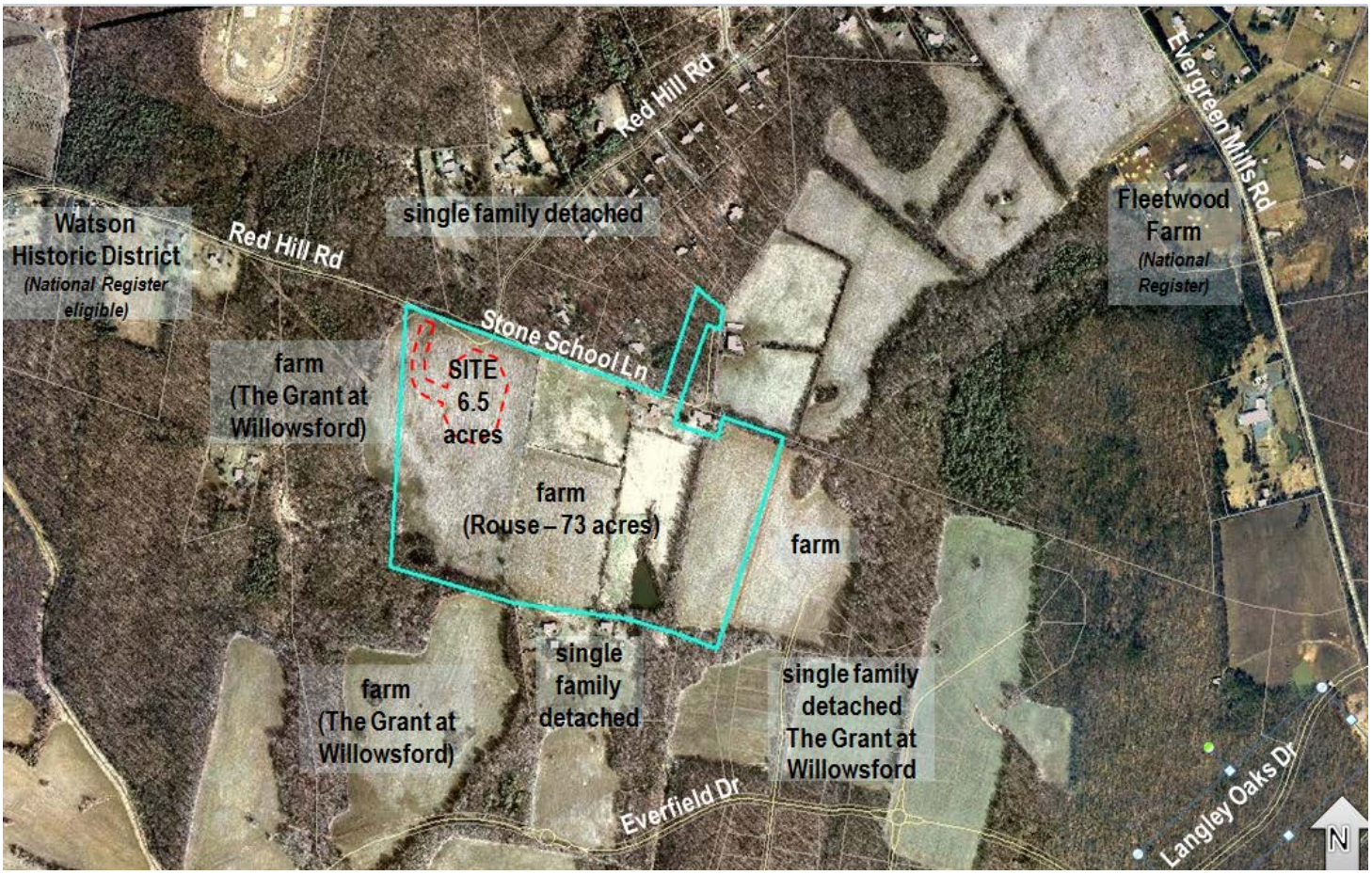
VICINITY MAP
Loudoun Water – 600 Zone, Red Hill Road Water Storage Tanks
SPEX 2013-0040



FINDINGS FOR APPROVAL
SPEX-2013-0040 and CMPT-2013-0015
Loudoun Water 600 Zone, Red Hill Road Water Storage Tanks

1. The location, character, and extent of the water storage tanks are in substantial accord with the Comprehensive Plan. The Revised General Plan (RGP)'s General Water and Wastewater Policies support the extension of public water throughout the Transition Policy Area and anticipate the construction of infrastructure such as the proposed elevated water storage tanks to support the system as it is extended within the Transition Policy Area.

2. The elevated water storage tanks will promote the welfare of the public by providing needed infrastructure for the delivery of water to residential and nonresidential uses within the Transition Policy Area.

3. Once the water storage tanks are operational, with only one (1) vehicle trip per week by a pick-up truck, the special exception use would generate minimal traffic and minimal impacts to Red Hill Road.

4. Approval of this application would allow Loudoun Water to meet the Commonwealth of Virginia Health Department (VDH)'s required storage volume requirements.

5. Existing mature trees along Red Hill Road will help screen views of the water storage tanks from adjacent residential properties. The modified Type 4 Buffer with all evergreen trees that are a minimum of ten (10) feet tall at the time of planting will provide year-round screening of the base of the water storage tank facility.

6. Prohibiting construction traffic on Red Hill Road will protect the mature trees along Red Hill Road and will avoid damaging the narrow sunken road bed.

