

# APPENDIX A – ATTACHMENT 1

## Individual Explanatory Variable Inventory

The Individual Explanatory Variable Inventory provides the values of each explanatory variable. These variables can be attributes of the source such as well depth, or land activities in the source water assessment area such as percent urban land use. This is not the entire Potential Contaminant Source Inventory for this system’s sources. Appendix A – Attachment 2 provides all point sources identified in the source water assessment areas.

If the variable value is shown as zero, then attributes or land activities are not present in the source water assessment area. If a value is not shown, this represents either unavailable data, or in the case of “Distance to” variables land activities of that type are not present in the source water assessment area.

This attachment, used in conjunction with Appendix A – Attachment 3 Contaminant Category Scoring System, enables users to calculate how each source’s susceptibility rating was determined. As an example a surface water source rates high for nutrients. As shown below, this attachment inventories identified values for the source’s explanatory variables.

<b>Nutrients Explanatory Variables – Source Rating = H</b>			
<b>Sensitivity Variable Inventory</b>		<b>Intensity Variable Inventory</b>	
		% Urban Land Use, 1995	20%
		% Agricultural Land Use, 1995	55%
		STP Density	0.005

This inventory can then be compared to the scoring system found in Appendix A – Attachment 3 Contaminant Category Scoring System shown below.

### Surface Water Nutrients

#### Nitrate

<b>Susceptibility rating scheme for nitrates in water from surface-water-quality sites.</b>							
<b>Nitrate Rating: 0-2 Low, 3-6 Medium, 7-15 High</b>							
	<b>Sensitivity Points</b>						<b>Conceptual variable</b>
<b>Variable</b>	No sensitivity variables for nitrate for surface water.						
	<b>Intensity Points</b>						<b>Conceptual variable</b>
<b>Variable</b>	0	1	2	3	4	5	
Percent Urban Land, 1995	0	>0	≥10	≥30			No
Percent Agricultural Land, 1995	0	>0	≥10	≥20	≥30	≥50	No
Sewage Treatment Plant Density (per square mile)	0	>0	≥0.01	≥0.03	≥0.04	≥0.05	No

In this example, the source received 2 points for Urban Land, 5 points for Agricultural Land, and 0 points for Sewerage Treatment Plant Density. The sensitivity and intensity points are summed giving a susceptibility score of 7. This susceptibility score was then plotted in the rating scheme (found in the header) and since 7-15 is High, a susceptibility rating of High for Nutrients was determined for this source.

<b>Groundwater Susceptibility Models</b>			
<b>EPTDS: 01 Source: 004 WELL 1 AT PLANT Status: U Source Type: G Confinement: U</b>			
<b>Sensitivity Variable Inventory</b>		<b>Intensity Variable Inventory</b>	
<b><i>Pathogens Explanatory Variables - Source Rating = M</i></b>			
Conceptual-Soil Available Water Capacity	0.15	Distance to Agricultural Land Use, 1995	
Depth to Top of Open Interval	447	Conceptual Septic Tank Density	13.96
Conceptual - GWUDI		Conceptual – Presence of Streams, Tier 1	478.67
<b><i>Nutrients Explanatory Variables – Source Rating = L</i></b>			
Conceptual – Depth to Top of Open Interval	447	% Urban Land Use, 1995	37.8
Conceptual – Length of Open Interval	40	% Agricultural Land Use, 1986	0
<b><i>Pesticides Explanatory Variables – Source Rating = L</i></b>			
Conceptual – Depth to Top of Open Interval	447	% Urban Land Use, 1995	37.8
Conceptual – Length of Open Interval	40	% Agricultural Land Use, 1986	0
		Distance to Agricultural Land Use, 1995	
		Conceptual – Distance to golf course	
<b><i>VOCs Explanatory Variables – Source Rating = H</i></b>			
% Soil Organic Matter	1.26	% Impervious Surface, 1995	15.8
		% Commercial/Industrial Land Use, 1995	7.2
		Sq. Mi. of Urban Land Use, 1995	0.25
		Density of SWL, USTs, and KCSL	4.6
<b><i>Inorganics Explanatory Variables – Source Rating = L</i></b>			
Geological Unit	Raritan Formation - Farrington Sand member	Density of KCSL, SWL, NJPDES GW/SW/Storm, Compost Facilities, SWRRF, SWTF200011, Class B Recycling, DPCC, UST	6.1
Dissolved Oxygen of water-quality sample	0.2	Distance to Agricultural Land Use, 1995	
pH of water-quality sample	6.23	Population Density, Tier 1	6385.36
Depth to Top of Open Interval	447	% Barren Land Use, 1995	7.7
% Soil Clay	33.93	% Urban Land Use, 1970	40.85
Soil Hydraulic Conductivity	7.79	Distance to STP	
Conceptual % Soil Organic Matter	1.26	STP Density	13.96
Physiographic Province	COASTAL PLAIN	Distance to DOT roads	336.47
		Length of railroads	5261.16
		Population Density	1396.17
<b><i>Radionuclides Explanatory Variables – Source Rating = H</i></b>			
pH of water-quality sample	6.23	% Urban Land Use, Tier 1, 1995	95.6
Physiographic Province	COASTAL PLAIN	Conceptual Distance to Agricultural Land Use, 1995	
Conceptual Depth of Well	487	% Developed Land, Tier 1, 1995	95.5
Conceptual Soil Hydraulic Conductivity	7.79	% Agricultural Land Use, 1970	0
Geological Unit	Raritan Formation - Farrington Sand member		
<b><i>Radon Explanatory Variables – Source Rating = M</i></b>			
Conceptual % Soil Clay	33.93	% Agricultural Land Use, 1995	0
Physiographic Province	COASTAL PLAIN	Conceptual Distance to Wetlands Land Use, 1995	312.91
Depth to Top of Open Interval	447		
Geological Unit	Raritan Formation - Farrington Sand member		
<b><i>DBPs Explanatory Variables – Source Rating = H</i></b>			
Conceptual – % Soil Organic Matter	1.26	Conceptual – Sq. Mi. of Wetlands Land Use, 1995	0.15
Conceptual NJGS Hydrologic Unit (aquifer)	middle Potomac-Raritan-Magothy aquifer	Number of NJPDES SW/GW/Storm, Compost, SWWRF, SWTF200011, Class B Recycling, and DPCC	1
pH of water-quality sample	6.23		

