# United States Environmental Protection Agency
# Region 5

**To: Steven Faryan**
**From: Amy Gahala, Hydrologist**
**USGS Liaison**
**Date: 11-13-12**
**Subject: Potentiometric Surface Map, Wedron Groundwater Site**

I have reviewed the above subject line provided by Weston Solutions, Inc. and have made comments and provided additional interpretations for your consideration.

**Summary:** On October 31, 2012 personnel from Weston Solutions and the EPA, including myself conducted a water level survey of 10 locations: 5 residential wells, 2 piezometers and 3 surface water locations. Permission to access residential wells was granted by the homeowners. Homeowners were instructed to turn off their well while we were surveying. Electronic Tapes were carefully lowered down the well, avoiding any wires and equipment where present. The depth to water was measured to the 100$^{th}$ of a foot using an Engineering Rule e-tape at a marked measuring point at top of casing on the north side. EPA field personnel surveyed this measuring point to within a few centimeters using GPS equipment capable of maintaining an accuracy of ± a few tenths of a foot. The largest point of error was at location 2060 with a ±0.313ft error. However, this degree of error does not alter the groundwater flow and is therefore within the acceptable margin of error. Weston Solution recorded the data from each site and produced the Potentiometric Surface Map.

Potentiometric Surface Map Interpretations and Conclusions:

The potentiometric surface map provided honors the data collected. There is a potentiometric surface mound that follows the surface topography in that area and flows downgradient towards the old sand and gravel pit (PIT3) to the west.

There is a data gap towards the northern half and the southwest of the potentiometric surface map area due to limited availability and/or access to residential wells. However, the groundwater levels show a hydraulic connection to the topography in this area. Therefore, I suspect that portions of the northern and southwest area groundwater potentiometric surface may differ from the interpretation provided by Weston. Again, Weston honored the data collected and provided the best interpretation for the data available.

Collecting the groundwater level data confirmed a close hydraulic connection to the surface topography. This allows some interpretation and extrapolation among the other data sets collected for this area. Therefore, my interpretation of the groundwater potentiometric surface and flow is based on the groundwater elevations obtained on October 31, 2012, the surface

topography, and the contaminant plume.

There is a topographic high slightly southwest of N3458 Rd (Alice St.) where the red 9 is on the map image below. The elevation in this area ranges from 540 to 577ft amsl. The surface elevation within the residential part of Wedron that created the "mound" ranges from ~530 to 550 ft amsl. The elevation directly north following along 2062nd Rd rises to a topographic high of ~585 ft amsl. Elevations are estimates based on Google Earth and were compared to the USGS Topographic Map (image below).

Groundwater is hydraulically connected to the local topography in this area based on the groundwater levels recorded at the wells 3467, 3471, 2071, HOXSEY, TMW09, and 2060. Therefore, even though there are some data gaps, some interpretations and extrapolations can be made based on the topography and the groundwater contamination data.

According to Figure 6, "Soil Analytical Results Exceeding Tier I Soil Remediation Objectives," there is a point source located on the topographic high at N3462nd Rd and N 2153rd Rd. The location of that point source is also at the highest point of the groundwater "mound" (502.44 ft and 502ft groundwater elevation). Groundwater flows from high points to low points and in this case there are multiple paths that the groundwater can flow. The groundwater flows along a natural topographic gradient from east to west and is further influenced by the steep drop in gradient created by the sand pit to the west. The groundwater also migrates towards the sand pit to the northeast and is bounded by a topographic high to the north. The groundwater also flows to the southeast towards the river following along topographic lows and bounded by topographic highs towards the southwest. This pattern of flow is supported by the surface topography and by the contaminant plume (image below). When you compare the plume migration paths to the topography, it is easy to see the plume migrating towards the topographic lows and bounded by the topographic highs.

I would like to emphasize that these are my interpretations based on the groundwater level data obtained on October 31, 2012, the topographic map (below) and the contaminant plume determined by Weston. Therefore, if and when possible, I would recommend confirming my interpretations in the event additional residential wells are able to be surveyed; particularly the data gaps towards the northern topographic high and the southwest topographic high. Additional groundwater level data may also be beneficial towards the far northeast to confirm Weston's interpretation of the preferential flow towards the east sand pit.

