

Issue Paper No. 4 – Areas of Concern & Environmental Considerations
Hardin County Water District No. 2
Regional Wastewater Facilities Plan

This issue paper presents information regarding areas of concern and environmental considerations. The information presented in this issue paper will be discussed at Advisory Committee Meeting No. 3.

Areas of Concern

At the previous Advisory Committee meeting and through discussions with the Health Department, several locations were identified as “areas of concern.” These areas are shown in Figure 1, and are listed below with approximate (future) house counts:

- Upton, 400 Homes
- Sonora, 200 Homes
- Cecilia, 400 Homes
- Rineyville, 400 Homes
- LaVista Estates area, 200 Homes
- Burns-Deckard School Road, 450 Homes
- Boone Road, 150 Homes
- Airview Estates, 80 Homes
- Smithersville, 30 Homes
- Bardstown Road Area, 400 Homes
- Springfield Road Area, 300 Homes
- Thoroughbred Estates, 150 Homes
- Hodgenville Road Area, 250 Homes
- New Glendale Road, 200 Homes
- Oxmoor Village, 100 Homes
- Glendale and areas North, 300 Homes
- Gilead Church-Glendale Road Area, 150 Homes

In addition to these delineated areas, the facility plan should consider protecting the drinking water well recharge and protection areas in the county, also shown in Figure 1. The above listed areas should be prioritized by the Advisory Committee for the regional facilities plan. The Advisory Committee of Health Department may add other areas to the list.

Environmental Considerations

In addition to specific areas, there are environmental considerations that should be reviewed when preparing the regional facilities plan. This list of considerations includes:

- Impaired Streams as identified by KDOW
- Impaired Lakes as identified by KDOW
- KPDES permits, and their compliance status
- Unpermitted discharges
- Soil Suitability for on-site wastewater treatment/disposal
- Septic Tank usage and failures and straight pipe discharges
- Wasteload allocation (WLA)
- Wetlands
- Flood Plains
- Topography
- Geology/Groundwater

Each of these items will be discussed below.



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Streams

Impaired streams are streams that are not supporting their designated use or only partially supporting use as listed in the State's 305(b) report to Congress. These streams are listed on the KDOW 303(d) list. 305(b) and 303(d) refer to the sections of the Clean Water Act. There are 7 stream segments in Hardin County that are classified as "not supporting" and 2 segments that are classified as "partially supporting" designated uses. Those streams are listed below with comment data from Division of Water. These streams are shown in Figure 1.

NOT SUPPORTING

- **Mill Creek** of Salt River from mile 6.0 to 7.0
 - Impaired Use(s): Aquatic Life (Nonsupport), Fish Consumption (Nonsupport)
 - Pollutant(s): Mercury
 - Suspected Sources: Municipal Point Sources (Major Municipal Point Sources).
 - Comment: Entirely contained on the Ft. Knox reservation. It is based on DMR data from Fort Knox. The KPDES permit requires in-stream monitoring upstream and downstream of the discharge location to define the contribution of mercury from the area. A streamflow gaging station has been installed.
- **Clear Creek** of Rolling Fork from mile 0.0 to 4.4
 - Impaired Use(s): Aquatic Life (Nonsupport)
 - Pollutant(s): Unknown
 - Suspected Sources: Unknown
 - Comment: Near Upper-Colesburg Road and I-65
- **Billy Creek** of Valley Creek from mile 0.0 to 5.9
 - Impaired Use(s): Swimming (Nonsupport), Aquatic Life (Partial Support)
 - Pollutant(s): Siltation, Organic Enrichment/Low DO, Habitat Alterations (Other than Flow)
 - Suspected Sources: Unknown
 - Comment: Section begins out beyond Ring Road between Rineyville Road and St. John Road. It crosses Ring Road, and turns toward Mulberry where it joins with Valley Creek near Central Hardin High School.
- **Valley Creek** of Nolin River from mile 10.3 to 11.8
 - Impaired Use(s): Swimming (Nonsupport)
 - Pollutant(s): Pathogens
 - Suspected Sources: Unknown
 - Comment: This segment of Valley Creek begins South of downtown outside of I-65. It flows toward the downtown area, crossing under Dixie Highway just south of the Square. It follows along Mulberry until it crosses under the By-pass.
- **Valley Creek** of Nolin River from mile 8.0 to 10.3
 - Impaired Use(s): Aquatic Life (Nonsupport)
 - Pollutant(s): Siltation, Nutrients, Flow Alterations, Habitat Alterations (Other than Flow)
 - Suspected Sources: Industrial Point Sources, Habitat Modification (Other than Hydromodification) - Removal of Riparian Vegetation and Bank Modification/Destabilization, Agriculture (Crop-related Sources), Agriculture (Grazing-related Sources), Urban Runoff/Storm Sewers (Hwy/Rd/Bridge Runoff)
 - Comment: This segment begins where the above segment ends along Mulberry to the West of the Bypass. It meanders along Mulberry until it reaches the confluence with Billy Creek near Central Hardin High School.



