



OFFICE OF THE COUNTY EXECUTIVE
ROCKVILLE, MARYLAND 20850

Isiah Leggett
County Executive

MEMORANDUM

March 30, 2015

TO: George Leventhal, President
Montgomery County Council

FROM: Isiah Leggett, Montgomery County Executive

SUBJECT: Transmittal of Reports and Recommendations on the Glen Hills Area Sanitary Study

As directed by the County Council, the Department of Environmental Protection (DEP) has conducted a study of sanitary service in the Glen Hills Area southwest of Rockville based on recommendations provided in the 2002 Potomac Subregion Master Plan. The purpose of this transmittal is twofold:

- To provide the Phase 1 and Phase 2 reports that present the background, methodology, and findings of this study.
- To provide recommendations concerning appropriate sewer service policies for the study area.

DEP conducted this study with the assistance of a local engineering firm, A. Morton Thomas and Associates, following the Council's allocation of funding for the consultant's work starting in FY 2012. Public participation in the study process included three public meetings: one at the start of the study process and then one each at the conclusion of the two study phases. DEP also formed a citizens advisory committee (CAC) consisting of twelve study area residents and property owners. The CAC met seven times during the study process to discuss study issues in more detail than the public meeting forums allowed. DEP maintained a Glen Hills Study webpage on the County's website to post public and CAC meeting notices, provide study updates, and present draft and final versions of the study reports. DEP also used a property owner survey at the start of the study process to gain a general understanding of the public's awareness of septic system use and maintenance.

The Department of Permitting Services (DPS), Well and Septic Section, had previously identified the Glen Hills area as a neighborhood where the replacement of existing, failed septic systems can be problematic. The study area has many vacant lots that at present

cannot be developed due to soil and regulatory limitations for septic systems. These limitations may also restrict a homeowner's ability to improve or replace existing houses. In response to these concerns, the 2002 master plan recommended that the County:

“Conduct a study described above of the Glen Hills area. Based on the results of that study develop a policy outlining the measures needed to ensure the long-term sustainability of septic service for new home construction and existing home renovations, minimizing the need for future sewer extensions. Under this policy the sole basis for providing new sewer service would be well-documented septic failures where extension could be provided consistent with the results of the study and in a logical, economical, and environmentally acceptable manner. Until a policy is developed, restrict further sewer service extensions in Glen Hills to properties with documented public health problems resulting from septic system failures.”

Although not explicitly stated in the master plan, DEP also recognized at the start of this study the need to support the existing housing stock through the replacement of existing septic systems that have failed or will require replacement in the future.

Phase 1

The Phase 1 report presents information on the collection of data concerning existing conditions in the study area, including soil conditions, septic systems type and age, septic testing results, and distribution of existing public sewerage systems. The purpose of this phase was to determine, as best possible from existing information, whether parts of the study area could experience potential difficulties with long-term septic system use and, if needed, replacement of existing septic systems using standard deep stone-trench septic systems. Phase 1 revealed the following among its findings:

- Approximately one-third of the study area is subject to soil conditions and regulatory requirements that may result in difficulties with the long-term use of deep stone-trench septic systems. Those parts of the study area so affected are referred to as “review areas” (RAs). Given the planning-level nature of the study, the determination of a review area does not infer that all land within the RAs is not suited for deep trench septic systems. Conversely, not all land outside the RAs is guaranteed as suited for deep trench septic systems.
- Approximately one-half of the 370 existing, operating septic systems in the study area were permitted and constructed before the advent of modern testing standards, which includes establishing reserve septic field areas as a backup for the initial system. When one of these septic systems fails, there is no established septic drainfield area guaranteed as a viable replacement. A new drainfield area must be established by on-site testing.

Phase 2

Following completion of the Phase 1 work and development of the draft Phase 1 report, DEP developed a scope of work for the Phase 2 portion of the study. The Phase 2 report presents alternatives for providing and maintaining wastewater disposal service for the review areas (RAs) identified in the Phase 1 report.

