

Houston-Galveston Area Wastewater Infrastructure Regionalization Summary

Regionalization refers to a wastewater infrastructure development process or policy under which the wastewater infrastructure needs of new development are coordinated or combined in regional facilities, or existing facilities are consolidated. This approach to managing the wastewater infrastructure network of an area has been proposed, in various forms, as a potential tool for the 13-county Houston-Galveston region (region). This summary document is intended to provide background for the discussion of regionalization by offering a brief review of wastewater infrastructure regionalization policy and/or implementation in the region. These examples include previous investigations of regionalization by H-GAC, applicable state and local policies, and select past and current local applications of regionalization. This document is not intended to be an exhaustive account of wastewater regionalization, but it should provide adequate background on its status in the region to foster further discussion.

Past H-GAC Studies

Under contract with TCEQ, H-GAC has maintained a Regional Water Quality Management Plan (WQMP) for over 30 years. Under this and other programs, H-GAC has evaluated many aspects of the region's wastewater infrastructure network. In the early 1970s, three studies were conducted to assess both the need for wastewater treatment facilities for the rapidly growing Houston area and the issue of regionalization. The *Eight County Regional Sewer Study* was written in 1971, the *Area-wide Waste Treatment Management Plan for the Greater Houston Area* (commonly known as the 208 Plan) was written in 1975, and the *Gulf Coast State Planning Region Waste Treatment Management Study* was written in 1976. These examples indicate that discussion of the regional nature of wastewater infrastructure planning and the potential for regionalization have long been considerations for the region's decision-makers.

In 2000, H-GAC produced a white paper evaluating domestic wastewater regionalization. Since that time, it has served as a primary source on regionalization in the area, as several entities have cited this document as their main reference on regionalization. H-GAC has continued to update the white paper, and the most recent version was produced in late 2009. The purpose of the white paper is to address a perceived need for wastewater regionalization, caused by specific issues arising from the patterns and character of wastewater infrastructure development in the region. Rapid population expansion and lack of regional coordination of facility development has led to an abundance of wastewater treatment facilities. The large number of small facilities and aging facilities, accompanied by continued reliance on aging and/or poorly maintained OSSFs in

unincorporated areas have created the potential for an appreciable impact on the water quality in local waterways. The white paper identified disadvantages to a network primarily composed of smaller plants, including a loss of economy of scale, due to a higher average cost of treatment, higher life cycle costs, and bearing higher financing costs for upgrades and repairs. Larger facilities have a diminishing incremental cost of providing service as volumes increase.

The white paper identifies large anticipated growth as another reason to consider regionalization of wastewater treatment facilities; however, it follows by identifying four distinct hurdles to implementation. Financial hurdles include lack of regional funding mechanisms. Statewide infrastructure funding programs exist, but there is a lack of regional coordination similar to the Regional Water Planning Groups, and funding is finite. This often leads to individual entities funding or pursuing projects without coordination with others, which frequently results in short-term incentives to pursue localized, small-scale plants. Until there is a regionally-oriented mechanism to fund large regional plants, small-scale plants will continue to be the primary mode of development based on existing funding considerations. Cost of redevelopment was another financial hurdle identified due to the high costs associated with retrofitting developed land, which often increases with density. A lack of incentive to consolidate was another primary financial hurdle identified in the white paper. As was the case with the nonexistent regional funding mechanism, there is also no incentive for developers to choose to pursue a long-term wastewater treatment option. Small package plants are often a more cost effective short-term treatment solution, and they do not require coordination with local political subdivisions. Lack of a coordinating body specific to this purpose exacerbates this issue.

Three other types of hurdles the study identified involve: developmental, control, and coordination issues. Growth in some areas is often rapid and not necessarily concurrent, which leaves coordination of regional wastewater treatment a difficult option. Communities are generally built by different developers, and development does often not follow the same pace of the growth of wastewater infrastructure. Owners of small treatment plants are often disinclined to voluntarily give up operational control and maintenance responsibilities to a larger regional facility due to concerns, real or perceived, of loss of control over vital services. Without a regionally coordinated entity, there is less likelihood that cooperation can be expected between the large amount of owners, operators, and developers in a region.

