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Drees of Thurmont

Preliminary WaterModel Study
LSA PROJECT NO. 1218-05-00

Prepared for:

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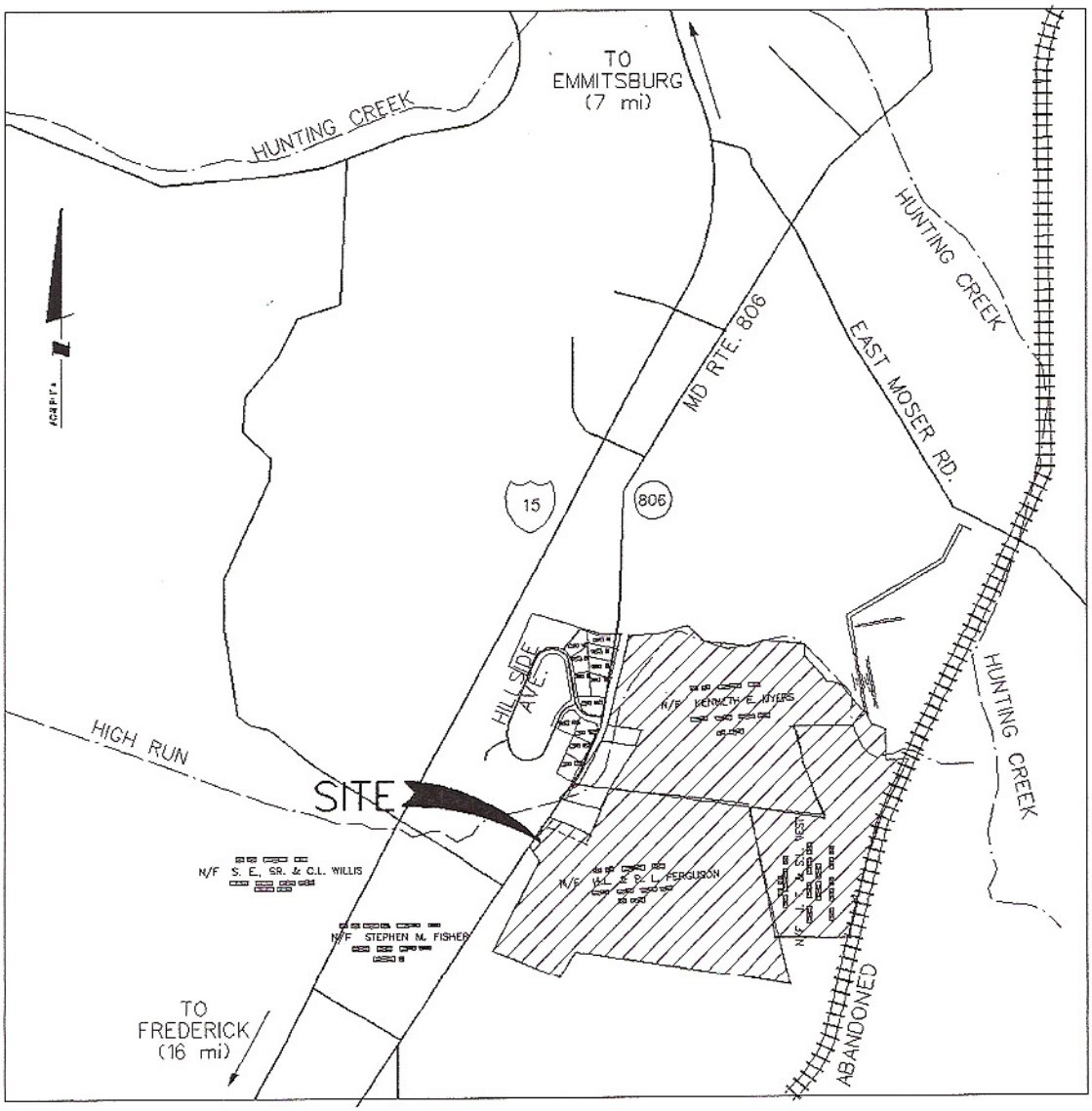
The proposed property is located in Thurmont, Frederick County, along the eastern side of Catoctin Furnace Road. The property is a proposed subdivision development of approximately 110 ac. with various housing units. The purpose of this study is to determine adequate capacity of a proposed water system for the site. Various scenarios will be analyzed to determine the most efficient water system. The study will analyze peak flow under static conditions and peak flow with fire flow at residential. During analysis the proposed system is checked for minimum and maximum pressure and adequate flow during various demand situations.



