Remedial Priority System

Human Health Layers
Vapor Exposure: School / Day Care

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**

Vapor Exposure: School/Daycare Layer

The Vapor Exposure: Residential Layer is a derived Layer (a layer created by DEP) that is based on population and exposure duration.

- **Mode of Exposure:** People being exposed (Inhalation) to contamination emanating from the site.

- **Background**: Vapor intrusion (VI) is defined as the migration of volatile chemicals from the subsurface into overlying buildings. The presence of volatile organic compounds in soil or ground water offers the potential to impacting indoor air quality. The RPS model is based on the "Decision Flow Chart for Vapor Intrusion Pathway" shown as Appendix A of the SRP's "Vapor Intrusion Technical Guidance" Document.

  The Vapor Exposure: Residential Layer only considers exposure to the residential population. Schools and Day Care Facilities are excluded from this count. A layer has been created specifically to evaluate receptors at those facilities.

Vapor Exposure: School/Daycare Layer

- Source Layer:
  - School Layer and Day Care Layer
    - Basis for layer: identifies residential properties and the type of usage
  - Population served:
    - The Cells values are based on an average population for a school and day care facility, which is assumed to be 500 and 75 respectfully.

  - Exposure Period:
    - A 5 year exposure period is used to account for a theoretical time to complete the Remedial Investigation phase as outlined by SRRA. For schools, the exposure period is adjusted to 2.5 years because of the 180 day school year (5 years * 180 days divided by 365 days per year).
      - ❖ School - The population is multiplied by an exposure period of 2.5 years
      - ❖ Day Care - The population is multiplied by an exposure period of 5 years

Vapor Exposure: School/Daycare Layer

- Cell Values
  - The assigned Cell Values are as follows

Soil Exposure: School / Daycare Layer	Cell Value
School	1250
Day Care	375

Vapor Exposure: School/Daycare Layer

- Calculation Method:
  - Two scores are calculated from the Vapor Exposure: School / Day Care Layer.
    - ❖ Score is calculated for Schools and another for Day Care Facilities.

    - School:
      - ❖ The Vapor Extent Area is overlain on the Vapor Exposure: School / Daycare Layer
      - ❖ If there is a School within the Extent Area, then the score for the Soil Exposure: School Layer is 1250.

    - Day Care:
      - ❖ The Vapor Extent Area is overlain on the Vapor Exposure: School / Daycare Layer.
      - ❖ If there is a Day Care within the Extent Area, then the score for the Soil Exposure: Day Care Layer is 375.

Vapor Exposure: School/Daycare Layer

- The following is the method used to create the Vapor Exposure: School / Day Care Layer

Vapor Exposure: School/Daycare Layer

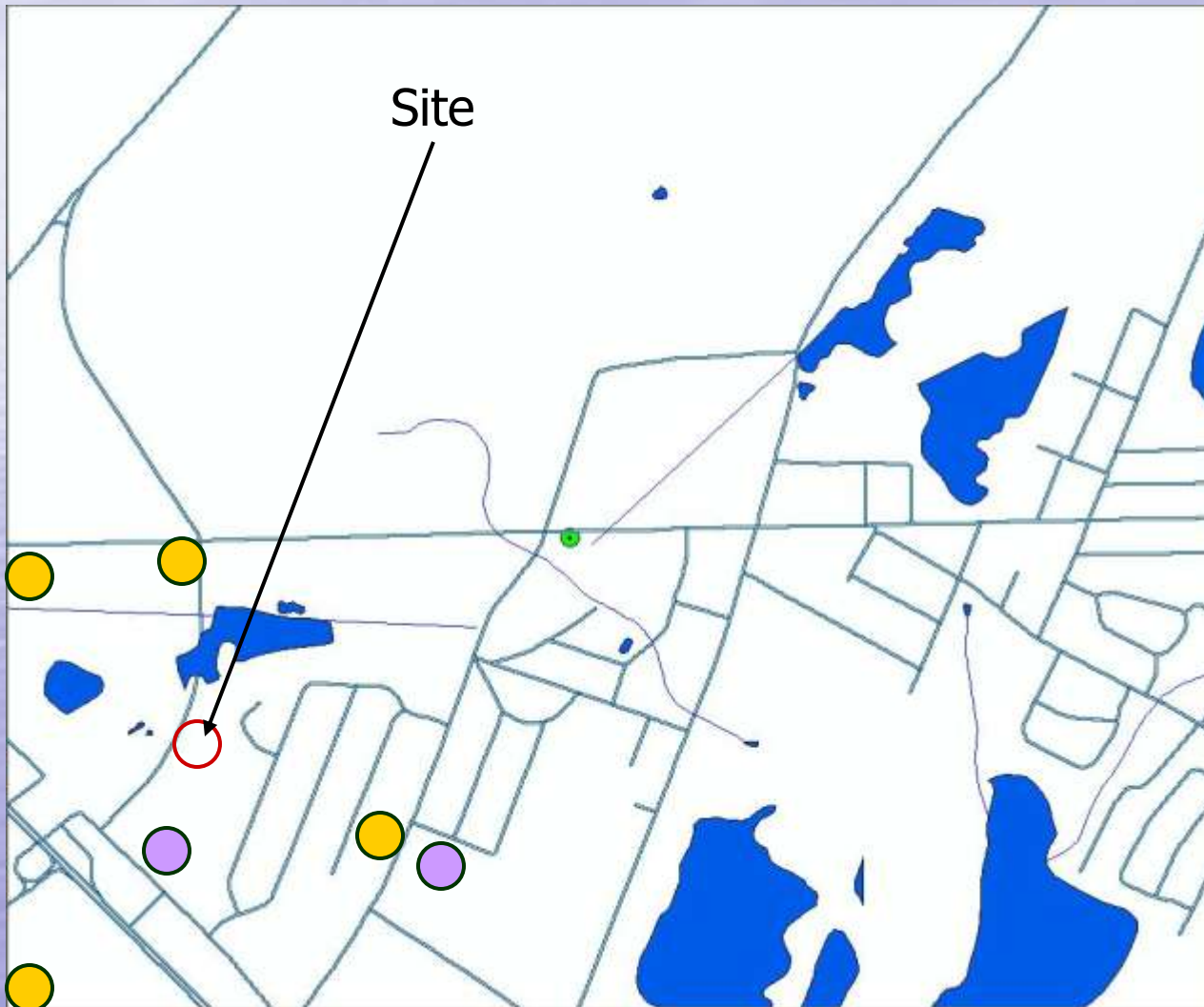Creating the Vapor Exposure: School/Daycare Layer

