

# 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: 002 WELL 1/DUNN PLACE Status: P Source Type: G Confinement: U</b> |                         |   |         |
| <b>Sensitivity Variable Inventory</b>  |                         | <b>Intensity Variable Inventory</b>   |         |
| <b><i>Pathogens Explanatory Variables - Source Rating = L</i></b>                      |                         |   |         |
| Conceptual-Soil Available Water Capacity   | 0.04                    | Distance to Agricultural Land Use, 1995   | 2015.58 |
| Depth to Top of Open Interval  | 120                     | Conceptual Septic Tank Density  | 493.86  |
| Conceptual - GWUDI   |                         | Conceptual - Presence of Streams, Tier 1  | 0       |
| <b><i>Nutrients Explanatory Variables - Source Rating = H</i></b>                      |                         |   |         |
| Conceptual - Depth to Top of Open Interval   | 120                     | % Urban Land Use, 1995  | 71.33   |
| Conceptual - Length of Open Interval   | 30                      | % Agricultural Land Use, 1986   | 0.73    |
| <b><i>Pesticides Explanatory Variables - Source Rating = L</i></b>                     |                         |   |         |
| Conceptual - Depth to Top of Open Interval   | 120                     | % Urban Land Use, 1995  | 71.33   |
| Conceptual - Length of Open Interval   | 30                      | % Agricultural Land Use, 1986   | 0.73    |
|  |                         | Distance to Agricultural Land Use, 1995   | 2015.58 |
|  |                         | Conceptual - Distance to golf course  |         |
| <b><i>VOCs Explanatory Variables - Source Rating = H</i></b>                           |                         |   |         |
| % Soil Organic Matter  | 0.19                    | % Impervious Surface, 1995  | 24.9    |
|  |                         | % Commercial/Industrial Land Use, 1995  | 23.68   |
|  |                         | Sq. Mi. of Urban Land Use, 1995   | 0.55    |
|  |                         | Density of SWL, USTs, and KCSL  | 2.6     |
| <b><i>Inorganics Explanatory Variables - Source Rating = M</i></b>                     |                         |   |         |
| Geological Unit  | Stratified drift        | Density of KCSL, SWL, NJPDES GW/SW/Storm, Compost Facilities, SWRRF, SWTF200011, Class B Recycling, DPCC, UST | 3.9     |
| Dissolved Oxygen of water-quality sample   |                         | Distance to Agricultural Land Use, 1995   | 2015.58 |
| pH of water-quality sample   | 7.58                    | Population Density, Tier 1  | 1010.1  |
| Depth to Top of Open Interval  | 120                     | % Barren Land Use, 1995   | 0       |
| % Soil Clay  | 6.96                    | % Urban Land Use, 1970  | 84.6    |
| Soil Hydraulic Conductivity  | 40.99                   | Distance to STP   |         |
| Conceptual % Soil Organic Matter   | 0.19                    | STP Density   | 493.86  |
| Physiographic Province   | PIEDMONT                | Distance to DOT roads   | 275.45  |
|  |                         | Length of railroads   | 2893.59 |
|  |                         | Population Density  | 1705.41 |
| <b><i>Radionuclides Explanatory Variables - Source Rating = H</i></b>                  |                         |   |         |
| pH of water-quality sample   | 7.58                    | % Urban Land Use, Tier 1, 1995  | 75.75   |
| Physiographic Province   | PIEDMONT                | Conceptual Distance to Agricultural Land Use, 1995  | 2015.58 |
| Conceptual Depth of Well   | 152                     | % Developed Land, Tier 1, 1995  | 75.6    |
| Conceptual Soil Hydraulic Conductivity   | 40.99                   | % Agricultural Land Use, 1970   | 6.2     |
| Geological Unit  | Stratified drift        |   |         |
| <b><i>Radon Explanatory Variables - Source Rating = H</i></b>                          |                         |   |         |
| Conceptual % Soil Clay   | 6.96                    | % Agricultural Land Use, 1995   | 0.7     |
| Physiographic Province   | PIEDMONT                | Conceptual Distance to Wetlands Land Use, 1995  | 1350.87 |
| Depth to Top of Open Interval  | 120                     |   |         |
| Geological Unit  | Stratified drift        |   |         |
| <b><i>DBPs Explanatory Variables - Source Rating = M</i></b>                           |                         |   |         |
| Conceptual - % Soil Organic Matter   | 0.19                    | Conceptual - Sq. Mi. of Wetlands Land Use, 1995   | 0.05    |
| Conceptual NJGS Hydrologic Unit (aquifer)  | glacial sand and gravel | Number of NJPDES SW/GW/Storm, Compost, SWWRF, SWTF200011, Class B Recycling, and DPCC                         | 1       |
| pH of water-quality sample   | 7.58                    |   |         |

