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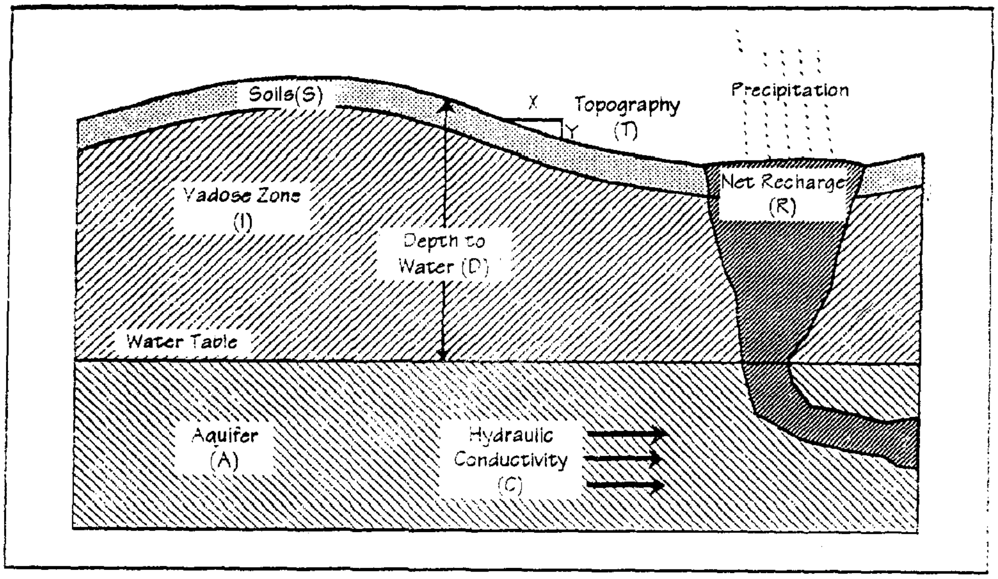
# *Stafford County Ground Water Resource Protection Program*




*Prepared for:*

*County of Stafford*
*Stafford, VA*

*By:*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*FINAL REPORT*

*December 31, 1991*




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# STAFFORD COUNTY GROUND WATER RESOURCE PROTECTION PROGRAM

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## SECTION 1

## INTRODUCTION

### PURPOSE

The purpose for developing a Ground Water Resource Protection Program as a part of the Shoreline Area Management Plan component of the Stafford County Comprehensive Plan is to assist the Board of Supervisors and Planning Commission in making land use decisions. The data, maps, and recommendations from this document will be used in determining a potential development's impact on the County's ground water resources and to provide recommendations which can mitigate any potential degradation identified. Development must proceed in a manner that is not detrimental to the County's ground water resources.

In July 1988, Section 15.1-446.1 of the Code of Virginia (1950), was amended to add ground water protection as an item that local governments should consider when evaluating land use proposals. A growing awareness of the vulnerability of ground water to pollution, especially from development, has led the County to seek a coordinated effort to protect ground water resources. Residential, commercial, and industrial uses rely heavily on ground water to supply a portion of their needs. Indeed, in many areas of the County, ground water is the only feasible source of water.

This Ground Water Resource Protection Program was funded, in part, by the Virginia Council on the Environment's Coastal Resources Management Program through grant #NA90AA-H-CZ796 of the National Oceanic and Atmospheric Administration under the Coastal Zone Management Act of 1972 as amended.

### BACKGROUND

Stafford County is located in the northeast region of Virginia approximately fifty-six (56) miles north of Richmond and forth (40) miles south of Washington, D.C. The County is bisected by I-95, which is also the approximate dividing line between the two physiographic regions (Coastal Plain and Piedmont) which define the surface features of the County.

Currently, the County draws its public water supply from two impoundments, Abel Lake and Smith Lake, that rely, in large part, upon ground water recharge. In addition, approximately one-half of Stafford County residents rely on private wells recharged by ground water supplies. These recharge areas need to be identified and strategies developed to ensure a safe and adequate water supply for the County.

Stafford County is a predominantly rural locality experiencing the pressures of suburban development from the Fredericksburg and Northern Virginia areas. The 1990 decennial census documented a fifty-one (51) percent growth rate in the County from 1980-1990 from 40,470 to 61,236. This has resulted in a greater need to ensure that the development which occurs is planned in a way that protects the County's ground water resources. This Ground Water Resource Protection Program is the first step towards ensuring that as development occurs, specific strategies are implemented to protect the County's ground water resources.

## SECTION 2

## GROUND WATER

### COUNTY GROUND WATER RESOURCES

Stafford County is in the position of having ground water reserves; however, this supply is a dynamic resource intimately connected with and affected by general land use activities. Ground water is generally recharged through water percolating through the soil or through direct resupply by surface water in areas where ground water aquifers outcrop at the surface. The quantity and quality of the water that reaches the ground water aquifers depends on the amount and type of topography, vegetation, soils, land use, and underlying bedrock.

That ground water is naturally cleansed of pollution as it moves through the soil is a common misconception. Although soil has the capacity to filter and absorb pollutants, many pass through the soil layer. Increasing the amount of pollutants entering the soil will lessen the soil's ability and capacity to filter pollutants. In addition, stream, marsh, and wetland environments and the sensitive wildlife habitats they support are preserved by ground water during dry periods.

In Stafford County, a large surface recharge area for the Potomac aquifer is located along, and generally parallel to, I-95. This recharge area is located at the fall line (the dividing line between the Coastal Plain and Piedmont Physiographic Regions). This aquifer provides an important water resource to residents in the eastern part of the County and for residents in King George County.

Other aquifers that are within the County include: the Piedmont in the western part of the County, the Chickahominy/Piney Point and the Aquia in the southeastern section of the County, and the Potomac in the central and northern portions of the County.

Residential, commercial, and industrial land uses, if improperly developed, can have an adverse impact on the County's ground water resources. This Ground Water Resource Protection Program provides recommendations that can assist in protecting ground water resources while still providing for growth and development.

### GROUND WATER CONTAMINATION

Ground water pollution is caused by a variety of substances originating from many different activities. In general, pollutants enter ground water through the following pathways: 1) improper application of fertilizers, pesticides, and other water soluble products on the land surface; 2) runoff from development sites; 3) leakage from landfills, underground storage tanks, and improperly operating septic systems; 4) improper storage and disposal of toxic substances; 5) the burial in the ground of inorganic (man-made) substances or organic substances that nave been chemically treated; 6) the injection of materials into the ground; and 7) the leaching of pollutants from the soil or bedrock.

After release on the land surface, the pollutant may infiltrate downward through the soil. If the volume of pollutant is not great, the pollutant may be attenuated. If the pollutant is not completely attenuated, it may later be flushed toward the water table by infiltrating precipitation or additional amounts of pollutant. The majority of pollutants will generally travel in the direction of ground water flow at a velocity slightly less than that of the ground water.

The attenuation process includes mechanisms which reduce the velocity of the pollutant through processes such as dilution, dispersion, mechanical filtration, volatilization, biological assimilation and decomposition, precipitation, sorption, ion exchange, oxidation-reduction, and buffering and neutralization. The degree of attenuation which can occur is a function of 1) the time that the pollutant is in contact with the material through which it passes, 2) the grain size and physical and chemical characteristics of the material through which it passes, and 3) the distance which the pollutant has traveled. In general, for any given material, the longer the time the pollutant takes to move through the material and the greater the distance of the movement, the greater the effects of attenuation. In a similar manner, the greater the surface area of the material through which the pollutant passes, the greater the potential for sorption of the pollutant and, hence, for attenuation. The greater the reactivity of the material through which the pollutant passes, the greater the potential for attenuation. Any combination of these processes may be active depending on the hydrogeologic conditions and the characteristics of the pollutant. It is therefore necessary to have a general idea of these processes and whether they are active.

The effectiveness of dilution and attenuation processes is largely determined by 1) the rate and loading of the applied pollutant, 2) the characteristics of the pollutant, and 3) the physical and chemical characteristics of the area. Ultimately, it is these factors which control the ground water pollution potential of any area. The rate and loading factor is generally of site-specific character. However, it is the physical properties characterized by the hydrogeologic characteristics of the area that determine the extent to which the attenuation mechanisms may have the potential to be active.

Because it is neither practical nor feasible to obtain quantitative evaluations of these intrinsic mechanisms from a regional perspective, it is necessary to look at the broader physical parameters which incorporate the many processes. This is accomplished under the DRASTIC methodology. Each of the DRASTIC parameters includes various mechanisms which will help to evaluate the vulnerability of ground water to pollution. When this is coupled with an understanding of the hydrogeology of the area, the result will be a clearer image of the potential for pollutant travel and attenuation.

## SECTION 3

## METHODOLOGY

### DRASTIC OVERVIEW

The DRASTIC (Aller, et al., 1987) model was used to evaluate ground water pollution potential in Stafford County. This section discusses the DRASTIC methodology and how it was applied in this study.

DRASTIC is a methodology for evaluating the relative ground water pollution potential of an area through the application of an environmental component rating system. This rating system allows for the assessment of the vulnerability of an area to ground water contamination based on various hydrogeologic parameters. DRASTIC was developed by the National Water Well Association under the sponsorship of the Environmental Protection Agency. The following discussion is largely taken from the DRASTIC documentation (Aller, et al., 1987).

DRASTIC is an acronym that represents the most important physical characteristics, either alone, or in combination, for determining susceptibility to ground water contamination. The DRASTIC factors represent measurable parameters for which data is generally available from a variety of sources without detailed reconnaissance.

D - Depth to Water;

R - (Net) Recharge;

A - Aquifer Media;

S - Soil Media;

T - Topography (Slope);

I - Impact of the Vadose Zone Media; and

C - Conductivity (Hydraulic) of the Aquifer.

These factors, as shown in Figure 1, form the acronym, DRASTIC, for ease of reference. While this list is not all inclusive, these factors, in combination, were determined to include the basic requirements needed to assess general pollution potential.

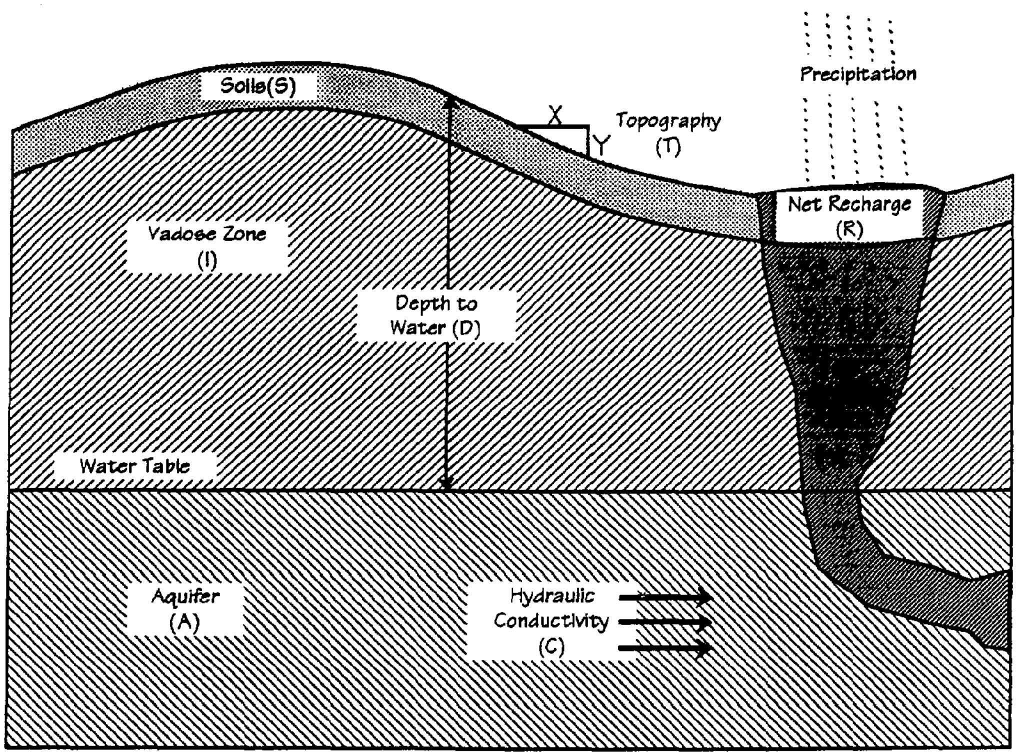


***Figure 1***
***DRASTIC Parameter Schematic***

## Depth to Water

Depth to water is important primarily because it determines the depth of material through which a pollutant must travel before reaching the aquifer, and it may help to determine the contact time with the surrounding media. In general, there is a greater chance for attenuation to occur as the depth to water increases because deeper water levels imply longer travel times. The ranges in depth to water as defined in the DRASTIC system have been determined based on what are considered to be depths where the potential for ground water pollution significantly changes.

## Net Recharge

The primary source of ground water typically is precipitation which infiltrates through the surface of the ground and percolates to the aquifer. Net recharge represents the amount of water per unit area of land which penetrates the ground surface and reaches the water table. This recharge water is thus available to transport a pollutant vertically to and horizontally within the aquifer. In addition, the quantity of water available for dispersion and dilution of the pollutant in the vadose zone and in the saturated zone is controlled by this parameter. Recharge water, therefore, is a principal vehicle for leaching and transporting solid or liquid pollutants to the water table. The greater the recharge, the greater the potential for ground water pollution. This general statement is true until the amount of recharge is great enough to cause dilution of the pollutant, at which point the ground water pollution potential ceases to increase and may actually decrease. This phenomena has been acknowledged but the ranges and associated ratings do not reflect the dilution factor.

