

Source Water Assessment Program Report
for
BARNARDSVILLE FWB CHURCH
Transient Water System

Do You Know Where Your Drinking Water Comes From?

Everyone wants clean, safe drinking water and we assume this natural resource will always be available to us. However, drinking water wells can be threatened by many potential contaminant sources, including underground storage tanks for gasoline, permitted waste disposal sites, storm water runoff or improper handling of hazardous materials. Your drinking water is supplied by your WELL #2. Protecting your drinking water from becoming contaminated is a wise investment in public health and your community's future. This report provides a summary of the results for the **Source Water Assessment** for your drinking water supply.

Introduction: What is a Source Water Assessment?

The North Carolina Division of Environmental Health, Public Water Supply (PWS) Section is responsible for completing the assessments of all public drinking water supplies in the state. The 1996 amendments to the Safe Drinking Water Act provided federal support and required states to conduct assessments of all public water systems. A source water assessment is a qualitative evaluation of the potential of a drinking water source to become contaminated by the identified Potential Contaminant Sources (PCS) within the assessment area. In North Carolina there are more than 10,000 public water supply wells that were assessed by the state.

The PWS Section has gathered information for each well and developed a process for completing the assessments. This process is summarized in the next few pages. For more detailed information about North Carolina's Source Water Assessment Program (SWAP) approach you may access a document on the Internet at www.deh.enr.state.nc.us/pws/swap, or request a copy of the document be sent to you by mail.

Table 1. Public Water Supply System Information

System Name	BARNARDSVILLE FWB CHURCH
City	BARNARDSVILLE
PWS ID	01-11-478
Well Name	WELL #2

What is in My SWAP Report?

This SWAP report includes the following sections:

- Section 1: Assessment Area Delineation
- Section 2: Potential Contaminant Source Inventory and Map
- Section 3: How Was My Well's Susceptibility Rating Determined?
- Section 4: Reviewing Your SWAP Results
- Section 5: List of Maps, Tables and Figures for Your Well

Section 1: Assessment Area Delineation

The area delineated for your well for the purpose of this assessment is the contributing area for the well. When a well is pumped, it begins to influence groundwater that is flowing through the subsurface and toward the well. The pumping of the well creates a contributing area around the well that supplies water to the well. This is the area through which contaminants, if released to the environment, can be reasonably expected to move through the ground and reach the well.

Section 2: Potential Contaminant Source Inventory and Map

The delineated area for your well encompasses the area where potential contaminant sources, if released to the environment, could reasonably be expected to be a risk or a potential for contamination of your drinking water supply. A PCS in this assessment report is a facility or site regulated under a state or federal regulatory program. These facilities are identified in electronic databases that contain location information for each facility. Only databases that include statewide information were used for this source water assessment. Included in this report are:

- 1) A table of any PCS identified within the delineated assessment area; and
- 2) A map of the delineated assessment area showing PCSs, roads, jurisdictional boundaries and other pertinent information.

It is important to note that the PCSs identified in this report are only potential sources of contamination to your well. Environmental contamination is not likely to occur if harmful contaminants are managed properly.

Section 3: How Was My Well's Susceptibility Rating Determined?

In North Carolina the susceptibility of any drinking water source is based on two components, a contaminant rating and an inherent vulnerability rating. Your well was assigned a qualitative susceptibility rating of higher, moderate or lower based on the results of the contaminant rating and inherent vulnerability rating process as described in the following paragraphs.

Susceptibility Rating

The final susceptibility rating for your well is determined by combining the contaminant rating and the inherent vulnerability rating. The contaminant rating and inherent vulnerability rating are summarized below. For a more detailed description of how your well's susceptibility rating was assigned, you may access the document "North Carolina's SWAP Approach" on the Internet at www.deh.enr.state.nc.us/pws/swap, or request a copy of the document to be sent to you by mail.

Contaminant Rating

The contaminant rating for your well was determined based on the number and location of PCSs within the delineated area of your well. Each PCS identified within the delineated area was assigned a risk rating of higher, moderate or lower. If a PCS is a facility regulated in an existing environmental program, it will receive a risk rating of higher. The number of PCSs that occur within the delineated area was determined and a contaminant rating of higher, moderate or lower was assigned to your well.

Inherent Vulnerability Rating

The inherent vulnerability rating of your well refers to the geologic characteristics or existing conditions of the well and its delineated assessment area. These characteristics include aquifer rating, unsaturated zone rating and well integrity/well construction rating. The aquifer rating is an assessment of the water transmitting characteristics of the aquifer. The unsaturated zone rating is an assessment of the likelihood that contaminants from surface and shallow sources will follow the path of aquifer recharge and reach the water table. The well integrity/construction rating is an assessment of the quality of the construction of the well. An inherent vulnerability rating of higher, moderate or lower was assigned to your well.

Table 2. SWAP Results Summary

Source Name	Inherent Vulnerability Rating	Contaminant Rating	Susceptibility Rating
WELL #2	Moderate	Lower	Moderate

It is important to understand that a susceptibility rating of higher does not imply poor water quality. Susceptibility is an indication of a water supply's potential to become contaminated by the identified PCSs within the assessment area.

Table 3. Well Information

Source Name	WELL #2
Well Depth (Feet)	150
Well Yield (Gallons/Min)	20

Section 4: Reviewing Your SWAP Results

Please review the well information provided in the Well Information Table above. If you believe any of this information is incorrect, please contact the Public Water Supply Section by e-mail at the following address: SWAP@ncmail.net. Or you may submit comments to us at:

SWAP
Public Water Supply Section
1634 Mail Service Center
Raleigh, NC 27699-1634

Or you may contact the Source Water Assessment staff by phone at 919-715-2633.

Section 5: List of Maps, Tables and Figures for Your Well

Maps, tables and figures for your well are included in this report in the following pages and listed below.