Potential solutions identified by the white paper to overcome hurdles to regionalization include both voluntary and mandatory measures, as well as a hybrid of the two. Voluntary measures rely on utilizing previous efforts while still moving forward to create a regional guiding effort. This effort could be based on developing financial and political incentives for the development of regional facilities, and providing a forum for coordination. However, voluntary measures require buy-in from affected parties and additional funding sources. Mandatory measures would potentially include state regulation and/or local ordinances and policies that require regionalization as an aspect of wastewater development. While TCEQ does require the feasibility of regionalization to be assessed before new treatment facilities are permitted, further mandatory

measures are likely to be met with some degree of political resistance at both the state and local level. To account for the potential drawbacks for both voluntary and mandatory measures, the white paper emphasizes the prospective benefits that could be yielded by a regional wastewater authority as a coordinating and incentivizing entity¹.

TCEQ Policy on Wastewater Regionalization²

The Texas Commission on Environmental Quality's policy on regionalization states that regionalization is feasible unless:

- no other systems are reasonably close;
- request has been denied for service from neighboring systems;
- an exception based on cost, rates, and financial, managerial, and technical capabilities of the current system should be granted.

When applying for a new certificate of convenience and necessity (CCN), an evaluation of feasibility must be completed. Sufficient evidence must be provided to TCEQ staff to determine if any of the three criteria applies to the planned system. According to state law, 'reasonably close' is defined as 2 miles for new CCNs. The evaluation is not required for systems that do not require a CCN. The regionalization review was created mainly for new systems; however, a similar review applies to systems that were constructed without appropriate approval, has a history of noncompliance, and/or has been subject to a TCEQ enforcement action.

The TCEQ's stated goal is to encourage regionalization of water and wastewater systems in order to ensure both cost effective and long-term quality water for the State of Texas. It is becoming more difficult for water and wastewater systems to both meet demand and stay in compliance with the Safe Drinking Water Act and Clean Water Act. The cost of meeting those compliance requirements increases as the system size decreases. By applying this policy, the goal is to decrease the number of existing and potential new systems that are unable to maintain the ability to provide continuous, adequate, and environmentally sensitive service to its customers.

¹ Houston-Galveston Area Council. 2009. *A Regional Approach to Wastewater Infrastructure Planning*. White Paper. Community and Environmental Planning Department. Revised November 2009.

² TCEQ. 2003. *The Feasibility of Regionalizing Water and Wastewater Utilities: A TCEQ Policy Statement*. Water Supply Division. RG-357. January 2003.

Harris County and the Harris County Flood Control District Water and Wastewater Regionalization Policy³

Harris County and the Harris County Flood Control District developed a policy to affirm their position on the issue of water and wastewater regionalization. The policy is in compliance with both entities' NPDES storm water permits, and its goal is to reduce the total number of treatment plants and their subsequent pollutant loads into the local waterways. According to the policy, when regionalization is applied properly, it is believed that treatment efficiency is improved, unit cost for treatment is improved, number of wastewater discharges is reduced, amount of groundwater extraction is reduced, liability from regulatory oversight, permitting, and fines is reduced, ambient water quality is improved by improved treatment, and overall maintenance cost is reduced.

Eighteen months after the adoption of the policy, all existing Harris County and Harris County Flood Control District wastewater systems were to be reviewed to determine the feasibility of regionalization. The criteria for determining feasibility included the cost of conveyance to the nearest available system and the impact to areas of historical and cultural significance, environmental sensitive areas, or highly-developed areas. In addition to existing systems, all future systems and systems that are modified using grant funding from either entity must provide evidence that regionalization was considered using the same two criteria.

