31	158.471	155.635	DN	8/15/2019	10:40	158.427	155.591	38.713	24.88%
14	7/31/2019	2.831	8/5/2019	14:18	185.532	182.701	DN	8/8/2019	14:33	149.181	146.350	DN	8/15/2019	10:41	149.147	146.316	36.385	24.87%
15	7/31/2019	2.848	8/5/2019	14:25	194.610	191.762	DN	8/8/2019	14:43	157.609	154.761	DN	8/15/2019	10:28	157.485	154.637	37.125	24.01%
16	7/31/2019	2.817	8/5/2019	14:27	199.171	196.354	DN	8/8/2019	14:45	160.229	157.412	DN	8/15/2019	10:29	160.108	157.291	39.063	24.83%
17	7/31/2019	2.838	8/5/2019	14:29	195.831	192.993	DN	8/8/2019	14:42	157.523	154.685	DN	8/15/2019	10:30	157.403	154.565	38.428	24.86%
18	7/31/2019	2.877	8/5/2019	14:31	198.356	195.479	DN	8/8/2019	14:46	159.182	156.305	DN	8/15/2019	10:28	159.100	156.223	39.256	25.13%
19	7/31/2019	2.840	8/5/2019	14:33	199.811	196.971	DN	8/8/2019	14:46	162.659	159.819	DN	8/15/2019	10:30	162.538	159.698	37.273	23.34%
20	7/31/2019	2.832	8/5/2019	14:35	194.377	191.545	DN	8/8/2019	14:42	157.518	154.686	DN	8/15/2019	10:30	157.384	154.552	36.993	23.94%

Plot of Liquid Limit and Plasticity



Wetlands Delineation Data Form

Site: Westfield
 County/State: Union/NJ
 Block & Lot: N/A

Date: 6/26/2019
 Data Point: B1
 Investigator: Ethan Freeman

Vegetation

Community Type:
 Dominant Plant Species:

Layer	Common Name	Scientific Name	Indicator
Ground	Poison Ivy	Toxicodendron radicans	FAC
Ground	Virginia Creeper	Parthenocissus quinquefolia	FACU
Canopy	Sweet Gum	Ciquidambar styracifua	FAC
Canopy	Red Oak	Quercus rubra	FACU
Canopy	Eastern Red Cedar	Juniperus virginiana	FACU

Hydrology

Stream	
Lake	
Tide Gauge	
Aerial Photos	

Depth of Surface Water:	
Depth to Free Water in Pit:	
Depth to Saturated Soil:	

Field Indicators:	
Inundation:	
Saturated in Upper 12":	
Water Marks:	
Drift Lines:	
Sediment Deposits:	
Drainage Patterns in Wetlands:	
Oxidized Root Channels:	
Water-Stained Leaves:	
Local Soil Survey Data:	
FAC-Neutral Test:	
Dominance by OBL:	
Bettressed Trunks:	
Multiple-stemmed Trees:	
Low Topographic Elevation:	
Proximity to Open Water:	
Shallow Rooting of Trees:	
Other:	

Remarks: No Wetland Hydrology

Soils

Soil Series: BovB
 State Hydric: Yes ___ No X

Taxonomy:

Depth (in.)	Matrix Color(s)	Mottle Color(s)	Abundance	Texture, Concretions, Structure, Etc
0 - 1	5YR 2.5/2	None	None	Clayey - Silt
1 - 3	7.5YR 3/3	None	None	Clayey - Silt
3 - 19	7.5YR 4/4	10YR 2/1 , 10YR 5/6	None	Clayey - Silt, Course Sand

Hydric Soil Indicators	
Histosol	
Histic Epipedon	
Sulfidic Odor	
Aquic Moisture Regime	
Reducing Conditions	
Gleyed or Low-Chroma Colors	
Concretions	
Organic Streaking in Sandy Soils	
Listed on Local Hydric Soils List	
Listed on National Hydric Soils List	
Other	

Remarks: No Hydric Soil Indicators, Moist Soil

Wetland Determination

Hydrophytic Vegetation Present? Yes ___ No X
 Wetlands Hydrology Present? Yes ___ No X
 Hydric Soils Present? Yes ___ No X

