

Issue Paper No. 8 –Alternatives Development
 Hardin County Water District No. 2
 Regional Wastewater Facilities Plan

This issue paper presents information regarding flow projections and alternatives development for service areas outside current municipal sewer service areas. The information presented in this issue paper will be discussed at Advisory Committee Meeting No. 6.

Service Areas

In Issue Papers No 7 and Advisory Committee Meeting no 5, the service areas were defined based on watershed boundaries. These watersheds were prioritized based on existing needs and concerns. The Advisory Committee has established the following service areas and alternatives to be considered

Table 1 – Wastewater Service Areas and Alternatives for Treatment

| Service Area | ETown WWTP | Radcliff WWTP | Vine Grove WWTP | Ft. Knox WWTP | Caveland Environmental | New South County WWTP | New North County WWTP | New East County WWTP | Local Subsurface Disposal System` | Do Nothing |
|--|------------|---------------|-----------------|---------------|------------------------|-----------------------|-----------------------|----------------------|-----------------------------------|------------|
| Watersheds with Identified Needs (0-10 year needs) – See Figure 1 | | | | | | | | | | |
| Upper Shaw Creek (Smithersville) | | ? | | | | | | | | |
| Upper Otter Creek (Boone Rd. Area) | | | | | | | | | | |
| Pawley Creek (Lavista Estate & Rineyville) | | | | | | | | | | |
| Brushy Fork (Burns-Deckard School Rd.) | | | | | | | | | | |
| Mill Creek Branch (Aireview Estate) | | | | | | | | | | |
| Buffalo Creek (Bardstown Rd. Area) | | | | | | | | | | |
| Upper Younger Creek (Springfield Road Area) | | | | | | | | | | |
| Middle Creek Branch (Thoroughbred Estate) | | | | | | | | | | |
| East Rhudes Creek (Oxmoor Village & Hodgenville) | | | | | | | | | | |
| North Upper Nolin River (Gilead Church – Glendale Rd.) | | | | | | | | | | |
| Rose Run (Glendale – North Glendale) | | | | | | | | | | |
| West Rhudes Creek (Cecilia) | | | | | | | | | | |
| Dorsey Run (Sonora) | | | | | ? | | | | | |
| Sandy Creek (Upton) | | | | | ? | | | | | |
| Valley Creek (Industrial Area) | | | | | | | | | | |



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|--|------------|---------------|-----------------|---------------|------------------------|-----------------------|-----------------------|----------------------|----------------------------------|------------|
| Other near urban watersheds (10-20 year needs) – See Figure 2 | | | | | | | | | | |
| Mill Creek | | | | | | | | | | |
| Lower Otter Creek | | | | | | | | | | |
| Flippin Creek (moved from Rural) | | | | | | | | | | |
| Upper Pawley Creek | | | | | | | | | | |
| Billy Creek | | ? | | | | | | | | |
| Upper West Rhudes Creek | | ? | | | | | | | | |
| Lower Valley Creek | | | | | | | | | | |
| Nolin River | | | | | | | | | | |
| Cox Run | | | | | | | | | | |
| Upper Nolin River | | | | | | | | | | |
| Jackson Branch | | | | | | | | | | |
| Upper Valley Creek | | | | | | | | | | |
| Clear Creek | | | | | | | | | | |
| Upper Buffalo Creek | | | | | | | | | | |
| Upper Freeman Creek | | | | | | | | | | |
| Cedar Creek | | | | | | | | | | |
| Rural Watersheds (beyond year 20 needs) – See Figure in Issue Paper 7 | | | | | | | | | | |
| Lower Clear Creek | | | | | | | | | | |
| Rolling Fork | | | | | | | | | | |
| Younger Creek | | | | | | | | | | |
| Broadhead Run | | | | | | | | | | |
| Middle Creek | | | | | | | | | | |
| Copelin Valley | | | | | | | | | | |
| Lower Sandy Creek | | | | | | | | | | |
| Akers Valley | | | | | | | | | | |
| Lower Nolin River | | | | | | | | | | |
| Meeting Creek | | | | | | | | | | |

Alternatives Refined

In Issue Paper No. 7 the range of feasible alternatives has been developed. The Advisory Committee previously narrowed down the range of feasible alternatives to be considered in the plan. This Issue Paper will present the progress made in refining the alternatives. Each service area was considered either individually or in concert with adjoining or downstream service areas to identify the trunk sewer and conveyance infrastructure required. The following figures showing the potential infrastructure are presented as attachments:

- Figure 3 - Northern Service Areas (year 2015)
- Figure 4 - Northern Service Areas (year 2025)



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- Figure 5 - Eastern Service Areas (year 2015)
- Figure 6 - Eastern Service Areas (year 2025)
- Figure 7 - Valley Creek Service Area (year 2015)
- Figure 8 - Valley Creek Service Area (year 2025)
- Figure 9 - Southern Service Areas (year 2015)
- Figure 10 - Southern Service Areas (year 2025)
- Figure 11 - Upton & Sonora Service Areas (year 2015 and 2025)

Flow Projections:

For each area, the flow projections over time have been established based on the current and future population projections and vacant industrial parcel development. Table 2 presents the flow by year for each of the service areas.

Infrastructure Sizing:

Table 3 lists the infrastructure and capacities required for each area. In general, trunk sewers will be installed at minimum grade and were sized for 20 year or ultimate needs with rounding up to the next available sewer size. Pump stations will be sized for the 0-10 year flows initially followed by the ultimate flows. Where feasible the stations would be installed at their ultimate locations and with large enough wet wells to handle ultimate conditions. In situations where the ultimate location does not make sense for many years, an interim station is considered. The forcemain sizing considered an initial velocity of 2 feet per second (fps) minimum and an ultimate velocity of 5 fps. Parallel forcemain infrastructure may ultimately be required and was considered in the analysis. The alternatives will continue to be refined as we solicit input from the municipal treatment providers and KDOW regarding the potential to construct new WWTPs in the county.

Cost Functions:

Strand Associates is developing several cost functions to be used to predict the cost of the following infrastructure:

- Gravity collector Sewers
- Gravity interceptor Sewers
- Pump Stations
- Forcemains
- Wastewater treatment plants
- Clustered–type no discharge systems for rural areas

Conveyance Model:

Strand is developing a spreadsheet-based hydraulic model for the County's use in managing demands on conveyance infrastructure. This model will enable routine comparison of impacts of future growth on the existing and proposed infrastructure. The model will be developed in Microsoft Excel and will include color background images generated from ArcView. We envision two 'worksheets' for each service area. One worksheet will be the image and capacity results and the other worksheet will include all of the assumptions and calculations. The user will be able to update the assumptions made in the sizing of the infrastructure as growth and development ultimately occur.

USEPA has proposed that utilities follow a rigorous approach to managing their infrastructures Capacity, Management, Operation and Maintenance (CMOM). This model will be an invaluable tool as the utilities manage their conveyance systems as part of the future CMOM requirements. A concept of this hydraulic model will be presented in the advisory committee meeting. The



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final model will be delivered at the completion of the study so that it reflects the recommendations of the study and is as accurate as possible.

Wasteload Allocations:

The Kentucky Division of Water provides a wasteload allocation (WLA) for each increased or new discharge to the waters of the State. The WLA identifies the necessary effluent limits to protect the receiving stream's water quality and aquatic ecosystem. We have requested wasteload allocations from KDOW for the three potential sites for new county WWTPs. Figure 4 identifies some possible locations for one or more county WWTPs. The request is still pending at the KDOW. KDOW could not commit to a date when the requested WLAs would be issued. A delay in this information will hold up the completion of the study.

Information Requests to Municipal Treatment providers:

As of the date of the Advisory Committee meeting, we are delivering specific requests to the Elizabethtown, Radcliff, Vine Grove, Ft Knox and Caveland utilities. The requests include potential flows (peak and average daily) from the various service areas and will request the utilities provide the following information:

1. Where in their collection system the new wastewater sources will have to be delivered (terminal location of forcemain or gravity sewer).
2. Identification of any capital costs to be paid for the new connections to upgrade the conveyance infrastructure or treatment plant.
3. Identification of the anticipated cost per 1000 gallons to treat the assumed domestic strength wastewater and any other foreseen monthly costs (customer charges, etc).

The utilities may require additional time to assemble answers to these requests. The overall alternatives evaluation cannot be completed until this information is provided.

Issues To Be Resolved:

No issues require resolution at this meeting. Once the alternatives have been fully developed, the Advisory Committee will be asked for their concurrence.

