

**TOWN OF FLOWER MOUND, TEXAS**

**ORDINANCE NO. 11-10**

**AN ORDINANCE OF THE TOWN COUNCIL OF THE TOWN OF FLOWER MOUND, TEXAS, AMENDING THE CODE OF ORDINANCES OF THE TOWN OF FLOWER MOUND, TEXAS, BY AMENDING SUBPART B OF THE CODE OF ORDINANCES THROUGH THE AMENDMENT OF CHAPTER 82, "DEVELOPMENT STANDARDS," BY THE ADDITION OF A NEW ARTICLE VI, ENTITLED "WATER AND WASTEWATER," TOGETHER WITH THE ADDITION OF A NEW SECTION 82-371. "WATER AND/OR WASTEWATER CAPACITY ANALYSIS REQUIRED," NEW SECTION 82-372. "PURPOSE" AND NEW SECTION 82-373. "PAYMENT OF COST;" THROUGH THE AMENDMENT OF CHAPTER 98, "DEFINITIONS AND METHODOLOGIES," SECTION 98-33, "SMARTGrowth IMPLEME"ZONING," ARTICLE II, "SMARTGrowth PROGRAM," BY AMENDING SECTION 98-32,NTATION MANUAL--AMENDMENTS," SECTION 98-72, "GENERAL EXCEPTIONS," SECTION 98-74, "EVALUATION," SECTION 98-100, "SUPPLY," SECTION 98-101, "PUMPING CAPACITY," SECTION 98-102, "WASTEWATER TREATMENT CAPACITY," SECTION 98-147, "TOPOGRAPHICAL SLOPE PROTECTION;" AND INCLUDING A REQUIREMENT OF A THREE-FOURTHS SUPER MAJORITY VOTE OF THE TOWN COUNCIL FOR AN EXCEPTION; AND BY AMENDING APPENDIX A "FEE SCHEDULE" OF THE CODE OF ORDINANCES OF THE TOWN OF FLOWER MOUND RELATIVE TO CHAPTER 98 SMARTGrowth ANALYSIS FEES; MAKING FINDINGS; PROVIDING FOR THE REPEAL OF CONFLICTING ORDINANCES; PROVIDING A SEVERABILITY CLAUSE; PROVIDING FOR A PENALTY; PROVIDING FOR PUBLICATION; AND PROVIDING AN EFFECTIVE DATE.**

**WHEREAS**, on January 11, 1999, the Town Council adopted Ordinance No. 2-99, the Town's SMARTGrowth Program, a strategic initiative to manage both the rate and character of development in the Town of Flower Mound ("Town"), which acronym represents "Strategically Managed and Responsible Town Growth"; and

**WHEREAS**, the Town Council thereafter adopted additional components to the SMARTGrowth Program between January 11, 1999 and May 21, 2001; and

**WHEREAS**, on July 15, 2002, the Town Council adopted Ordinance No. 41-02, amending the Town's earlier SMARTGrowth Program in its entirety to build upon, strengthen and improve the SMARTGrowth Program and ensure that the Town's development framework and its land use decisions continued to be consistent, equitable and based upon sound legal principles; and

**WHEREAS**, the SMARTGrowth Commission has considered and recommended approval of certain revisions to the Town's SMARTGrowth Program to update, build upon and make certain modifications arising out of the historical application of the SMARTGrowth Program and to ensure that each Threshold Zoning Criterion referenced in

the SMARTGrowth Program continues to be relevant, necessary and appropriate to its stated purpose; and

**WHEREAS**, after public notice and public hearing as required by law, the Planning and Zoning Commission of the Town of Flower Mound, Texas, has recommended amending certain provisions of the Code of Ordinances of the Town of Flower Mound regarding the SMARTGrowth Program and certain related ordinances that are identified herein-below; and

**WHEREAS**, after public notice and public hearing as required by law, and upon due deliberation and consideration of the recommendation of said Planning and Zoning Commission and of all testimony and information submitted during said public hearing, the Town Council of the Town of Flower Mound, Texas, has determined that it is in the public's best interest and in furtherance of the health, safety, morals, and general welfare of the citizens of the Town to amend the Town Code of Ordinances as set forth herein.

**NOW, THEREFORE, BE IT ORDAINED BY THE TOWN COUNCIL OF THE TOWN OF FLOWER MOUND, TEXAS, THAT:**

**SECTION 1**

All the above premises are hereby found to be true and correct and are hereby approved and incorporated into the body of this Ordinance as if copied in their entirety.

**SECTION 2**

From and after the effective date of this Ordinance, Chapter 82, "Development Standards" of the Code of Ordinances of the Town of Flower Mound, Texas, is hereby amended by the addition of a new Article VI, entitled "Water and Wastewater," to read as follows:

**"ARTICLE VI. WATER AND WASTEWATER**

**DIVISION 1. GENERALLY**

Secs. 82-350--82-370. Reserved.

**DIVISION 2. CAPACITY ANALYSES**

**Sec. 82-371. Water and/or wastewater capacity analysis required.**

The town engineer may require that a water and/or wastewater capacity analysis be prepared by an engineering

firm designated by the town and be included as part of submittals for approval of a master plan, land use, or zoning amendment for new development. The water and/or wastewater capacity analysis may be required when one or more of the following conditions exist:

- (1) For any project triggering a change in anticipated demand on the water and/or wastewater system.
- (2) For any project requesting a change in master plan, land use or zoning.

**Sec. 82-372. Purpose.**

The water and/or wastewater capacity analysis, when required by the town engineer, shall be used by the town to determine:

- (1) The impact of the proposed development on the water and/or wastewater infrastructure of the town, including any necessary revisions to size, location and or direction of the flows to accommodate the new development;
- (2) That the town's infrastructure is adequate to meet the additional demands caused by the proposed development and to maintain the level of service standards of the town;
- (3) The need to adjust, upsize or reconfigure the town's facilities to minimize the impact of the proposed development on the town's infrastructure facilities;
- (4) The need for the developer to make or pay for legally authorized and related improvements to the infrastructure system in order to mitigate the impacts of the proposed development on the water and/or wastewater system and to maintain the level of service standards of the town.

**Sec. 82-373. Payment of cost.**

- (a) The applicants of the proposed development shall pay to the town a fee to cover the expense of the water and/or

wastewater capacity analysis. The fee determination will be made by the town after review of the type, size and location of the proposed development.

(b) The owners of the property to be developed shall pay for any required water and/or wastewater capacity analysis.

Secs. 82-373--82-390. Reserved.”

### SECTION 3

From and after the effective date of this Ordinance, existing Section 98-32, entitled “Definitions and Methodologies,” of the Code of Ordinances of the Town of Flower Mound, Texas, is hereby amended in part by amending subparagraph (b), “*Methodologies*,” by deleting the provisions entitled “*Water supply*,” “*Water pumping capacity*” and “*Wastewater treatment capacity*” in their entirety and replacing said provisions with new provisions also entitled “*Water supply*,” “*Water pumping capacity*” and “*Wastewater treatment capacity*” to read as follows:

*“Water supply.* Total available supply shall be the sum of contracted and available treated water supply from Dallas Water Utilities (DWU), contracted and available treated water supply from the Upper Trinity Regional Water District (UTRWD), and any treated water supply projected to be available from programmed capacity improvements. Net available supply shall be equal to total available supply less five percent (5%) to be reserved for economic development, institutional or civic uses.

Total projected demand shall be the sum of projected maximum day demand (MDD) for all existing lots, and approved but not constructed development, plus the projected MDD for the proposed development. For proposed development to be approved, total projected demand must not exceed net available supply.

*Water pumping capacity.* Total available pumping capacity shall be determined on the basis of individual pressure planes and shall be the sum of the rated name plate pumping capacity of each pump station (in MGD) with the largest pump out of service at each station, any pumping capacity projected to be available from programmed capacity improvements, and contributed capacity from elevated storage. Net available pumping capacity shall be equal to total available pumping

capacity less five percent (5%) to be reserved for economic development, institutional or civic uses.