| <b>Groundwater Susceptibility Models</b>   |                         |   |        |
|--|-------------------------|---|--------|
| <b>EPTDS: 02 Source: 004 WELL 2/RIDGE RD Status: P Source Type: G Confinement: U</b> |                         |   |        |
| <b>Sensitivity Variable Inventory</b>  |                         | <b>Intensity Variable Inventory</b>   |        |
| <b><i>Pathogens Explanatory Variables - Source Rating = L</i></b>                    |                         |   |        |
| Conceptual-Soil Available Water Capacity   | 0.05                    | Distance to Agricultural Land Use, 1995   | 776.64 |
| Depth to Top of Open Interval  | 171                     | Conceptual Septic Tank Density  | 174.49 |
| Conceptual - GWUDI   |                         | Conceptual - Presence of Streams, Tier 1  | 0      |
| <b><i>Nutrients Explanatory Variables - Source Rating = H</i></b>                    |                         |   |        |
| Conceptual - Depth to Top of Open Interval   | 171                     | % Urban Land Use, 1995  | 62.5   |
| Conceptual - Length of Open Interval   | 25                      | % Agricultural Land Use, 1986   | 1.42   |
| <b><i>Pesticides Explanatory Variables - Source Rating = L</i></b>                   |                         |   |        |
| Conceptual - Depth to Top of Open Interval   | 171                     | % Urban Land Use, 1995  | 62.5   |
| Conceptual - Length of Open Interval   | 25                      | % Agricultural Land Use, 1986   | 1.42   |
|  |                         | Distance to Agricultural Land Use, 1995   | 776.64 |
|  |                         | Conceptual - Distance to golf course  |        |
| <b><i>VOCs Explanatory Variables - Source Rating = H</i></b>                         |                         |   |        |
| % Soil Organic Matter  | 0.38                    | % Impervious Surface, 1995  | 21.4   |
|  |                         | % Commercial/Industrial Land Use, 1995  | 22.4   |
|  |                         | Sq. Mi. of Urban Land Use, 1995   | 0.27   |
|  |                         | Density of SWL, USTs, and KCSL  | 0      |
| <b><i>Inorganics Explanatory Variables - Source Rating = M</i></b>                   |                         |   |        |
| Geological Unit  | Stratified drift        | Density of KCSL, SWL, NJPDES GW/SW/Storm, Compost Facilities, SWRRF, SWTF200011, Class B Recycling, DPCC, UST | 0      |
| Dissolved Oxygen of water-quality sample   | 6.63                    | Distance to Agricultural Land Use, 1995   | 776.64 |
| pH of water-quality sample   | 8.15                    | Population Density, Tier 1  | 572.13 |
| Depth to Top of Open Interval  | 171                     | % Barren Land Use, 1995   | 0      |
| % Soil Clay  | 6                       | % Urban Land Use, 1970  | 79.4   |
| Soil Hydraulic Conductivity  | 55.99                   | Distance to STP   |        |
| Conceptual % Soil Organic Matter   | 0.38                    | STP Density   | 174.49 |
| Physiographic Province   | PIEDMONT                | Distance to DOT roads   | 120.71 |
|  |                         | Length of railroads   | 0      |
|  |                         | Population Density  | 786.76 |
| <b><i>Radionuclides Explanatory Variables - Source Rating = H</i></b>                |                         |   |        |
| pH of water-quality sample   | 8.15                    | % Urban Land Use, Tier 1, 1995  | 63.76  |
| Physiographic Province   | PIEDMONT                | Conceptual Distance to Agricultural Land Use, 1995  | 776.64 |
| Conceptual Depth of Well   | 196                     | % Developed Land, Tier 1, 1995  | 63.8   |
| Conceptual Soil Hydraulic Conductivity   | 55.99                   | % Agricultural Land Use, 1970   | 4.8    |
| Geological Unit  | Stratified drift        |   |        |
| <b><i>Radon Explanatory Variables - Source Rating = M</i></b>                        |                         |   |        |
| Conceptual % Soil Clay   | 6                       | % Agricultural Land Use, 1995   | 1.3    |
| Physiographic Province   | PIEDMONT                | Conceptual Distance to Wetlands Land Use, 1995  | 602.84 |
| Depth to Top of Open Interval  | 171                     |   |        |
| Geological Unit  | Stratified drift        |   |        |
| <b><i>DBPs Explanatory Variables - Source Rating = M</i></b>                         |                         |   |        |
| Conceptual - % Soil Organic Matter   | 0.38                    | Conceptual - Sq. Mi. of Wetlands Land Use, 1995   | 0.01   |
| Conceptual NJGS Hydrologic Unit (aquifer)  | glacial sand and gravel | Number of NJPDES SW/GW/Storm, Compost, SWWRF, SWTF200011, Class B Recycling, and DPCC                         | 0      |
| pH of water-quality sample   | 8.15                    |   |        |