The underlying assumption in the second phase of the study was that the use of deep stone trench systems within the RAs may not satisfy today's septic regulations. The permitting and construction of this type of septic system could be difficult predominantly due to poor soil conditions including slow percolation rates, shallow depth to ground water, and shallow depth to bedrock. The alternatives to the use of this type of septic system were as follows:

- **Use of other types of permitted septic systems: shallow stone-trench systems, sand mound systems, or drip-disposal systems.** Each of these on-site systems has applications for specific soil constraints, although even taken together they do not necessarily provide solutions for all situations. The use of a specific type of on-site septic system for the replacement or expansion of an existing septic system will require proper soil testing and evaluations to determine that system's suitability for a particular property. Given these testing requirements, the development of alternative solutions for specific sites was not attempted.
- **Provision of public sewer service.** The Phase 2 report showed that only a few of the identified review areas had access to existing sewer mains. For those review areas without available sewer mains, the study contractor designed 13 conceptual sewer extension alignments to show possibilities for providing public sewer service, if needed. Both gravity and low-pressure sewer mains were used in this design work. Low-pressure mains were primarily used where the study criteria from the 2002 master plan directed sewer extensions away from streams, stream buffers, and easements across private properties, and instead towards public road alignments. Note that of the 13 conceptual sewer extension alignments shown in the Phase 2 report none are proposed for approval or construction at this time.

Planning-level cost estimates developed for each of the preceding Phase 2 alternatives showed that, in most cases, the use of an on-site septic system for new or replacement wastewater service, where feasible, provided a less expensive service option than the extension of new mains for public sewer service for property owners. Costs for sewer service connections to an available, existing sewer main were much closer to the range of septic system costs, depending on the type of septic system required for service.

Policy Issues and Recommendations for Septic System Sustainability

The feasibility of permitting a new septic system for any particular piece of property is dependent on the characteristics of the soils and geology of that property. These characteristics (permeability, water table depth, depth to rock, etc.) do not change substantially over time. Soil testing standards for septic systems for the County have become both more encompassing and restrictive over time. This serves to improve the longevity of septic system use and to help mitigate environmental impacts resulting from septic system use in vulnerable areas. (See the Phase 1 report, Section 3.5 and Table 3.1.) Other regulatory standards (drainage and drinking water well setbacks, best available technology requirements, etc.), have also been strengthened to help protect human and environmental health. The DPS permitting process recognizes that a septic system approved and built for a new home—including the initial system and planned replacement fields—is intended to serve that property for an indefinite time. These standards exist to ensure that new development dependent on septic systems does not occur on properties that cannot support septic system use for the foreseeable future.

Recommendation:

- **Consistent with the policy focus of the 2002 master plan, where public sewer service is not currently available in the Glen Hills area, it is typically in the interest of a property owner to explore on-site septic system options, as needed, when needing to replace an existing system or install a system for new development.**

Policy Issues and Recommendations for the Extension of Public Sewer Service

Based on Water and Sewer Plan general service policies, and supported by the 2002 master plan's service recommendations, areas designated for standard-type development under the RE-1 Zone—such as this study area—are not intended for widespread public sewer service. However, the master plan also recognized that the relief of some septic problems within the study area could require the provision of public sewer service. The master plan advocated a sewer service policy that would allow new sewer service only for cases of documented septic system failures. This refers to cases where new sewer construction would be required, as the master plan goes on to specify that sewer extensions would need to be planned and provided in a logical, economical, and environmentally acceptable manner. Other than to relieve public health problems, there are few Water and Sewer Plan special sewer service policy justifications (public facilities, private institutional facilities, etc.) that would have an application for the extension of new sewer mains within the study area.

Typically, the County's designation of a public health problem results from an on-site system failure applying to a single property. However, Water and Sewer Plan policies also direct the County to identify public health problem areas, where appropriate; groupings of properties where existing and anticipated on-site systems problems apply to more than just one property, usually in a relatively small geographic area. The Council's designation of a public health problem area by an amendment to the Water and Sewer Plan usually applies to an area

where public service is not yet provided and often not approved, but needs to become a priority to support public and environmental health. Where the Plan establishes such an area, all properties within it are eligible to pursue the extension of public service, regardless of whether or not an existing failure has occurred. This allows for some public service extension within the health problem area in advance of an immediate failure. The study does not propose the designation of any part of the study area as a public health problem area at this time.