City of Houston Wastewater Treatment Plant Consolidation Plan⁴

The City of Houston developed its consolidation plan in order to eliminate several wastewater treatment plants in favor of more efficient, regional facilities. The plan outlined a specific diversion plan for each facility, along with various scenarios that allow flow to be diverted to the regional plants. The city planned to utilize the regionalization effort to produce a more efficient wastewater collection and treatment process, which in many cases could eliminate the need for lift stations. About twenty facilities were under consideration for abandonment or diversion, and they were grouped into near, intermediate, and long term projects. The City of Houston currently operates and maintains 40 WWTFs, which treat an average of 277 million gallons per day⁵.

³ Harris County Public Infrastructure Department. 2008. *Water and Wastewater Regionalization Policy for Harris County and Harris County Flood Control District*. May 1, 2008.

⁴ City of Houston. *Wastewater Treatment Plant Consolidation*.

⁵ City of Houston. 2011. *Wastewater Operations*. Public Works and Engineering. <http://www.publicworks.houstontx.gov/utilities/wwops.html>. Accessed 4/11/11.

Aldine Improvement District Water and Wastewater Planning Study⁶

The Aldine Improvement District (Aldine ID) published its Water and Wastewater Planning Study in 2004, which presented a plan for both quantifying water supply and wastewater treatment needs and providing public water and sewer services for its service area. The Aldine ID is bound by Little York Road, the Hardy Toll Road, Aldine Bender Road, Homestead Road, and Hirsch Road, which makes up an area of 14.79 square miles north of downtown Houston. In this plan, wastewater regionalization was identified as a necessary tool for providing adequate sewer services for the area.

The plan cited a City of Houston study from 1979, which called for the need of two regional wastewater facilities to provide service for the Aldine area. One site is now the location of the North Belt Regional WWTF, and the other area was subsequently determined to be too small to support a regional facility. The City now has no intentions of developing a WWTF on that site. A City of Houston study in 1988 stated that it is more economical to operate wastewater treatment facilities that are more than 5 MGD capacity, and smaller facilities should be abandoned. Wastewater should then be diverted to a regional treatment facility.

The City of Houston is now in negotiations to provide wastewater treatment for the Aldine ID with the North Belt Regional WWTF. That facility is near the northeastern corner of the desired service area, and is operating at only 30 percent of its designed flow capacity.

City of Sugar Land 2007-2010 Capital Improvement Program⁷

The City of Sugar Land's wastewater master plan indicated that increased treatment capacity would be needed to accommodate continued development in the city. The New Territory plant was identified as the most appropriate site for regionalized wastewater treatment. In 2008, the facility was expanded from 2.5 to 4.0 MGD and the City diverted flow from the North WWTF to the New Territory WWTF. An estimated \$8 million in funds were allocated to expand the facility again from 4.0 to 6.0 MGD in 2009.

TWDB Regional Facility Planning Grants⁸

The TWDB recently authorized the execution of contracts totaling approximately \$470,000 for the development of regional water and wastewater facility plans in 2011. Of the six applications

⁶ Aldine Improvement District. 2004. *Aldine Improvement District Water and Wastewater Planning Study*. Prepared by WaterEngineers, Inc. December 2004.

⁷ City of Sugar Land. *2007-2011 Capital Improvement Program Summary – Wastewater*.

⁸ Meesey, David. 2001. *Award of Fiscal Year (FY) 2011 Grants for Solicited Regional Facility Planning Grant Applications*. Memorandum. Texas Water Development Board. March 9, 2011.

that were submitted to the TWDB for funding, three involved developing plans for a regional wastewater facility. The City of Hutto is planning to study the feasibility of a regional wastewater system and the beneficial use of its treated effluent. The Greens Bayou South Reach area currently has 32 permitted wastewater treatment plants in its area. The Gulf Coast Waste Disposal Authority plans to study the feasibility of developing a wastewater treatment facility to consolidate existing facilities and to accommodate the needs of anticipated future industrial development. The third application involving the development of a regional wastewater facility was submitted by the City of Sugar Land, who plans to study the feasibility of a regional wastewater reuse system for areas within the City and its ETJ.