



# Remedial Priority System

## Human Health Layers Non-Community Supply Wells

March 2012





# Human Health Layers

The Human Health Layers developed by the Department are:

- Water Media
  - Private Wells
  - Community Supply Wells
  - **Non-Community Supply Wells**
  - Surface Water Intakes
  - Surface Water Body (Surface Water Quality Standards)
  - Agricultural
- Soil Media
  - Soil Exposure: Residential,
  - Soil Exposure: School / Day Care
- Vapor Media
  - Vapor Exposure: Residential
  - Vapor Exposure: School / Day Care





# Non-Community Supply Wells Layer

Non-Community Supply Wells Layer → a derived Layer (a layer created by DEP) based on population and exposure duration.

- **Mode of Exposure:** People drinking (Ingestion / Dermal) contaminated ground water from a Non-Community Supply Well
- **Background:**
  - **Public Non-Community Water Supply Well:** well that supplies water to a Non-Community Public Water Systems, which serve both non-transient and transient populations
    - **Non-transient Non-Community Public Supply Well:** Well that serves at least 25 of the same persons over a period of six months in any given calendar year such as schools, hospitals and office buildings
    - **Transient Non-Community Public Supply Well:** Well that serves at least 25 transient individuals present for at least 60 days in any given calendar year, but does not serve the same individuals during that time period, such as restaurants or gas stations





# Non-Community Supply Wells Layer

- **Well Head Protection Area:** A Well Head Protection Area (WHPA) is the area from which a well draws its water within a specific time frame. WHPAs are an integral part of the Well Head Protection Program, which was created pursuant to the 1986 Federal Safe Drinking Water Act Amendments (Section 1428, P.L. 93-523, 42 USC 300 et. Seq.)

Note: WHPA delineation is described in NJDEP's "Guidelines for Delineation of Well Head Protection Areas in New Jersey"

- **Source Layer:**

- Non-Community Well Head Protection Area (WHPA)

- **Basis for layer:**

- shows potential capture zone for a Non-Community Supply Well
- Three WHPA tiers (2 year, 5 year and 12 year) indicate the estimated travel time for contamination moving towards a well
- Different tiers are used to factor in distance from the source





# Non-Community Supply Wells Layer

- Cells values:

- Population served:

- based on the population served by the supply Well as documented by information submitted to the Department and modified by the distance from well
  - ❖ If there are multiple WHPAs, then the scores for each WHPA are added together

- Travel Distance:

- WHPA tiers are used to factor in distance from the source
- Population values are multiplied by the Tier Factor based on the WHPA tier for that site

WHPA Tiers / Travel Time	Tier Factor
Tier 1 / Travel Time less than 2 years	1
Tier 2 / Travel Time between 2 and 5 years	0.5
Tier 3 / Travel Time between 5 and 12 years	0.1

- Exposure Period: Two year exposure period is used to account for a theoretical time between sampling of a Non-Community Supply Wells





# Non-Community Supply Wells Layer

- Calculation Method:

- Maximum cell value that intersects the ground water Extent Area is used

Cell Values are based on total population serviced by the well and not population density, as is the Private Wells Layer

- If the Cell Values were summed, the total population would be counted several times
- The purpose of the layer is to estimate the potential population at risk





# Non-Community Supply Wells Layer

- The following is the method used to create the Non-Community Supply Wells GIS layer





# Non-Community Supply Wells Layer

Creating the Non-Community Supply Wells Layer

Base Map



Non-Community Supply Well  
(1 supply well)

Site





# Non-Community Supply Wells Layer

1. A population served by each well system is calculated from NJEMS
2. The population is divided among the wells within that system
3. Populations are multiplied by the Tier factor to determine the value that will be assigned
  - Tier 1 = 1.0
  - Tier 2 = 0.5
  - Tier 3 = 0.1
4. GIS layer for each Non-Community Supply Well is converted into a Raster file (100 by 100 foot grid) by assigning the appropriate value  

Adjusted population calculated in section 3 above is assigned to each cell in the Tier
5. Overlay each individual Supply well layer and sum up the cell values to combine a final Non-Community Supply Wells Layer
6. Multiply the Cell values by the exposure duration of 0.5 years





# Non-Community Supply Wells Layer

1. Population served by each well system = 41 people
2. Population per well: 41 people / 1 wells = 41 people per well
3. Adjusted Population by
  - Tier 1 =  $40 \times 1.0 = 41.0$
  - Tier 2 =  $40 \times 0.5 = 20.5$
  - Tier 3 =  $40 \times 0.1 = 4.1$
4. There is 1 well head protection area near site, it is Tier 3 (4.1)
5. Non-Community Supply Wells Layer cell values: = 4.1
6. Exposure Duration:  $4.1 \times 2 = 8.2$

