FAIRFAX COUNTY WATER AUTHORITY
8560 Arlington Boulevard, Fairfax, Virginia 22031
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PLANNING AND ENGINEERING DIVISION

JAMIE BAIN HEDGES, P.E.
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February 6, 2007

Mr. Sterling Wheeler, Chief
Policy & Plan Development
Fairfax County Department of Planning & Zoning
12055 Government Center Parkway, Suite 730
Fairfax, Virginia 22035-5507

Re: Tysons Corner Public Facility and Infrastructure Analysis
Consideration of Advanced Prototypes

Dear Mr. Wheeler:

Fairfax Water has completed its preliminary assessment of the two advanced development prototypes for Tysons Corner and offers the following:

1. Required Capacity – Estimated quantities of public water needed to support each development option are listed in the attached Table No. 1.

2. Required Infrastructure – Capacity of the existing Fairfax Water system infrastructure is fully capable of meeting all public water supply needs defined by the existing distribution configuration and the County's adopted comprehensive land use plan. These facilities can be readily expanded to satisfy additional demand associated with proposed land use density increases or incorporation of additional customers. Fairfax Water's system development plans have historically included expansion options for providing additional water supply to Tysons Corner. Consequently, water system infrastructure development options, capable of supporting either of the advanced land use prototypes, are available. Prospective water system projects capable of expanding service to Tysons Corner are identified in attached Table No. 2.

3. Conservation Measures – Integrating water conservation measures into potential urban land development strategies by encouraging sustainable building practices in Tysons Corner warrants consideration, recognizing:
    a. Future water transmission and distribution costs are expected to increase in proportion to cost increases in energy, labor, equipment, and construction materials.

b. Future water production costs are expected to increase as the scope of required treatment processes expand. Additional treatment may be needed to satisfy future water quality standards. Treatment costs also reflect prevailing costs for chemicals, energy, labor, equipment, and construction materials.
c. Costs to access future sources of water for the Washington Metropolitan Area are likely to increase in proportion to the various technical and political complexities associated with each supply development option.
d. The potential impact of climate change on future water supplies may require more aggressive resource management policies.

Elements of sustainable construction incorporated into the design of urban high-rise buildings in Tysons Corner are intended to promote efficiency, generate less waste, and require lower energy consumption. Green building designs often have lower water consumption rates than comparable traditional designs. Less water consumption results from low flow plumbing fixtures, high efficiency heating and cooling systems, on-site wastewater and stormwater reuse, as well as low impact landscaping. Benefits attributed to lower, more consistent water consumption rates include reduced water and sewer bills for consumers. More efficient water use by consumers reduces the need to develop and maintain peak water system capacity, benefiting developers by helping contain connection charges.

The rate structure used by Fairfax Water allocates expenses for increasing system capacity exclusively to those consumers and developers requiring additional capacity. System growth is funded through the collection of peak use charges, paid by customers exhibiting a significant variation in seasonal water use, and system connection charges, paid primarily by land developers. More efficient water use, achieved through green building initiatives, benefits developers by limiting the system expansion component of utility capital investment funded by connection charges. Deferred water system expansion or reductions in the scope of expansion related projects, present opportunities for savings to developers. Because developers pay for expansion related projects, savings are accomplished through cost avoidance.

As local water distribution becomes more highly integrated into high-rise building plumbing systems, land developers and their engineers will become increasingly responsible for design decisions pertaining to water supply outside the scope of services provided by Fairfax Water. Developers can leverage water conservation measures against building system design decisions to control project costs.

4. New Technologies – Emerging technologies and associated changes in practice are expected to provide future access to additional water supplies at a corresponding

increased cost. Promising new technologies and practices helping ensure access to an adequate supply of public water, irrespective of land use density decisions, include:

a. Membrane technology and alternative disinfectants allow access to new non-traditional supplies including brackish water from tidal sources.
b. Advanced wastewater treatment will make water reuse a viable alternative for an increasing number of water supply applications.