The cost of extending new water and sewer mains currently remains beyond the financial reach of most individual property owners, including those situations where new service is needed to relieve a public health problem resulting from a septic system failure. Under WSSC's current system expansion permit (SEP) process, virtually all new main construction is paid in total by the applicant seeking service, typically a developer constructing a new subdivision. This has drained funding resources away from the older front-foot benefit financed (or "WSSC-built") process, wherein WSSC finances and constructs new mains, to the point where the older process is no longer functional. Staff from Montgomery and Prince George's Counties and from WSSC are working to develop a modified financing system that would again make construction of new main extensions for individual property owners feasible. In cases where the County determines that new public service is needed to relieve health problems, manageable financing is of great importance.

Recommendations:

- **Adopt, but also expand on the policy recommendation from the 2002 master plan; that documented health problems resulting from septic system failures are the only justification for the construction of new sewer main extensions within the study area. Public sewer mains can also be constructed to serve public health problem areas--throughout the study area—that are explicitly designated by the County Council in the Water and Sewer Plan. Two Water and Sewer Plan policies address this situation: the "public health problems" and "properties affected by public improvements" policies (Chapter 1, Sect. II.E.2. & II.E.7., respectively.**
- **Pursue with WSSC and Prince George's County the development of a modified water and sewer main extension process that improves the affordability of main construction for individual property owners.**

One other special service policy that relates to the use of public sewer in place of on-site septic systems is the "on-site system regulation changes" policy (CWSP Chapter 1, Sect. II.E.10.). The policy provides for consideration of public sewer service where changes in testing regulations now render a property previously established and permitted for an on-site system unsuited for septic system use. The substantial majority of lots in the study area were not established on the basis of successful septic system testing. Before 1965, septic testing was not required in order to record a building lot. As a result, this requirement for the application of this

service policy cannot be satisfied. This policy is not proposed to justify sewer main construction to provide new sewer service for unimproved lots within the study area.

Policy Issues and Recommendations for the Abutting Mains Sewer Service Policy

The 2002 master plan specifically recommends that the Glen Hills study include, “An evaluation and recommendation of the abutting mains policy for this area.” The “abutting mains” service policy (CWSP Chapter 1, Sect. II.E.3.) involves the provision of public service from existing or approved public mains. To qualify for consideration, a property or a building on the property had to exist at the time the abutting main was or will be installed. This policy typically limits public service to a single sewer hookup for each existing property abutted by a main. While the policy allows for limited public service from an abutting main, new main construction is not the policy’s function.

Where public service mains are already provided, or where they are approved, Water and Sewer Plan service policies support limited use of those mains by abutting property owners. In the past, this policy helped to support new main construction, where front-foot benefit charges helped to finance that construction. As noted previously, escalating costs associated the “WSSC-built” process have made its use by individual property owners largely infeasible, including cases where needed a new main is needed to relieve a public health problem. The potential for the participation of abutting property owners in a modified WSSC extension financing system needs to be maintained through the use of the abutting mains policy. Owners of qualifying properties that abut or will abut sewer mains in the study area should have an option to use public sewer service if they choose. Although the cost for connecting to public sewer service can be greater than for replacing a septic system, public service provides a permanent means of wastewater disposal, as opposed to septic systems which will require periodic replacement.

Starting in 2002, County Council actions on sewer category change requests suspended use of the abutting mains policy (CWSP Chapter 1, Section II.E.2.) within the Glen Hills area, as recommended in the 2002 master plan. Currently, 21 properties designated as sewer category S-6, and as such ineligible for public sewer service, abut existing sewer mains within the study area; all are improved with existing single-family homes. Of these, one category change request case filed since 2002 would have benefitted from the ability to use the abutting mains policy.

Recommendation:

- **Restore the use of the abutting mains policy for public sewer service within the Glen Hills study area. Note that no property owner is compelled to connect to public sewer service as long as their property remains in category S-6 and their existing septic system continues to function.**

Information included in the Phase 2 report (Table 5.1, pg. 24) provides details about the number of properties that could be served by each of the 13 sewer main extensions conceptually designed for the purposes of this study to serve the Review Areas. In the unlikely event that all 13 sewer extensions were to be built in their entirety, they could abut and serve as many as 223 properties: 197 already improved with single-family homes using septic systems and 26 unimproved. (The total study area currently includes 370 improved properties using septic systems and 69 unimproved properties.)