 Is the Sampling Point Within a Wetland? Yes ___ No X

Remarks: Refusal at 19 Inches in Borehole

Wetlands Delineation Data Form

Site: Westfield
 County/State: Union / NJ
 Block & Lot: N/A

Date: 6/26/2019
 Data Point: B2
 Investigator: Ethan Freeman

Vegetation

Community Type:
 Dominant Plant Species:

Layer	Common Name	Scientific Name	Indicator
Ground	Poison Ivy	Toxicodendron radicans	FAC
Ground	Virginia Creeper	Parthenocissus quinquefolia	FACU
Canopy	Sweet Gum	Ciquidambar styracifua	FAC
Shrub	Black Cherry	Prunus serotina	FACU
Shrub	Japanese Barberry	Berberis thunbergii	FACU

Hydrology

Stream	
Lake	
Tide Gauge	
Aerial Photos	

Depth of Surface Water:	3 inches
Depth to Free Water in Pit:	20 inches
Depth to Saturated Soil:	N/a

Field Indicators:	
Inundation:	X
Saturated in Upper 12":	
Water Marks:	X
Drift Lines:	X
Sediment Deposits:	X
Drainage Patterns in Wetlands:	
Oxidized Root Channels:	
Water-Stained Leaves:	X
Local Soil Survey Data:	X
FAC-Neutral Test:	
Dominance by OBL:	
Bettressed Trunks:	X
Multiple-stemmed Trees:	
Low Topographic Elevation:	X
Proximity to Open Water:	
Shallow Rooting of Trees:	X
Other:	

Remarks:

Wetlands Delineation Data Form

Site: Westfield
 County/State: Union / NJ
 Block & Lot: N/A

Date: 6/26/2019
 Data Point: B3
 Investigator: Ethan Freeman

Vegetation

Community Type:
 Dominant Plant Species:

Layer	Common Name	Scientific Name	Indicator
Ground	Water Smartweed	Persicaria amphibia	OBL
Ground	Shallow Sedge	Carex lurida wahlend sedge	OBL
Ground	Common Fleabane	Erigeron philadelphicus	FAC
Ground	Soft Rush	Juncus effusus	OBL
Shrub	Sweet Pepper	Clethra alnifolia	FAC
Canopy	Sweet Gum	Liquidambar styraciflua	FAC

Hydrology

Stream	
Lake	
Tide Gauge	
Aerial Photos	

Depth of Surface Water:	2 inches
Depth to Free Water in Pit:	23 inches
Depth to Saturated Soil:	N/A

Field Indicators:	
Inundation:	X
Saturated in Upper 12":	
Water Marks:	
Drift Lines:	X
Sediment Deposits:	X
Drainage Patterns in Wetlands:	X
Oxidized Root Channels:	
Water-Stained Leaves:	X
Local Soil Survey Data:	X
FAC-Neutral Test:	
Dominance by OBL:	X
Bettressed Trunks:	X
Multiple-stemmed Trees:	
Low Topographic Elevation:	X
Proximity to Open Water:	
Shallow Rooting of Trees:	X
Other:	X

Remarks: Close proximity to parking lot

Wetlands Delineation Data Form

Site: Westfield
 County/State: Union, NJ
 Block & Lot: N/A

Date: 7/31/2019
 Data Point: B4
 Investigator: Ethan Freeman

Vegetation

Community Type:
 Dominant Plant Species:

Layer	Common Name	Scientific Name	Indicator
Shrub	Jewel Weed	Impatiens capensis	FACW
Shrub	Healall	Prunella vulgaris	FAC
Shrub	Soft Rush	Juncus effusus	OBL
Shrub	Shallow Sedge	Carex lurida wahlen sedge	OBL
Shrub	Seedbox	Ludwigia alternifolia	OBL
Sapling	Catalpa	Catalpa speciosa	FACU
Canopy	Sweet Gum	Liquidambar styraciflua	FAC

Hydrology

Stream	
Lake	
Tide Gauge	
Aerial Photos	

Depth of Surface Water:	
Depth to Free Water in Pit:	
Depth to Saturated Soil:	