Total projected demand shall be the sum of projected peak-hour demand (in MGD) for all existing and approved but not constructed development, plus the projected peak-hour demand for the proposed development. For proposed development to be approved, total projected demand must not exceed net available pumping capacity.

*Wastewater treatment capacity.* Total available treatment capacity for the town's wastewater treatment plant shall be the sum of the TNRCC permitted discharge flow (in MGD) from the treatment plant and any treatment capacity projected to be available from programmed capacity improvements. Net available treatment capacity shall be equal to total available treatment capacity less five percent (5%) to be reserved for economic development, institutional or civic uses.

Total projected demand for areas served by the town's wastewater treatment plant shall be the sum of projected wastewater flows for all existing lots and approved but not constructed development, plus the projected wastewater flows for the proposed development. For proposed development to be approved, total projected demand must not exceed net available treatment capacity.

Total available treatment capacity for the Denton Creek and Prairie Vista districts, as defined in the adopted land use plan, shall be the sum of contracted and available treatment capacity from the Trinity River Authority's Denton Creek regional wastewater system and any treatment capacity projected to be available from programmed capacity improvements. Net available treatment capacity for the Denton Creek and Prairie Vista districts shall be equal to total treatment capacity less five percent (5%) to be reserved for economic development, institutional or civic uses.

Total projected demand for areas within the Denton Creek and Prairie Vista districts shall be the sum of projected wastewater flows for all existing lots and uses within the district and approved but not constructed development within the district, plus the projected wastewater flows for the proposed development. For proposed development to be approved, total

projected demand must not exceed net available treatment capacity.”

**SECTION 4**

From and after the effective date of this Ordinance, existing Section 98-32, entitled “Definitions and Methodologies,” of the Code of Ordinances of the Town of Flower Mound, Texas, is hereby amended in part by amending subparagraph (b), “*Methodologies*,” to insert a new bulleted paragraph to the provision entitled “*Miscellaneous*” immediately following the title of the provision regarding payment for the performance of water and wastewater capacity to read as follows:

“• All costs incurred by the town to perform a water capacity analysis and/or wastewater capacity analysis, to update the master planning models, and to evaluate a proposed development in relation to its compliance with the SMARTGrowth criteria will be paid by the development applicant. Said applicant shall deposit the cost to perform such analyses with the town prior to said analyses being performed.”

**SECTION 5**

From and after the effective date of this Ordinance, the existing SMARTGrowth Implementation Manual is amended by deleting Subsections 1 through 5 -- entitled “Water Supply,” “Water Pumping Capacity,” “Wastewater Treatment Capacity,” “Wastewater Lift Station Pumping Capacity” and “Wastewater Interceptor Capacity,” respectively -- of Section A of the SMARTGrowth Analysis, entitled “Adequate Public Infrastructure,” in their entirety and replacing said provisions with new Subsections 1 through 5 – also entitled “Water Supply,” “Water Pumping Capacity,” “Wastewater Treatment Capacity,” “Wastewater Lift Station Pumping Capacity” and “Wastewater Interceptor Capacity,” respectively -- of Section A of the SMARTGrowth Analysis, entitled “Adequate Public Infrastructure,” to read as set forth in Exhibit 1 attached hereto and incorporated herein by reference for all purposes allowed by law.

**SECTION 6**

From and after the effective date of this Ordinance, existing Section 98-72, entitled “General exceptions,” of the Code of Ordinances of the Town of Flower Mound, Texas, is hereby amended by deleting said provision in its entirety and replacing said provision with a new Section 98-72 also entitled “General exceptions” to read as follows:

**"Sec. 98-72. General exceptions.**

(a) The SMARTGrowth analysis referenced herein shall not be applicable to minor plats, amended plats, replats that do not increase density, or for institutional or civic uses.

(b) Rough Proportionality: In the event that a situation arises that places SMARTGrowth in conflict with state or federal law, the Town may recognize that the development exactions (land dedication, payment of fees other than impact fees, and construction of facilities and infrastructure) required to satisfy the Town's SMARTGrowth Program assuring the provision of adequate public facilities may in certain circumstances be limited by the restrictions of rough proportionality as announced by the Texas Supreme Court, the United States Supreme Court and adopted, in part at least, by the Texas Legislature in Tex. Loc. Gov. Code § 212.904 and allow for SMARTGrowth approval in those particular circumstances."

**SECTION 7**

From and after the effective date of this Ordinance, existing Section 98-74, entitled "Evaluation," of the Code of Ordinances of the Town of Flower Mound, Texas, is hereby amended by deleting said provision in its entirety and replacing said provision with a new Section 98-74 also entitled "Evaluation" to read as follows:

**"Sec. 98-74. Evaluation.**

(a) In applying the SMARTGrowth criteria to a specific development application or project, a "pass-fail" evaluation will be utilized to determine compliance with applicable criteria. In other words, for a development application or project to attain compliance with the SMARTGrowth program (ensuring that it contributes to community character and quality of life objectives), it must be evaluated as "passing" or complying with each applicable SMARTGrowth criterion. Otherwise, it will "fail" and be denied until such time as compliance is or can be attained.

(b) For analysis of large multi-phase projects over 100 acres in area, the evaluation will include a development agreement that captures the timing of the infrastructure construction and phasing. With this information, up-front

modeling and planning for build-out of the entire development can be included in the water and wastewater models, with a check for adequacy of the existing infrastructure. If there exists an inadequacy of the existing infrastructure, the phasing and timing of construction of the additional infrastructure required will be addressed in the development agreement. In addition to the modeling updates, pass/fail worksheets for the current and next 2-years of development in accordance with the phasing plan provided by the developer will be included with the initial application. Each subsequent Site Plan or Final Plat will include model updates and pass/fail worksheets.

(c) With 2009 updates to the Water Master Plan and Wastewater Master Plan, and associated town-wide models, a hybrid approach to include model updates and pass/fail worksheets will be implemented. This effort will provide a link between SMARTGrowth results and our Capital Improvement Projects planning and may provide a transition to a more streamlined evaluation approach.”

### **SECTION 8**

From and after the effective date of this Ordinance, existing Section 98-100, entitled “Supply,” Section 98-101, entitled “Pumping capacity,” and Section 98-102, entitled “Wastewater treatment capacity,” of the Code of Ordinances of the Town of Flower Mound, Texas, are hereby amended by deleting said provisions in their entirety and replacing said provisions with new Sections 98-100, 98-101 and 98-102 also entitled “Supply,” “Pumping capacity” and “Wastewater treatment capacity,” respectively, to read as follows:

#### **“Sec. 98-100. Supply.**

(a) Restrictions; purpose. No development application or project shall be approved if the town has exceeded or is projected to exceed ninety-five percent (95%) of its treated water supply, based upon its then-available treated water supply plus any additional supply programmed for commencement of construction within the then current or the next fiscal year of the town's capital improvement program, with the remaining five percent (5%) of supply being reserved for future economic development, institutional or civic uses. The purpose of this criterion is to provide adequate public infrastructure to serve the demands created by new development without degrading or diminishing service levels to existing development, while also fostering a balanced tax base

through economic development to ensure Flower Mound's long-term financial ability to respond to the service demands of both new and existing development without placing a disproportionate tax-burden on homeowners.

(b) Application. For residential projects, applicable to applications for master plan amendments, zoning amendments, development plans and record plats, with capacity being reserved at record plat approval. For nonresidential projects, applicable to applications for master plan amendments, zoning amendments, development plans, record plats and site plans, with capacity being reserved at site plan approval.

**Sec. 98-101. Pumping capacity.**

(a) Restrictions; purpose. No development application or project shall be approved if the town has exceeded or is projected to exceed ninety-five percent (95%) of its rated water-pumping capacity in any pressure plane during peak-hour demand with the largest pump at each pump station out of service, based upon the then-available rated pumping capacity and contributed capacity from then-available elevated storage and any additional pumping capacity or contributed elevated storage capacity programmed for commencement of construction within the then-current or the next fiscal year of the town's capital improvement program, with the remaining five percent (5%) of rated pumping capacity being reserved for future economic development, institutional or civic uses. The purpose of this criterion is to provide adequate public infrastructure to serve the demands created by new development without degrading or diminishing service levels to existing development, while also fostering a balanced tax base through economic development to ensure Flower Mound's long-term financial ability to respond to the service demands of both new and existing development without placing a disproportionate tax burden on homeowners.