**Groundwater Susceptibility Models**

**EPTDS: 07 Source: 015 WELL NO. 3/WEST PARKWAY Status: P Source Type: G Confinement: U**

| Sensitivity Variable Inventory                                 |                         | Intensity Variable Inventory  |        |
|--|-------------------------|---|--------|
| <b>Pathogens Explanatory Variables - Source Rating = L</b>     |                         |   |        |
| Conceptual-Soil Available Water Capacity                       | 0.06                    | Distance to Agricultural Land Use, 1995   | 867.93 |
| Depth to Top of Open Interval                                  | 99999                   | Conceptual Septic Tank Density  | 146.93 |
| Conceptual - GWUDI   |                         | Conceptual - Presence of Streams, Tier 1  | 0      |
| <b>Nutrients Explanatory Variables - Source Rating = H</b>     |                         |   |        |
| Conceptual - Depth to Top of Open Interval                     | 99999                   | % Urban Land Use, 1995  | 51.2   |
| Conceptual - Length of Open Interval                           | 0                       | % Agricultural Land Use, 1986   | 2.21   |
| <b>Pesticides Explanatory Variables - Source Rating = M</b>    |                         |   |        |
| Conceptual - Depth to Top of Open Interval                     | 99999                   | % Urban Land Use, 1995  | 51.2   |
| Conceptual - Length of Open Interval                           | 0                       | % Agricultural Land Use, 1986   | 2.21   |
|  |                         | Distance to Agricultural Land Use, 1995   | 867.93 |
|  |                         | Conceptual - Distance to golf course  |        |
| <b>VOCs Explanatory Variables - Source Rating = L</b>          |                         |   |        |
| % Soil Organic Matter  | 0.3                     | % Impervious Surface, 1995  | 20     |
|  |                         | % Commercial/Industrial Land Use, 1995  | 30     |
|  |                         | Sq. Mi. of Urban Land Use, 1995   | 0.15   |
|  |                         | Density of SWL, USTs, and KCSL  | 0      |
| <b>Inorganics Explanatory Variables - Source Rating = M</b>    |                         |   |        |
| Geological Unit  | Sand and gravel         | Density of KCSL, SWL, NJPDES GW/SW/Storm, Compost Facilities, SWRRF, SWTF200011, Class B Recycling, DPCC, UST | 0      |
| Dissolved Oxygen of water-quality sample                       |                         | Distance to Agricultural Land Use, 1995   | 867.93 |
| pH of water-quality sample                                     | 7.58                    | Population Density, Tier 1  | 579.59 |
| Depth to Top of Open Interval                                  | 99999                   | % Barren Land Use, 1995   | 0      |
| % Soil Clay  | 5.26                    | % Urban Land Use, 1970  | 74.83  |
| Soil Hydraulic Conductivity                                    | 60.43                   | Distance to STP   |        |
| Conceptual % Soil Organic Matter                               | 0.3                     | STP Density   | 146.93 |
| Physiographic Province   | PIEDMONT                | Distance to DOT roads   | 74.17  |
|  |                         | Length of railroads   | 0      |
|  |                         | Population Density  | 631.65 |
| <b>Radionuclides Explanatory Variables - Source Rating = H</b> |                         |   |        |
| pH of water-quality sample                                     | 7.58                    | % Urban Land Use, Tier 1, 1995  | 37.64  |
| Physiographic Province   | PIEDMONT                | Conceptual Distance to Agricultural Land Use, 1995  | 867.93 |
| Conceptual Depth of Well                                       | 99999                   | % Developed Land, Tier 1, 1995  | 37.6   |
| Conceptual Soil Hydraulic Conductivity                         | 60.43                   | % Agricultural Land Use, 1970   | 0      |
| Geological Unit  | Sand and gravel         |   |        |
| <b>Radon Explanatory Variables - Source Rating = H</b>         |                         |   |        |
| Conceptual % Soil Clay   | 5.26                    | % Agricultural Land Use, 1995   | 1.9    |
| Physiographic Province   | PIEDMONT                | Conceptual Distance to Wetlands Land Use, 1995  | 0.65   |
| Depth to Top of Open Interval                                  | 99999                   |   |        |
| Geological Unit  | Sand and gravel         |   |        |
| <b>DBPs Explanatory Variables - Source Rating = M</b>          |                         |   |        |
| Conceptual - % Soil Organic Matter                             | 0.3                     | Conceptual - Sq. Mi. of Wetlands Land Use, 1995   | 0      |
| Conceptual NJGS Hydrologic Unit (aquifer)                      | glacial sand and gravel | Number of NJPDES SW/GW/Storm, Compost, SWWRF, SWTF200011, Class B Recycling, and DPCC                         | 0      |
| pH of water-quality sample                                     | 7.58                    |   |        |