Map 1. Location Map

Map 2. Delineated Area and PCS Map

Table 4. Potential Contaminant Source Attributes

Table 5. Inherent Vulnerability Table

Table 6. Unsaturated Zone Rating Calculation

Figure 1. Land Use / Land Cover Categories

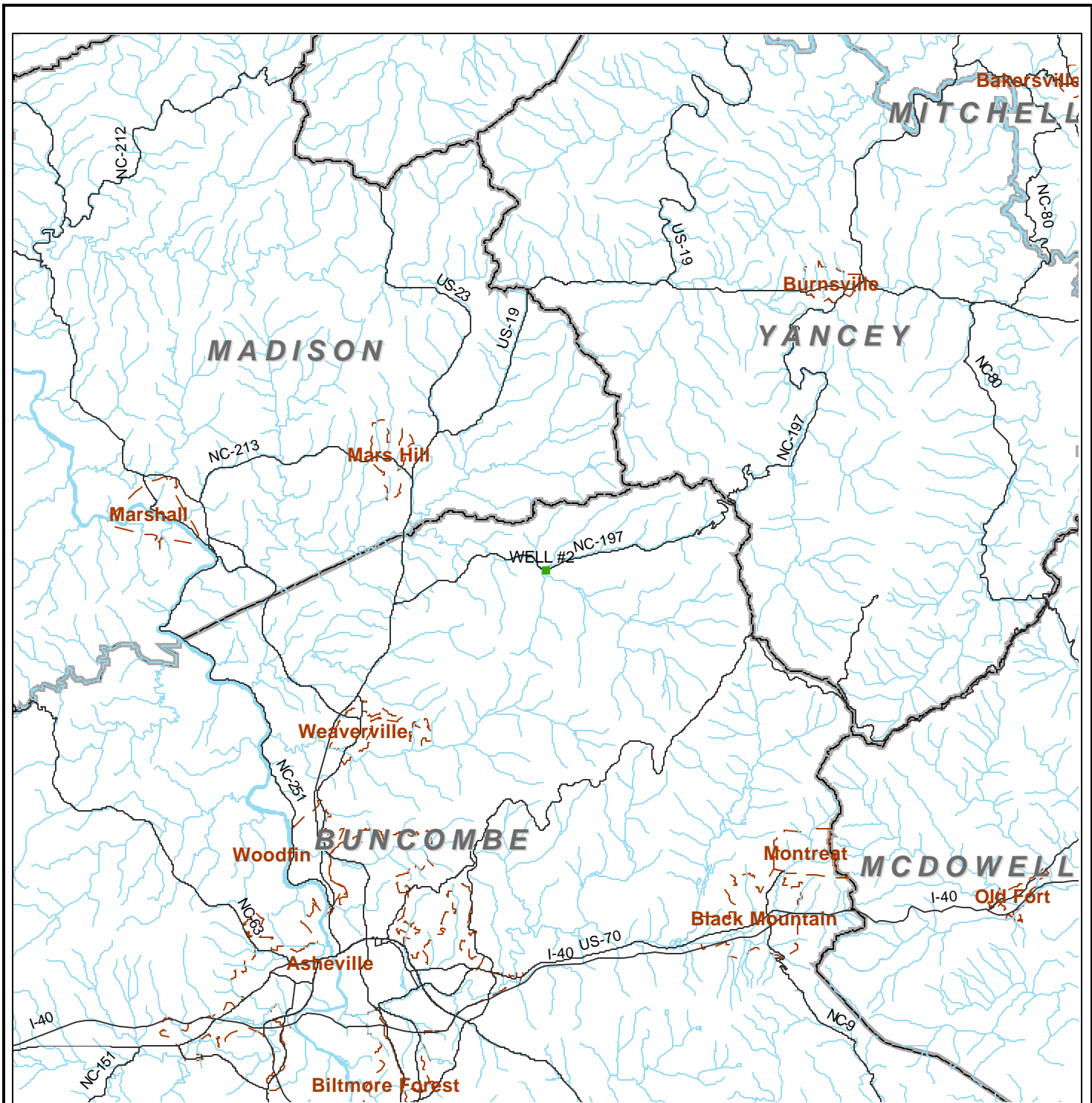
Figure 2. Unsaturated Zone Rating

Figure 3. Vertical Hydraulic Conductance Rating

Figure 4. Land Surface Slope Rating

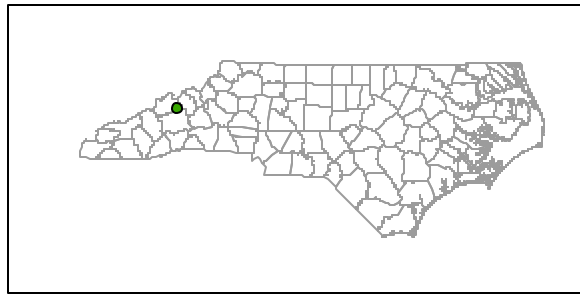
Figure 5. Land Use Rating

Figure 6. Land Cover Rating

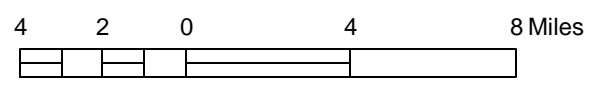
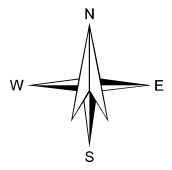