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- **Valley Creek** of Nolin River from mile 0.0 to 3.5
 - Impaired Use(s): Swimming (Nonsupport), Aquatic Life (Partial Support)
 - Pollutant(s): Pathogens, Unknown
 - Suspected Sources: Unknown, Unknown
 - Comment: This segment of Valley Creek begins along Bacon Creek Road, crosses Glendale-Hodgenville Road until it reaches the confluence with Nolin River.
- **Dorsey Run** of Sinks of Nolin River from mile 1.9 to 3.7
 - Impaired Use(s): Aquatic Life (Nonsupport)
 - Pollutant(s): Nutrients, Siltation, Habitat Alterations (Other than Flow), Algal Growth/Chlorophyll_a
 - Suspected Sources: Agriculture (Grazing-related Sources - Pasture Grazing - Riparian and/or Upland), Habitat Modifications (Other than Hydromodification) – Removal of Riparian Vegetation, Urban Runoff/Storm Sewers (Erosion and Sedimentation)
 - Comment: Section is south of Sonora, and begins between I-65 and Dixie Hwy. Runs toward Sonora to Flint Hill Road.

PARTIALLY SUPPORTING

- **Mill Creek Branch** of Mill Creek from mile 0.0 to 0.7
 - Impaired Use(s): Aquatic Life (Partial Support)
 - Pollutant(s): Organic Enrichment/Low DO, Ammonia (Un-ionized)
 - Suspected Sources: Municipal Point Sources (Package Plants – Small Flows)
 - Comment: Near AirView Estates. DMR data showed significant noncompliance for ammonia. A Notice of Violation was issued on June 22, 2001 based on an inspection of May 31, 2001. Enforcement actions are continuing. Discussions have also been held with the City of Elizabethtown concerning the possibility of Elizabethtown incorporating this facility into its sewage treatment network. Gaging station has been installed.
- **Cox's Run** of Nolin from mile 0.0 to 3.2
 - Impaired Use(s): Aquatic Life (Partial Support)
 - Pollutant(s): Siltation, Nutrients, Habitat Alterations (Other than Flow)
 - Suspected Sources: Agriculture (Crop-related Sources and Grazing-related Sources), Habitat Modifications (Other than Hydromodification) – Bank Modification/Destabilization, Urban Runoff/Storm Sewers (Hwy/Rd/Bridge Runoff and Erosion and Sedimentation)
 - Comment: Cox's Run begins along I-65 between the rest stops north of Sonora. It runs Northwest along Nolin Road (1407) until the confluence with Nolin River.

Lakes

A small portion of Rough River Lake in Hardin County is listed in the 305(b) report as a partial use failure for fish consumption. The pollutant is listed as Mercury, however the source is unknown. Freeman Lake is the only other Hardin County lake that is monitored, and was found to fully support all use categories. Rough River Lake is shown in Figure 1.

KPDES Permittees

As discussed in previous Issue Papers and committee meetings, an evaluation of current KPDES permitted treatment facilities and possible elimination of package plants is an important



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consideration in the facilities plan. The locations of the plants are shown in Figure 1. The current Public Permittees are located in Elizabethtown, Radcliff, Ft. Knox, and Vine Grove. The current package plant permittees are as follows:

WWTP Name	Type	Rated Capacity (mgd)	Average Flow (4/02 - 3/03) (mgd)
Elizabethtown	Municipal	7.2	6.18
Radcliff	Municipal	4.0	2.34
Vine Grove	Municipal	0.7145	0.30
Ft. Knox	Municipal	6	3.0
Airview Estates Subdivision	Private	0.055	0.032
Glendale Children's Home	Private	0.022	0.010
Glendale Auto Truck Plaza	Private	0.015	0.006
Hardin County Board of Education Outfall 001	Private	0.012	0.005
Hardin County Board of Education Outfall 002	Private	0.012	0.004
Heartland Mobile Home Community	Private	0.007	0.004
KTC Hardin Co Rest Area I-65 Outfall 001	Private	0.02	0.009
KTC Hardin Co Rest Area I-65 Outfall 002	Private	0.02	0.01
Petro Shopping Centers	Private	0.06	0.036
Sonora Auto Truck Plaza Outfall 001	Private	Unknown	0.001
Sonora Auto Truck Plaza Outfall 002	Private	Unknown	0.001

In addition to these plants, the Health Department will help identify significant non-point source discharges such as schools and industry in the County.

Unpermitted Discharges

Areas within the county that are discharging sewage without a permit represent a serious health hazard. An effort should be made to identify any of these discharges by the committee in conjunction with the Health Department.