(b) Application. For residential projects, applicable to applications for master plan amendments, zoning amendments, development plans and record plats, with capacity being reserved at record plat approval. For nonresidential projects, applicable to applications for master plan amendments, zoning amendments, development plans,

record plats and site plans, with capacity being reserved at site plan approval.)

**Sec. 98-102. Wastewater treatment capacity.**

(a) Restrictions; purpose. No development application or project shall be approved if the town has exceeded or is projected to exceed ninety-five percent (95%) of its wastewater treatment capacity, based upon its then-available treatment capacity and any additional treatment capacity programmed for commencement of construction within the then current or the next fiscal year of the town's capital improvement program, with the remaining five percent (5%) of wastewater treatment capacity being reserved for future economic development, institutional or civic uses. This criterion is not applicable if a proposed development's wastewater flows will not be treated by the town's wastewater treatment plant or the Trinity River authority's Denton Creek regional wastewater system. The purpose of this criterion is to provide adequate public infrastructure to serve the demands created by new development without degrading or diminishing service levels to existing development, while also fostering a balanced tax base through economic development to ensure Flower Mound's long-term financial ability to respond to the service demands of both new and existing development without placing a disproportionate tax burden on homeowners.

(b) Application. For residential projects, applicable to applications for master plan amendments, zoning amendments, development plans and record plats, with capacity being reserved at record plat approval. For nonresidential projects, applicable to applications for master plan amendments, zoning amendments, development plans, record plats and site plans, with capacity being reserved at site plan approval.”

**SECTION 9**

From and after the effective date of this Ordinance, existing Section 98-147, entitled “Topographical slope protection,” of the Code of Ordinances of the Town of Flower Mound, Texas, is hereby amended by deleting said provision in its entirety and replacing said provision with a new Section 98-147 also entitled “Topographical slope protection” to read as follows:

**“Sec. 98-147. Topographical slope protection.**

(a) *Restrictions; purpose.* No development application or project shall be approved that proposes development on any existing topographical slopes of 12 percent or greater, or that proposes to alter any existing topographical slopes that are less than 12 percent but equal to or greater than five percent then available (other than within five feet of the footprint of the proposed structure or structures). The purpose of this criterion is to ensure that development is respectful of and appropriately integrated with the natural physical geography of the land in Flower Mound by requiring environmentally sensitive development techniques to eliminate "scrape and build."

(b) *Exception.* An exception to this requirement may be approved by the Town Council by the affirmative vote of at least three-fourths super majority vote of all members of the Town Council, for any development that keeps the character of the natural topography, and integrates the development into and maintains the overall integrity of the natural topography. Requests for an exception shall be accompanied by the following submissions:

(1) Detailed drawings that illustrate the impact of the proposed development on the natural topography and the manner by which the development is integrated into, reflects and maintains the overall integrity of the natural topography.

(2) The identification of those specific Best Management Practices (BMPs) that will be used to maintain and responsibly integrate the development into the natural topography together with an explanation regarding their use within the plans for such development. The BMPs to be used shall include, but are not limited to, those BMPs found within the Town's Engineering Design and Construction Standards.

(3) While recognized as a potential BMP, the use of retaining walls should be kept to a minimum. Any retaining wall four foot (4') or greater in height shall be designed by a professional engineer licensed by the State of Texas. Retaining walls exceeding eight feet (8') in height are discouraged.

In considering an exception to this criterion, the Town shall, in addition to the foregoing, consider the effects of granting an exception on other environmental features such as trees, habitats, floodplains, scenic vistas, ridgelines, and other environmental features as well as adjacency to established developments and neighborhoods.

(c) *Application.* For residential projects, applicable to applications for zoning, planned developments, development plans and record plats. For nonresidential projects, applicable to applications for zoning, planned developments, record plats and site plans.”

**SECTION 10**

From and after the effective date of this Ordinance, Appendix A, “Fee Schedule,” relative to SMARTGrowth Analysis Fees as set forth under Chapter 98, “Zoning,” of the Code of Ordinances of the Town of Flower Mound, Texas, is hereby amended to delete existing subparagraph (v) identified under *Code Section 98-1 et seq., Zoning Fees* and replace said provision with a new subparagraph (v) to read as follows:

(v)	SMARTGrowth analysis --	
	Transportation deposit. (Additional fees may be assessed, depending on scope of work.)	2,500.00
	Water deposit. (Additional fees may be assessed, depending on scope of work.)	550.00
	Wastewater deposit. (Additional fees may be assessed, depending on scope of work.)	550.00

**SECTION 11**

This Ordinance shall be cumulative of all provisions of ordinances of the Town of Flower Mound, Texas, except where the provisions of this Ordinance are in direct conflict with the provisions of such ordinances, in which event the conflicting provisions of such ordinances are hereby repealed.


**SECTION 12**

It is hereby declared to be the intention of the Town Council that the phrases, clauses, sentences, paragraphs, and sections of this Ordinance are severable, and if any phrase, clause, sentence, paragraph, or section of this Ordinance shall be declared unconstitutional by any court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs, and sections of this Ordinance, since same would have been enacted by the Town Council without the incorporation in this Ordinance of any such unconstitutional phrase, clause, sentence, paragraph, or section, and said remaining portions shall remain in full force and effect.

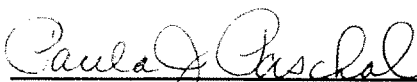
**SECTION 13**

This Ordinance shall take effect and be in full force from and after its passage, as provided by the Revised Civil Statutes of the State of Texas and the Home Rule Charter of the Town of Flower Mound, Texas.

**DULY PASSED, APPROVED AND ADOPTED BY THE TOWN COUNCIL OF THE TOWN OF FLOWER MOUND, TEXAS, BY A VOTE OF 5 TO 0, ON THIS THE 15<sup>th</sup> DAY OF FEBRUARY, 2010.**

  
\_\_\_\_\_  
Jody Smith, Mayor

**ATTEST:**

  
\_\_\_\_\_  
Paula Paschal, Town Secretary

**APPROVED AS TO FORM AND LEGALITY:**

  
\_\_\_\_\_  
Terrence S. Welch, Town Attorney

# Exhibit 1

## **SMARTGrowth ANALYSIS**

### **A. ADEQUATE PUBLIC INFRASTRUCTURE**

## 1. WATER SUPPLY

- A. **PURPOSE:** The purpose of this criterion is to provide adequate public infrastructure to serve the demands created by new development without degrading or diminishing service levels to existing development, while also fostering a balanced tax base through economic development to ensure Flower Mound's long-term financial ability to respond to the service demands of both new and existing development without placing a disproportionate tax burden on homeowners.
- B. **CRITERION: Water Supply.** No development application or project shall be approved if the Town has exceeded or is projected to exceed ninety-five percent (95.0%) of its treated water supply, based upon its then available treated water supply plus any additional supply programmed for commencement of construction within the then current or the next fiscal year of the Town's Capital Improvement Program, with the remaining five percent (5.0%) of supply being reserved for future economic development, institutional or civic uses.
- C. **METHODOLOGY:** Total available supply shall be the sum of contracted and available treated water supply from Dallas Water Utilities (DWU), contracted and available treated water supply from the Upper Trinity Regional Water District (UTRWD), and any treated water supply projected to be available from programmed capacity improvements. Net available supply shall be equal to total available supply less 5.0% to be reserved for economic development, institutional or civic uses.
- Total projected demand shall be the sum of projected maximum day demand (MDD) for all existing lots, and approved but not constructed development, plus the projected MDD for the proposed development. For proposed development to be approved, total projected demand must not exceed net available supply.
- D. **INFORMATION NEEDED FOR ANALYSIS:** The information needed to perform the analysis necessary to determine compliance with this criterion is shown on Table 1 along with who is responsible for providing the information, the source of that information and when the information is to be provided during the application process.
- E. **APPLICATION:** For residential projects, applicable to applications for Master Plan amendments, zoning amendments, development plans, and record plats, with capacity being reserved at record plat approval. For nonresidential projects, applicable to applications for Master Plan amendments, zoning amendments, development plans, record plats and site plans, with capacity being reserved at site plan approval.