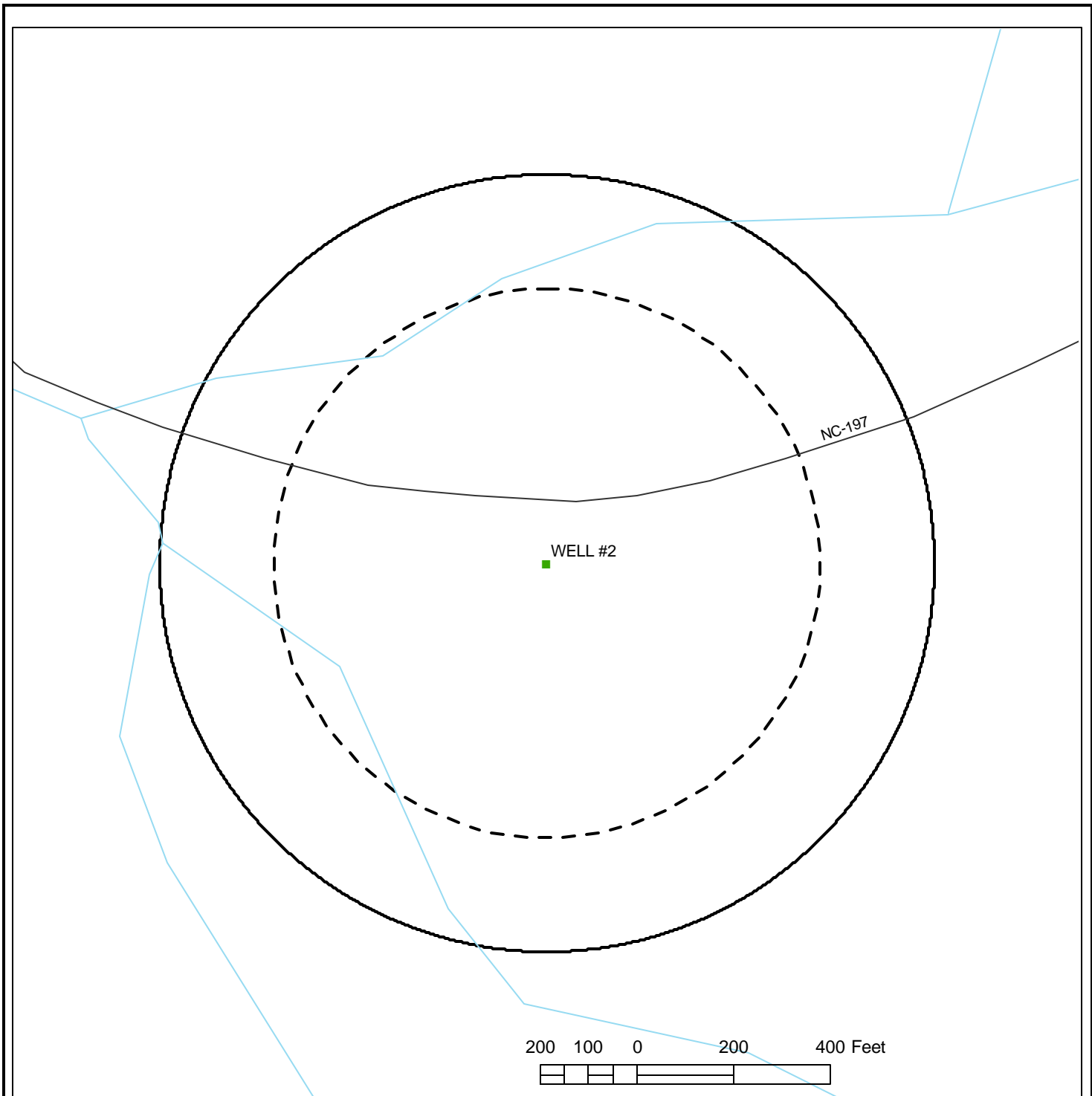
MAP 1. LOCATION MAP

BARNARDSVILLE FWB CHURCH, PWS ID: 0111478, WELL #2



- Roads
- Rivers and Streams
- Major Hydrology
- Municipal Boundaries
- County Boundaries





MAP 2. DELINEATED AREA AND PCS MAP

BARNARDSVILLE FWB CHURCH, PWS ID: 0111478, WELL #2

PCS Types

Animal Operations	Septage Disposal Sites	Roads
CERCLIS Sites	Soil Remediation Sites	Rivers and Streams
RCRA Gen. / Trans. Facilities	Solid Waste Facilities	Major Hydrology
Non Discharge Permits	Tier II Sites	Municipal Boundaries
NPDES Permits	RCRA TSD Facilities	Ground Water Assessment Area - Delineated Area
National Priority List Sites	Old Landfill Sites	Ground Water Assessment Area - Zone A
PCB Sites	UIC Permits	
Pollution Incidents	UST Permits	



**Table 4. Potential Contaminant Source Attributes
BARNARDSVILLE FWB CHURCH
PWS ID: 01-11-478, WELL #2**

Common Attributes

PCS Name	PCS ID	PCS Type	PCS Risk Rating	Street Address	City	Zip	County

**Table 4. (Cont.) Potential Contaminant Source Attributes
BARNARDSVILLE FWB CHURCH
PWS ID: 01-11-478, WELL #2**

Unique Attributes

PCS Name	PCS ID	Attribute	Value

**Table 5. Inherent Vulnerability Rating
BARNARDSVILLE FWB CHURCH
PWS ID: 01-11-478, WELL #2**

Ground Water Source Characteristics	Higher Vulnerability	Moderate Vulnerability	Lower Vulnerability
Aquifer Rating	Higher		
Unsaturated Zone Rating			Lower
Well Integrity/Construction Rating	Higher		

Inherent Vulnerability Rating: Moderate

**Table 6. Unsaturated Zone Rating Calculation
BARNARDSVILLE FWB CHURCH
PWS ID: 01-11-478 , WELL #2**

Unsaturated Zone Rating	48.4
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Notes:

1. Unsaturated Zone Rating for each cell (CR):

$$\text{CR} = [3 \times (\text{vertical hydraulic conductance rating})] + [2 \times (\text{land surface slope rating})] \\ + [3 \times (\text{land use rating})] + [2 \times (\text{land cover rating})]$$

2. Unsaturated Zone Rating (R) for the entire Assessment Area is the mean of the cell ratings (CR) calculated as:

The sum of all cell unsaturated zone ratings (CR) divided by the number of cells (N) within the assessment area: $R = (\sum \text{CR}) / N$

3. The USGS publication “Methods of ranking unsaturated zone and watershed characteristics of public water supplies in North Carolina,” by J. L. Eimers, J. C. Weaver, S. Terziotti, and R. W. Midgette, 1999, provides a detailed discussion of the methods used to determine unsaturated zone ratings.