## Aquifer Media

Aquifer media refers to the consolidated or unconsolidated material which serves as an aquifer (such as sand and gravel or limestone). An aquifer is defined as a subsurface rock unit which will yield sufficient quantities of water for use. Water is contained in aquifers within the pore spaces of granular and clastic rock and in the fractures and solution openings of non-clastic and non-granular rock. The media that water must flow through is an important control (along with hydraulic conductivity and gradient) in determining the time available for attenuation processes such as sorption, reactivity, and dispersion to occur. The aquifer medium also influences the amount of effective surface area of materials with which the pollutant may come in contact within the aquifer. In general, the larger the grain size and the more fractures or openings within the aquifer, the higher the permeability and the lower the attenuation capacity of the aquifer media.

## Soil Media

Soil media refers to that uppermost portion of the vadose zone characterized by significant biological activity. Soil is commonly considered the upper weathered zone of the earth which averages a depth of six feet or less from the ground surface. Soil has a significant impact on the amount of recharge which can infiltrate into the ground and, hence, on the ability of a pollutant to move vertically into the vadose zone. The presence of fine-textured materials such as silts and clays can decrease relative soil permeabilities and restrict pollutant migration. Moreover, where the soil zone is fairly thick, the attenuation processes of filtration, biodegradation, sorption, and volatilization may be quite significant. Thus, for certain land surface practices, such as agricultural applications of pesticides, soil may have the primary influence on pollution potential. In general, the pollution potential of a soil is largely affected by the type of clay present, the shrink/swell potential of that clay, and the grain size of the soil. In general, the less the clay shrinks and swells and the smaller the grain size, the less the pollution potential. The quantity of organic material present in the soil may also be an important factor particularly in the attenuation of pesticides. Organic matter is typically contained in the surface layer of the soil and composed of undecayed plant and animal tissue, charcoal, and various humic compounds. The organic content of the soil generally decreases with depth from the surface.

Topography

As used here, "topography" refers to the slope and slope variability of the land surface. Topography influences the likelihood that a pollutant will run off or remain on the surface in one area long enough to infiltrate. Slopes which provide a greater opportunity for pollutants to infiltrate will be associated with a higher ground water pollution potential. Topography influences soil development and therefore has an effect on pollutant attenuation. Topography is also significant because gradient and direction of flow often can be inferred for water table conditions from the general slope of the land. Typically, steeper slopes signify higher ground water velocity.

Impact of the Vadose Zone

The vadose zone is defined as that zone above the water table which is unsaturated or discontinuously saturated. The type of vadose zone media determines the attenuation characteristics of the material below the typical soil horizon and above the water table. The media also controls the path length and routing, thus affecting the time available for attenuation and the quantity of material encountered.

Hydraulic Conductivity

Hydraulic conductivity refers to the ability of the aquifer materials to transmit water, which in turn, controls the rate at which ground water will flow under a given hydraulic gradient. The rate at which the ground water flows also controls the rate at which a pollutant moves away from the point at which it enters the aquifer. Hydraulic conductivity is controlled by the amount and interconnection of void spaces within the aquifer which may occur as a consequence of intergranular porosity, fracturing, and bedding planes. For purposes of this model, hydraulic conductivity is divided into ranges where high hydraulic conductivities are associated with higher pollution potential.

## The DRASTIC Parameters

From the discussions on the DRASTIC parameter, it is apparent that there is overlap between the various parameters. The depth to the water, for example, affects the quantity of material that will be encountered by a pollutant moving downward toward an aquifer. The thicker the vadose zone in a given setting, the greater the effect may be upon the degradation, retardation, or attenuation of the pollutant.

However, in considering the impact of the vadose zone, degradation, retardation, and other significant attenuation processes are all varied according to the nature of the materials present and their condition within the vadose zone. If, for instance, the vadose zone is moderately fractured granite, the materials within the vadose zone will have only a slight impact on most pollutants entering the vadose zone. The protection provided will be a function of depth and the failure of critical fractures to interconnect.

If, however, the vadose zone is comprised of unfractured glacial till, it can be anticipated that consumptive sorption will be moderately high; infiltration will be moderately low; retardation will be significant; and with any substantial thickness of till, considerable time will be required for most pollutants to penetrate the till. Thus it can be seen that the overlapping consideration of degradation, retardation, and attenuation within the context of both depth to water and impact of the vadose zone is useful in the comparative evaluation of sites.

Net recharge determines, on an annual basis, the quantity of water from precipitation that is available for vertical transport, dispersion, and dilution of a pollutant from a specific point of application. Net recharge exemplifies how some parameters can have both positive and negative effects. For example, greater recharge typically means more rapid transport of a pollutant and therefore less time for attenuation. However, in this situation, dilution is also greater, thereby exerting a positive influence because the concentration of an introduced pollutant will be lessened. It is also evident that a thick unsaturated zone, with a layered sequence of bedded and fractured shales, sandstones, and limestones, can have a profound impact on all three of the same factors (transport, dispersion, dilution) that are of primary importance to net recharge.

Topography and soil media also influence net recharge. Topography has site-specific influence which determines whether the capacity for recharge is high or low at a given point. The permeability of the surface soils has a similar impact. However, the nature of the surface soil materials has an additional impact upon potential pollutant attenuation, consumptive sorption, route length and direction, and time available for penetration.

In addition to its direct influence upon recharge, topography exerts a significant influence upon soil thickness, drainage characteristics, and profile development. For example, in high slope areas, wind and rain are more likely to erode the soil surface, diminishing the soil thickness. High slopes also result in faster runoff, allowing less time for infiltration to occur. In addition, topography usually bears a predictable relationship to hydraulic gradient, and direction of probable pollutant movement under water table conditions, with a consequent impact on dispersion and dilution.

The upper portion of the vadose zone exerts influence on the type of soils developed on the surface. The vulnerability of an aquifer to a given pollution event varies in response to the nature of the materials in the vadose zone including but not limited to: grain size, sorting, reactivity, bedding, fracturing, thickness, and sorptive character. In general, finer grain-size materials, i.e., clays and silt, have lower hydraulic conductivity and greater capacity for the temporary and long-term attenuation of pollutants. If expandable clay minerals are present, the sorptive capacity is further enhanced. If a material is even moderately cemented, then grain size and sorting may be less significant than the degree of cementation.

If the material in the vadose zone is reactive to the pollutant, or soluble in it, then there may be two different effects. First, the pollutant may be retarded (a positive effect) or second, the solution of the vadose zone material may actually increase permeability and allow subsequent introduction of pollutants to pass through more quickly with less retardation (a negative effect). In the case of reactive pollutants, the importance of secondary by-products must be considered. It is here that the risks associated with gaseous phase transport are most likely to have an impact on ground water.

The thickness of the vadose zone and the degree of fracturing and frequency of bedding planes in the vadose zone all impact upon the tortuosity, route length, dispersion, and consequent travel time that is required for a pollutant to move through the vadose zone. This is not only of time-delay importance but also is important as the control of contact time for reactions to occur.

The vadose zone, including the surficial soil, is also of great importance as the zone where most of the biologic activity occurs. There are natural organisms found in this zone that break down many polluting substances into secondary by-products, both harmless and harmful. For many chemicals, these reactions are very poorly understood, if at all, but it is known that with sufficient time, the eventual results are generally beneficial. Among the best known of these processes at present are the bacterial fixation of iron and the bacterial breakdown of non-chlorinated hydrocarbons under natural conditions. Both of these processes occur in the vadose zone and in the aerobic portion of shallow aquifers.

The hydraulic conductivity, with the gradient of the aquifer beneath a site, influences the rate of movement of an introduced pollutant away from the point of introduction. In conjunction with hydraulic gradient, conductivity also controls the direction of movement. These are, in turn, affected with regard to dispersion, by grain size, bedding, fracturing, and tortuosity.

## DRASTIC RANKING SYSTEM

A numeric ranking system to assess ground water pollution potential has been devised using the DRASTIC factors. The system contains three significant parts: weights, ranges, and ratings.

Each DRASTIC factor has been evaluated with respect to the other factors to balance the relative importance of each factor in determining an area's susceptibility to ground water pollution. Each DRASTIC factor has been assigned a relative weight ranging from 1 to 5 as shown in Table 1. Those DRASTIC factors with a weight of 5 have the greatest impact on whether or not an area is susceptible to ground water contamination. Those with a weight of 1 have the least impact.

Table 1. Assigned Weights for DRASTIC Features

| Feature | Weight |
|---|---|
| Depth to Water (D) | 5 |
| Net Recharge (R) | 4 |
| Aquifer Media (A) | 3 |
| Soil Media (S) | 2 |
| Topography (T) | 1 |
| Impact of the Vadose Zone Media (I) | 5 |
| Hydraulic Conductivity of the Aquifer (C) | 3 |

Each DRASTIC factor has been divided into the appropriate ranges or significant media type and then assigned a rating. The rating is based on the relative pollution potential impact of the range or media type given the factor being evaluated. The range for each DRASTIC factor has been assigned a rating which varies between 1 and 10 (Tables 2 - 8). The higher the rating, the higher the factor's contribution to the pollution potential. This information was not modified from the recommendations in the DRASTIC handbook.

This system allows the determination of a numeric value for an area by using an additive model. This number provides a representative value of the relative potential susceptibility to pollution of an area. The equation for determining the DRASTIC Index is:

$$D_R D_W + R_R R_W + A_R A_W + S_R S_W + T_R T_W + I_R I_W + C_R C_W = Pollution\ Potential$$

where:

R = rating

W = weight

The DRASTIC model was used to evaluate ground water pollution potential on a grid cell basis. The County was divided into 557 grid cells with a unit length of 3,500 feet (grid cell area = 281 acres). Ratings were determined for each hydrogeologic parameter for each grid cell. The DRASTIC Index was then computed using the aforementioned equation in an overlay scheme as shown in Figure 2.

Once a DRASTIC Index has been computed, it is possible to identify areas which are relatively more likely to be susceptible to ground water contamination. The higher the DRASTIC Index, the greater the ground water pollution potential. The DRASTIC Index provides only a relative evaluation tool and is not designed to provide absolute answers such as pollutant loadings to aquifers and resulting ground water pollutant concentrations.

Table 2. Ranges and Ratings for Depth to Water

Weight: 5

| Depth to Water ("D") (feet) | |
|---|---|
| Range | Rating |
| 0 - 5 | 10 |
| 5 - 15 | 9 |
| 15 - 30 | 7 |
| 30 - 50 | 5 |
| 50 - 75 | 3 |
| 75 - 100 | 2 |
| 100+ | 1 |

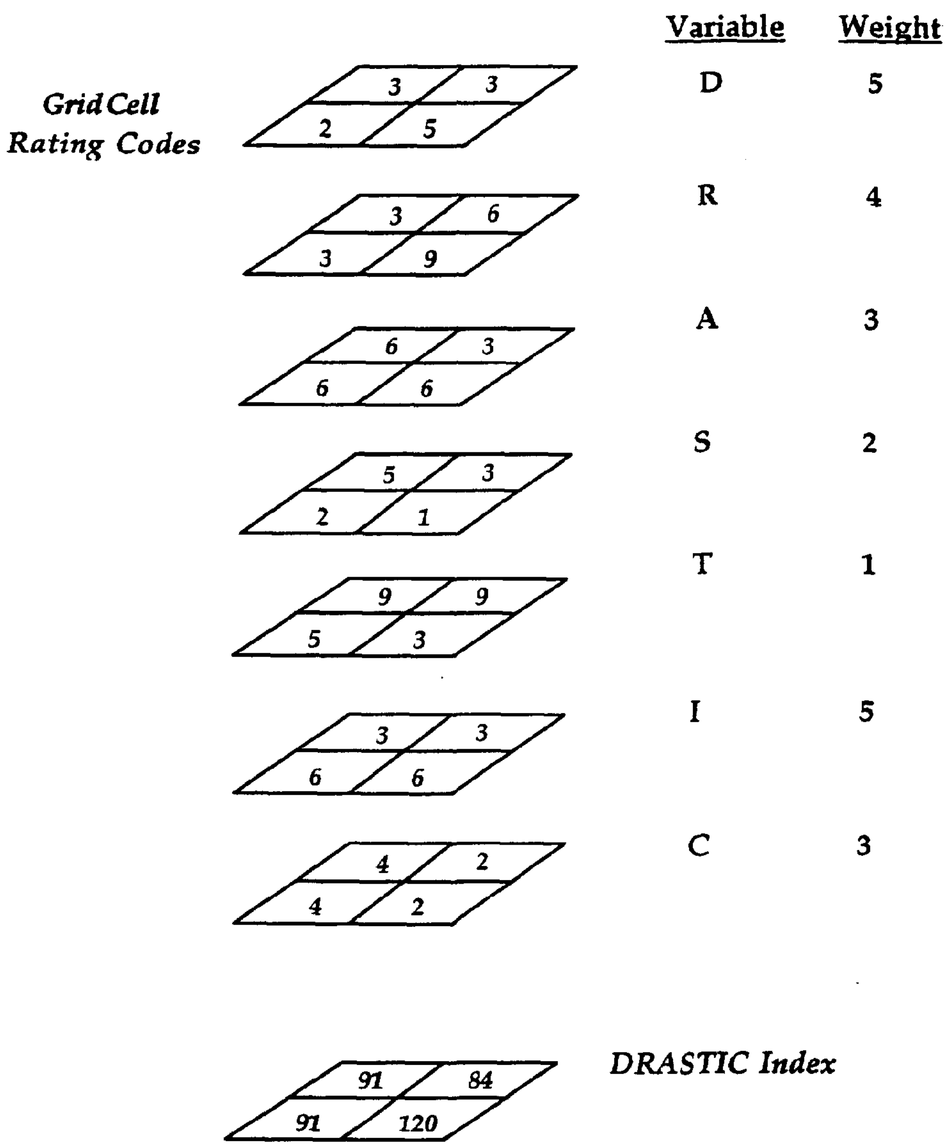


*Figure 2*
*DRASTIC Overlay Scheme*

Table 3. Ranges and Ratings for Net Recharge

Weight: 4

| Net Recharge ("R") (inches/year) | |
|---|---|
| Range | Rating |
| 0 - 2 | 1 |
| 2 - 4 | 3 |
| 4 - 7 | 6 |
| 7 - 10 | 8 |
| 10+ | 9 |