Policy Issues and Recommendations for the Piney Branch Subwatershed

The western and northwestern parts of the study area fall within the Piney Branch subwatershed of Watts Branch. (See the Phase 1 report, Figure 2.1, pg. 7.) Starting in late 1991, during planning for the Piney Branch Trunk Sewer, the County decided to implement a restricted sewer service access policy for the subwatershed that sought to limit environmental impacts from sewer-dependent development in the lower, less-densely zoned parts of the subwatershed. This includes some of the properties within this study area. The 2002 master plan does not recommend any changes to the application of the restricted sewer service access policy within the study area. This restricted sewer access policy remains in effect for those parts of the study area included in the subwatershed.

Recommendation:

- **Maintain the Piney Branch restricted sewer service access policy for those parts of the Glen Hills study area that fall within the limits of the Piney Branch subwatershed.**

Additional Master Plan Study Recommendations

The 2002 master plan also recommended that the study include elements such as the delineation and causes of known septic system failures, and the identification and exclusion of environmentally sensitive properties with no development potential. Each of these recommendations and brief discussions about how they were addressed as part of the Glen Hills study are included in the Phase 2 report; see Sect. 6, pg. 31.

Copies of the Executive Summaries from the Phase 1 and Phase 2 reports are attached with this transmittal. The full reports are available for review and download at DEP's Glen Hills webpage: www.montgomerycountymd.gov/glenhills.

Staff from DEP will be available to discuss the Glen Hills Area Sanitary Study at work sessions with the Transportation, Infrastructure, Energy, and Environment Committee and with the full Council.

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Attachments

George Leventhal, Council President
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cc: Jay Sakai, Director, Water Management Administration, Maryland Department of the Environment
David Craig, Secretary, Maryland Department of Planning
Casey Anderson, Chair, Montgomery County Planning Board
Jerry Johnson, General Manager, Washington Suburban Sanitary Commission
Lisa Feldt, Director, Department of Environmental Protection
Diane Schwartz Jones, Director, Department of Permitting Services

Glen Hills Area Sanitary Study: Phase 1 Report

1. Executive Summary

The 2002 *Potomac Subregion Master Plan* recommended that Montgomery County conduct a sanitary survey to evaluate the general condition of the septic systems within the study area, determine the probability of continued reliability of these facilities and, if necessary, evaluate the feasibility of extending public sanitary sewer service to portions of the study area. The Department of Permitting Services, Well and Septic Section, has periodically raised concerns with the Department of Environmental Protection about septic system failures in the study area. In some cases, subsurface conditions do not allow for septic system replacements that satisfy current regulations. The first phase of the study evaluated existing conditions that may constrain areas for future use of deep stone trench septic systems.

This report presents the findings of Phase 1, developed to consider the feasibility of the future and continued use of on-site septic systems in the Glen Hill study area as recommended in the 2002 master plan. The study area includes Glen Hills and adjacent neighborhoods and consists of 542 properties. Data was gathered from the Well and Septic Section of the Montgomery County Department of Permitting Services (MCDPS), Montgomery County Department of Environmental Protection and U.S. Department of Agriculture.

The information gathered for Phase 1 was analyzed using eight parameters of data. Each of the parameters was investigated to determine its effect on the long-term use of deep stone trench septic systems. While the use of other types of septic systems can be considered on a case-by-case basis, the deep stone trench septic system is the standard type of system used throughout the county for on-site wastewater disposal. Maps were generated depicting areas containing characteristics that have the potential to constrain the long-term use of these deep trench septic systems.

Each of the following factors has the potential to constrain the use of deep trench septic systems, but cannot alone determine areas that are not suited for septic systems. Ultimately, only regulated, on-site testing and evaluation of test results can determine the actual suitability of a specific site for septic system use.

System Age: The age of the septic treatment system on each property was determined by reviewing MCDPS record information. Older systems typically do not meet today's standards; upgrading a septic system can be very challenging due to setbacks, finding undisturbed land, etc. Approximately 35 percent of the septic systems in the Glen Hills area are outdated systems such as seepage pits and seepage lagoons. With regard to system requirements, critical date is 1975 since that is when a reserve area requirement was implemented. For the purposes of this study, systems installed after 1975 are assumed to have adequate reserve areas in which a new system could be built, should the current one fail. For systems built prior to 1975, an adequate reserve area for one or more replacement systems may not exist and those properties will be further studied to consider their suitability for long-term septic system use.