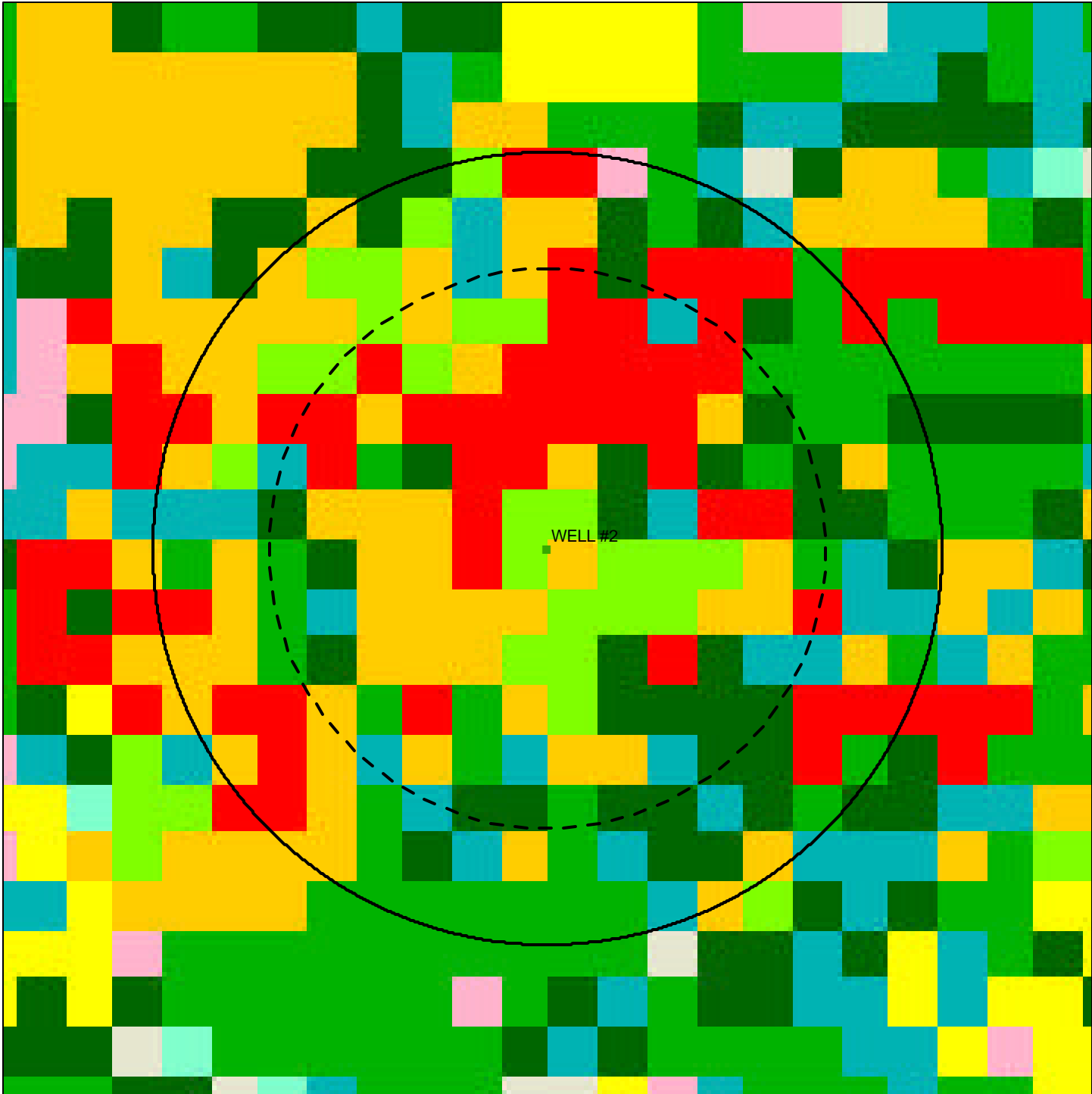
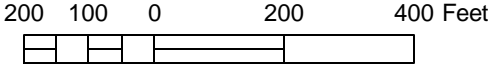


FIGURE 1. LAND USE/LAND COVER CATEGORIES

BARNARDSVILLE FWB CHURCH, PWS ID: 0111478, WELL #2



- | | | |
|--|------------------------------------|------------------------------|
| Water | Quarries, Strip Mines, Gravel Pits | Pasture, Hay |
| Low Intensity Residential | Transitional | Row Crops |
| High Intensity Residential | Deciduous Forest | Emergent Herbaceous Wetlands |
| Commercial, Industrial, Transportation | Evergreen Forest | Urban, Recreational Grasses |
| Bare Rock, Sand, Clay | Mixed Forest | Woody Wetlands |
| Ground Water Assessment Area - Delineated Area | | |
| Ground Water Assessment Area - Zone A | | |