Table 4. Ranges and Ratings for Aquifer Media

Weight: 3

| Aquifer Media ("A") | | |
|---|---|---|
| Range | Rating | Typical Rating |
| Massive Shale | 1 - 3 | 2 |
| Metamorphic/Igneous | 2 - 5 | 3 |
| Weathered Metamorphic/Igneous | 3 - 5 | 4 |
| Glacial Till | 4 - 6 | 5 |
| Bedded Sandstone, Limestone and Shale Sequences | 5 - 9 | 6 |
| Massive Sandstone | 4 - 9 | 6 |
| Massive Limestone | 4 - 9 | 6 |
| Sand and Gravel | 4 - 9 | 8 |
| Basalt | 2 - 10 | 9 |
| Karst Limestone | 9 - 10 | 10 |

Table 5. Ranges and Ratings for Soil Media

Weight: 2

| Soil Media ("S") | |
|---|---|
| Range | Rating |
| Thin or Absent | 10 |
| Gravel | 10 |
| Sand | 9 |
| Peat | 8 |
| Shrinking and/or Aggregated Clay | 7 |
| Sandy Loam | 6 |
| Loam | 5 |
| Silty Loam | 4 |
| Clay Loam | 3 |
| Muck | 2 |
| Nonshrinking and Nonaggregated Clay | 1 |

Table 6. Ranges and Ratings for Topography

Weight: 1

| Topography ("T") (Percent Slope) | |
|---|---|
| Range | Rating |
| 0 - 2 | 10 |
| 2 - 6 | 9 |
| 6 - 12 | 5 |
| 12 - 18 | 3 |
| 18+ | 1 |

Table 7. Ranges and Ratings for Impact of the Vadose Zone Media

Weight: 5

| Impact of the Vadose Zone Media ("I") | | |
|---|---|---|
| Range | Rating Range | Typical Rating |
| Confining Layer | 2 | 1 |
| Silt/Clay | 2 - 6 | 3 |
| Shale | 2 - 5 | 3 |
| Limestone | 2 - 7 | 6 |
| Sandstone | 4 - 8 | 6 |
| Bedded Limestone, Sandstone, Shale | 4 - 8 | 6 |
| Sand and Gravel with Significant Silt and Clay | 4 - 8 | 6 |
| Metamorphic/Igneous | 2 - 8 | 4 |
| Sand and Gravel | 6 - 9 | 8 |
| Basalt | 2 - 10 | 9 |
| Karst Limestone | 8 - 10 | 10 |

Table 8. Ranges and Ratings for Hydraulic Conductivity

Weight: 3

| Hydraulic Conductivity ("C") ($GPD/ft^2$) | |
|---|---|
| Range | Rating |
| 1 - 100 | 1 |
| 100 - 300 | 2 |
| 300 - 700 | 4 |
| 700 - 1000 | 6 |
| 1000 - 2000 | 8 |
| 2000+ | 10 |

## DRASTIC MODEL

DRASTIC was developed using four major assumptions:

1. the pollutant is introduced at the ground surface;
2. the pollutant is flushed into the ground water by precipitation;
3. the pollutant has the mobility of water; and
4. the area evaluated using DRASTIC is 100 acres or larger.

In evaluating specific project impacts, there may be special conditions which would need to be more fully evaluated. For example, the methodology assumes that a pollutant will start at the surface, enter the soil, travel through the vadose zone, and enter the aquifer much like water. However, a pollutant may have unique chemical and physical properties which would restrict movement into ground water. A pollutant may be denser than water and exhibit travel characteristics different from water. Further, a disposal method which injects pollutants directly into ground water negates many of the natural attenuation mechanisms assumed in the methodology. In this particular case, DRASTIC does not provide an accurate assessment of ground water pollution potential.

In assuming areas of 100 acres or larger, the DRASTIC method attempts to evaluate ground water pollution potential from an area-wide perspective rather than a site-specific focus. For example, in an area of fractured rock, ground water flows in a general direction. However, ground water flow at any one site will be directly controlled by fracture orientation. In this scenario, exact direction of pollutant movement is controlled by a site-specific characteristic. Generally, however, the pollutant would still flow in a general direction.

## SECTION 4

## DATA COLLECTION AND RATING DEVELOPMENT

This section describes the data collection activities, interpretations, and assumptions used in developing DRASTIC parameter ratings. Relevant references are cited. The detailed data base is included as Appendix A while maps showing the distribution of DRASTIC parameter ratings are included in Appendix B.

### DEPTH TO WATER

The primary source of data on depth to water is the logs for approximately 1,300 wells within the County. The Virginia Water Control Board (VWCB) has compiled the well logs and entered the data into the EPA STORET data base. This data was downloaded to microcomputer and manipulated in order to develop the rating by grid cell. Powell and Abe (1985) and Meng and Harsh (1988) provided supplemental information on depth to water. A very shallow (0 - 5 feet) depth to water was assumed for wide, flat river and overbank areas. This shallow depth was also assumed for swamps. Much of the Piedmont has a rating of 7 (depth to water of 15 - 30 feet) but the Coastal Plain varies greatly in rating.

### NET RECHARGE

Net recharge information was collected from numerous sources, including Aller, et al. (1987), Hamilton and Larson (1986), Harsh and Laczniak (1990), O'Brien and Gere (1991), Weston (1976), and Wagner, et al. (1988). These references indicate that, in general, net recharge is between 7 and 10 inches per year (rating of 8) in the Piedmont, and over 10 inches per year (rating of 9) in the Coastal Plain. Further refinements were made in the Piedmont, to account for the impact of topography. In high slope areas, water moves faster along the surface, providing less time for infiltration. Also, higher slope areas tend to have larger outcroppings of impermeable solid rock, since weathered material is easily transported away with wind and runoff. A net recharge of 4 - 7 inches per year (rating of 6) was used for areas with slopes between 12 and 18 percent, and a net recharge of 2 - 4 inches per year (rating of 3) was used where slope is greater than or equal to 18 percent. In the Coastal Plain, the soil, vadose zone, and aquifer media is predominantly sand and silt, so topography has less impact on recharge.

### AQUIFER MEDIA

VWCB well data, along with Meng and Harsh (1988), were used to delineate the various aquifers within the County. Meng and Harsh (1988) also describe the aquifer media, as do the following references: Commonwealth of Virginia (1963, 1971, and 1980), Mixon, et al. (1989), Mixon and Newell (1977), Mixon (1990), Pavlides (1976 and 1990), Powell and Abe (1985), Weston (1976), and Wagner, et al. (1988). The Piedmont is predominantly weathered granite and gneiss, which correspond to the weathered metamorphic/igneous DRASTIC range (rating of 4). Fresh unweathered rock is exposed in high slope areas (assumed to be greater than or equal to 12 percent), corresponding to the metamorphic/igneous DRASTIC range (rating of 3). The Coastal Plain is predominantly sand and gravel. A rating of 8 was applied to the Potomac Aquifer, and 7 to the Aquia and Chickahominy/Piney Point aquifers. This difference in ratings accounts for the higher attenuation (lower hydraulic conductivity) in the Potomac, which could be caused by the size and orientation of clay lenses in the sand and gravel.

## SOIL MEDIA

Soil characteristics were derived from the County Soil Survey (Isgrig and Strobel, 1974). Representative cores were reported for the various soil classifications. These cores were, in turn, used to develop DRASTIC ranges. The Coastal Plain soil media is sandy loam (rating of 6), and the sandy loam stretches into a small section of the southeastern Piedmont. The majority of the Piedmont has a clay loam (rating of 3) soil media. The soil media was assumed to be thin or absent (rating of 10) in high slope areas (slopes greater than or equal to 12 percent). This is consistent with the Soil Survey and is a reasonable assumption because soils erode to a far greater extent in high slope areas where they are carried away by runoff and wind.

## TOPOGRAPHY

Percent slope was determined by evaluating the Stafford County topographic map (U.S. Geological Survey, 1974). Steep slopes form the flood boundary for parts of Aquia Creek, Accokeek Creek, Potomac Creek, Long Branch, and the Rappahannock River. Extremely flat areas can also be found, particularly in some river overbank areas and around Widewater Beach.

## IMPACT OF THE VADOSE ZONE MEDIA

A number of resources were used to derive the vadose zone media in the Piedmont, including Aller, et al. (1987), Mixon (1990), Pavlides (1976), Powell and Abe (1985), and Wagner, et al. (1988). The vadose zone media in the Piedmont is predominantly sand and gravel with significant silt and clay (rating of 5). In high slope areas (where slope is greater than or equal to 12 percent), the vadose zone media is assumed to be metamorphic/igneous (rating of 4) since high erosion leaves exposed bedrock. The vadose zone media in the Coastal Plain was derived from Aller, et al. (1987), Meng and Harsh (1988), and Weston (1976). The vadose zone in the Coastal Plain is also sand and gravel with significant silt and clay, although there is far more sand in the Coastal Plain vadose zone than in the Piedmont. A rating of 7 was used for the Potomac Aquifer, and a rating of 6 was used for the Aquia and Chickahominy/Piney Point Aquifers. As with the aquifer media rating, this difference accounts for the higher attenuation (lower hydraulic conductivity) in the Potomac, which could be caused by the size and orientation of clay lenses in the vadose zone.

## HYDRAULIC CONDUCTIVITY

Hydraulic conductivity was derived from Harsh and Laczniak (1990) and Hamilton and Larson (1986). Hydraulic conductivity in the Piedmont is approximately 50 gallons per day per square foot (gpd/ft$^2$), corresponding to a rating of 1. In the Coastal Plain, the Aquia Aquifer has a hydraulic conductivity of approximately 110 gpd/ft$^2$ (rating of 2), the Chickahominy/Piney Point Aquifer has a hydraulic conductivity of approximately 90 gpd/ft$^2$ (rating of 1), and the Potomac Aquifer has a hydraulic conductivity of approximately 400 gpd/ft$^2$ (rating of 4). These values are not site-specific since conductivity can vary substantially within any of the aquifers present. Rather, these values are typical of the aquifers and are derived from very limited well pump tests and modeling studies.

## SECTION 5

## RESULTS

### STUDY SUMMARY

The ratings discussed in Section 4 form the basis for the composite DRASTIC index. The sum over the seven DRASTIC parameters of the product of the rating and the weight determine the index value as described in Section 2. These values were determined for each of the grid cells, as shown in Figure 8, and range from 90 to 179. In the Piedmont, the DRASTIC Index values generally range from 100 to 130, while in the Coastal Plain, values range from 130 to 179. The fall line separates the two regions and is easily distinguished by the sharp break in DRASTIC values between the Piedmont and the Coastal Plain. The Coastal Plain has higher composite DRASTIC values, which is associated with greater pollution potential, because the sand and gravel in the soil, vadose zone, and aquifer media facilitate chemical transport as opposed to the metamorphic/igneous formations of the Piedmont. Within the Coastal Plain, the DRASTIC Index values are generally lower in the Aquia and Chickahominy/Piney Point Aquifers than in the Potomac Aquifer because of the increased attenuation provided by the aquifer and vadose zone media in these two aquifers. These results match very well with general DRASTIC ratings developed in the Prince William County study (Wagner, et al., 1988) of 111 to 119 in the Piedmont and 127 to 182 in the Coastal Plain.

### SPREADSHEETS

Spreadsheets were developed to store grid cell data and determine ratings. The spreadsheets are presented in Appendix A. The first two columns specify the Virginia grid location of the center of each grid cell. The third and fourth columns specify the depth to ground water and corresponding **D** rating for the grid cell, respectively. The regional aquifer system - Piedmont (P) or Coastal Plain (C) - is included in column five. Column six specifies the net recharge rating, **R**. Column seven includes the specific aquifer - Piedmont, or, within the Coastal Plain, the Aquia, Chickahominy/Piney Point (CH/P), or Potomac Aquifer. The aquifer media rating, **A**, and the soil media rating, **S**, are specified in columns eight and nine, respectively. The mean percent slope and corresponding topography rating, **T**, are included in columns ten and eleven, respectively. The impact of the vadose zone media rating, **I**, is specified in column twelve. The hydraulic conductivity (gpd/$ft^2$) and corresponding rating, **C**, are specified in columns thirteen and fourteen, respectively. The final column presents the composite DRASTIC Index for the individual grid cells.