**TABLE 1**

**Town of Flower Mound SMARTGrowth Analysis  
Water Supply**

<u>Information Needed</u>	<u>Who Provides</u>	<u>How Provided</u>	<u>When Provided</u>
<b>CAPACITY</b>			
- UTRWD (Contract)	Town by Contract	20 MGD**	Initial Submittal
- DWU (Contract)	Town by Contract	11 MGD**	Initial Submittal
- Programmed Capacity (CIP) ++	Town by Contract	10 MGD**	Initial Submittal
- Total Capacity		41 MGD	
<b>DEMAND</b>			
- Existing Baseline MDD	Town	29.32 MGD*	Initial Submittal
- Res. Demand/Unit	Town	Water Master Plan	Initial Submittal
- Res. Lot Inventory Demand	Town	Compiled by Approved Applications +	Initial Submittal
- Res. Building Permits Demand	Town	Compiled by Permits***	Initial Submittal
- Non Res. Inventory Demand	Town	Compiled by Permits***	Initial Submittal
- Proposed Res. Demand	Applicant	Number of Lots	Initial Submittal
- Proposed Non Res. Demand	Applicant	Use Type or Historical Data	Initial Submittal

MDD = Maximum Day Demand

\*Baseline MDD will be 29.32 MGD from 2006 until historical water records indicate that the existing baseline demand has been exceeded. Baseline MDD will be reviewed and updated in January of each year.

\*\*As of July 1, 2002.

\*\*\* Permits issued subsequent to date of most updated baseline MDD.

+ Approved applications for Master Plan amendments, zoning amendments, development plans, record plats, and/or site plans.

++ Programmed capacity includes capital infrastructure capacity improvements programmed for commencement of construction within the then current or the next fiscal year of the Town's adopted Five-Year Capital

## Town of Flower Mound –SMARTGrowth Analysis Treated Water Supply Calculation Sheet

**Capacity:** Treated water supply capacity is measured in Million Gallons per Day (MGD) and must be capable of supplying the Maximum Day Demand (MDD).

**Calculation:**

**Current Capacity**

DWU	Contract	11 MGD
UTRWD	Original Contract	20 MGD

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<i>Subtotal Current Treated Water Supply Capacity</i>	31 MGD
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**Programmed Capacity ++**

UTRWD Capacity Available January 2004	10 MGD
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<i>Subtotal Program Treated Water Supply Capacity</i>	41.0 MGD
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<b>Total Water Supply Capacity</b>	<b>41 MGD</b>
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**Reserved Capacity**

5% Reserved for Economic Development Civic and Institutional	2.0 MGD
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<i>Subtotal Reserved Treated Water Supply Capacity</i>	2.0 MGD
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<b>Total Available Water Treatment Capacity</b>	<b>39.0 MGD</b>
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++ Programmed capacity includes capital infrastructure capacity improvements programmed for commencement of construction within the then current or the next fiscal year of the Town's adopted Five-Year Capital Improvement Program.

**Town of Flower Mound – SMARTGrowth Analysis  
Treated Water Supply Calculation Sheet**

**Demand:** Water supply demand is measured in Million Gallons per Day (MGD) for the Maximum Day Demand (MDD).

**Calculation:**

**Historical MDD**  
July 2006 MDD = **29.32 MGD**

**Additional Existing Residential MDD**  
(Residential demand that increased since last historical demand mark)

**0** X 500 gpd/unit x 1.91 Divided By 1,000,000 = **0.00 MGD**  
(Building Permits Issued Since Historical MDD) (Demand per Unit in Water Master Plan) (MDD/ADD 2006 Demand Factor)

**Residential Inventory MDD**

**0** X 500 gpd/unit x 1.91 Divided By 1,000,000 = **0.00 MGD**  
(Approved by plat, however no Building Permit Issued; i.e., vacant approved lot) (Demand per Unit in Water Master Plan) (MDD/ADD 2006 Demand Factor)

**Proposed Residential MDD**

**0** X 500 gpd/unit x 1.91 Divided By 1,000,000 = **0.00 MGD**  
(# of Residential Units Proposed) (Demand per Unit in Water Master Plan) (MDD/ADD 2006 Demand Factor)

**Additional Existing Non-Residential MDD** (Multifamily is included)

Sum of approved Non-Residential demand where a building permit has been issued since Historical MDD plus demand for sites with approved site plan, but no building permit issued; i.e., vacant approved lot = **0.00 MGD**

**Proposed Non-Residential MDD** (Multifamily is included)

MDD projected for Non-Residential use as calculated based on historical data provided by the applicant to the Town for a similar development. = **0.00 MGD**

**TOTAL DEMAND** **29.32 MGD**

(Sum of the Maximum Day Demand for Historical, Residential Inventory, Proposed Residential, Additional Existing Non-Residential, Non-Residential Inventory, and Proposed Non-Residential)

**IF TOTAL TREATED WATER SUPPLY CAPACITY** **39.00 MGD**

**IS GREATER THAN TOTAL DEMAND** **29.32 MGD**

**DEVELOPMENT MAY PROCEED**

### Demand Per Land Use Type:

Land Use Type	Demand gpm/ac	Demand gpd/ac	Demand gpd/dwelling unit
Single Family	N/A	N/A	500
Multi-Family	3.47	5,000	NA
Retail	0.56	800	NA
Campus Commercial/Industrial			
Medium Office	3.47	5,000	NA
Medium Commercial	2.01	2,900	NA
Warehouse	0.56	800	NA
Commercial/Industrial	0.97	1,400	NA
Office	2.43	3,500	NA
School	0.97	1,400	NA
Churches	0.56	800	NA
Park	0.14	200	NA
Utility	0.00	0	NA
Open Space	0.00	0	NA

The projected build out Average Day Demand is approximately 29 MGD.

#### **Maximum Day Demand (MDD)**

Maximum day demand is generally expressed as a ratio of the average day demand. Historical data was used to determine this ratio. The maximum day demand is also dependent on precipitation but only during the summer months. It is possible to experience a dry-year-type maximum day demand during a wet year because of a short-term dry period in the summer months. The ratio for the maximum day demand to the average day demand in a normal year is 1:1.91. The projected build out Maximum Day Demand is approximately 62 MGD.

#### **Peak Hour Demand (PHD)**

Peak-hour demand is determined by creating a diurnal curve for the day that maximum demand occurs at build-out. The value is expressed as a ratio of peak-hour demand to maximum-day demand. The build out peak-hour demand is approximately 109 MGD. The projected build out Maximum Day Demand is approximately 62 MGD. The resulting ratio is 1:1.75.

Note: This information is taken from the 2009 Water System Master Plan prepared by Kellogg Brown & Root, Inc. and adopted by the Town Council on August 17, 2009.