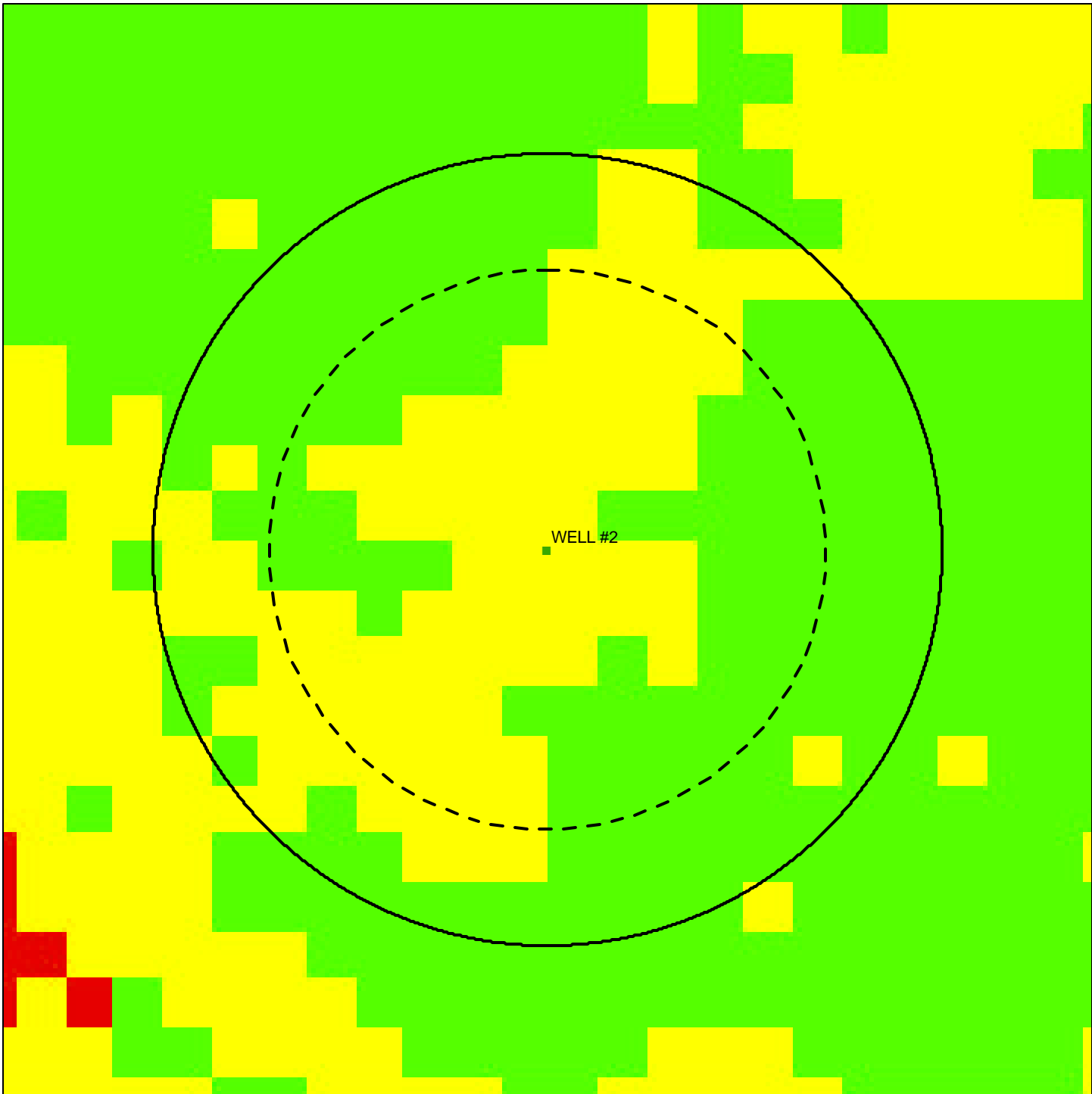


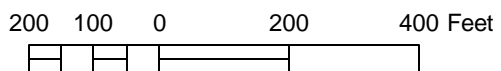
FIGURE 2. UNSATURATED ZONE RATING

BARNARDSVILLE FWB CHURCH, PWS ID: 0111478, WELL #2

Assigned Ratings

- Lower ≤ 50
- Moderate < 50 to 65
- Higher > 65

- Ground Water Assessment Area - Delineated Area
- Ground Water Assessment Area - Zone A