Streams and Floodplains: Stream setbacks and Federal Emergency Management Association floodplains were mapped within the study area. Current regulations preclude constructing septic fields within the FEMA-defined 100-year flood plain or a buffer associated with any stream shown on County Geographical Information System topography mapping. By regulation, areas containing streams and floodplains and their associated buffers are considered not suitable for septic system use.

Glen Hills Area Sanitary Study: Phase 1 Report

Topography and Steep Slopes: Steep slope areas that would preclude construction of septic systems were mapped. Traditional trench drain fields are not permitted on slopes greater than 25 percent but, since sand mound systems are not permitted on slopes that are 12 percent or greater, a 12 percent slope was used as the limiting slope. By regulation, these steep slope areas are considered to be not suitable for septic system use.

Depth to Groundwater: MCDPS record information included groundwater levels for a limited number of properties. USDA maps include a description of the expected groundwater levels for each type of soil, and were used to obtain groundwater levels for the entire site. USDA map information is only given down to a depth of six feet. And therefore deep groundwater depths were only stated as "six feet or greater." It is possible to install certain septic systems with groundwater depths between two and six feet. Land with groundwater depth of zero to three feet were considered as areas potentially unsuited for deep stone trench septic system use.

Percolation and Permeability Rate: The available percolation rate for each septic treatment system was determined by reviewing MCDPS record information. Not all of the study properties have records indicating the percolation rate; therefore, the USDA soil map information was used to plot permeability of soil across the entire study area. Any area categorized as "Moderately Slow" or slower was considered to have the potential to constrain deep trench septic system use.

Depth to Bedrock: MCDPS permit record information had very limited information on depth to bedrock. USDA soil surveys include depth to bedrock estimates for the entire study area. USDA soils surveys information listed various depths to bedrock with the deepest depths designated as greater than five feet. It is possible to install certain septic systems in areas with depth to bedrock of five to six feet. All areas with depth to bedrock of less than five feet were considered to have the potential to constrain deep trench septic system use.

Soils Classification on Septic Field Limitations per USDA: The USDA Montgomery County Soil Maps assign a rating of "Severe," "Moderate," and "Slight" for each type of soil regarding how suitable it is for septic system trench development. The predominant soil type on each property was identified using GIS mapping, and the accompanying rating was used. Areas noted as severe have the potential to severely constrain the use of deep trench septic systems.

System Failure and Replacement: Where multiple septic field failures have occurred, usable lot areas are eliminated for the needed future replacement of systems. Therefore, these lot areas were considered to be potentially constrained for septic system use.

Undeveloped lots that previously failed septic field tests and lots using public sewer due to previous septic system failures were also considered to be unsuited for future septic system replacement and therefore likely not sustainable for deep trench septic systems in the long term.

Summary: The combination of the above-mentioned parameters produced a map of the study areas that delineated areas considered potentially constrained for the use of deep trench septic systems for one or more of the preceding categories. There are numerous areas potentially constrained and they are predominantly located along low lying stream valleys. Approximately 36 percent of the study area is considered potentially constrained for deep trench septic systems.

It is recommended to proceed to Phase 2 of this study to study further and make recommendations for providing sewerage to the areas potentially constrained for deep trench septic system use. Alternatives should include both traditional and innovative septic systems and the extension of public sewer mains.

Glen Hills Area Sanitary Study: Phase 2 Report

1. Executive Summary

The 2002 *Potomac Subregion Master Plan* recommended that Montgomery County conduct a sanitary survey to evaluate the general condition of the septic systems within the study area, determine the probability of continued reliability of these facilities and, if necessary, evaluate the feasibility of extending public sanitary sewer service to portions of the study area. The Department of Permitting Services, Well and Septic Section, has periodically raised concerns with the Department of Environmental Protection about septic system failures in the study area. In some cases, subsurface conditions do not allow for septic system replacements that satisfy current regulations. The project was conducted in two phases. The results indicated for Phase 1 in this report reflect the evaluation of existing conditions that may constrain areas for future use of deep stone trench septic systems.

This report presents the results of Phase 2 of the Glen Hills Area Sanitary Study. In the Phase 1 report, approximately 36 percent of the study area was potentially affected by constraints that could limit the long-term use of deep-trench septic systems, the type of septic system most commonly installed today for new construction and replacement systems.