## 2. WATER PUMPING CAPACITY

- A. PURPOSE:** The purpose of this criterion is to provide adequate public infrastructure to serve the demands created by new development without degrading or diminishing service levels to existing development, while also fostering a balanced tax base through economic development to ensure Flower Mound's long-term financial ability to respond to the service demands of both new and existing development without placing a disproportionate tax burden on homeowners.
- B. CRITERION: Water Pumping Capacity.** No development application or project shall be approved if the Town has exceeded or is projected to exceed ninety-five percent (95.0%) of its rated water pumping capacity in any pressure plane during peak-hour demand with the largest pump at each pump station out-of-service, based upon the then available rated pumping capacity and contributed capacity from then available elevated storage and any additional pumping capacity or contributed elevated storage capacity programmed for commencement of construction within the then current or the next fiscal year of the Town's Capital Improvement Program, with the remaining five percent (5.0%) of rated pumping capacity being reserved for future economic development, institutional or civic uses.
- C. METHODOLOGY:** Total available pumping capacity shall be determined on the basis of individual pressure planes and shall be the sum of the rated name plate pumping capacity of each pump station (in MGD) with the largest pump out of service at each station, any pumping capacity projected to be available from programmed capacity improvements, and contributed capacity from elevated storage. Net available pumping capacity shall be equal to total available pumping capacity less five percent (5.0%) to be reserved for economic development, institutional or civic uses.
- Total projected demand shall be the sum of projected peak-hour demand (in MGD) for all existing lots and approved but not constructed development, plus the projected peak-hour demand for the proposed development. For proposed development to be approved, total projected demand must not exceed net available pumping capacity.
- D. INFORMATION NEEDED FOR ANALYSIS:** The information needed to perform the analysis necessary to determine compliance with this criterion is shown on Table 2 along with who is responsible for providing the information, the source of that information and when the information is to be provided during the application process.
- E. APPLICATION:** For residential projects, applicable to applications for Master Plan amendments, zoning amendments, development plans, and record plats, with capacity being reserved at record plat approval. For nonresidential projects, applicable to applications for Master Plan amendments, zoning amendments, development plans, record plats and site plans, with capacity being reserved at site plan approval

**TABLE 2**

**Town of Flower Mound –SMARTGrowth Analysis  
Water Pumping Capacity**

<u>Information Needed</u>	<u>Who Provides</u>	<u>How Provided</u>	<u>When Provided</u>
<b>CAPACITY</b>			
- Existing Pump Capacity	Town	Water Master Plan	Initial Submittal
- Programmed Pump Capacity +	Town	Town CIP	Initial Submittal
<b>DEMAND</b>			
- Existing Baseline PHD	Town	63.8 MGD*	Initial Submittal
- Res. Demand/Unit	Town	Water Master Plan	Initial Submittal
- Residential Lot Inventory PHD	Town	Compiled by Approved Applications **	Initial Submittal
- Residential Building Permits	Town	Compiled by Permits***	Initial Submittal
- Non-Residential Inventory PHD	Town	Compiled by Permits ***	Initial Submittal
- Proposed Res. PHD	Applicant	Number of Lots	Initial Submittal
- Proposed Non Res. PHD	Applicant	Historical Data or Type of Use	Initial Submittal

PHD = Peak Hour Demand

\* Baseline PHD will be 63.8 MGD from 2006 until historical records indicate that the existing baseline demand has been exceeded. Baseline PHD will be reviewed and updated in January of each year.

\*\* Approved applications for Master Plan amendments, zoning amendments, development plans, record plats, and/or site plans.

\*\*\* Permits issued subsequent to date of most updated baseline PHD.

+ Programmed capacity includes capital infrastructure capacity improvements programmed for commencement of construction within the then current or the next fiscal year of the Town’s adopted Five-Year Capital Improvement Program.

## Town of Flower Mound – SMARTGrowth Analysis Water Pumping Calculation Sheet

**Capacity:** Pumping capacity is measured in Million Gallons per Day (MGD) for firm pumping capacity at each pump station plus contribution from elevated storage to meet the Peak Hour Demand (PHD).

**Calculation:**

**Existing Pumping Capacity**

(equals Firm Name Plate Capacity)

Station	Pumps	Firm Capacity*
Pintail	2-5MGD, 2-7.2 MGD	17.2 MGD
Stonehill	5-10.08 MGD	40.3 MGD
<i>Subtotal Existing Firm Pumping Capacity</i>		57.5 MGD

\*Firm Capacity: Determined with Largest Pump Out of Service

**Existing Contribution from Elevated Storage**

(shall be calculated as a 6 hour drain rate with 25% of storage reserved for fire protection)

Tank	Size	Capacity
Bruton Orand	2 MG	6.0 MGD
Waketon	1 MG	3.0 MGD
<i>Subtotal Existing Contributions from Elevated Storage</i>		9.0 MGD

**Total Existing Pumping Capacity** **66.5 MGD**

**Programmed Pumping Capacity:**

Western Pump Station 35.0 MGD

**Programmed Elevated Storage:**

2.5MG Western Elevated Storage Tank 7.5 MGD

*Total Programmed Capacity Improvements* 42.5 MGD

**Total Existing and Programmed Capacity** **109.0 MGD**

**Reserved Capacity**

5% Reserved for Economic Development, Civic, and Institutional Purposes 5.5 MGD

*Subtotal Reserved Treated Water Supply Capacity* 5.5 MGD

**TOTAL AVAILABLE PUMPING CAPACITY** **103.5 MGD**

## Town of Flower Mound – SMARTGrowth Analysis Water Pumping Calculation Sheet

**Demand:** Water supply demand is measured in Million Gallons per Day (MGD) for the Peak Hour Demand (PHD).

**Calculation:**

**Historical PHD**  
July 2006 = **63.8 MGD**

**Additional Existing Residential PHD**  
(Residential demand that increased since last historical demand mark)

**0** x 500 gpd/unit x 1.91 X 1.75 Divided By 1,000,000 = **0.0 MGD**  
(Building Permits Issued Since Historical PHD) (Demand per Unit in Water Master Plan) (MDD/ADD 2006 Demand Factor) (PHD/MDD build out Demand Factor)

**Residential Inventory PHD**

**0** x 500 gpd/unit x 1.91 X 1.75 Divided By 1,000,000 = **0.0 MGD**  
(# of Residential Units in Inventory) (Demand per Unit in Water Master Plan) (MDD/ADD 2006 Demand Factor) (PHD/MDD build out Demand Factor)

**Proposed Residential PHD**

**0** x 500 gpd/unit x 1.91 X 1.75 Divided By 1,000,000 = **0.0 MGD**  
(# of Residential Units Proposed) (Demand per Unit in Water Master Plan) (MDD/ADD 2006 Demand Factor) (PHD/MDD build out Demand Factor)

**Additional Existing Non-Residential PHD** (Multifamily is included)

Sum of approved Non-Residential demand where a building permit has been issued since Historical PHD plus demand for sites with approved site plan, but no building permit issued; i.e., vacant approved lot. = **0.0 MGD**

**Proposed Non-Residential PHD** (Multifamily is included)

PHD projected for Non-Residential use as calculated based on historical data provided by the applicant to the Town for a similar development = **0.0 MGD**

**TOTAL DEMAND** 63.8 MGD

(Sum of the Peak Hour Demand for Historical, Residential Inventory, Proposed Residential, Additional Existing Non-Residential, Non-Residential Inventory, and proposed Non-Residential)

**IF TOTAL AVAILABLE PUMPING CAPACITY** 103.5 MGD

**IS GREATER THAN TOTAL DEMAND** 63.8 MGD

**DEVELOPMENT MAY PROCEED**

### Demand Per Land Use Type:

Land Use Type	Demand gpm/ac	Demand gpd/ac	Demand gpd/dwelling unit
Single Family	N/A	N/A	500
Multi-Family	3.47	5,000	NA
Retail	0.56	800	NA
Campus Commercial/Industrial			
Medium Office	3.47	5,000	NA
Medium Commercial	2.01	2,900	NA
Warehouse	0.56	800	NA
Commercial/Industrial	0.97	1,400	NA
Office	2.43	3,500	NA
School	0.97	1,400	NA
Churches	0.56	800	NA
Park	0.14	200	NA
Utility	0.00	0	NA
Open Space	0.00	0	NA

The projected build out Average Day Demand is approximately 29 MGD.

#### **Maximum Day Demand (MDD)**

Maximum day demand is generally expressed as a ratio of the average day demand. Historical data was used to determine this ratio. The maximum day demand is also dependent on precipitation but only during the summer months. It is possible to experience a dry-year-type maximum day demand during a wet year because of a short-term dry period in the summer months. The ratio for the maximum day demand to the average day demand in a normal year is 1:1.91. The projected build out Maximum Day Demand is approximately 62 MGD.

#### **Peak Hour Demand (PHD)**

Peak-hour demand is determined by creating a diurnal curve for the day that maximum demand occurs at build-out. The value is expressed as a ratio of peak-hour demand to maximum-day demand. The build out peak-hour demand is approximately 109 MGD. The projected build out Maximum Day Demand is approximately 62 MGD. The resulting ratio is 1:1.75.