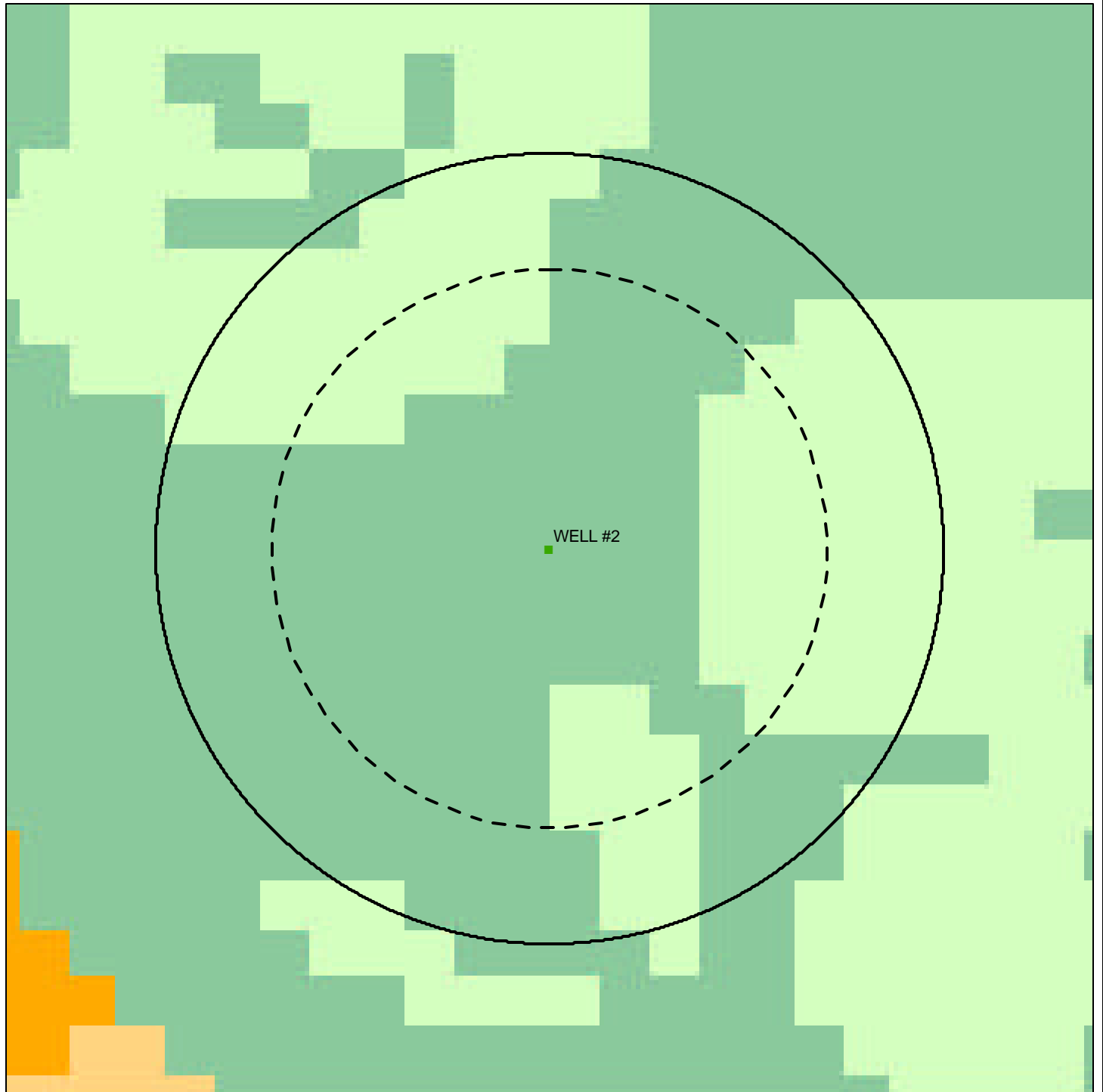
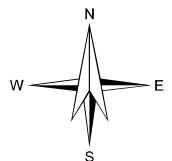


FIGURE 3. VERTICAL HYDRAULIC CONDUCTANCE RATING

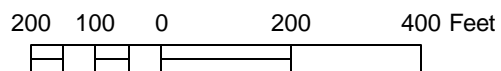
BARNARDSVILLE FWB CHURCH, PWS ID: 0111478, WELL #2



Assigned Ratings

- | | |
|---------------------------------|-------------------------------------|
| 1 (≤ 5 sq. ft./day) | 6 (> 80 to 160 sq. ft./day) |
| 2 (>5 to 10 sq. ft./day) | 7 (> 160 to 320 sq. ft./day) |
| 3 (>10 to 20 sq. ft./day) | 8 (> 320 to 640 sq. ft./day) |
| 4 (> 20 to 40 sq. ft./day) | 9 (> 640 to $1,280$ sq. ft./day) |
| 5 (> 40 to 80 sq. ft./day) | 10 ($> 1,280$ sq. ft./day) |

- | | |
|--|--|
| | Ground Water Assessment Area - Delineated Area |
| | Ground Water Assessment Area - Zone A |



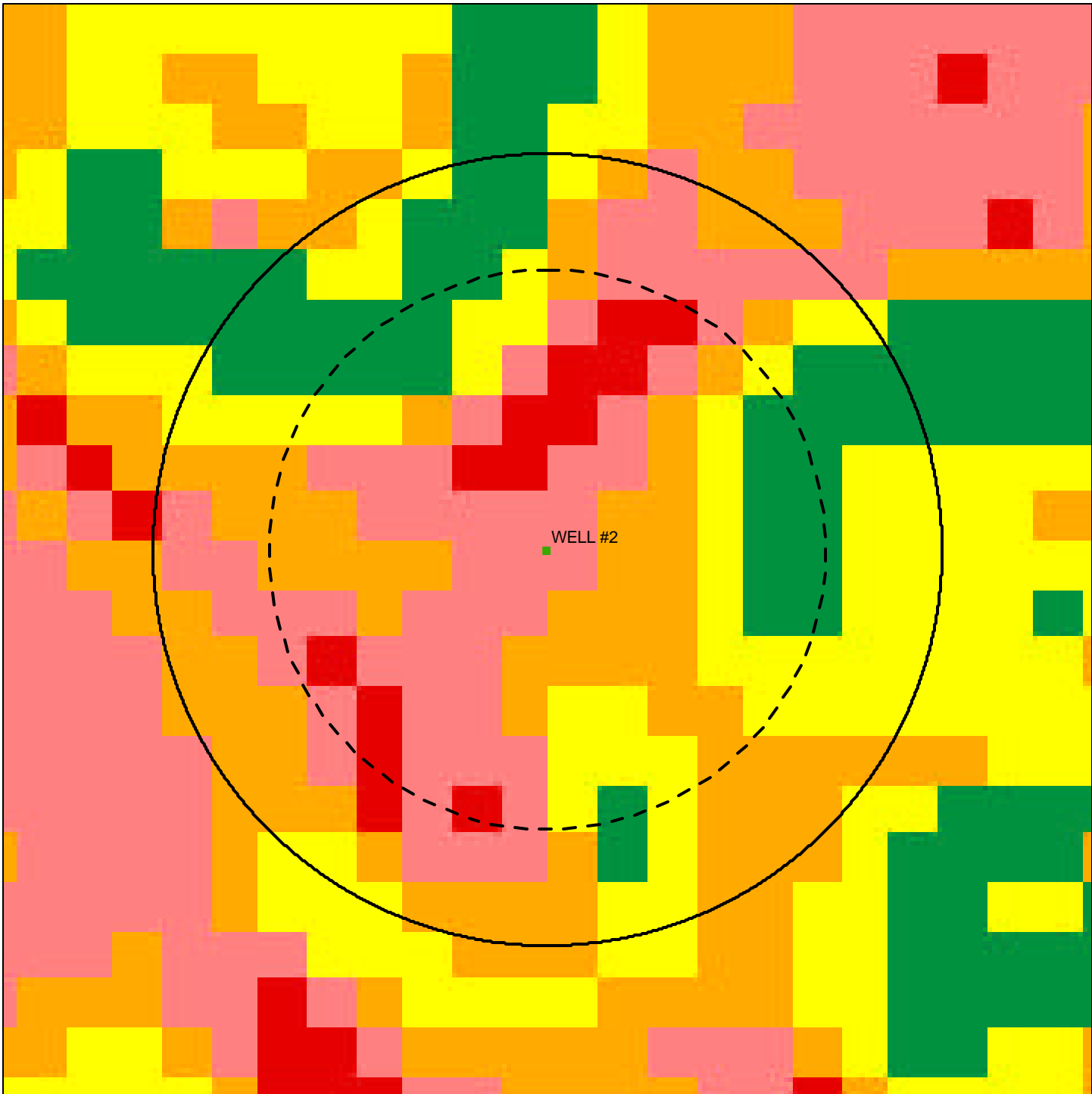
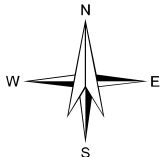