<b>Groundwater Susceptibility Models</b>			
<b>EPTDS: 01 Source: 005 WELL 2/CLIFFWOOD AVE Status: U Source Type: G Confinement: U</b>			
<b>Sensitivity Variable Inventory</b>		<b>Intensity Variable Inventory</b>	
<b><i>Pathogens Explanatory Variables - Source Rating = M</i></b>			
Conceptual-Soil Available Water Capacity	0.14	Distance to Agricultural Land Use, 1995	
Depth to Top of Open Interval	422	Conceptual Septic Tank Density	11.14
Conceptual - GWUDI		Conceptual - Presence of Streams, Tier 1	1055.11
<b><i>Nutrients Explanatory Variables - Source Rating = L</i></b>			
Conceptual - Depth to Top of Open Interval	422	% Urban Land Use, 1995	38.92
Conceptual - Length of Open Interval	35	% Agricultural Land Use, 1986	0
<b><i>Pesticides Explanatory Variables - Source Rating = L</i></b>			
Conceptual - Depth to Top of Open Interval	422	% Urban Land Use, 1995	38.92
Conceptual - Length of Open Interval	35	% Agricultural Land Use, 1986	0
		Distance to Agricultural Land Use, 1995	
		Conceptual - Distance to golf course	
<b><i>VOCs Explanatory Variables - Source Rating = H</i></b>			
% Soil Organic Matter	1	% Impervious Surface, 1995	16.6
		% Commercial/Industrial Land Use, 1995	9.28
		Sq. Mi. of Urban Land Use, 1995	0.32
		Density of SWL, USTs, and KCSL	3.6
<b><i>Inorganics Explanatory Variables - Source Rating = M</i></b>			
Geological Unit	Raritan Formation - Farrington Sand member	Density of KCSL, SWL, NJPDES GW/SW/Storm, Compost Facilities, SWRRF, SWTF200011, Class B Recycling, DPCC, UST	4.8
Dissolved Oxygen of water-quality sample		Distance to Agricultural Land Use, 1995	
pH of water-quality sample		Population Density, Tier 1	4407.01
Depth to Top of Open Interval	422	% Barren Land Use, 1995	5.99
% Soil Clay	34.14	% Urban Land Use, 1970	47.3
Soil Hydraulic Conductivity	8.84	Distance to STP	
Conceptual % Soil Organic Matter	1	STP Density	11.14
Physiographic Province	COASTAL PLAIN	Distance to DOT roads	256.09
		Length of railroads	6526
		Population Density	1646.9
<b><i>Radionuclides Explanatory Variables - Source Rating = H</i></b>			
pH of water-quality sample		% Urban Land Use, Tier 1, 1995	88.19
Physiographic Province	COASTAL PLAIN	Conceptual Distance to Agricultural Land Use, 1995	
Conceptual Depth of Well	457	% Developed Land, Tier 1, 1995	88.1
Conceptual Soil Hydraulic Conductivity	8.84	% Agricultural Land Use, 1970	0
Geological Unit	Raritan Formation - Farrington Sand member		
<b><i>Radon Explanatory Variables - Source Rating = M</i></b>			
Conceptual % Soil Clay	34.14	% Agricultural Land Use, 1995	0
Physiographic Province	COASTAL PLAIN	Conceptual Distance to Wetlands Land Use, 1995	249.48
Depth to Top of Open Interval	422		
Geological Unit	Raritan Formation - Farrington Sand member		
<b><i>DBPs Explanatory Variables - Source Rating = H</i></b>			
Conceptual - % Soil Organic Matter	1	Conceptual - Sq. Mi. of Wetlands Land Use, 1995	0.22
Conceptual NJGS Hydrologic Unit (aquifer)	middle Potomac-Raritan-Magothy aquifer	Number of NJPDES SW/GW/Storm, Compost, SWWRF, SWTF200011, Class B Recycling, and DPCC	1
pH of water-quality sample			