Site

Vapor Exposure: School/Daycare Layer

Creating the Vapor Exposure: School/Daycare Layer

Site

- Start with School and Land Use Layers

- The following table is the basis for assigning cell values:

  - School   1250
  - Day Care   375

Legend

○ Site

● Day Care

● School

Vapor Exposure: School/Daycare Layer

Creating the Vapor Exposure: Residential Layer

Vectors are converted into a Raster file (100 by 100 grid) and assign the appropriate values to each cell

Legend

1250

375

Vapor Exposure: School/Daycare Layer

Creating the Vapor Exposure: Residential Layer

Overlay the Vapor Extent Area

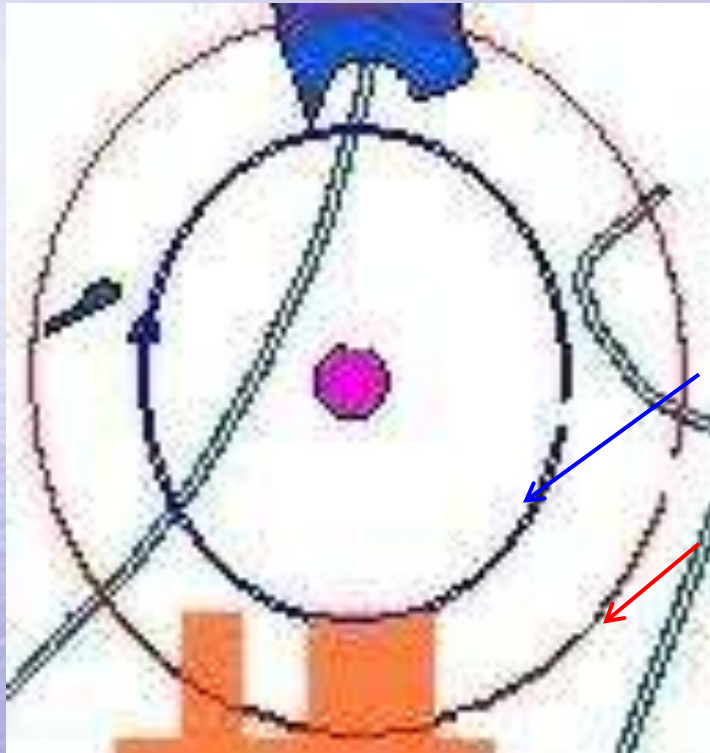Vapor Extent Area

Legend

🟩	1250
🟧	375

Vapor Exposure: School/Daycare Layer

Creating the Vapor Exposure: School / Day Care Layer

GW Extent Area

Vapor Extent Area

Legend

- 1250
- 375

- To calculate the Score:

  Zoom in to the Vapor Extent Area

School Layer

– Maximum score for schools within the Vapor Extent Area

  ➢ cell value = 1250

Day Care Layer

– Maximum score for Day Cares within the Vapor Extent Area

  ➢ cell value = 0

Vapor Exposure: Residential Layer

- A Vapor Exposure: Residential Layer is created for the entire state

- The following is the layer used to calculate the Vapor Exposure: Residential Receptors Layer Score

Vapor Exposure: School/Daycare Layer

Legend

Vapor Exposure:
School/Daycare
Score

- ☐ 0
- 🟩 375
- 🟥 1250