### SURFER

**SURFER** (Golden Software, Inc., 1987) is a powerful software tool which can create two- and three-dimensional graphics. **SURFER** was used to assist in interpreting data collected for this project. Much of the well data downloaded from the EPA STORET data base were mapped in various ways to assist in data collection. **SURFER** was used to map the locations of the wells and the observations (such as depth to water) at the wells. **SURFER** was also used to create surface (topographic) maps of depth to water to assist in data interpolation. The figures presented in Appendix B were created with **SURFER**, and are examples of mapping observations (ratings) at sampling locations (grid cells). Engineering judgment and literature review, along with the graphics created with **SURFER**, contributed to the development of the spreadsheets previously described.

## MAPPING DRASTIC RESULTS

The following presents the methodology for preparing the Ground Water Pollution Potential Map of Stafford County. The DRASTIC Index values were grouped into 3 ranges: less than 125; 125 to 149; and 150 and greater. These three ranges correspond to low, moderate, and high relative ground water pollution potential, respectively. Three ranges were chosen to enhance the map's utility as a general policy tool for ground water protection. Each of these ranges has an associated shading pattern. The grid cells were shaded according to the range within which their associated index values fall. Shading boundaries were smoothed to more accurately and aesthetically present the physical situation. The County boundary was also mapped.

The index values themselves are not included on the map since the shading indicates a general range. The reason these values are not mapped is that the methodology is qualitative; quantitative comparisons of index values can lead to misapplication of results. Grid cell tick marks and the corresponding Virginia grid location are included on the four sides of the map, which was drafted on reproducible mylar. The map was created on a 1:36,000 scale, which directly overlays on the Stafford County planning maps.

## SECTION 6

## GROUND WATER RESOURCE PROTECTION OVERLAY AREAS

The goal of this Ground Water Resource Protection Program is to identify the relative ground water pollution potential of land areas throughout the County and to provide guidelines for protecting ground water quality as development occurs. In order for the County to protect the quantity and quality of its ground water resources, an overlay scheme is proposed. The purpose of the overlay is not to place undo restrictions on future development, but rather to support land use decision making by focusing data gathering and analysis efforts in those regions which are potentially most susceptible to ground water contamination. A further objective is to collect well data countywide to support the evaluation of ground water resources as a possible supplement in responding to projected water supply shortfalls.

Through the application of the DRASTIC methodology, ground water pollution potential has been evaluated throughout the County. The resulting pollution potential (DRASTIC) index values have been grouped into three categories which correspond to areas of low, moderate, and high susceptibility to ground water pollution. These categories form the basis for the ground water protection overlay guidelines. The guidelines detailed below account for the ground water contamination risks associated with certain land uses and how these risks must be managed according to the ground water pollution potential of a given area. However, developments should analyze their impact relative to each individual DRASTIC parameter as well as implementing strategies that address the overall recommendations of the appropriate overlay area.

### GUIDELINES FOR LOW GROUND WATER POLLUTION POTENTIAL AREAS

Those areas identified as being the least susceptible to ground water pollution are generally located west of I-95 in the Piedmont Physiographic Region and impacting the Piedmont Aquifer. The depth to water is generally greater than 15 feet with a net recharge of 7-10 inches per year. The aquifer media is generally weathered metamorphic and igneous rock with the predominant soil media being clay and sandy loam. These soil types relate to a low hydraulic conductivity as they do not have a great ability to transmit water to the water table. However, some isolated gravel areas are present that would be capable of effectively transmitting water to the water table. The percent slope varies greatly throughout this overlay area. The guidelines for areas of low susceptibility to ground water pollution are as follows:

- Discourage the location of landfills and dumps unless they are developed in such a manner as to ensure the protection of ground water resources.

- Discourage the location of industrial waste disposal sites.

- Encourage the replacement of older underground storage tanks in a manner and timeliness that is not detrimental to the economic potential of small business owners.

- Recommend mining operations utilize stormwater Best Management Practices (BMPs) to prevent ground water degradation.

- Recommend that the storage of petroleum, fertilizer, pesticide, and other toxic substances occur only in containers specifically designed and maintained for these activities.

- Provide educational opportunities for the storage and application of pesticides, fertilizers, and other toxic materials for agricultural, commercial, industrial, and golf course use.

- Establish a well monitoring program to collect data from community residential wells and commercial and industrial wells on the following parameters:

    - average yield, elevation of water table, and monitoring results for: silica, iron, manganese, calcium, magnesium, sodium, potassium, bicarbonate, sulphate, chloride, fluoride, nitrate, total dissolved solids, specific conductance (micromhos), pH, fecal coliform bacteria, hardness as $CaCO_3$;

    - for new wells, include the following parameters: static water level (unpumped level-measured), stabilized measured pumping water level, stabilized yield, time to stabilized yield, water zones.

    - for commercial and industrial wells, include pollutants associated with the particular land use.

## GUIDELINES FOR MODERATE GROUND WATER POLLUTION POTENTIAL AREAS

Those areas identified as being moderately susceptible to ground water pollution are generally located in the central and southeastern portions of the County in the Coastal Plain Physiographic Region and impacting the Aquia and Chickahominy/Piney Point Aquifers. The depth to water is greater than 15 feet with a net recharge of greater than 10 inches per year. The aquifer media is generally sand and gravel with soils varying from sandy loams to gravel. In general, these soil types will transmit water at a higher rate (moderate hydraulic conductivity) than the areas of low pollution potential. The percent slope varies greatly throughout the overlay area. Additional guidelines are recommended for areas of moderate ground water pollution potential as follows:

- All guidelines listed under low pollution potential areas.
- Encourage the use and continued maintenance of BMPs for all land uses designed in such a manner so that outlets are not directing infiltration at points were ground water contamination could occur.
- Prevent runoff from impervious areas to be directed at points where ground water contamination could occur.
- Provide vegetated buffers for runoff from impervious.
- Encourage clustering of developments with the preservation of large undisturbed open areas.
- Preserve existing vegetation during site development to increase the filtration of pollutants prior to water entering the soil.
- Regulate the concentration of animals in order to provide additional filtration of nutrient-rich runoff that may degrade ground water quality.
- Encourage developments to disturb only the area necessary for the desired use and limit the amount of runoff from the site.
- Improve land management practices which encourage the use of alternative materials, including the use of non-toxic materials, that support infiltration on the developed site in the appropriate area.
- Encourage public sewer connections for all land uses except:
    - recreational (active and passive);
    - agricultural;
    - low intensity commercial (local markets) and industrial (warehouse); and
    - low density residential (>1 acre lots).
- Encourage the continued periodic maintenance of individual sewage disposal systems to provide for maximum treatment of wastewater.
- Design public sewage treatment systems using best available technology that provides for maximum treatment of wastewater.
- Provide educational opportunities for the storage and application of pesticides, fertilizers, and other toxic materials for all land uses.

**GUIDELINES FOR HIGH GROUND WATER POLLUTION POTENTIAL AREAS**

Those areas identified as being the most susceptible to ground water pollution are generally located along the fall line. The band of land area runs parallel to and inclusive of I-95 and Jefferson Davis Highway (US-1) through the County. In addition, the land area which would include the Aquia Harbor subdivision and the entire Widewater area from I-95 to the peninsula is identified as a high ground water pollution potential area. This area generally relates to the Coastal Plain Physiographic Region impacting the Potomac Aquifer. The depth to water varies ranging from less than 5 feet to 30 feet with a net recharge of greater than 10 inches per year. The aquifer media is sand and gravel. This soil type relates to a high hydraulic conductivity which provides for rapid transmission of water (and thus pollutants) to the water table. The percent slope varies throughout the overlay area. Additional guidelines are recommended for areas of high ground water pollution potential as follows:

- All guidelines listed in the low and moderate pollution potential areas.
- Discourage the establishment of automobile junkyards and salvage operations.
- Discourage the establishment of quarries, gravel pits, and other surface mining operations.
- Discourage the development of landfills and dumps.
- Discourage the establishment of confined feedlots for livestock.
- Develop more stringent controls for wastewater spray irrigation operations.
- Develop more stringent controls for underground and above ground storage of petroleum, pesticide, fertilizer, and other toxic materials.
- Encourage public sewer connections for all land uses except:
    - recreational (active and passive);
    - agricultural; and
    - very low density residential (>3 acre lots).

## GLOSSARY

Aquifer - A waterbearing stratum of rock, sand, or gravel that has the property of transmission.

Attenuate - To reduce the severity of (concentration and/or volume of pollutant, in this case).

Clastic - Made of fragments of pre-existing rocks.

Dilution - The action of diminishing in concentration.

Dispersion - The process of dissipating.

Hydraulic Conductivity - The ability of the aquifer materials to transmit water.

Igneous - Rock formed by the solidification of molten magma.

Metamorphic - Rock which has been changed by pressure, heat, and water, resulting in a more compact and more highly crystalline condition.

Net Recharge - The amount of precipitation which infiltrates through to the water table.

Tortuous - Marked by repeated twists, bends, or turns.

Vadose Zone - The zone above the water table which is saturated or discontinuously saturated.

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# APPENDIX A

# DRASTIC DATA BASE

STAFFORD COUNTY GROUNDWATER PROTECTION STUDY
SOUTH OF VA 269500
OCTOBER 18,1991

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2317000 | 213500 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2320500 | 213500 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 140 |
| 2324000 | 213500 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2327500 | 213500 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2331000 | 213500 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2334500 | 213500 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2310000 | 217000 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2313500 | 217000 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 140 |
| 2317000 | 217000 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 140 |
| 2320500 | 217000 | 50 | 5 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 140 |
| 2324000 | 217000 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2327500 | 217000 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 140 |
| 2331000 | 217000 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2334500 | 217000 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2306500 | 220500 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2310000 | 220500 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2313500 | 220500 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 140 |
| 2317000 | 220500 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2320500 | 220500 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2324000 | 220500 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2327500 | 220500 | 20 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2331000 | 220500 | 20 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2306500 | 224000 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2310000 | 224000 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2313500 | 224000 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2317000 | 224000 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2320500 | 224000 | 25 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2324000 | 224000 | 20 | 7 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 146 |
| 2327500 | 224000 | 20 | 7 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 146 |
| 2331000 | 224000 | 20 | 7 | C | 9 | CH/P | 7 | 6 | 9 | 5 | 6 | 90 | 1 | 142 |
| 2303000 | 227500 | 30 | 7 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 164 |
| 2306500 | 227500 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2310000 | 227500 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2313500 | 227500 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2317000 | 227500 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2320500 | 227500 | 30 | 7 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 146 |
| 2324000 | 227500 | 15 | 9 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 156 |
| 2327500 | 227500 | 20 | 7 | C | 9 | CH/P | 7 | 6 | 9 | 5 | 6 | 90 | 1 | 142 |
| 2331000 | 227500 | 20 | 7 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 146 |
| 2299500 | 231000 | 50 | 5 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 153 |
| 2303000 | 231000 | 60 | 3 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 143 |
| 2306500 | 231000 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 140 |
| 2310000 | 231000 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2313500 | 231000 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2317000 | 231000 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 145 |
| 2320500 | 231000 | 25 | 7 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 146 |
| 2324000 | 231000 | 20 | 7 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 146 |
| 2327500 | 231000 | 20 | 7 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 146 |