Field Indicators:	
Inundation:	
Saturated in Upper 12":	
Water Marks:	
Drift Lines:	X
Sediment Deposits:	X
Drainage Patterns in Wetlands:	X
Oxidized Root Channels:	
Water-Stained Leaves:	X
Local Soil Survey Data:	
FAC-Neutral Test:	
Dominance by OBL:	X
Bettressed Trunks:	
Multiple-stemmed Trees:	
Low Topographic Elevation:	X
Proximity to Open Water:	
Shallow Rooting of Trees:	
Other:	X

Remarks: Run off from parking lot

Soils

Soil Series: BovB
 State Hydric: Yes ___ No X

Taxonomy:

Depth (in.)	Matrix Color(s)	Mottle Color(s)	Abundance	Texture, Concretions, Structure, Etc
0 - 8	7.5YR 3/1	N/A		Clayey Silt
8 - 12	10YR 3/2	10YR 5/4		Clayey Silt
12 - 20	10YR 6/8	10YR 6/1, 5YR 2.5/1		Clayey Silt
20 - 26	7.5YR 6/1	7.5YR 4/6		Clayey Silt

Hydric Soil Indicators	
Histosol	
Histic Epipedon	
Sulfidic Odor	
Aquic Moisture Regime	
Reducing Conditions	
Gleyed or Low-Chroma Colors	X
Concretions	
Organic Streaking in Sandy Soils	
Listed on Local Hydric Soils List	
Listed on National Hydric Soils List	
Other	

Remarks: Moist Soil

Wetland Determination

Hydrophytic Vegetation Present? Yes X No ___
 Wetlands Hydrology Present? Yes X No ___
 Hydric Soils Present? Yes X No ___

 Is the Sampling Point Within a Wetland? Yes X No ___

Remarks:

Wetlands Delineation Data Form

Site: Westfield
 County/State: Union, NJ
 Block & Lot:

Date: 7/31/2019
 Data Point: B5
 Investigator: Ethan Freeman

Vegetation

Community Type:
 Dominant Plant Species:

Layer	Common Name	Scientific Name	Indicator
Canopy	Sweet Gum	Liquidambar styraciflua	FAC
Shrub	Poison Ivy	Toxicodendron radicans	FAC
Shrub	Virginia Creeper	Parthenocissus quinquefolia	FACU
Canopy	Red Oak	Quercus rubra	FACU

Hydrology

Stream	
Lake	
Tide Gauge	
Aerial Photos	

Depth of Surface Water:	
Depth to Free Water in Pit:	
Depth to Saturated Soil:	

Field Indicators:	
Inundation:	
Saturated in Upper 12":	
Water Marks:	
Drift Lines:	
Sediment Deposits:	
Drainage Patterns in Wetlands:	
Oxidized Root Channels:	
Water-Stained Leaves:	
Local Soil Survey Data:	
FAC-Neutral Test:	
Dominance by OBL:	
Bettressed Trunks:	
Multiple-stemmed Trees:	
Low Topographic Elevation:	
Proximity to Open Water:	
Shallow Rooting of Trees:	
Other:	

Remarks: No wetland hydrology indicators

Soils

Soil Series: BovB
 State Hydric: Yes ___ No X

Taxonomy:

Depth (in.)	Matrix Color(s)	Mottle Color(s)	Abundance	Texture, Concretions, Structure, Etc
0 - 2	5YR 2.5/1	N/A		Clayey Silt
2 - 14	5YR 4/2	N/A		Clayey Silt
14 - 17	5YR 4/4	7.5YR 3/2	Some Iron Concretions	Clayer Silt, Course Sand

Hydric Soil Indicators	
Histosol	
Histic Epipedon	
Sulfidic Odor	
Aquic Moisture Regime	
Reducing Conditions	
Gleyed or Low-Chroma Colors	
Concretions	X
Organic Streaking in Sandy Soils	
Listed on Local Hydric Soils List	
Listed on National Hydric Soils List	
Other	

Remarks: Dry Soil

Wetland Determination

Hydrophytic Vegetation Present? Yes ___ No X
 Wetlands Hydrology Present? Yes ___ No X
 Hydric Soils Present? Yes ___ No X

 Is the Sampling Point Within a Wetland? Yes ___ No X

Remarks: This sample was taken in a known Upland area for comparison to Wetlands areas.