The report presents an evaluation of options for providing sewage disposal to parts of the Glen Hills study area. As explained in the Phase 1 report, these are areas where the use of a conventional deep stone trench septic system for future on-site sewage disposal may be constrained by soil characteristics and regulatory requirements. These areas are identified in this report as Review Areas (RAs). Two options are presented for the purpose of wastewater disposal:

- On-site replacement of septic systems, including alternatives for both conventional systems (deep stone trench, shallow stone trench, and sand mound) and innovative systems (drip-disposal).
- Provision of public sewer service.

Upon completion of the two phases of the study, and following an opportunity for public comment, DEP will prepare a staff report addressing the study results to present to the County Executive. (The Phase 1 and 2 reports will be a part of this staff report.) Included with the staff report will be service policy recommendations for the study area for the Executive to endorse, as appropriate, and forward to the County Council for consideration as intended by the 2002 *Potomac Subregion Master Plan*. The Council will then decide what, if any, changes in service policy are needed for the study area and how those changes will be implemented.

On-site Sewage Disposal Systems

Based on previous data accumulated in Phase 1 of this report deep stone trench systems within the RAs may not meet today's septic regulations and could be difficult to construct within the RAs predominantly due to poor soil conditions including slow percolation rates, high ground water elevations and high bedrock elevations.

On-site septic systems replacements or expansions will require proper soil testing and evaluations to determine their suitability. With more detailed field soil testing some of the areas within the RAs may reveal better soil conditions than the preliminary data that the Phase 1 report based its delineation of the RAs. If areas within the RAs are found with moderate depths to groundwater or bedrock, shallow trench stone systems could be used as replacements systems in these areas where otherwise deep stone trench systems would not be viable.

Glen Hills Area Sanitary Study: Phase 2 Report

Because sand mound systems are built over the existing ground without the need to excavate down into the ground, sand mound systems are better able to function in high ground water and high bedrock areas than stone trench systems. There are areas within the RAs with high bedrock that may be suitable for sand mound systems. Areas within the RAs with high groundwater also had poor percolation rates and therefore would not be suitable for sandmound systems.

Drip systems are innovative systems that are designed by a MDE certified designers who test soils and determine the allowable percolation rate on a case by case basis. Designers could design a system that functions in soils with slower percolation than the normally required 30 minutes per inch. Drip systems may be viable in areas with marginal percolation rates that would not normally be viable for a stone trench system.

Planning level estimates and the associated costs were generated for each option to serve the existing septic systems potentially affected by the conditions in the RAs. The average costs for replacing the 197 septic systems within the RAs ranges from \$17,500 to \$48,000 for each property depending on the type of on-site sewage disposal system.

Public Sewerage Systems

Existing public sewer service within the study area is provided primarily by the Washington Suburban Sanitary Commission (WSSC). The City of Rockville provides sewer service to properties located within the city limits along the northeastern edge of the study area. The City's sewerage system feeds into WSSC's Watts Branch sewerage system, the flows from which are treated at the Blue Plains regional wastewater treatment plant in Washington, D.C.

Conceptual public sewer service extension plans were developed to prepare a comparative cost analysis. Sewer main alignments were located within the public roadways and avoided environmentally sensitive stream valleys. The alignments maximized the usage of gravity systems and minimized pump station and pressure lines. The conceptual alignment also avoided the need for any easements from private land owners.

Conceptual alignments were developed for thirteen separate sewer extension systems. The systems included both gravity and pressure main line pipes. Each applicant will require a connection from the existing house to the main line pipe in the road. These connections could be a gravity system or a pump system depending on the topography. To obtain public sewer service several steps are needed. These include a service category change from Montgomery County, which typically takes nine to 15 months from the time of application, and an extension application process through WSSC, which takes four to ten months from the time an engineer is selected for system design to receiving a permit.

Planning level cost estimates for providing public sewer service to relieve a failed septic system typically exceed those estimated for using a replacement septic system (see above). Sewer main extension costs rise dramatically the further a property is located from the existing public sewerage system.

Exceptions only occur where a property already has access to an existing sewer main. To connect a single property to an available public sewer main will cost an estimated \$23,000 to \$32,000. The construction of new sewer mains for properties that lack direct access to existing sewer mains starts at an estimated \$20,000 to \$80,000 for each pair of lots along a street that a new main passes by.