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2331000 | 231000 | 40 | 5 | C | 9 | CH/P | 7 | 6 | 9 | 5 | 6 | 90 | 1 | 132 |
| 2278500 | 234500 | 25 | 7 | P | 3 | PIEDMONT | 3 | 10 | 18 | 1 | 4 | 50 | 1 | 100 |
| 2299500 | 234500 | 70 | 3 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 139 |
| 2303000 | 234500 | 40 | 5 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 153 |
| 2306500 | 234500 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2310000 | 234500 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2313500 | 234500 | 55 | 3 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 125 |
| 2317000 | 234500 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2320500 | 234500 | 45 | 5 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 136 |
| 2324000 | 234500 | 25 | 7 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 146 |
| 2327500 | 234500 | 25 | 7 | C | 9 | CH/P | 7 | 6 | 9 | 5 | 6 | 90 | 1 | 142 |
| 2331000 | 234500 | 50 | 5 | C | 9 | CH/P | 7 | 6 | 9 | 5 | 6 | 90 | 1 | 132 |
| 2334500 | 234500 | 50 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2275000 | 238000 | 25 | 7 | P | 3 | PIEDMONT | 3 | 10 | 18 | 1 | 4 | 50 | 1 | 100 |
| 2278500 | 238000 | 25 | 7 | P | 3 | PIEDMONT | 3 | 10 | 18 | 1 | 4 | 50 | 1 | 100 |
| 2292500 | 238000 | 70 | 3 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 104 |
| 2296000 | 238000 | 70 | 3 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 143 |
| 2299500 | 238000 | 50 | 5 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 154 |
| 2303000 | 238000 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2306500 | 238000 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2310000 | 238000 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2313500 | 238000 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2317000 | 238000 | 40 | 5 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 136 |
| 2320500 | 238000 | 25 | 7 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 146 |
| 2324000 | 238000 | 15 | 9 | C | 9 | CH/P | 7 | 6 | 9 | 5 | 6 | 90 | 1 | 152 |
| 2327500 | 238000 | 25 | 7 | C | 9 | CH/P | 7 | 10 | 15 | 3 | 6 | 90 | 1 | 148 |
| 2331000 | 238000 | 35 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2334500 | 238000 | 50 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2271500 | 241500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2275000 | 241500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2278500 | 241500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2282000 | 241500 | 25 | 7 | P | 3 | PIEDMONT | 3 | 10 | 18 | 1 | 4 | 50 | 1 | 100 |
| 2285500 | 241500 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2289000 | 241500 | 45 | 5 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 114 |
| 2292500 | 241500 | 65 | 3 | P | 8 | PIEDMONT | 4 | 6 | 4 | 9 | 5 | 50 | 1 | 108 |
| 2296000 | 241500 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2299500 | 241500 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2303000 | 241500 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 163 |
| 2306500 | 241500 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2310000 | 241500 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2313500 | 241500 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2317000 | 241500 | 45 | 5 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 136 |
| 2320500 | 241500 | 25 | 7 | C | 9 | CH/P | 7 | 6 | 9 | 5 | 6 | 90 | 1 | 142 |
| 2324000 | 241500 | 35 | 5 | C | 9 | CH/P | 7 | 10 | 15 | 3 | 6 | 90 | 1 | 138 |
| 2327500 | 241500 | 30 | 7 | C | 9 | CH/P | 7 | 10 | 15 | 3 | 6 | 90 | 1 | 148 |
| 2331000 | 241500 | 25 | 7 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 151 |
| 2334500 | 241500 | 55 | 3 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 129 |
| 2257500 | 245000 | 35 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2261000 | 245000 | 35 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2268000 | 245000 | 35 | 5 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 114 |
| 2271500 | 245000 | 35 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2275000 | 245000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 4 | 9 | 5 | 50 | 1 | 128 |
| 2278500 | 245000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2282000 | 245000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2285500 | 245000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2289000 | 245000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 4 | 9 | 5 | 50 | 1 | 128 |
| 2292500 | 245000 | 60 | 3 | P | 8 | PIEDMONT | 4 | 6 | 4 | 9 | 5 | 50 | 1 | 108 |
| 2296000 | 245000 | 50 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2299500 | 245000 | 40 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2303000 | 245000 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2306500 | 245000 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2310000 | 245000 | 50 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2313500 | 245000 | 60 | 3 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 125 |
| 2317000 | 245000 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2320500 | 245000 | 30 | 7 | C | 9 | CH/P | 7 | 10 | 15 | 3 | 6 | 90 | 1 | 148 |
| 2324000 | 245000 | 40 | 5 | C | 9 | CH/P | 7 | 10 | 15 | 3 | 6 | 90 | 1 | 138 |
| 2327500 | 245000 | 25 | 7 | C | 9 | CH/P | 7 | 10 | 15 | 3 | 6 | 90 | 1 | 148 |
| 2331000 | 245000 | 25 | 7 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 151 |
| 2334500 | 245000 | 30 | 7 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 151 |
| 2257500 | 248500 | 25 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2261000 | 248500 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2264500 | 248500 | 35 | 5 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 112 |
| 2268000 | 248500 | 40 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2271500 | 248500 | 45 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2275000 | 248500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2278500 | 248500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2282000 | 248500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2285500 | 248500 | 15 | 9 | P | 8 | PIEDMONT | 4 | 6 | 4 | 9 | 5 | 50 | 1 | 138 |
| 2289000 | 248500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 6 | 1 | 10 | 5 | 50 | 1 | 129 |
| 2292500 | 248500 | 45 | 5 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 114 |
| 2296000 | 248500 | 45 | 5 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 114 |
| 2299500 | 248500 | 50 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2303000 | 248500 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2306500 | 248500 | 35 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2310000 | 248500 | 35 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2313500 | 248500 | 25 | 7 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 151 |
| 2317000 | 248500 | 25 | 7 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 151 |
| 2320500 | 248500 | 25 | 7 | C | 9 | CH/P | 7 | 10 | 15 | 3 | 6 | 90 | 1 | 148 |
| 2324000 | 248500 | 25 | 7 | C | 9 | CH/P | 7 | 6 | 4 | 9 | 6 | 90 | 1 | 146 |
| 2327500 | 248500 | 25 | 7 | C | 9 | CH/P | 7 | 6 | 1 | 10 | 6 | 90 | 1 | 147 |
| 2331000 | 248500 | 25 | 7 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 150 |
| 2334500 | 248500 | 25 | 7 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 150 |
| 2257500 | 252000 | 25 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2261000 | 252000 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2264500 | 252000 | 35 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2268000 | 252000 | 35 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2271500 | 252000 | 35 | 5 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 114 |
| 2275000 | 252000 | 35 | 5 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 114 |
| 2278500 | 252000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2282000 | 252000 | 15 | 9 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 134 |
| 2285500 | 252000 | 15 | 9 | P | 8 | PIEDMONT | 4 | 6 | 4 | 9 | 5 | 50 | 1 | 138 |
| 2289000 | 252000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2292500 | 252000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 4 | 9 | 5 | 50 | 1 | 128 |
| 2296000 | 252000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 4 | 9 | 5 | 50 | 1 | 128 |
| 2299500 | 252000 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2303000 | 252000 | 30 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2306500 | 252000 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2310000 | 252000 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2313500 | 252000 | 50 | 5 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 139 |
| 2317000 | 252000 | 5 | 10 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 165 |
| 2320500 | 252000 | 5 | 10 | C | 9 | CH/P | 7 | 6 | 1 | 10 | 6 | 90 | 1 | 162 |
| 2324000 | 252000 | 5 | 10 | C | 9 | CH/P | 7 | 6 | 9 | 5 | 6 | 90 | 1 | 157 |
| 2327500 | 252000 | 30 | 7 | C | 9 | CH/P | 7 | 10 | 18 | 1 | 6 | 90 | 1 | 146 |
| 2331000 | 252000 | 30 | 7 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 149 |
| 2334500 | 252000 | 30 | 7 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 149 |
| 2338000 | 252000 | 35 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2341500 | 252000 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 145 |
| 2345000 | 252000 | 25 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2254000 | 255500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2257500 | 255500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2261000 | 255500 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2264500 | 255500 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2268000 | 255500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2271500 | 255500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2275000 | 255500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2278500 | 255500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2282000 | 255500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2285500 | 255500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2289000 | 255500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2292500 | 255500 | 35 | 5 | P | 8 | PIEDMONT | 4 | 6 | 4 | 9 | 5 | 50 | 1 | 118 |
| 2296000 | 255500 | 40 | 5 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 153 |
| 2299500 | 255500 | 30 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2303000 | 255500 | 30 | 7 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 165 |
| 2306500 | 255500 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2310000 | 255500 | 5 | 10 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 165 |
| 2313500 | 255500 | 50 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2317000 | 255500 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2320500 | 255500 | 40 | 5 | C | 9 | CH/P | 7 | 10 | 15 | 3 | 6 | 90 | 1 | 138 |
| 2324000 | 255500 | 40 | 5 | C | 9 | CH/P | 7 | 10 | 18 | 1 | 6 | 90 | 1 | 136 |
| 2327500 | 255500 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2331000 | 255500 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2334500 | 255500 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2338000 | 255500 | 45 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2341500 | 255500 | 5 | 10 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 164 |
| 2345000 | 255500 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 149 |
| 2254000 | 259000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2257500 | 259000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2261000 | 259000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2264500 | 259000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2268000 | 259000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2271500 | 259000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 259000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2278500 | 259000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2282000 | 259000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2285500 | 259000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2289000 | 259000 | 35 | 5 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 114 |
| 2292500 | 259000 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2296000 | 259000 | 45 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2299500 | 259000 | 45 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2303000 | 259000 | 5 | 10 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 178 |
| 2306500 | 259000 | 5 | 10 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 164 |
| 2310000 | 259000 | 45 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2313500 | 259000 | 45 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2317000 | 259000 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2320500 | 259000 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2324000 | 259000 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2327500 | 259000 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2331000 | 259000 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2334500 | 259000 | 5 | 10 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 164 |
| 2338000 | 259000 | 5 | 10 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 164 |
| 2341500 | 259000 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2345000 | 259000 | 30 | 7 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 151 |
| 2250500 | 262500 | 25 | 7 | P | 3 | PIEDMONT | 3 | 10 | 18 | 1 | 4 | 50 | 1 | 100 |
| 2254000 | 262500 | 25 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2257500 | 262500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2261000 | 262500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2264500 | 262500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2268000 | 262500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2271500 | 262500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 262500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 1 | 10 | 5 | 50 | 1 | 123 |
| 2278500 | 262500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2282000 | 262500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2285500 | 262500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2289000 | 262500 | 40 | 5 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 114 |
| 2292500 | 262500 | 45 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2296000 | 262500 | 5 | 10 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 178 |
| 2299500 | 262500 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2303000 | 262500 | 20 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2306500 | 262500 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2310000 | 262500 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2313500 | 262500 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2317000 | 262500 | 25 | 7 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 145 |
| 2320500 | 262500 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 145 |
| 2324000 | 262500 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2327500 | 262500 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2331000 | 262500 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2334500 | 262500 | 45 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2338000 | 262500 | 50 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2341500 | 262500 | 35 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2247000 | 266000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2250500 | 266000 | 25 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2254000 | 266000 | 25 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2257500 | 266000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2261000 | 266000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2264500 | 266000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2268000 | 266000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2271500 | 266000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2275000 | 266000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2278500 | 266000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2282000 | 266000 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2285500 | 266000 | 35 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2289000 | 266000 | 40 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2292500 | 266000 | 45 | 5 | P | 3 | PIEDMONT | 3 | 10 | 18 | 1 | 4 | 50 | 1 | 90 |
| 2296000 | 266000 | 45 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2299500 | 266000 | 35 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2303000 | 266000 | 30 | 7 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 165 |
| 2306500 | 266000 | 30 | 7 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 145 |
| 2310000 | 266000 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2313500 | 266000 | 35 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2317000 | 266000 | 30 | 7 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 151 |
| 2320500 | 266000 | 45 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2324000 | 266000 | 35 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2327500 | 266000 | 35 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2331000 | 266000 | 35 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2334500 | 266000 | 25 | 7 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 149 |
| 2338000 | 266000 | 25 | 7 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 150 |

STAFFORD COUNTY GROUNDWATER PROTECTION STUDY
NORTH OF VA 269500
OCTOBER 18, 1991

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A AQ. MEDIA | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2247000 | 269500 | 20 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2250500 | 269500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2254000 | 269500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2257500 | 269500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2261000 | 269500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2264500 | 269500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2268000 | 269500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2271500 | 269500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 269500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2278500 | 269500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2282000 | 269500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2285500 | 269500 | 35 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2289000 | 269500 | 45 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2292500 | 269500 | 50 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2296000 | 269500 | 50 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2299500 | 269500 | 45 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2303000 | 269500 | 40 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2306500 | 269500 | 40 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2310000 | 269500 | 40 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |
| 2313500 | 269500 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2317000 | 269500 | 40 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2320500 | 269500 | 30 | 7 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 151 |
| 2324000 | 269500 | 30 | 7 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 149 |
| 2327500 | 269500 | 25 | 7 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 149 |
| 2331000 | 269500 | 20 | 7 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 149 |
| 2334500 | 269500 | 20 | 7 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 151 |
| 2338000 | 269500 | 20 | 7 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 150 |
| 2341500 | 269500 | 20 | 7 | C | 9 | AQUIA | 7 | 6 | 1 | 10 | 6 | 110 | 2 | 150 |
| 2247000 | 273000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2250500 | 273000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2254000 | 273000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2257500 | 273000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2261000 | 273000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2264500 | 273000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2268000 | 273000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2271500 | 273000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2275000 | 273000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2278500 | 273000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2282000 | 273000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2285500 | 273000 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2289000 | 273000 | 40 | 5 | P | 3 | PIEDMONT | 3 | 10 | 18 | 1 | 4 | 50 | 1 | 90 |
| 2292500 | 273000 | 45 | 5 | P | 3 | PIEDMONT | 3 | 10 | 18 | 1 | 4 | 50 | 1 | 90 |
| 2296000 | 273000 | 40 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2299500 | 273000 | 40 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2303000 | 273000 | 55 | 3 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 139 |
| 2306500 | 273000 | 65 | 3 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 139 |
| 2310000 | 273000 | 65 | 3 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 139 |
| 2313500 | 273000 | 50 | 5 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 135 |