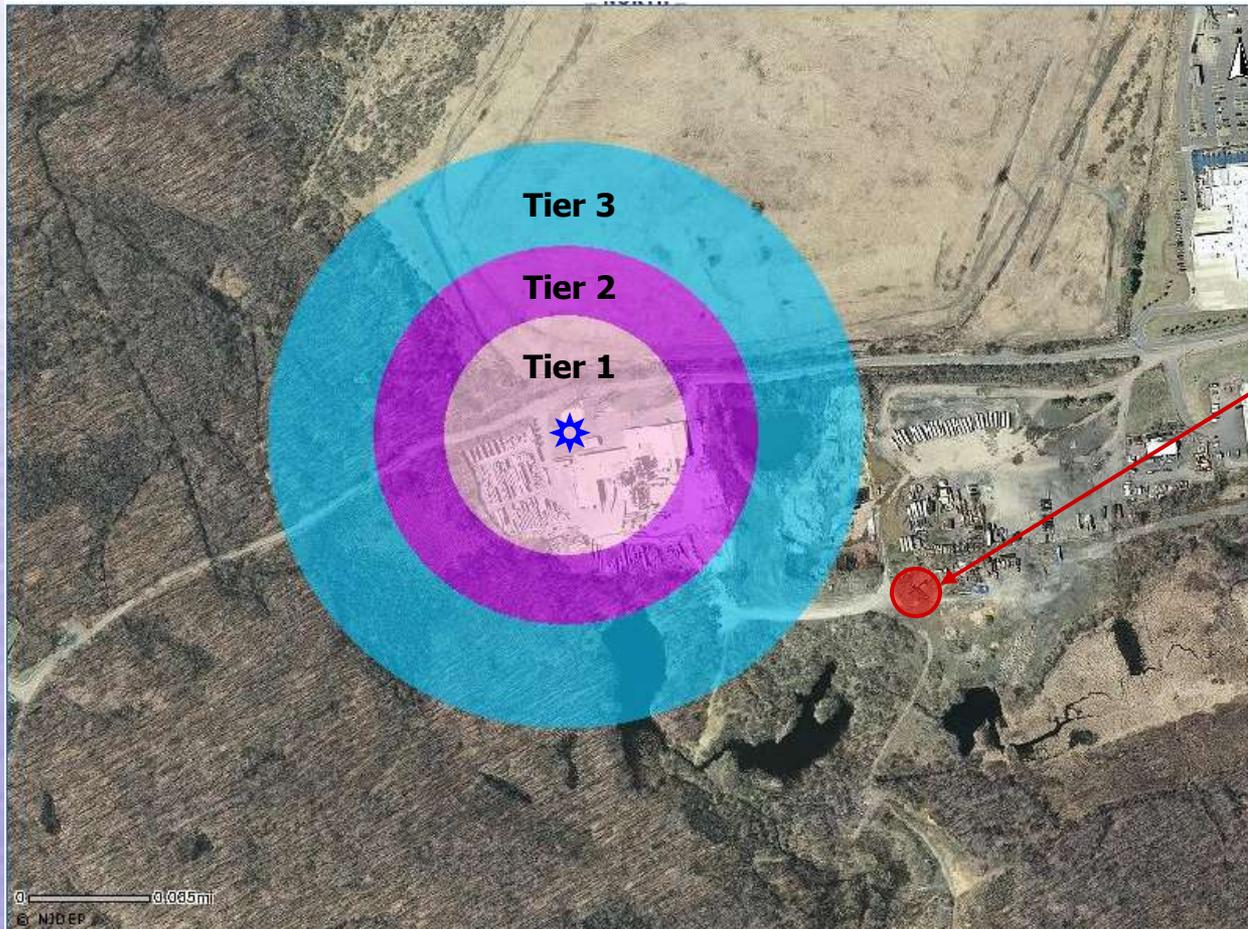
➤ **Final Cell values = 8**





# Non-Community Supply Wells Layer

## Creating the Non-Community Supply Wells Layer



Start with the Non-Community Well Head Protection Layer

Site

### Legend

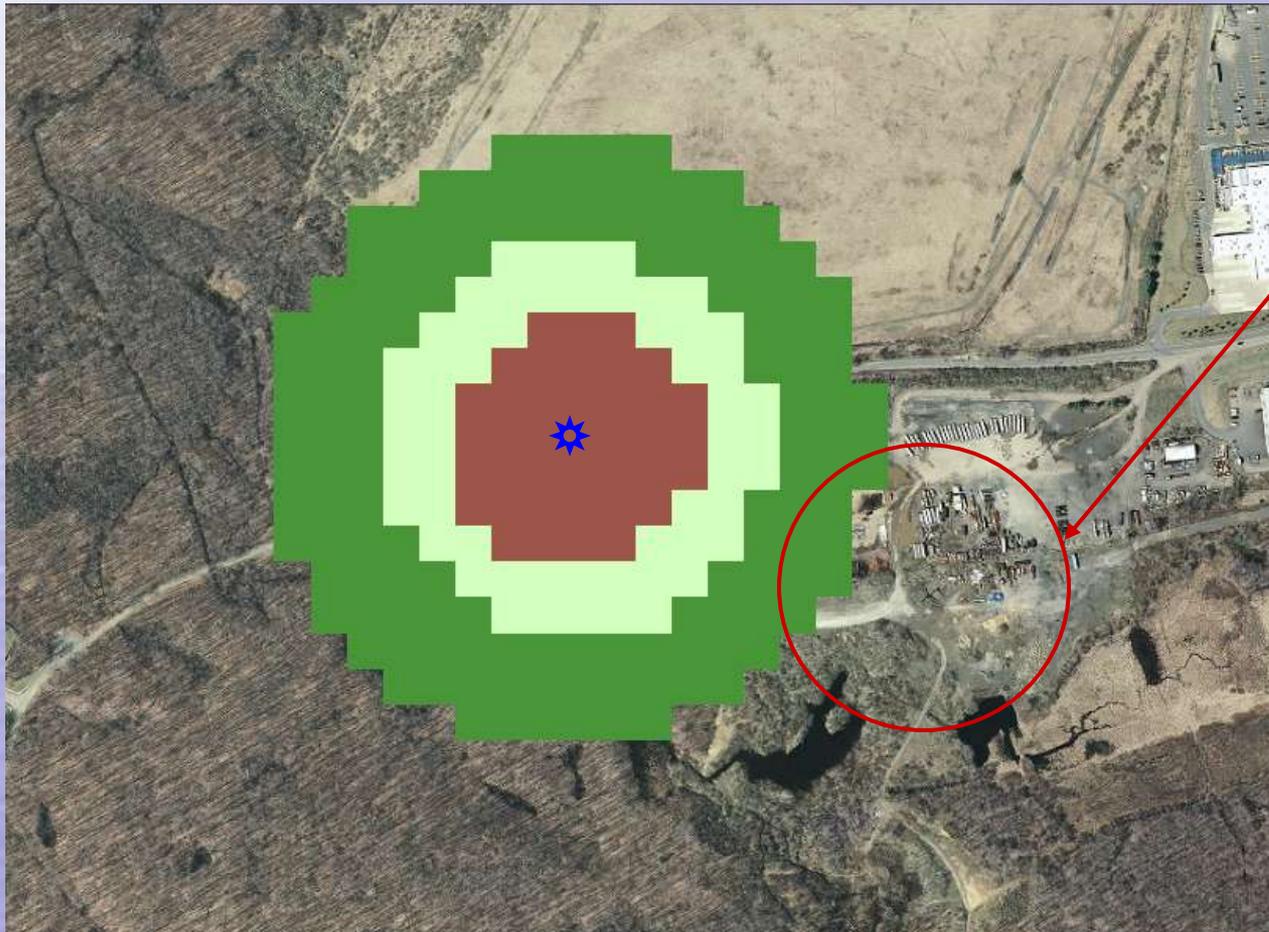
- Tier 1: 2-Year
- Tier 2: 5-Year
- Tier 3: 12-Year





# Non-Community Supply Wells Layer

## Creating the Non-Community Supply Wells Layer



- Overlay the Ground Water Extent Area for the site

**Ground Water Extent Area**

### Legend

82

41

8





# Non-Community Supply Wells Layer

## Creating the Non-Community Supply Wells Layer

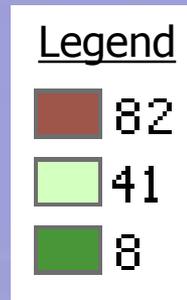


Zoom in

Maximum cell value that is within the Extent Area

– **Maximum** cell value = 8

**Final Score = 8**





# Non-Community Supply Wells Layer

- A Non-Community Supply Wells Layer is created for the entire state.
- The following is the layer used to calculate the Non-Community Supply Wells Receptor Layer Score



# Non-Community Supply Wells Layer