USGS Map Name: Wedron, IL  Map MRC: 41088D7
Map Center: N41.43423° W88.77046°  Datum: NAD27  Zoom: 4m/pixel

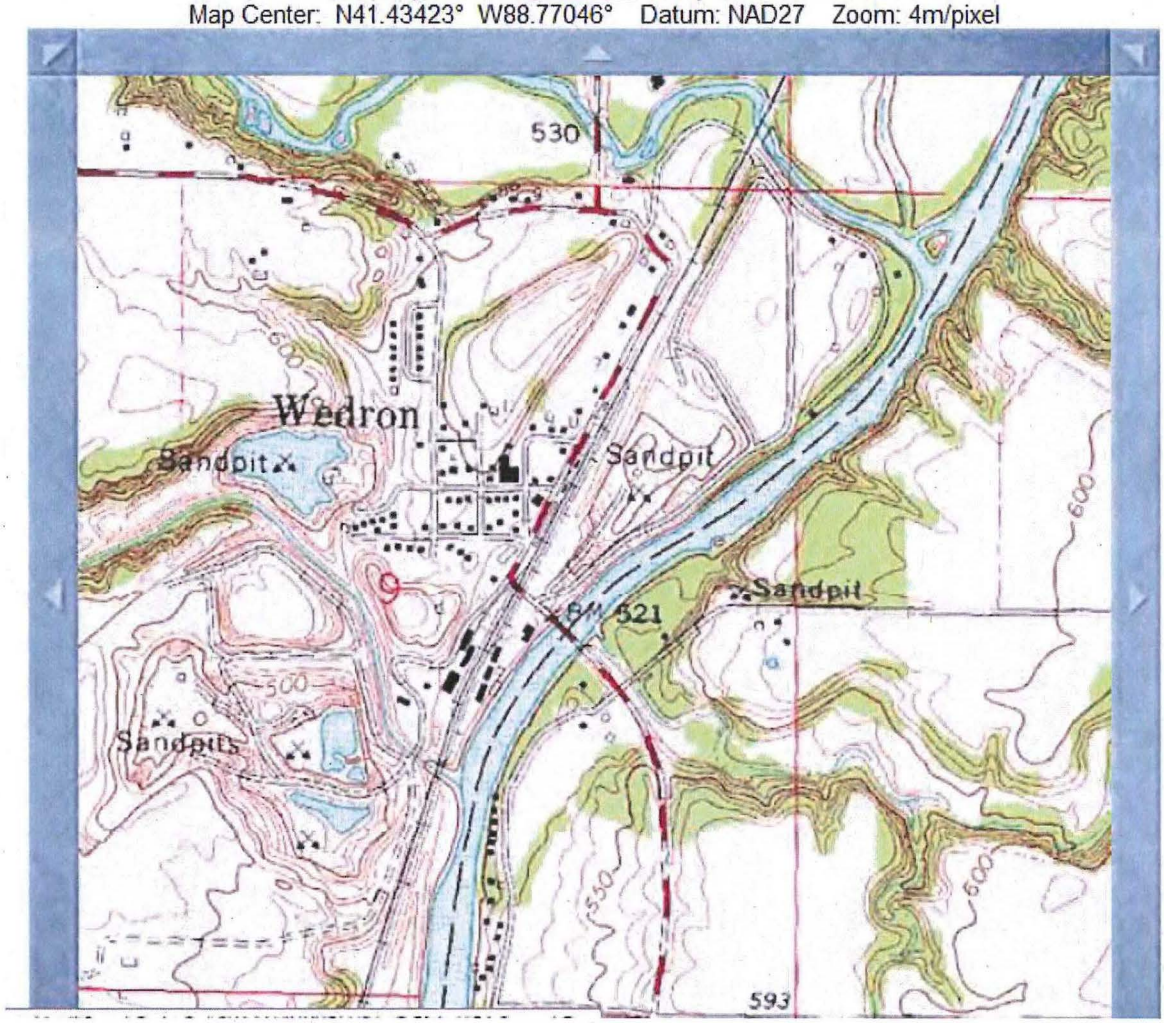


Image taken from Weston Solutions Figure 7 "Approximate Area of Groundwater Contamination"

I hope these comments have been helpful to you. If you have any questions, please feel free to contact me.

Sincerely,
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