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2317000 | 273000 | 55 | 3 | C | 9 | AQUIA | 7 | 6 | 9 | 5 | 6 | 110 | 2 | 125 |
| 2320500 | 273000 | 45 | 5 | C | 9 | AQUIA | 7 | 10 | 15 | 3 | 6 | 110 | 2 | 141 |
| 2324000 | 273000 | 45 | 5 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 139 |
| 2327500 | 273000 | 20 | 7 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 149 |
| 2331000 | 273000 | 15 | 9 | C | 9 | AQUIA | 7 | 10 | 18 | 1 | 6 | 110 | 2 | 159 |
| 2334500 | 273000 | 15 | 9 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 159 |
| 2338000 | 273000 | 15 | 9 | C | 9 | AQUIA | 7 | 6 | 4 | 9 | 6 | 110 | 2 | 159 |
| 2247000 | 276500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2250500 | 276500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2254000 | 276500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2257500 | 276500 | 35 | 5 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 108 |
| 2261000 | 276500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2264500 | 276500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2268000 | 276500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2271500 | 276500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 276500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2278500 | 276500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2282000 | 276500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2285500 | 276500 | 40 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2289000 | 276500 | 35 | 5 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 104 |
| 2292500 | 276500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2296000 | 276500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 6 | 9 | 5 | 5 | 50 | 1 | 124 |
| 2299500 | 276500 | 30 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2303000 | 276500 | 50 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2306500 | 276500 | 60 | 3 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 139 |
| 2310000 | 276500 | 60 | 3 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 139 |
| 2313500 | 276500 | 45 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2317000 | 276500 | 40 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2320500 | 276500 | 40 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2324000 | 276500 | 70 | 3 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 145 |
| 2327500 | 276500 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2331000 | 276500 | 15 | 9 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 174 |
| 2334500 | 276500 | 20 | 7 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 164 |
| 2338000 | 276500 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 164 |
| 2250500 | 280000 | 20 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2254000 | 280000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2257500 | 280000 | 35 | 5 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 112 |
| 2261000 | 280000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2264500 | 280000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2268000 | 280000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2271500 | 280000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 280000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2278500 | 280000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2282000 | 280000 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2285500 | 280000 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2289000 | 280000 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2292500 | 280000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2296000 | 280000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2299500 | 280000 | 30 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2303000 | 280000 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2306500 | 280000 | 40 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2310000 | 280000 | 45 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2313500 | 280000 | 35 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2317000 | 280000 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2320500 | 280000 | 40 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2324000 | 280000 | 60 | 3 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 145 |
| 2327500 | 280000 | 20 | 7 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 163 |
| 2331000 | 280000 | 20 | 7 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 164 |
| 2334500 | 280000 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 164 |
| 2338000 | 280000 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 164 |
| 2247000 | 283500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2250500 | 283500 | 25 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2254000 | 283500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2257500 | 283500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2261000 | 283500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2264500 | 283500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2268000 | 283500 | 35 | 5 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 112 |
| 2271500 | 283500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 283500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2278500 | 283500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2282000 | 283500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2285500 | 283500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2289000 | 283500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2292500 | 283500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2296000 | 283500 | 25 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2299500 | 283500 | 35 | 5 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 108 |
| 2303000 | 283500 | 40 | 5 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 108 |
| 2306500 | 283500 | 40 | 5 | C | 9 | POTOMAC | 8 | 3 | 9 | 5 | 7 | 400 | 4 | 143 |
| 2310000 | 283500 | 40 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2313500 | 283500 | 20 | 7 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 165 |
| 2317000 | 283500 | 25 | 7 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 165 |
| 2320500 | 283500 | 30 | 7 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 163 |
| 2324000 | 283500 | 5 | 10 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 174 |
| 2327500 | 283500 | 15 | 9 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 173 |
| 2331000 | 283500 | 20 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2334500 | 283500 | 20 | 7 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 164 |
| 2338000 | 283500 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 164 |
| 2250500 | 287000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2254000 | 287000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2257500 | 287000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2261000 | 287000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2264500 | 287000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2268000 | 287000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2271500 | 287000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 287000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2278500 | 287000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2282000 | 287000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2285500 | 287000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2289000 | 287000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2292500 | 287000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2296000 | 287000 | 15 | 9 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 128 |
| 2299500 | 287000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2303000 | 287000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2306500 | 287000 | 35 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2310000 | 287000 | 40 | 5 | C | 9 | POTOMAC | 8 | 3 | 9 | 5 | 7 | 400 | 4 | 143 |
| 2313500 | 287000 | 30 | 7 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 163 |
| 2317000 | 287000 | 20 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2320500 | 287000 | 5 | 10 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 178 |
| 2324000 | 287000 | 15 | 9 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 173 |
| 2327500 | 287000 | 20 | 7 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 163 |
| 2331000 | 287000 | 20 | 7 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 163 |
| 2334500 | 287000 | 15 | 9 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 175 |
| 2247000 | 290500 | 35 | 5 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 108 |
| 2250500 | 290500 | 35 | 5 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 108 |
| 2254000 | 290500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2257500 | 290500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2261000 | 290500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2264500 | 290500 | 15 | 9 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 132 |
| 2268000 | 290500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2271500 | 290500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2275000 | 290500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2278500 | 290500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2282000 | 290500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2285500 | 290500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2289000 | 290500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2292500 | 290500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2296000 | 290500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2299500 | 290500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2303000 | 290500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2306500 | 290500 | 25 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2310000 | 290500 | 35 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2313500 | 290500 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2317000 | 290500 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2320500 | 290500 | 5 | 10 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 179 |
| 2324000 | 290500 | 20 | 7 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 163 |
| 2327500 | 290500 | 35 | 5 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 153 |
| 2331000 | 290500 | 20 | 7 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 163 |
| 2334500 | 290500 | 20 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2338000 | 290500 | 20 | 7 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 163 |
| 2250500 | 294000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2254000 | 294000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2257500 | 294000 | 10 | 9 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 128 |
| 2261000 | 294000 | 15 | 9 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 128 |
| 2264500 | 294000 | 15 | 9 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 132 |
| 2268000 | 294000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2271500 | 294000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 294000 | 15 | 9 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 132 |
| 2278500 | 294000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2282000 | 294000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2285500 | 294000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2289000 | 294000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2292500 | 294000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2296000 | 294000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2299500 | 294000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2303000 | 294000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2306500 | 294000 | 20 | 7 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 114 |
| 2310000 | 294000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2313500 | 294000 | 35 | 5 | C | 9 | POTOMAC | 8 | 3 | 9 | 5 | 7 | 400 | 4 | 143 |
| 2317000 | 294000 | 5 | 10 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 178 |
| 2320500 | 294000 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2324000 | 294000 | 20 | 7 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 165 |
| 2327500 | 294000 | 25 | 7 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 163 |
| 2331000 | 294000 | 20 | 7 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 163 |
| 2334500 | 294000 | 25 | 7 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 165 |
| 2338000 | 294000 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 163 |
| 2254000 | 297500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2257500 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2261000 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2264500 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2268000 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2271500 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2278500 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2282000 | 297500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2285500 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2289000 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2292500 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2296000 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2299500 | 297500 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2303000 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2306500 | 297500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2310000 | 297500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2313500 | 297500 | 35 | 5 | C | 9 | POTOMAC | 8 | 3 | 9 | 5 | 7 | 400 | 4 | 143 |
| 2317000 | 297500 | 5 | 10 | C | 9 | POTOMAC | 8 | 6 | 1 | 10 | 7 | 400 | 4 | 179 |
| 2320500 | 297500 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2324000 | 297500 | 35 | 5 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 149 |
| 2327500 | 297500 | 15 | 9 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 175 |
| 2331000 | 297500 | 15 | 9 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 173 |
| 2334500 | 297500 | 15 | 9 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 173 |
| 2338000 | 297500 | 20 | 7 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 165 |
| 2257500 | 301000 | 30 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2261000 | 301000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2264500 | 301000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2268000 | 301000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2271500 | 301000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 301000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2278500 | 301000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2282000 | 301000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2285500 | 301000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2289000 | 301000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2292500 | 301000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2296000 | 301000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2299500 | 301000 | 35 | 5 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 108 |
| 2303000 | 301000 | 45 | 5 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 108 |

| VA GRID E-W | VA GRID N-S | DEPTH | D | REGIONAL AQUIFER SYSTEM | R RECHARGE RATING | AQUIFER | A | S SOIL | MEAN SLOPE | T | I IMP. VADOSE | HYDRAULIC CONDUCT. | C | DRASTIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2306500 | 301000 | 55 | 3 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 98 |
| 2310000 | 301000 | 60 | 3 | P | 6 | PIEDMONT | 3 | 10 | 15 | 3 | 4 | 50 | 1 | 94 |
| 2313500 | 301000 | 55 | 3 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 98 |
| 2317000 | 301000 | 50 | 5 | C | 9 | POTOMAC | 8 | 3 | 9 | 5 | 7 | 400 | 4 | 143 |
| 2320500 | 301000 | 35 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2324000 | 301000 | 45 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2327500 | 301000 | 45 | 5 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 155 |
| 2331000 | 301000 | 15 | 9 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 175 |
| 2334500 | 301000 | 15 | 9 | C | 9 | POTOMAC | 8 | 10 | 18 | 1 | 7 | 400 | 4 | 173 |
| 2261000 | 304500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2264500 | 304500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2268000 | 304500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2271500 | 304500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 304500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2278500 | 304500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2282000 | 304500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2285500 | 304500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2320500 | 304500 | 30 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2324000 | 304500 | 30 | 7 | C | 9 | POTOMAC | 8 | 6 | 9 | 5 | 7 | 400 | 4 | 159 |
| 2264500 | 308000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2268000 | 308000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2271500 | 308000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2275000 | 308000 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2320500 | 308000 | 25 | 7 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 165 |
| 2324000 | 308000 | 25 | 7 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 165 |
| 2264500 | 311500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2268000 | 311500 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 9 | 5 | 5 | 50 | 1 | 118 |
| 2271500 | 311500 | 20 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |
| 2320500 | 311500 | 25 | 7 | C | 9 | POTOMAC | 8 | 10 | 15 | 3 | 7 | 400 | 4 | 165 |
| 2324000 | 311500 | 25 | 7 | C | 9 | POTOMAC | 8 | 6 | 4 | 9 | 7 | 400 | 4 | 163 |
| 2268000 | 315000 | 25 | 7 | P | 8 | PIEDMONT | 4 | 3 | 4 | 9 | 5 | 50 | 1 | 122 |