<b>Groundwater Susceptibility Models</b>			
<b>EPTDS: 01 Source: 006 WELL 3/MAXWELL ST Status: U Source Type: G Confinement: U</b>			
<b>Sensitivity Variable Inventory</b>		<b>Intensity Variable Inventory</b>	
<b><i>Pathogens Explanatory Variables - Source Rating = M</i></b>			
Conceptual-Soil Available Water Capacity	0.14	Distance to Agricultural Land Use, 1995	
Depth to Top of Open Interval	420	Conceptual Septic Tank Density	4.71
Conceptual - GWUDI		Conceptual – Presence of Streams, Tier 1	1360.92
<b><i>Nutrients Explanatory Variables – Source Rating = L</i></b>			
Conceptual – Depth to Top of Open Interval	420	% Urban Land Use, 1995	48.14
Conceptual – Length of Open Interval	50	% Agricultural Land Use, 1986	0
<b><i>Pesticides Explanatory Variables – Source Rating = L</i></b>			
Conceptual – Depth to Top of Open Interval	420	% Urban Land Use, 1995	48.14
Conceptual – Length of Open Interval	50	% Agricultural Land Use, 1986	0
		Distance to Agricultural Land Use, 1995	
		Conceptual – Distance to golf course	
<b><i>VOCs Explanatory Variables – Source Rating = H</i></b>			
% Soil Organic Matter	1.81	% Impervious Surface, 1995	19.4
		% Commercial/Industrial Land Use, 1995	16.75
		Sq. Mi. of Urban Land Use, 1995	0.42
		Density of SWL, USTs, and KCSL	5.7
<b><i>Inorganics Explanatory Variables – Source Rating = L</i></b>			
Geological Unit	Raritan Formation - Farrington Sand member	Density of KCSL, SWL, NJPDES GW/SW/Storm, Compost Facilities, SWRRF, SWTF200011, Class B Recycling, DPCC, UST	5.7
Dissolved Oxygen of water-quality sample	0.3	Distance to Agricultural Land Use, 1995	
pH of water-quality sample	6.2	Population Density, Tier 1	1643.74
Depth to Top of Open Interval	420	% Barren Land Use, 1995	4.71
% Soil Clay	32.53	% Urban Land Use, 1970	67.24
Soil Hydraulic Conductivity	12.02	Distance to STP	
Conceptual % Soil Organic Matter	1.81	STP Density	4.71
Physiographic Province	COASTAL PLAIN	Distance to DOT roads	139.36
		Length of railroads	4703.49
		Population Density	1826.49
<b><i>Radionuclides Explanatory Variables – Source Rating = H</i></b>			
pH of water-quality sample	6.2	% Urban Land Use, Tier 1, 1995	76.5
Physiographic Province	COASTAL PLAIN	Conceptual Distance to Agricultural Land Use, 1995	
Conceptual Depth of Well	473	% Developed Land, Tier 1, 1995	76.5
Conceptual Soil Hydraulic Conductivity	12.02	% Agricultural Land Use, 1970	0
Geological Unit	Raritan Formation - Farrington Sand member		
<b><i>Radon Explanatory Variables – Source Rating = M</i></b>			
Conceptual % Soil Clay	32.53	% Agricultural Land Use, 1995	0
Physiographic Province	COASTAL PLAIN	Conceptual Distance to Wetlands Land Use, 1995	154.86
Depth to Top of Open Interval	420		
Geological Unit	Raritan Formation - Farrington Sand member		
<b><i>DBPs Explanatory Variables – Source Rating = H</i></b>			
Conceptual – % Soil Organic Matter	1.81	Conceptual – Sq. Mi. of Wetlands Land Use, 1995	0.26
Conceptual NJGS Hydrologic Unit (aquifer)	middle Potomac-Raritan-Magothy aquifer	Number of NJPDES SW/GW/Storm, Compost, SWWRF, SWTF200011, Class B Recycling, and DPCC	0
pH of water-quality sample	6.2		