Note: This information is taken from the 2009 Water System Master Plan prepared by Kellogg Brown & Root, Inc. and adopted by the Town Council on August 17, 2009.

### 3. WASTEWATER TREATMENT CAPACITY

- A. **PURPOSE:** The purpose of this criterion is to provide adequate public infrastructure to serve the demands created by new development without degrading or diminishing service levels to existing development, while also fostering a balanced tax base through economic development to ensure Flower Mound's long-term financial ability to respond to the service demands of both new and existing development without placing a disproportionate tax burden on homeowners.
- B. **CRITERION: Wastewater Treatment Capacity.** No development application or project shall be approved if the Town has exceeded or is projected to exceed ninety-five percent (95.0%) of its wastewater treatment capacity, based upon its then available treatment capacity and any additional treatment capacity programmed for commencement of construction within the then current or the next fiscal year of the Town's Capital Improvement Program, with the remaining five percent (5.0%) of wastewater treatment capacity being reserved for future economic development, institutional or civic uses. This criterion is not applicable if a proposed development's wastewater flows will not be treated by the Town's wastewater treatment plant or the Trinity River Authority's Denton Creek Regional Wastewater System.
- C. **METHODOLOGY:** Total available treatment capacity for the Town's wastewater treatment plant shall be the sum of the TCEQ permitted discharge flow (in MGD) from the treatment plant and any treatment capacity projected to be available from programmed capacity improvements. Net available treatment capacity shall be equal to total available treatment capacity less 5.0% to be reserved for economic development, institutional or civic uses.

Total projected demand for areas served by the Town's wastewater treatment plant shall be the sum of projected wastewater flows for all existing lots, and approved but not constructed development, plus the projected wastewater flows for the proposed development. For proposed development to be approved, total projected demand must not exceed net available treatment capacity.

Total available treatment capacity for the Denton Creek and Prairie Vista Districts, as defined in the adopted Land Use Plan, shall be the sum of contracted and available treatment capacity from the Trinity River Authority's Denton Creek Regional Wastewater System and any treatment capacity projected to be available from programmed capacity improvements. Net available treatment capacity for the Denton Creek and Prairie Vista Districts shall be equal to total treatment capacity less 5.0% to be reserved for economic development, institutional or civic uses.

Total projected demand for areas within the Denton Creek and Prairie Vista Districts shall be the sum of projected wastewater flows for all existing lots and uses within the District, and approved but not constructed development within the District, plus the projected wastewater flows for the proposed development. For proposed development to be approved, total projected demand must not exceed net available treatment capacity.

- D. INFORMATION NEEDED FOR ANALYSIS:** The information needed to perform the analysis necessary to determine compliance with this criterion is shown on Table 3 along with who is responsible for providing the information, the source of that information and when the information is to be provided during the application process.
- E. APPLICATION:** For residential projects, applicable to applications for Master Plan amendments, zoning amendments, development plans, and record plats, with capacity being reserved at record plat approval. For nonresidential projects, applicable to applications for Master Plan amendments, zoning amendments, development plans, record plats and site plans, with capacity being reserved at site plan approval.

**TABLE 3**

**Town of Flower Mound –SMARTGrowth Analysis  
Wastewater Treatment Plant Capacity**

<u>Information Needed</u>	<u>Who Provides Information</u>	<u>How is Information Obtained</u>	<u>When is Information Needed</u>
<b>CAPACITY</b>			
- Existing wastewater treatment plant capacity	Town	Wastewater Master Plan	Initial Submittal
- Programmed capacity +	Town	Town CIP	Initial Submittal
<b>DEMAND</b>			
- Existing flows	Town	Wastewater Treatment Plant Records	Initial Submittal
- Projected flows by lot inventory	Town	Wastewater Master Plan (updated periodically based on actual flows)	Initial Submittal
- Projected flows for proposed new residential development	Town	Wastewater Master Plan (flows per lot - updated periodically)	Initial Submittal
- Location, number of lots, and acreage of proposed new residential development	Applicant	Applicant	Initial Submittal
- Location, size and projected flows for proposed new non-residential development	Applicant	Historical Data or Type of Use	Initial Submittal
+ Programmed capacity includes capital infrastructure improvements programmed for commencement of construction within the then current or the next fiscal year of the Town’s adopted Five-Year Capital Improvement Program.			

**Town of Flower Mound –SMARTGrowth Analysis  
Wastewater Treatment Capacity Calculation Sheet**

**Capacity:** Wastewater treatment capacity is measured in Million Gallons per Day (MGD) and must be capable of supplying the Maximum Day Demand (MDD).

**Calculation:**

<b>Current Capacity</b> TCEQ Permit	10 MGD
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<b>Total Wastewater Treatment Capacity</b>	<b>10 MGD</b>
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<b>Reserved Capacity</b> 5% Reserved for Economic Development Civic and Institutional	0.5 MGD
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<b>Total Available Wastewater Treatment Capacity</b>	<b>9.5 MGD</b>
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## Town of Flower Mound – SMARTGrowth Analysis Wastewater Treatment Capacity Calculation Sheet

Demand: Wastewater treatment demand is measured in Million Gallons per Day (MGD) for the Annual Average Day Demand (ADD).

**Calculation:**

**Historical Flows (From TCEQ Reports)**

Average Day Demand (ADD) For Previous 12 Months = **4.41 MGD**

**Additional Existing Residential Flow**

(Residential demand that increased since Historical-ADD)

**0** X 240 gpd/unit x Divided By 1,000,000 = **0.0 MGD**  
 (Building Permits Issued Since Historical ADD) (Flow per Unit in Wastewater Master Plan)

**Residential Inventory ADD**

**0** X 240 gpd/unit x Divided By 1,000,000 = **0.0 MGD**  
 (# of Residential Units in Inventory) (Flow per Unit in Wastewater Master Plan)

**Proposed Residential ADD**

**0** X 240 gpd/unit x Divided By 1,000,000 = **0.0 MGD**  
 (# of Residential Units Proposed) (Flow per Unit in Wastewater Master Plan)

**Additional Existing Non-Residential ADD**

(Multifamily is included)

Sum of approved Non-Residential demand where a building permit has been issued since Historical flows plus demand for sites with approved site plan, but no building permit issued; i.e., vacant approved lot = **0.0 MGD**

**Proposed Non-Residential ADD**

(Multifamily is included)

ADD projected for Non-Residential use as calculated based on historical data provided by the applicant to the Town for a similar development. = **0.0 MGD**

**TOTAL DEMAND**

**4.41 MGD**

(Sum of the Average Day Demand for Historical, Residential Inventory, Proposed Residential, Additional Existing Non-Residential, Non-Residential Inventory, and Proposed Non-Residential)

**IF TOTAL WASTEWATER TREATMENT CAPACITY**

**9.5 MGD**

**IS GREATER THAN TOTAL DEMAND**

**4.4 MGD**

**DEVELOPMENT MAY PROCEED**

## 4. WASTEWATER LIFT STATION PUMPING CAPACITY

- A. **PURPOSE:** The purpose of this criterion is to provide adequate public infrastructure to serve the demands created by new development without degrading or diminishing service levels to existing development, while also fostering a balanced tax base through economic development to ensure Flower Mound's long-term financial ability to respond to the service demands of both new and existing development without placing a disproportionate tax burden on homeowners.
- B. **CRITERION: Wastewater Lift Station Pumping Capacity.** No development application or project shall be approved if the Town has exceeded or is projected to exceed ninety-five percent (95.0%) of the rated pumping capacity of any lift station serving the development during the maximum wet weather flow event with the largest pump at each lift station out-of-service and without considering wastewater interceptor capacity, based upon the then available rated pumping capacity of each lift station and any additional pumping capacity programmed for commencement of construction within the then current or the next fiscal year of the Town's Capital Improvement Program, with the remaining five percent (5.0%) of rated pumping capacity of each lift station being reserved for future economic development, institutional or civic uses.
- C. **METHODOLOGY:** Total available lift station pumping capacity shall be the sum of the rated name plate pumping capacity of each lift station serving the proposed development with the largest pump out of service and any pumping capacity projected to be available from programmed capacity improvements. Net available lift station pumping capacity shall be equal to total available lift station pumping capacity less 15.0% to be reserved for economic development, institutional or civic uses.
- Total projected demand shall be determined on the basis of a five-year design storm for peak hour wet weather wastewater flows and shall be the sum of projected wastewater flows for all existing lots served by each lift station serving the proposed development, and approved but not constructed development that will be served by each lift station serving the proposed development, plus the projected wastewater flows for the proposed development. For proposed development to be approved, total projected demand must not exceed net available lift station pumping capacity.
- D. **INFORMATION NEEDED FOR ANALYSIS:** The information needed to perform the analysis necessary to determine compliance with this criterion is shown on Table 4 along with who is responsible for providing the information, the source of that information and when the information is to be provided during the application process.
- E. **APPLICATION:** For residential projects, applicable to applications for Master Plan amendments, zoning amendments, development plans, and record plats, with capacity being reserved at record plat approval. For nonresidential projects, applicable to applications for Master Plan amendments, zoning amendments, development plans, record plats and site plans, with capacity being reserved at site plan approval.