# APPENDIX B

# GEOGRAPHIC DISTRIBUTION OF DRASTIC PARAMETER RATINGS

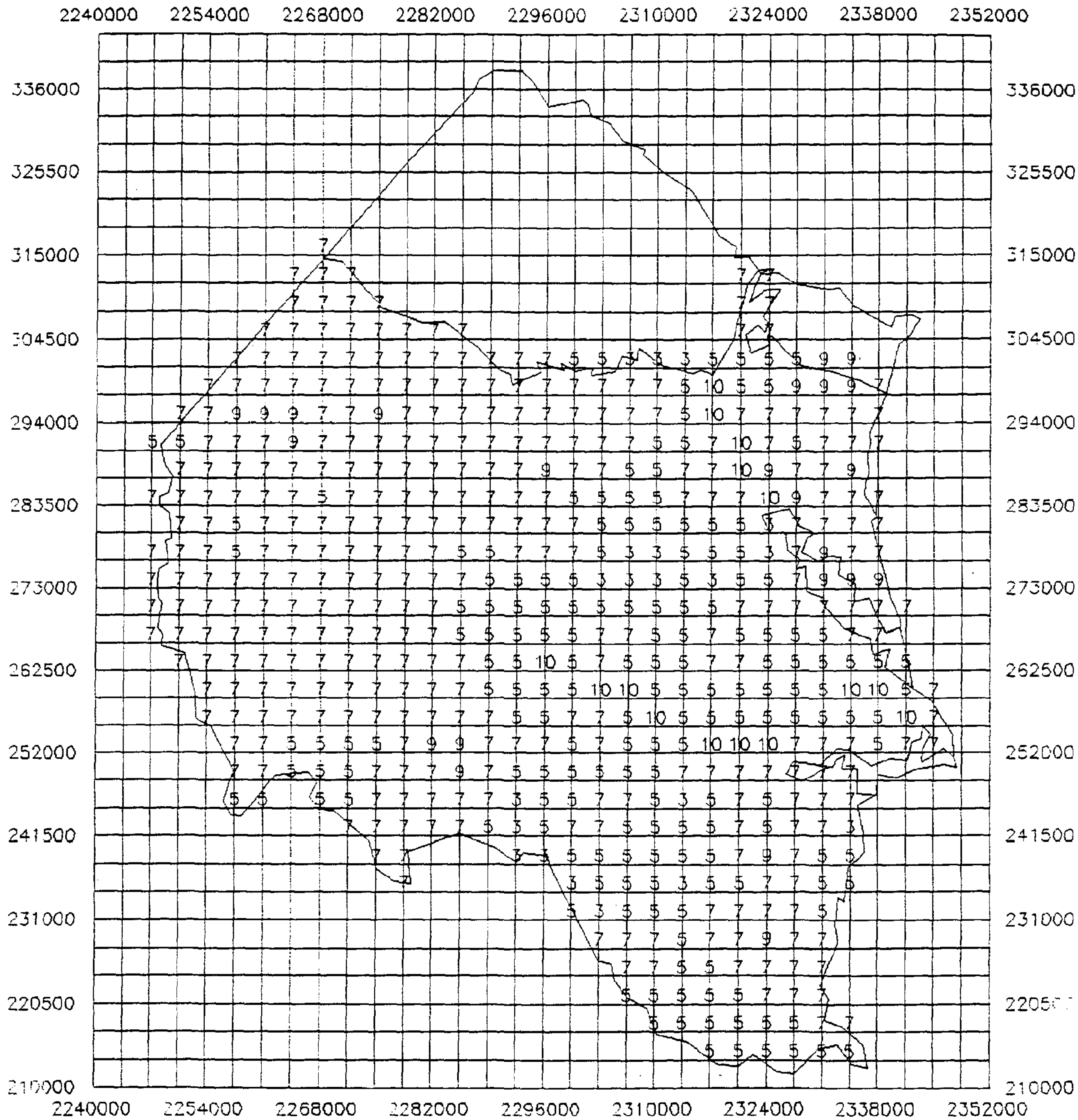


Figure 3
Depth to Water
(D) Rating

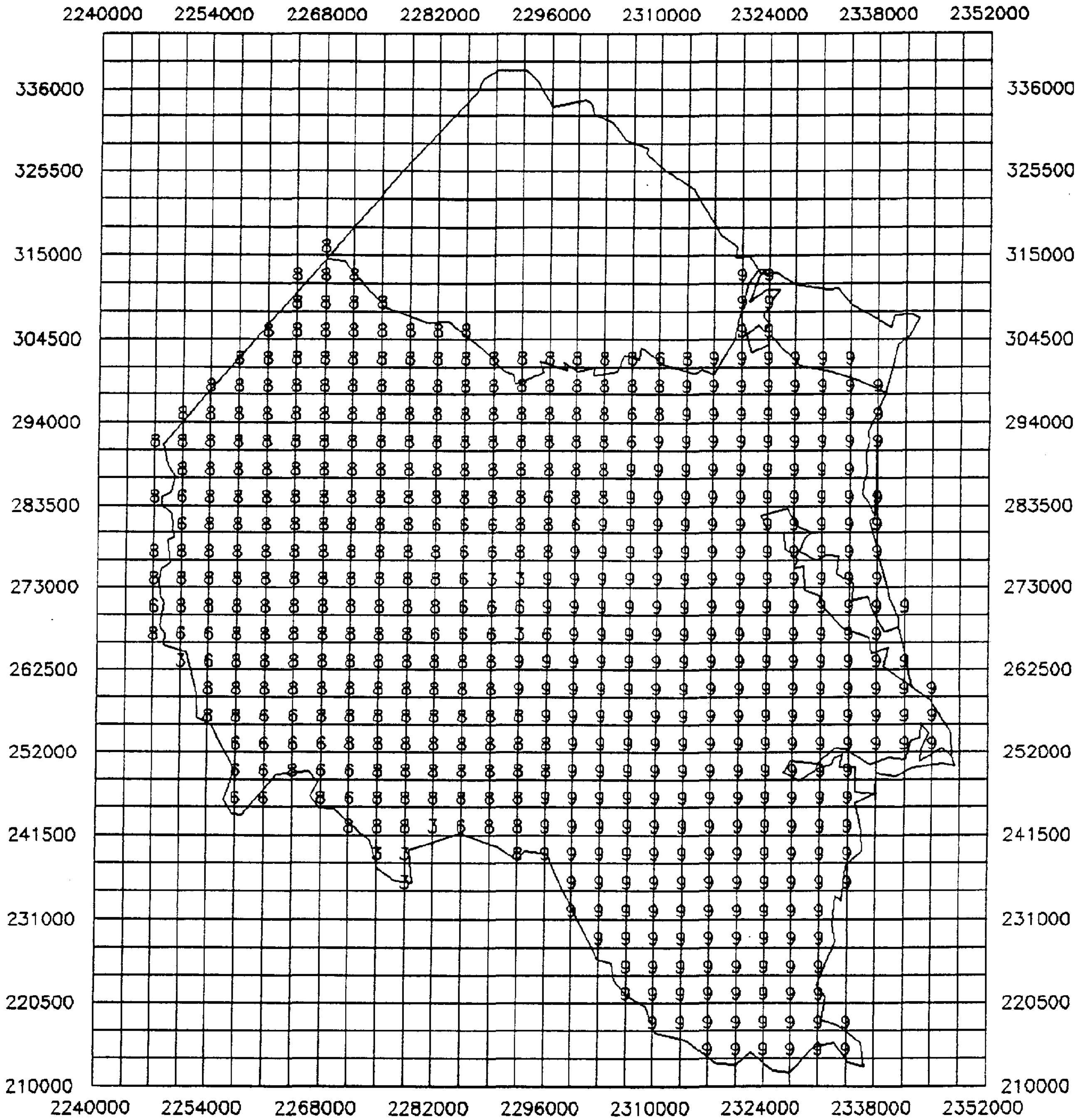


Figure 4
Net Recharge
(R) Rating

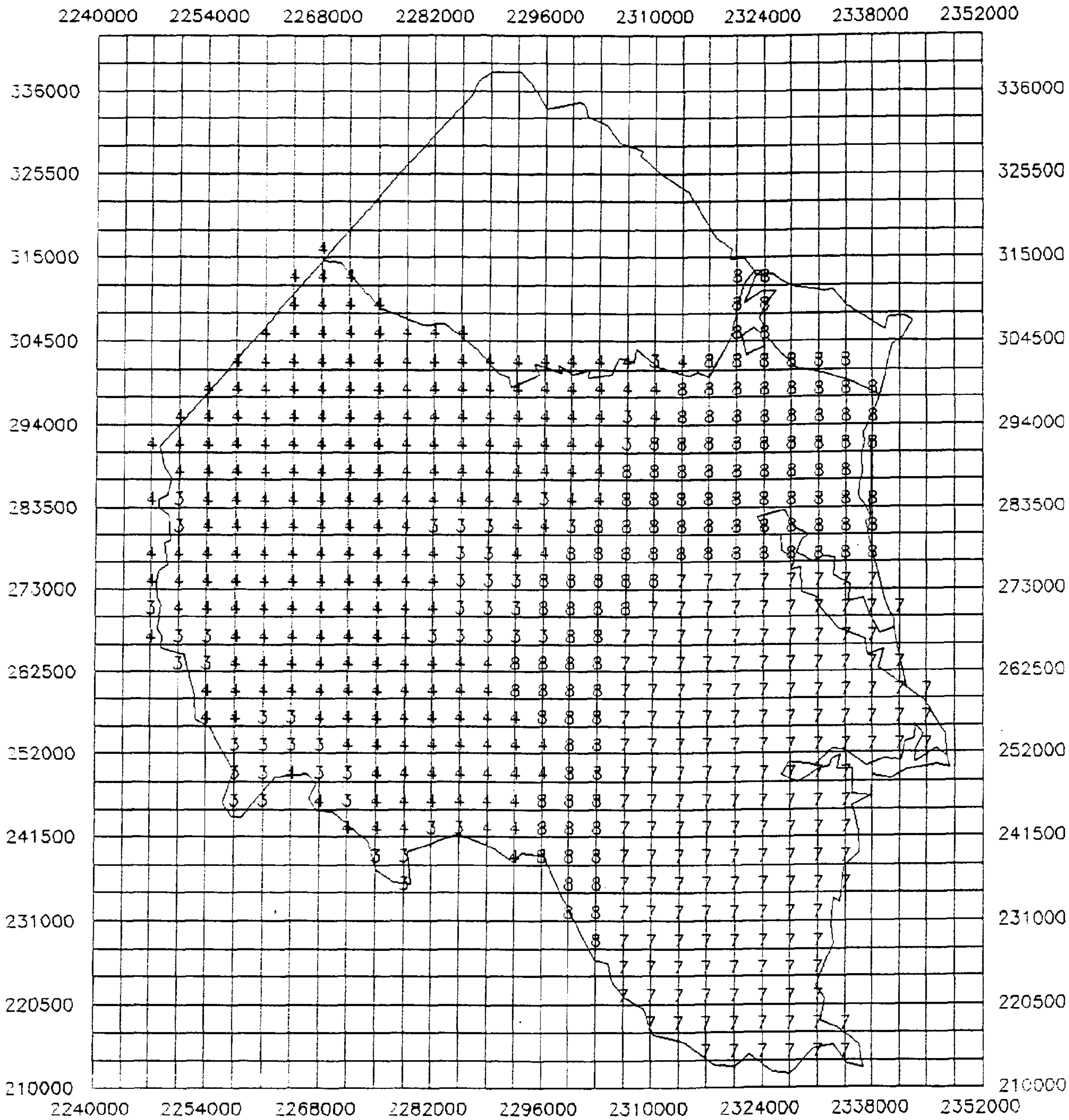


Figure 5
Aquifer Media
(A) Rating

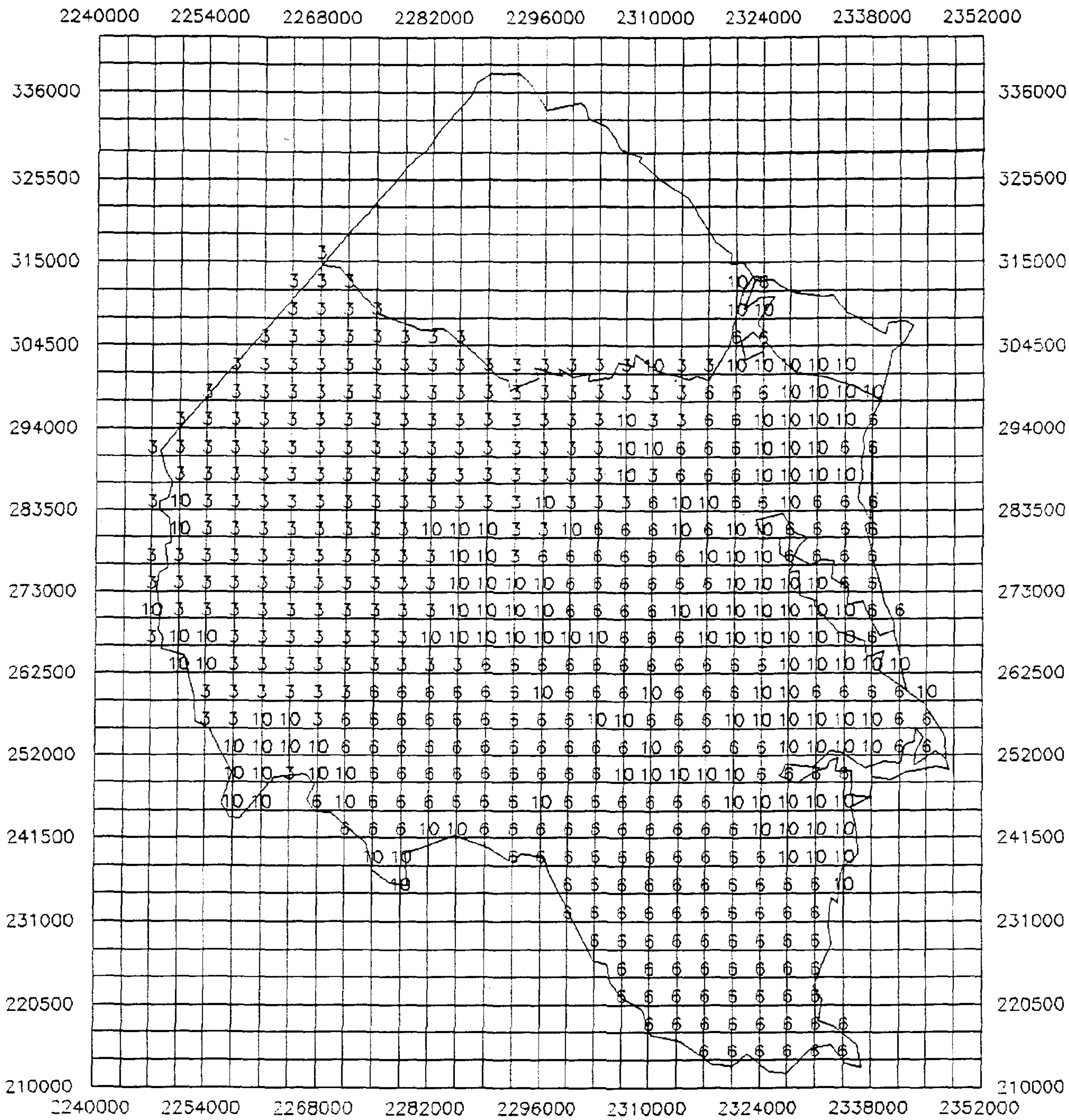


Figure 6