Methodology

A watermodel as designed by Loiederman Soltesz Associates Inc. was analyzed using Haestads WaterCad. An 8" water main is proposed with a connection at the Weis Market. The layout as designed by Loiederman Soltesz Associates Inc. was used to determine the approximate number of Single Family homes and Townhouses. Water demands for Single Family homes and Townhomes usages are taken from the Frederick Co. Water and Sewer Manual. Pressure, flow, and fire flow requirements are from the Frederick Co. Water and Sewer Manual. The various models that LSA has analyzed represent a static model and two residential fire flow models.

Condition	Minimum/Maximum Pressure
Static – Non Fire Flow	35 – 100 *psi*
Fire Flow	20 – 100 *psi*

Frederick Co. Water and Sewer Design Manual 2-36

All the models represented in WaterCad use an identical water main layout. The nodal demands are represented by the surrounding estimated Residential usages. The Fire flow models differ from the static model due to a selected node given a specific Fire flow demand. Individual Fire flow models have a single node given either a 1000 *gpm* or 1250 *gpm* demand.

Usage	Fire Flow Demand
Residential	1000 *gpm*
Townhome	1250 *gpm*

Frederick Co. Water and Sewer Design Manual C-122

Fire hydrant flow test by the City of Thurmont, MD Water and Sewer Dept. on 1/05/2006
Hydrant at Weis Market and Hydrant at Pizza Hut

Flow 1805 *gpm*
Static 96 *psi*
Residual 85 *psi*

Water Model Results

Static Peak flow/Non-fire flow
The model run is simulating an estimated peak demand at all nodes on site. This test does not have a fire proposed on site. A minimum pressure of 35 *psi* is required at all nodes.

Residential Fire A
The model run is testing the ability of the system to provide peak demand during a fire at a townhouse location. **A fire flow demand of 1250 *gpm* was placed on node J-42 at elevation 454.** The minimum pressure during a fire is 20 *psi* at all nodes.

Residential Fire B
The model run is testing the ability of the system to provide peak demand during a fire at the highest elevation Single family home. **A fire flow demand of 1000 *gpm* was place on node J-20 at elevation 530.**

Water Model Summary

Test Discription	Pressure Range	Average Pressure	Lowest Pressure	Highest Pressure
Static Peak flow/Non-fire flow	35 - 100 *psi*	87.34 *psi*	62.42 *psi* J-20	98.78 *psi* J-35
Residential Fire A – Townhouse Fire 1250 *gpm* node J-42 Elev = 454	20 - 100 *psi*	61.64 *psi*	35.97 *psi* J-20	87.84 *psi* J-2
Residential Fire B –Highest Fire 1000 *gpm* node J-20 Elev = 530	20 - 100 *psi*	69.06 *psi*	41.05 *psi* J-20	90.23 *psi* J-2

Note:

- For Statistical Data See Appendix
- See Watermodel Map for node locations
- See WaterCad results for individual test results
  - Pipe, pump, and pressure reports
  - A map of Passing/Failing nodes

Conclusion

The proposed property approximately ± 110 ac. of proposed development along the eastern side of Catoctin Furnace Road in Thurmont, Maryland was analyzed using Haestads WaterCad. This water model study determined the adequacy of the existing water system using city run flow test at local hydrants to the site. In addition Drees Homes is actively pursuing providing a water supply to accommodate the proposed development even though there is adequate supply available. Any additional water that such a water supply would yield above the demands of the proposed development would be provided back to the Town.

The proposed water system will consist of 8" water main. The site is designed as a residential subdivision with a community pool house. The proposed system has adequate pressure and flow to meet the water system criteria under all conditions.

The model was performed under Frederick County Water and Sewer Design Manual guidelines. Flow tests were presented to Loiederman Soltesz Associates Inc. by the City of Thurmont Water and Sewer Department. See sheet 11 for test data.