**TABLE 4**

**Town of Flower Mound – SMARTGrowth Analysis  
Lift Station Capacity**

<u>Information Needed</u>	<u>Who Provides Information</u>	<u>How is Information Obtained</u>	<u>When is Information Needed</u>
<b>CAPACITY</b>			
- Existing capacity of lift stations	Town	Wastewater Master Plan	Initial Submittal
- Programmed capacity +	Town	Town CIP	Initial Submittal
<b>DEMAND</b>			
- Existing flows by interceptor/drainage basin	Town	Wastewater Master Plan updated to include newly constructed lots by subdivision (updated periodically)	Initial Submittal
- Projected flows by lot inventory by drainage basin	Town	Wastewater Master Plan updated to include new approved developments (lots without building permits - updated periodically)	Initial Submittal
- Projected flows for proposed new residential development	Town	Wastewater Master Plan (flow per lot - updated periodically)	Initial Submittal
- Location, number of lots, and acreage of proposed new residential development	Applicant	Applicant	Initial Submittal
- Location, size and projected flows for proposed new non-residential development	Applicant	Historical Data or Type of Use	Initial Submittal
+ Programmed capacity includes capital infrastructure capacity improvements programmed for commencement of construction within the then current or the next fiscal year of the Town’s adopted Five-Year Capital Improvement Program.			



**TOWN OF FLOWER MOUND  
LIVING UNIT EQUIVALENT (LUE) FLOW CALCULATIONS**

Assumptions and Equations																						
<u>Sanitary Flow:</u>																						
per capita contribution rate	75 Gpcd																					
no. people per living unit	3.2 People/LUE																					
unit sanitary flow	240 gpd/LUE																					
sanitary peaking factor	1.9																					
peak units sanitary flow rate	456 gpd/LUE <span style="float: right; border: 1px solid black; padding: 2px;">A</span>																					
<u>I/I Flow:</u>																						
average aerial I/I rate	224 gal/acre/day																					
I/I peaking factor	4.3																					
Peak aerial I/I rate	970 gal/acre/day																					
no. living units per acre	2.1 LUE/acre																					
peak unit I/I flow	460 gpd/LUE <span style="float: right; border: 1px solid black; padding: 2px;">B</span>																					
<u>Total Peak Flow Calculation:</u>																						
OR >>	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px 10px;">916</td> <td style="padding: 0 5px;">gpd/LUE</td> <td style="border: 1px solid black; padding: 2px 5px;">C</td> <td style="padding: 0 5px;">=A+B</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px 10px;">1090</td> <td style="padding: 0 5px;">LUE/MGD</td> <td style="border: 1px solid black; padding: 2px 5px;">D</td> <td style="padding: 0 5px;">=1,000,000/C</td> </tr> </table>	916	gpd/LUE	C	=A+B	1090	LUE/MGD	D	=1,000,000/C													
916	gpd/LUE	C	=A+B																			
1090	LUE/MGD	D	=1,000,000/C																			
<u>Example Peak Flow Calculations:</u>																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">No. Lots</th> <th rowspan="2">No. Acres</th> <th colspan="3">Peak Flows (MGD)</th> </tr> <tr> <th>Sanitary</th> <th>I/I</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">Y</td> <td style="text-align: center;"><math>Q1=(XxA)/1E6</math></td> <td style="text-align: center;"><math>Q2=(YxB)/1E6</math></td> <td style="text-align: center;"><math>Q1+Q2</math></td> </tr> <tr> <td style="text-align: center;">100</td> <td style="text-align: center;">50</td> <td style="text-align: center;">0.046</td> <td style="text-align: center;">0.086</td> <td style="text-align: center;">0.132</td> </tr> </tbody> </table>					No. Lots	No. Acres	Peak Flows (MGD)			Sanitary	I/I	Total	X	Y	$Q1=(XxA)/1E6$	$Q2=(YxB)/1E6$	$Q1+Q2$	100	50	0.046	0.086	0.132
No. Lots	No. Acres	Peak Flows (MGD)																				
		Sanitary	I/I	Total																		
X	Y	$Q1=(XxA)/1E6$	$Q2=(YxB)/1E6$	$Q1+Q2$																		
100	50	0.046	0.086	0.132																		
Platted lot equivalencies		100.0																				
Capacities reserve for Economic Development		5%																				
Manning's Equation for Pipe Capacity Calculations																						
For pipe calculations in MGD: $Q_{capacity}=22.82(K'/n)(0.3048D/12)^{(8/3)}S$ D in inches; S in ft/ft																						
Source: Metcalf & Eddy Wastewater Engineering: collection & Pumping of Wastewater, Table 2-5																						
Manning's 'n' =	0.014																					
d/D =	0.9 >>>	K' = 0.33																				

## 5. WASTEWATER INTERCEPTOR CAPACITY

- A. **PURPOSE:** The purpose of this criterion is to provide adequate public infrastructure to serve the demands created by new development without degrading or diminishing service levels to existing development, while also fostering a balanced tax base through economic development to ensure Flower Mound's long-term financial ability to respond to the service demands of both new and existing development without placing a disproportionate tax burden on homeowners.
- B. **CRITERION: Wastewater Interceptor Capacity.** No development application or project shall be approved if the Town has exceeded or is projected to exceed ninety-five percent (95.0%) of the maximum capacity at any location or point on any major wastewater interceptor serving the development and identified in the Town's Wastewater Master Plan during the maximum wet weather flow event, without surcharging any manhole, based upon the then available maximum capacity of each major interceptor and any additional interceptor capacity programmed for commencement of construction within the then current or the next fiscal year of the Town's Capital Improvement Program, with the remaining five percent (5.0%) of wastewater interceptor capacity being reserved for future economic development, institutional or civic uses.
- C. **METHODOLOGY:** Total available wastewater interceptor capacity shall be the sum of the maximum capacity of each major interceptor serving the proposed development (as such capacity is defined in the Town's adopted Wastewater Master Plan for each interceptor segment) and any interceptor capacity projected to be available from programmed capacity improvements. Net available wastewater interceptor capacity shall be equal to total available wastewater interceptor capacity less five percent (5.0%) to be reserved for economic development, institutional or civic uses.
- Total projected demand shall be determined on the basis of a five-year design storm for peak hour wet weather wastewater flow and shall be the sum of projected wastewater flows for all existing lots and approved but not constructed development that will be served by each major interceptor serving the proposed development, plus the projected wastewater flows for the proposed development. For proposed development to be approved, total projected demand must not exceed net available wastewater interceptor capacity.
- D. **INFORMATION NEEDED FOR ANALYSIS:** The information needed to perform the analysis necessary to determine compliance with this criterion is shown on Table 5 along with who is responsible for providing the information, the source of that information and when the information is to be provided during the application process.
- E. **APPLICATION:** For residential projects, applicable to applications for Master Plan amendments, zoning amendments, development plans, and record plats, with capacity being reserved at record plat approval. For nonresidential projects, applicable to applications for Master Plan amendments, zoning amendments, development plans, record plats and site plans, with capacity being reserved at site plan approval.