Soil Media
(S) Rating

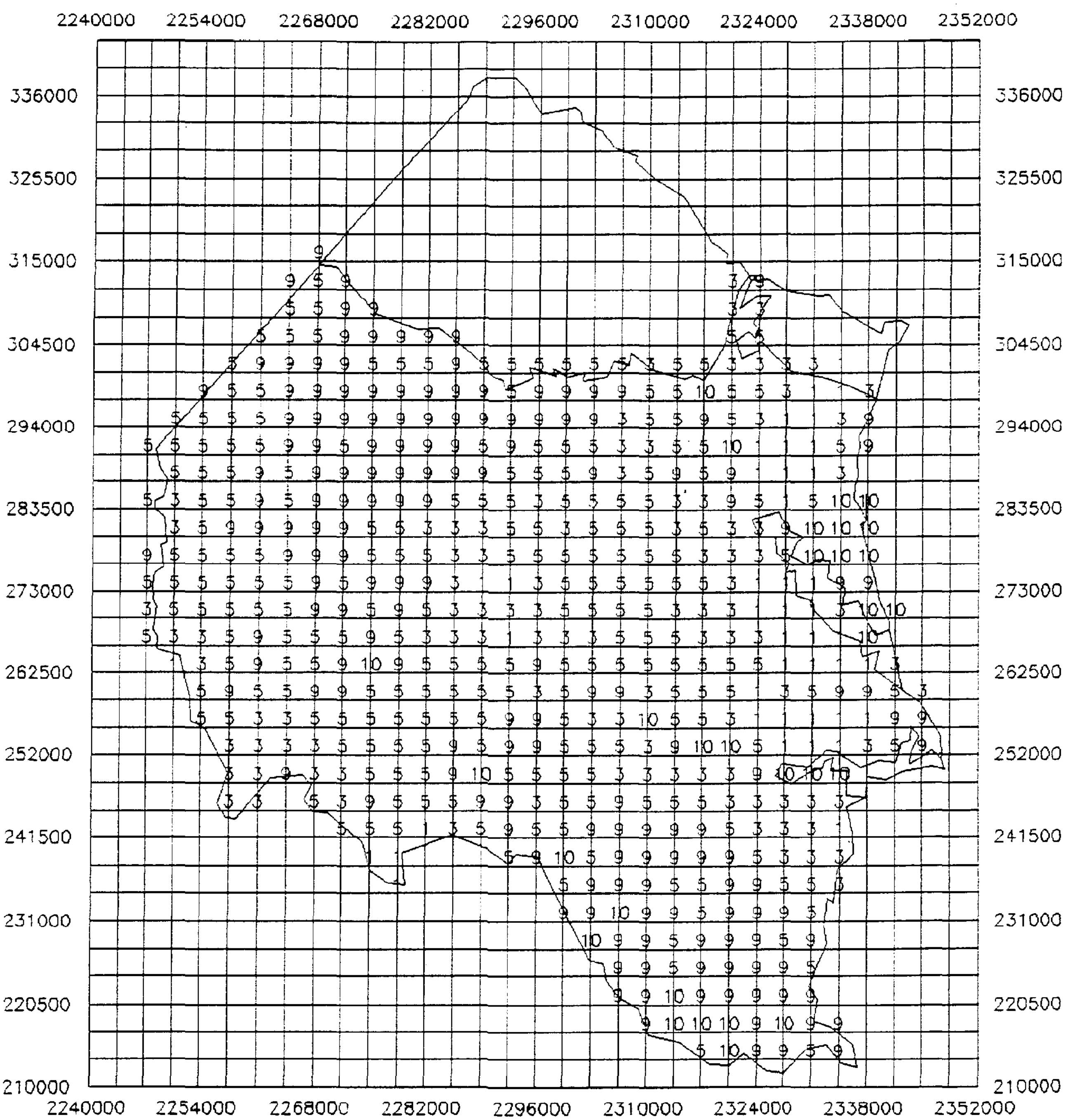


Figure 7
Topography
(T) Rating

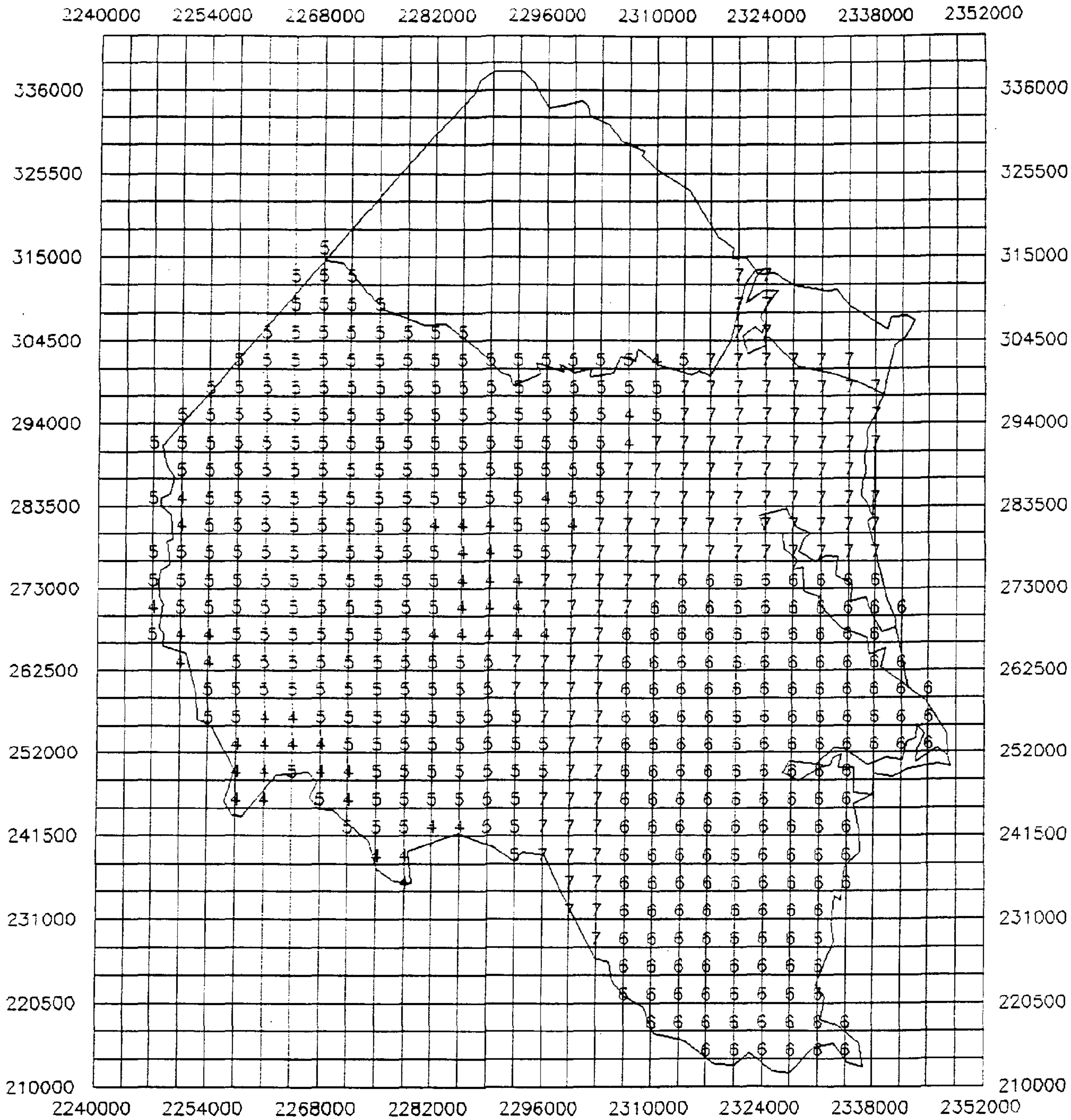


Figure 8
Impact of Vadose Zone
(I) Rating

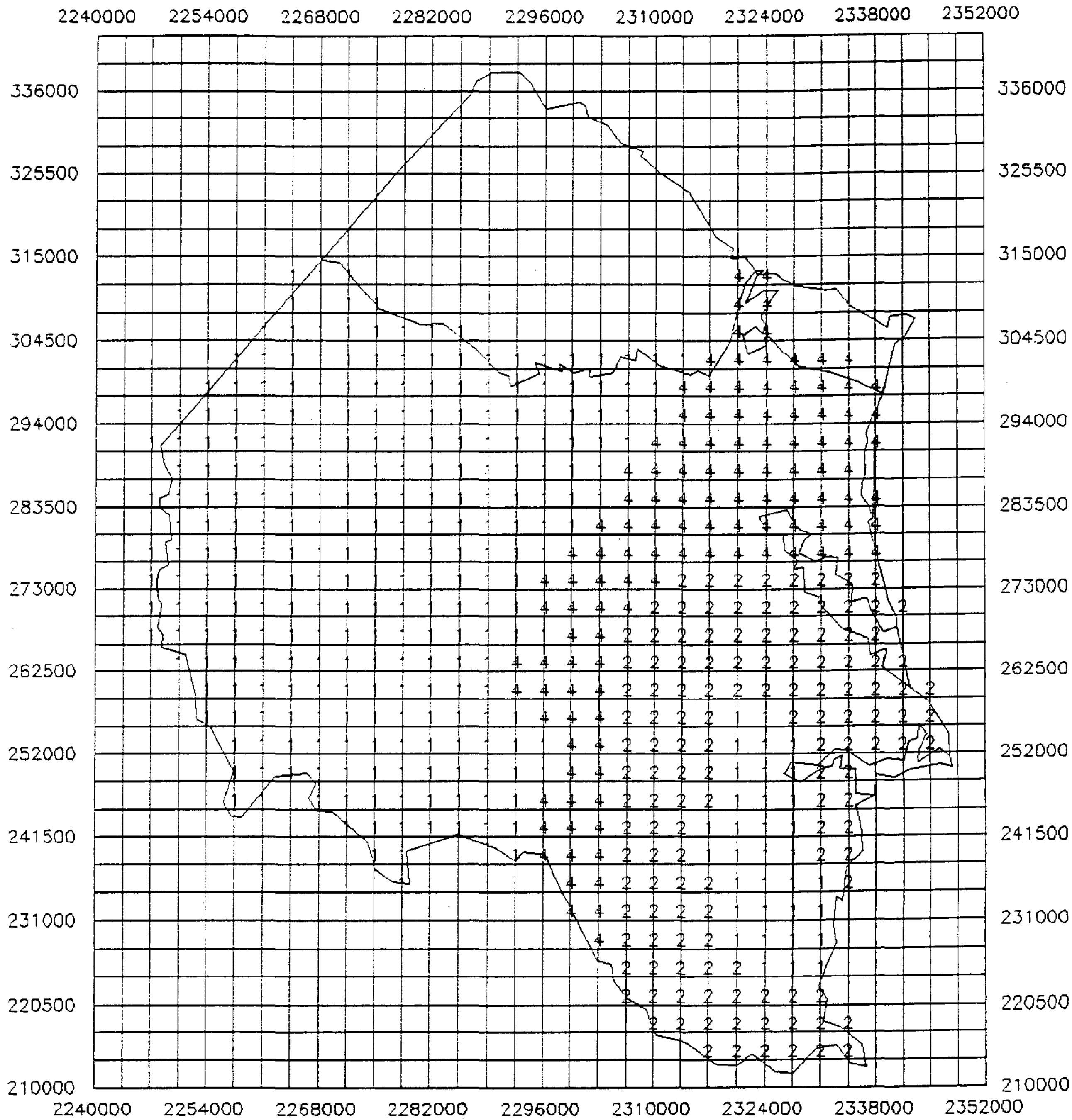


Figure 9
Hydraulic Conductivity
(C) Rating

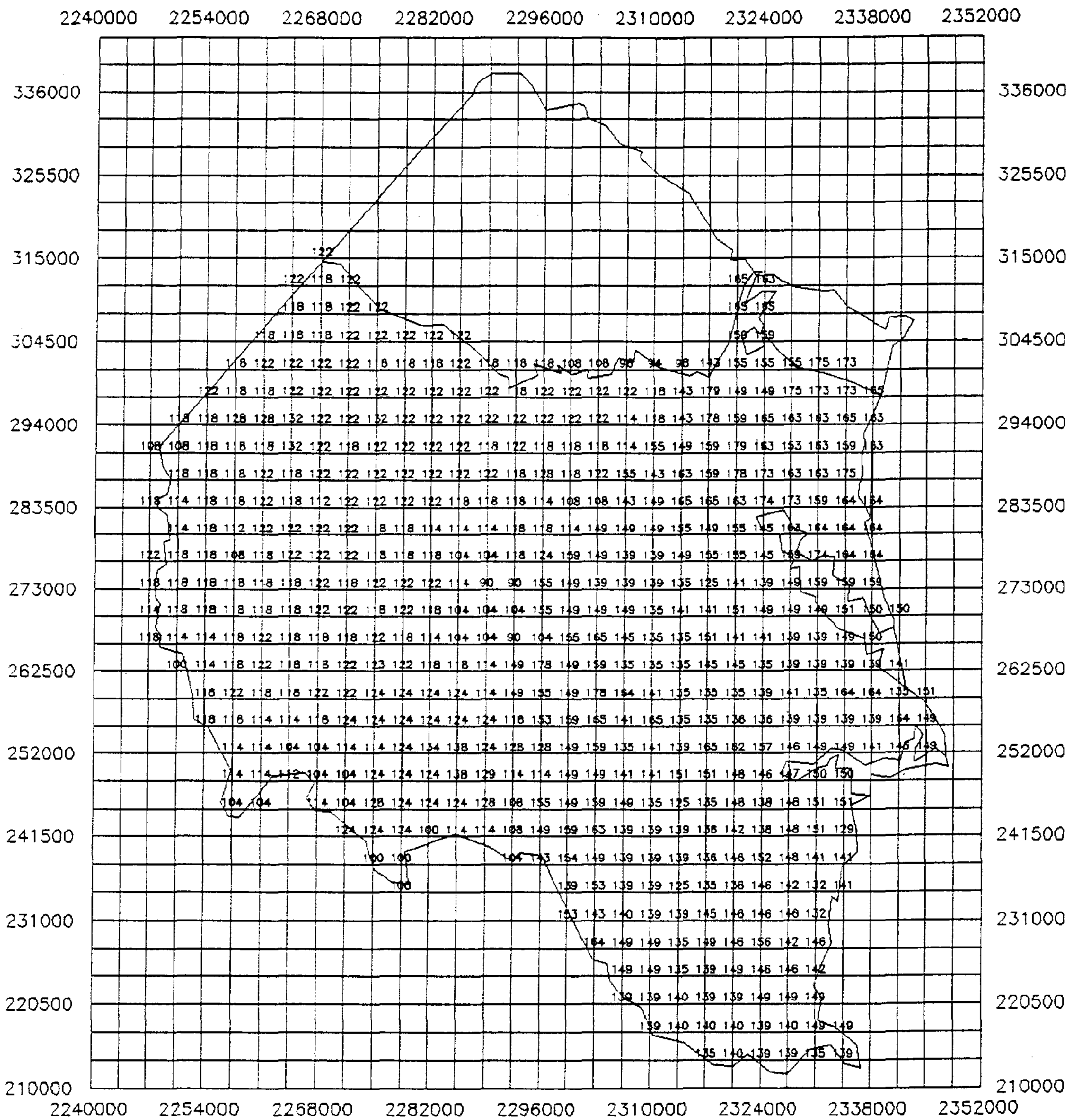


Figure 10
Composite DRASTIC Index Rating