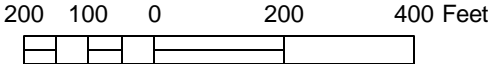
FIGURE 4. LAND SURFACE SLOPE RATING

BARNARDSVILLE FWB CHURCH, PWS ID: 0111478, WELL #2



Assigned Ratings

- | | | |
|--|---|--|
|  1 (> 50 percent) |  7 (> 5 to 10 percent) |  Ground Water Assessment Area - Delineated Area |
|  3 (> 20 to 50 percent) |  9 (> 2 to 5 percent) |  Ground Water Assessment Area - Zone A |
|  5 (> 10 to 20 percent) |  10 (<= 2 percent) | |



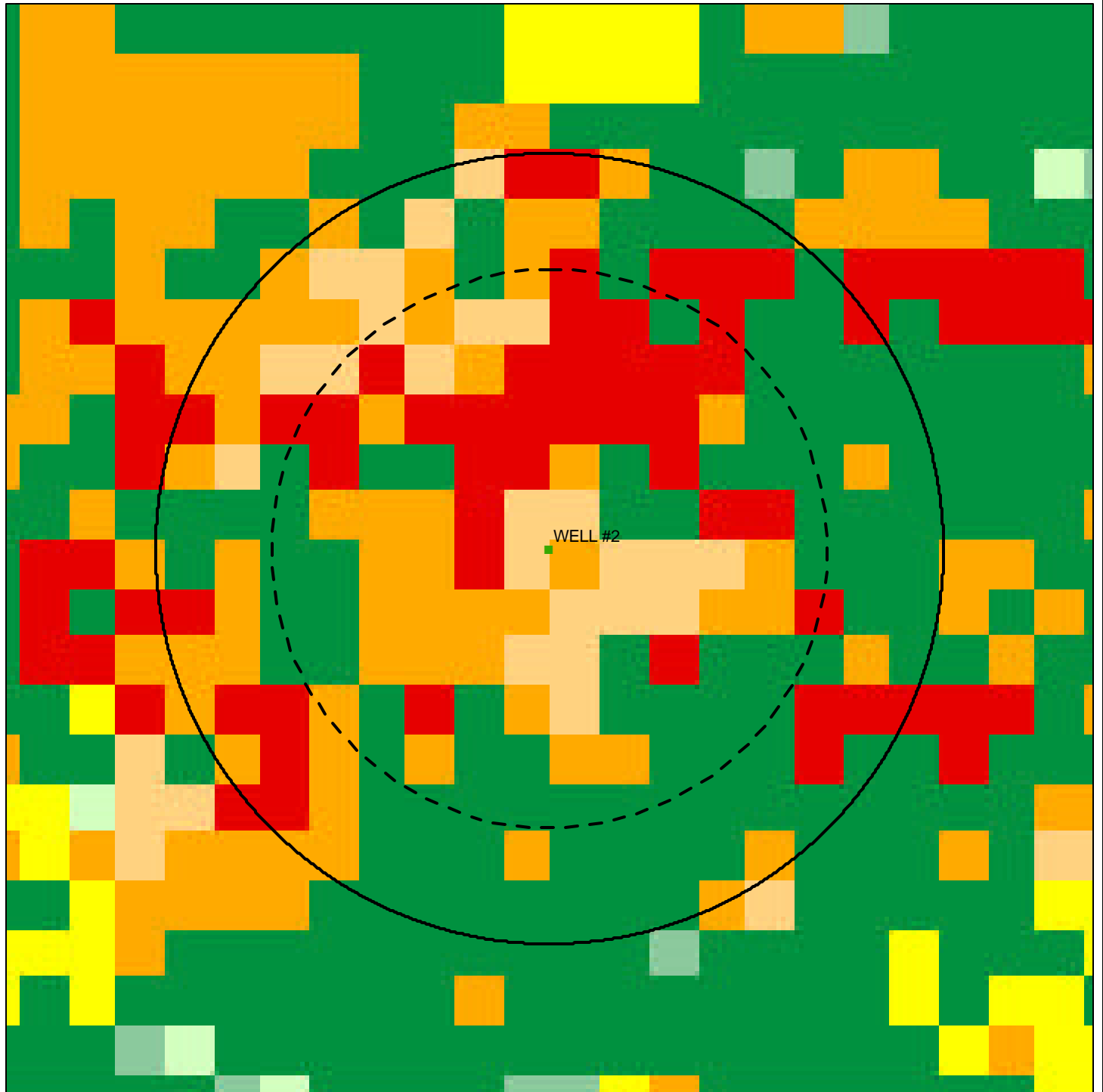
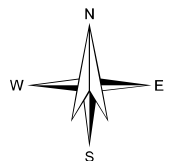