Soil Suitability for On-site Disposal

The quality of the soil in an area relative to use in on-site disposal of wastewater is very important when considering wastewater facilities. Figure 2 shows the soil map for Hardin County screened for suitability of on-site disposal. The majority of the soils in the county are silty loam or clay loam, neither of which is considered desirable for on-site systems such as septic /subsurface disposal.



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Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Permeability, a high water table, depth to bedrock, and flooding affect absorption of the effluent. Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Groundwater can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively.

The committee should work with the Health Department to quantify the septic systems in Hardin County and locate areas of recent failures.

Wasteload Allocation

A wasteload allocation must be obtained from KDOW for any new or increased discharge of wastewater to the environment. A wasteload allocation request will be made to KDOW once more is understood regarding the potential capacity needs and options.

Wetlands

The accepted definition of wetland is an area that is inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances does support, a prevalence of vegetation or aquatic life that requires saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds. The largest wetland areas in Hardin County are around Rough River Lake, Southern portions of Nolin River – especially along the Hardin County border, Freeman Lake, and Rolling Fork. Construction in wetlands should be avoided as special permitting would be required. The locations of wetlands are shown in Figure 3. Alternatives developed for the collection and treatment should avoid wetlands.

Flood Plain

Areas prone to flooding should be identified in the Regional Wastewater Facilities Plan. The established flood zones are shown in Figure 4. The Federal Emergency Management Agency (FEMA) defines many zones with regard to flooding. Zone X is defined as outside the 100 and 500 year flood limits. The majority of the County is in this zone. Flood Zones A and AE are both 100 year flood areas. Zone AE are areas that a base flood elevation has been determined, Zone A has no base elevation. The 100 Year flood areas include Nolin River, Rough River near Vertrees and again along the county border, Sandy Creek south of Sonora. Valley Creek south of the E-town limits, and East & West Rhudes Creek as they merge with Valley Creek near Bacon Creek Road. Shaw Creek and Freeman Creek confluence is also a flood area near the By-Pass and Mulberry. Billy Creek's confluence with Valley Creek south of the By-pass is another flood area. North of E-town, much of Rolling Fork, Mill Creek, and Cedar Creek are flood zones. In Radcliff and Vine Grove, Flippin Creek, Otter Creek, and Brushy Fork are 100 year flood areas.

Construction in the 100 year flood plain should be minimized, however for wastewater collection systems it is essentially unavoidable. New WWTP construction must be protected to operate up to the 100 year flood elevation. Often times WWTP's are constructed in the 100-year flood plain. Construction within the flood-way should be avoided.



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Gravity interceptor sewers and pump stations are often constructed with the 100-year flood plain. KDOW allows this, but requires the pump station to be accessible in the 25-year flood. Electrical gear and controls are to be protected to the 100-year flood elevation.

Topography

Topography can play an important role in collecting and transporting wastewater. The influence of topography will be considered during consideration of detailed alternatives. Generalized topography is shown in Figure 5. For example, the City of Elizabethtown is nestled just below the ridge that runs in the middle of the County. Areas to Northeast and Northwest naturally flow into the City, and serving those areas by gravity with existing infrastructure may prove easier than areas south of the city. Areas to the south of the City are lower in elevation and may require a separate treatment facility or a series of pump stations to convey wastewater to the City system.

Geology/Groundwater

Because of the mass occurrence of limestone in the area, Hardin County is mostly considered a karst area. Karst areas are susceptible to underground streams, caverns, and sinkholes. Figure 6 shows the county is categorized as 'major karst', with some areas as 'minor karst'. A few areas such as those along Rolling Fork, and upper Nolin are not considered karst. This mostly karst situation can greatly affect the groundwater quality by creating direct conduits for contaminated surface water to get to groundwater. Figure 7 shows the sensitivity of the area to groundwater contamination including known sinkholes. There are a great number of sinkholes and most of the county is considered Very Highly hydrosensitive for groundwater contamination.



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Issues To Be Resolved

Prioritize the areas of need. Use high-priority, medium-priority, and low-priority areas. The prioritization will be used in developing the facilities plan.

Resolution (at the April 15, 2005 Advisory Committee Meeting):

<u>High</u>	<u>Med</u>	<u>Low</u>	<u>Area of Concern</u>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Upton
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sonora
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Cecilia
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Rineyville (including Rineyville Elementary School)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LaVista Estates area
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Burns-Deckard School Road
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Boone Road
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Airview Estates
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Smithersville
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Bardstown Road Area
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Springfield Road Area
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Thoroughbred Estates/Thousand oaks
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hodgenville Road Area
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	New Glendale Road
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Oxmoor Village
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Glendale and areas North
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gilead Church-Glendale Road Area
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	West Hardin/Lakewood Schools, Stephensburg Area
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Glendale Children's home
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Colesburg
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Landfill (Springfield Road Area)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Septage Receiving Point