Wetlands Delineation Data Form

Site: Westfield
 County/State: Union/NJ
 Block & Lot: N/A

Date: 7/31/2019
 Data Point: B6
 Investigator: Ethan Freeman

Vegetation

Community Type:

Dominant Plant Species:

Layer	Common Name	Scientific Name	Indicator
Shrub	Common Fleabane	Erigeron philadelphicus	FACU
Shrub	Mimosa	Mimosa pudica	FACU
Shrub	Queen Anne's Lace	Daucus carota	FACU
Shrub	Soft Rush	Juncus effusus	OBL
Shrub	Shallow Sedge	Carex lurida wahlen sedge	OBL
Shrub	Evening Primrose	Oenothera	FACU
Shrub	Common Ragweed	Ambrosia artemisiifolia	FACU
Shrub	Rough Fruited Cinquefoil	Potentilla recta	FACU
Shrub	Wild Lettuce	Lactuca virosa	FACU
Shrub	Poison Ivy	Toxicodendron radicans	FAC
Canopy	Green Ash	Franxinus pennsylvanica	FACW
Shrub	Jewelweed	Impatiens capensis	FACW
Shrub	Black Cherry	Prunus serotina	FACU

Hydrology

Stream	
Lake	
Tide Gauge	
Aerial Photos	

Depth of Surface Water:	
Depth to Free Water in Pit:	
Depth to Saturated Soil:	

Field Indicators:	
Inundation:	
Saturated in Upper 12":	
Water Marks:	
Drift Lines:	
Sediment Deposits:	
Drainage Patterns in Wetlands:	
Oxidized Root Channels:	
Water-Stained Leaves:	
Local Soil Survey Data:	
FAC-Neutral Test:	
Dominance by OBL:	
Bettressed Trunks:	
Multiple-stemmed Trees:	
Low Topographic Elevation:	
Proximity to Open Water:	
Shallow Rooting of Trees:	
Other:	

Remarks: No wetland hydrology indicators

Wetlands Delineation Data Form

Site: Westfield
 County/State: Union, NJ
 Block & Lot: N/A

Date: 7/31/2019
 Data Point: B7 & B8
 Investigator: Ethan Freeman

Vegetation

Community Type:

Dominant Plant Species:

Layer	Common Name	Scientific Name	Indicator
Shrub	Soft Rush	Juncus effusus	OBL
Shrub	Shallow Sedge	Carx lurida wahlen sedge	OBL
Shrub	Indian Tobacco	Lobelia inflata	FACU
Shrub	Black Cherry	Prunus serotina	FACU
Canopy	Sweet Gum	Liquidambar styraciflua	FAC
Canopy	Green Ash	Franxinus pennsylvanica	FACW
Sapling	Catalpa	Catalpa speciosa	FACU
Shrub	Jewelweed	Impatiens capensis	FACW
Shrub	Wild Rose	Rosa acicularis	FACU
Shrub	Bush Honey Suckle	Diervilla	FACU
Shrub	Rice Cut Grass	Leersia oryzoides	OBL
Canopy	Red Maple	Acer rubrum	FAC
Shrub	Poison Ivy	Toxicodendrom radicans	FAC
Shrub	Virginia Creeper	Parthenocissus quinquefolia	FACU
Shrub	Yellow Woodsorrel	Oxalis stricta	FACU

Hydrology

Stream	
Lake	
Tide Gauge	
Aerial Photos	

Depth of Surface Water:	
Depth to Free Water in Pit:	
Depth to Saturated Soil:	

Field Indicators:	
Inundation:	
Saturated in Upper 12":	
Water Marks:	
Drift Lines:	
Sediment Deposits:	
Drainage Patterns in Wetlands:	
Oxidized Root Channels:	
Water-Stained Leaves:	
Local Soil Survey Data:	
FAC-Neutral Test:	
Dominance by OBL:	
Bettressed Trunks:	
Multiple-stemmed Trees:	
Low Topographic Elevation:	
Proximity to Open Water:	
Shallow Rooting of Trees:	
Other:	

Remarks: No hydrologic indicators