FIGURE 5. LAND USE RATING


BARNARDSVILLE FWB CHURCH, PWS ID: 0111478, WELL #2



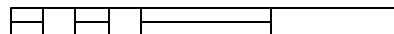
Assigned Ratings

- | | |
|---|--|
|  1 (Water, Woody wetlands, Emergent herbaceous wetlands) |  6 (Other grasses) |
|  2 (Bare rock/sand) |  7 (Low intensity residential, Transitional, Row crops) |
|  3 (Deciduous forest, Evergreen forest, Mixed forest) |  8 (High intensity residential) |
|  5 (Quarries/strip mines/gravel pits, Pasture/hay) |  10 (High intensity commercial/industrial/transportation) |

 Ground Water Assessment Area - Delineated Area

 Ground Water Assessment Area - Zone A

200 100 0 200 400 Feet



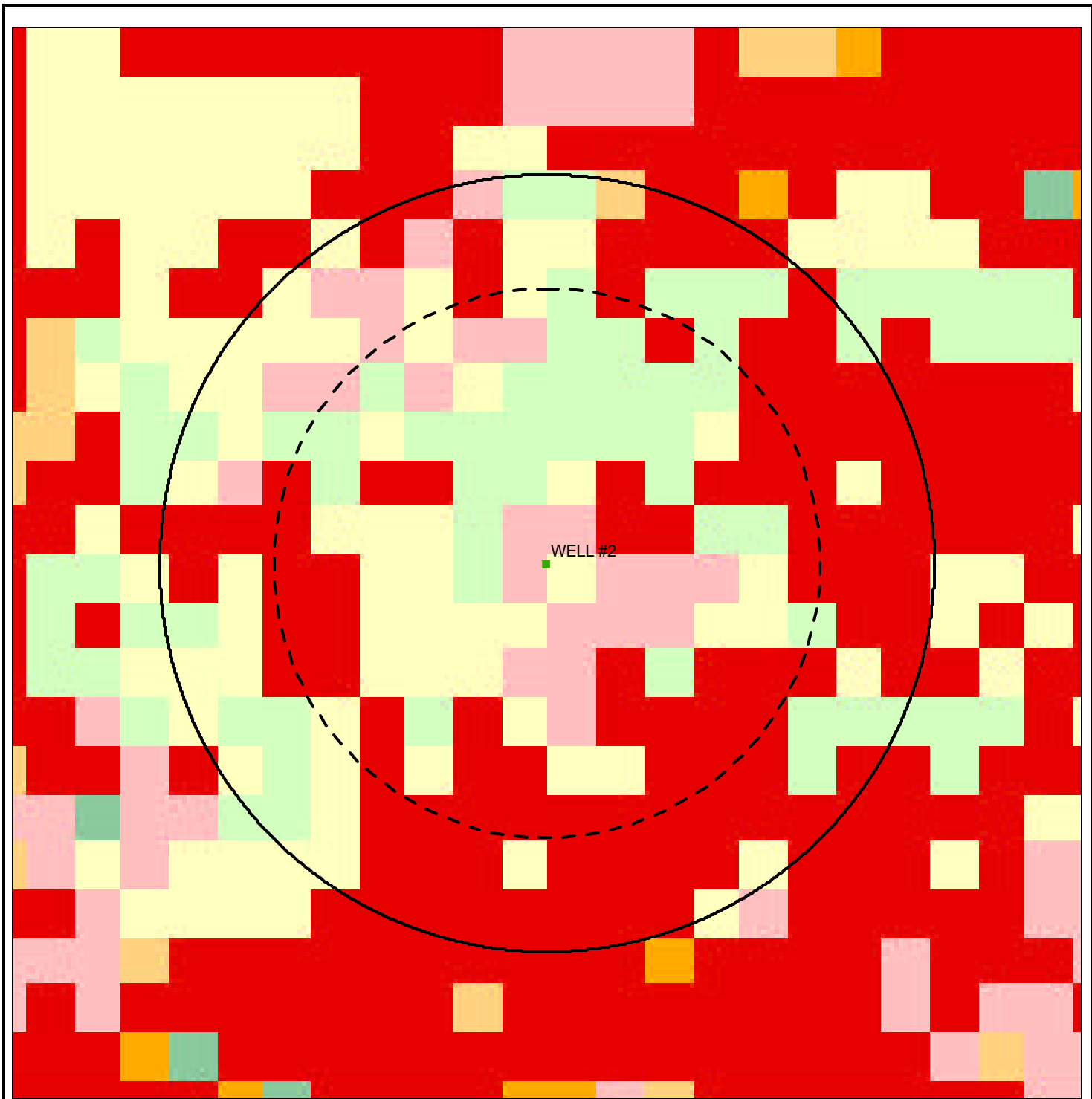


FIGURE 6. LAND COVER RATING

BARNARDSVILLE FWB CHURCH, PWS ID: 0111478, WELL #2

Assigned Ratings

- 1 (High intensity commercial/industrial/transportation)
- 2 (Water, Woody wetlands, Emergent herbaceous wetlands, High intensity residential)
- 4 (Low intensity residential)
- 5 (Transitional)
- 6 (Quarries/strip mines/gravel pits, Row crops)
- 7 (Bare rock/sand)
- 8 (Pasture/hay, Other grasses)
- 10 (Deciduous forest, Evergreen forest, Mixed Forest)

- Ground Water Assessment Area - Delineated Area
- Ground Water Assessment Area - Zone A