**TABLE 5**

**Town of Flower Mound – SMARTGrowth Analysis Evaluation  
Wastewater Interceptor Capacity**

<u>Information Needed</u>	<u>Who Provides Information</u>	<u>How is Information Obtained</u>	<u>When is Information Needed</u>
<b>CAPACITY</b>			
- Existing capacity of system by interceptor/drainage basin	Town	Wastewater Master Plan by interceptor/drainage area	Initial Submittal
- Programmed capacity of system by drainage basin +	Town	Town CIP by interceptor/drainage area	Initial Submittal
<b>DEMAND</b>			
- Existing flows by interceptor/drainage basin	Town	Wastewater Master Plan updated to include newly constructed lots by subdivision (updated periodically)	Initial Submittal
- Projected flows by lot inventory by drainage basin	Town	Wastewater Master Plan updated to include new approved developments (lots without building permits - updated periodically)	Initial Submittal
- Projected flows for proposed new residential development	Town	Wastewater Master Plan (flow per lot - updated periodically)	Initial Submittal
- Location, number of lots, and acreage of proposed new residential development	Applicant	Applicant	Initial Submittal
- Location, size and projected flows for proposed new non-residential development	Applicant	Applicant (case-by-case basis)	Initial Submittal
+ Programmed capacity includes capital infrastructure capacity improvements programmed for commencement of construction within the then current or the next fiscal year of the Town’s adopted Five-Year Capital Improvement Program			

## Town of Flower Mound- SMARTGrowth Analysis Wastewater Interceptor Calculation Sheet

**Demand:** Wastewater flow is measured in Million Gallons per Day (MGD) for the Peak Hour Wet Weather Flow Demands (PHD).

**Calculation:**

### Historical Park Flow

Most Updated measurement for interceptors served by proposed development = MGD

### Additional Existing Residential PHD

(Residential demand that increased since last historical demand mark)

$$0 \times 240 \text{ gpd/unit} \times 1.9 + 970 \text{ gpd/acre} \times 0 \text{ Acres of Development} \div 1,000,000 = \text{MGD}$$

(Building Permits Issued Since Historical Peak) (Flow per Unit in Wastewater Master Plan) (Peak Flow Factor) (Peak I/II Rate) From Building Permits

### Residential Inventory PHD

$$0 \times 240 \text{ gpd/unit} \times 1.9 + 970 \text{ gpd/acre} \times 0 \text{ Acres of Development} \div 1,000,000 = 0.0 \text{ MGD}$$

(# of Residential Units in Inventory) (Flow per Unit in Wastewater Master Plan) (Peak Flow Factor) (Peak I/II Rate) From Building Permits

### Proposed Residential PHD

$$0 \times 240 \text{ gpd/unit} \times 1.9 + 970 \text{ gpd/acre} \times 0 \text{ Acres of Development} \div 1,000,000 = \text{MGD}$$

(# of Residential Units in Proposed) (Flow per Unit in Wastewater Master Plan) (Peak Flow Factor) (Peak I/II Rate) From Building Permits

### Additional Existing Non-Residential PHD (Multifamily is included)

Sum of approved Non-Residential demand where a building permit has been issued since Historical Peak plus demand for sites with approved site plan, but no building permit issued; i.e., vacant approved lot = 0.0 MGD

### Proposed Non-Residential PHD (Multifamily is included)

PHD projected for Non-Residential use as calculated based on historical data provided by the applicant to the Town for a similar development plus 970 gallons per day per acre for peak Infiltration/Inflow rate. = 0.0 MGD

## TOTAL DEMAND MGD

(Sum of the Peak Hour Demand for historical, Residential Inventory, Proposed residential, Additional Existing Non-Residential Inventory, and Proposed Non-Residential)

**IF TOTAL AVAILABLE INTERCEPTOR CAPACITY** MGD

**IS GREATER THAN TOTAL DEMAND** MGD

### DEVELOPMENT MAY PROCEED

NOTE:: A computer program has been developed which will perform the calculations to determine compliance with the Wastewater interceptor capacity criterion.

## TOWN OF FLOWER MOUND LIVING UNIT EQUIVALENT (LUE) FLOW CALCULATIONS

Assumptions and Equations																						
<u>Sanitary Flow:</u>																						
per capita contribution rate	75 gpcd																					
no. people per living unit	3.2 people/LUE																					
unit sanitary flow	240 gpd/LUE																					
sanitary peaking factor	1.9																					
peak units sanitary flow rate	456 gpd/LUE <span style="float: right; border: 1px solid black; padding: 2px;">A</span>																					
<u>I/I Flow:</u>																						
average aerial I/I rate	224 gal/acre/day																					
I/I peaking factor	4.3																					
Peak aerial I/I rate	970 gal/acre/day																					
no. living units per acre	2.1 LUE/acre																					
peak unit I/I flow	460 gpd/LUE <span style="float: right; border: 1px solid black; padding: 2px;">B</span>																					
<u>Total Peak Flow:</u>	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px 10px;">916</td> <td style="padding: 0 5px;">gpd/LUE</td> <td style="border: 1px solid black; padding: 2px;">C</td> <td style="padding: 0 5px;">=A+B</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px 10px;">1090</td> <td style="padding: 0 5px;">LUE/MGD</td> <td style="border: 1px solid black; padding: 2px;">D</td> <td style="padding: 0 5px;">=1,000,000/C</td> </tr> </table>	916	gpd/LUE	C	=A+B	1090	LUE/MGD	D	=1,000,000/C													
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<u>Example Peak Flow Calculations:</u>																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">No. Lots</th> <th rowspan="2">No. Acres</th> <th colspan="3">Peak Flows (MGD)</th> </tr> <tr> <th>Sanitary</th> <th>I/I</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">Y</td> <td style="text-align: center;"><math>Q1=(XxA)/1E6</math></td> <td style="text-align: center;"><math>Q2=(YxB)/1E6</math></td> <td style="text-align: center;">Q1+Q2</td> </tr> <tr> <td style="text-align: center;">100</td> <td style="text-align: center;">50</td> <td style="text-align: center;">0.046</td> <td style="text-align: center;">0.086</td> <td style="text-align: center;">0.132</td> </tr> </tbody> </table>					No. Lots	No. Acres	Peak Flows (MGD)			Sanitary	I/I	Total	X	Y	$Q1=(XxA)/1E6$	$Q2=(YxB)/1E6$	Q1+Q2	100	50	0.046	0.086	0.132
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100	50	0.046	0.086	0.132																		
Platted lot equivalencies		100.0																				
Capacities reserve for Economic Development		5%																				
<u>Manning's Equation for Pipe Capacity Calculations</u>																						
For pipe calculations in MGD: $Q_{capacity}=22.82(K'/n)(0.3048D/12)^{(8/3)}S$ D in inches; S in ft/ft																						
Source: Metcalf & Eddy Wastewater Engineering: collection & Pumping of Wastewater, Table 2-5																						
Manning's 'n' =	0.014																					
d/D =	0.9 >>> K' = 0.33																					

### 3. TOPOGRAPHICAL SLOPE PROTECTION

- A. The purpose of this criterion is to ensure that development is respectful of and appropriately integrated with the natural physical geography of the land in Flower Mound by requiring environmentally sensitive development techniques to eliminate “scrape and build” development.
- B. **CRITERION: Topographical Slope Protection.** No development application or project shall be approved that proposes development on any existing topographical slopes of twelve percent (12.0%) or greater, or that proposes to alter any existing topographical slopes that are less than twelve percent (12.0%) but equal to or greater than five percent (5.0%) (other than within five feet of the footprint of the proposed structure or structures).
- C. **METHODOLOGY:** Compliance with this criterion shall be in accordance with the applicable provisions of the Design Criteria and Construction Standards as adopted by the Town Council. This criterion shall apply when the stated topographical slopes exist for a total horizontal distance over 50 feet or if the total vertical rise is over 6 feet.
- D. **APPLICATION:** For residential projects, applicable to applications for zoning, planned developments, development plans and record plats. For nonresidential projects, applicable to applications for zoning, planned developments, record plats and site plans.