5. Urban Standards – Design standards will have to be modified to reflect a new urban reality within Fairfax County in general and Tysons Corner in particular. A partial listing of issues to be considered in the development of urban water utility design standards includes:
    a. Increasingly congested utility corridors, providing limited clearances between water pipes and building structures, as well as water pipes and other utilities
    b. Integration of pumping and water storage facilities into multi-use, high-rise buildings
    c. Consolidation of required hydraulic capacity into fewer, larger diameter pipes which are configured in a fully developed distribution network
    d. Increased use of transportation right-of-ways as utility corridors due, in part, to the proliferation of underground parking structures
    e. Increased potential for more highly designed pipe installations requiring more complex and diverse construction methods
    f. Proliferation of privately maintained fire hydrants on or over multi-level parking decks
    g. Installation of privately maintained pipelines within underground parking structures
    h. Incorporation of isolating check valve vaults separating privately maintained and public water mains
    i. Requirements for building booster pumping systems capable of effectively operating over a wide range of utility delivery pressures
    j. Provisions for open access to Fairfax Water equipment within private building security areas

The premise that allowable land use density within Fairfax County should be defined by water system limitations is not consistent with the corporate mission of Fairfax Water. Among the fundamental operating objectives of Fairfax Water is the provision of service to meet the needs of Fairfax County as defined by the Fairfax Water Board of Directors and the Fairfax County Board of Supervisors. Land use decisions are predicated on political consensus achieved through a formal public process and the economic viability of individual projects determined by the developer. Water availability impacts land development projects more through connection fees and water main extension costs than limits on physical supply. Policies adopted by Fairfax Water

provide equitable opportunities for developers to satisfy their water service requirements without compromising service or placing undue financial burden on our existing customers. If you have any questions or require additional information please call me at 289-6316.

Sincerely,

William R. Kirkpatrick Jr

William R. Kirkpatrick, Jr., P.E.
Chief Planning Engineer

Attachments: Table No. 1
Table No. 2

cc: S. Edgemon, Deputy General Manager
J. Hedges, Director Planning & Engineering
T. Goldberg, Manager Planning

Fairfax Water

Tysons Corner Public Facility and Infrastructure Analysis
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February 6, 2008

Table No. 1

		Average Day Demand	Maximum Day Demand	Peak Hour Demand
		(MGD)	(MGD)	(MGD)
Baseline option				
(32,517 Residents)		11.33	18.13	29.00
(161,545 Employees)				
Advanced Prototype A				
(72,500 Residents)		15.20	24.32	38.91
(158,973 Employees)				
Advanced Prototype B		20.13	32.21	51.54
(99,912 Residents)				
(202,816 Employees)				

Fairfax Water

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Table No. 2

Existing Facilities

- 54-inch Transmission Main from Corbalis Water Treatment Plant
- 24-inch Transmission Main from Dulles Access Road to Rt. 123 along Rt. 7 (Under Construction)
- 24-inch Transmission Main from Rt. 7 to Tyco Road along Spring Hill Road (Under Construction)
- 4.5 MG Water Storage Facility
- 15 MGD Distribution Pumping Capacity

System Development Options for Increased Capacity

1. Proposed Future Transmission Main along Rt. 7 from Dranesville*
2. Proposed 36-inch Replacement Transmission Main along Gallows Road from Rt. 7 to Rt. 29*
3. Additional Distribution Pumping Capacity (can be incorporated into existing pumping station as only 3 from a total of 6 distribution pump positions are currently occupied)
4. Additional Local Distribution Storage Capacity (to be located within urban developed area)
5. Additional Fairfax Water Emergency Generation Capacity (Alternatively, all future customers must have individual emergency building booster pumping capacity to access prevailing pressure in distribution system)
6. Proposed Future Transmission Main along Tyco Road from Rt. 7 to International Drive*
7. Proposed 36-inch Transmission Main along Rt. 7 from Rt. 123 to Gallows Road
8. Proposed 36-inch Transmission Main along International Drive from Tysons Pumping Station to Gallows Road (in the vicinity of Tysons Corner Regional Shopping Center and the proposed Rt. 123 Metro station)

*Notes:

1. May be constructed concurrently with anticipated transportation system improvements
2. Sizes of future transmission mains between the Corbalis treatment facilities and Tysons Corner are currently undefined; however, minimum pipe size is expected to be at least 30-inches in diameter.