7. As conditioned, the water storage tanks will be a color that will blend with the skyline or a light neutral color, which will cause the least visual disruption, consistent with County policy.

8. The proposal is consistent with the Dulles South elevated water storage tanks that are approved and constructed within the Transition Policy Area. All seven (7) of Loudoun Water's existing water storage tanks are elevated water storage tanks.

9. The subject property contains no historic or archaeological resources; approval of the application would result in no direct impacts to historic or archaeological resources.

10. The application is in general compliance with the Revised 1993 Zoning Ordinance regulations for the TR3-UBF (Transitional Residential) zoning district.

CONDITIONS OF APPROVAL (June 27, 2014)
Loudoun Water – 600 Zone, Red Hill Road Water Storage Tanks
SPEX 2013-0040

1. **Substantial Conformance**. The approved Special Exception Use, two (2) water storage tanks, shall be developed in substantial conformance with the Special Exception Plat, consisting of four (4) sheets numbered as 1, 4, 5 and 6 and labeled as "Cover Sheet", "Overview Plan", "Special Exception Plat", "Landscape Plan and Computations", respectively, and dated March, 2014, as revised through March 28, 2014, and prepared by Urban, Ltd. (the "SPEX Plat"). As used in these conditions, "Property" is an approximately 6.5-acre portion of Tax Map # /91/////////15A (PIN# 243-45-9310). The Property is delineated on Sheet 2 of the SPEX Plat and labeled as "Limits of Special Exception". As used in these conditions, "Applicant" includes the owner of the Property subject to this Special Exception approval, its successors, and parties developing, establishing or operating the approved Special Exception Use. Approval of this application shall not relieve the Applicant or the owners of the Property from the obligation to comply with and conform to any Zoning Ordinance, Codified Ordinance, or applicable requirement.

2. **Height of Water Storage Tanks**. The maximum height of the water storage tanks shall not exceed 189 feet.

3. **Color of Water Storage Tanks**. The water storage tanks and any associated equipment and structures mounted to such water storage tanks shall be a light blue color to match the sky; or a light, neutral or buff color. The water storage tanks shall not be white.

4. **Lighting.** All exterior lighting, including security lighting, on the Property, shall be designed and installed to minimize light trespass and the visibility of lighting from properties offsite of the Property. Exterior light fixtures shall be full cut-off and fully shielded and shall direct light downwards and into the interior of the Property and away from surrounding public roads and properties.

5. **Construction Access.** All construction traffic associated with the Special Exception Use shall be prohibited from accessing the Property via Red Hill Road. All construction traffic associated with the Special Exception Use shall access the Property from a route other than Red Hill Road, such as but not limited to Everfield Drive to the south.

6. **Optional Permanent Access.** The Applicant shall attempt to obtain permanent access to the Property from a route other than Red Hill Road, such as but not limited to a permanent access easement through the Grant at Willowsford to the south. If the Applicant can obtain such permanent access, then such permanent access shall replace the Red Hill Road entrance shown on the SPEX Plat. Such relocation of the permanent entrance to the Property shall not require a revised or new SPEX Plat.

7. **Enhanced Evergreen Buffer.** All evergreen trees within the buffer labeled as "Modified Type 4 30' Buffer" on Sheets 5 and 6 of the SPEX Plat shall be a minimum of ten (10) feet in height at time of planting.

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June 20, 2014

Loudoun County Planning Commission
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Leesburg, Virginia 20177-7000

RE: SPEX 2013-0040, CMPT 2013-0015, SPMI 2013-0010, Loudoun Water – 600 Zone Storage Tanks

Dear Madame Chairman and Members of the Planning Commission:

On behalf of Loudoun Water, we appreciate the opportunity to provide you with the attached clarifications on the complicated topics raised at the Planning Commission public hearing on May 20, 2014. As you will see, the explanations which follow are detailed answers to very complex questions. As you review this information prior to the work session scheduled for July 1, 2014, please do not hesitate to contact me if further questions arise.

Loudoun Water has been providing water service and wastewater treatment to the areas of Loudoun County prescribed by the Board of Supervisors for over 50 years. The responsibility to provide these services in the most efficient and effective manner is rooted in the language of the adopted Comprehensive Plan which is explained further in the attached response. The need for additional water storage capacity in the 600 Zone to meet future residential and commercial demands must be addressed by Loudoun Water. Loudoun Water has conducted numerous studies and evaluations to determine the most responsible way to satisfy this need and these are explained within the answers provided. Additionally, several exhibits are included which help answer the questions raised and provide further clarification on site selection.

Loudoun Water has been responsive to the concerns of the citizens throughout this process from analyzing several potential sites to modifying the concept plan proposed for the Rouse Tract. It was acknowledged in the public hearing that shifting the driveway entrance to the west was a positive change in that it eliminated potential conflicts with the school bus stop and the mailboxes and allowed the mature trees in that area along Red Hill Road to remain undisturbed. Shifting the entrance to a more circuitous route on site also allows a continuous evergreen buffer to be provided between the tanks and Red Hill Road without a break for a driveway. The concept plan already shows a buffer comprised completely of evergreens rather than the required mixed deciduous/evergreen buffer which results in a year round screen. *Loudoun Water is also willing to commit to a planted height of 10 to 12 feet for these evergreens rather than 6 feet which is the planted height required by the Zoning Ordinance.*

Concern about the current condition of Red Hill Road, the potential impacts on the road from construction traffic and the potential safety issues for the citizens who travel the road was a

major focus of the citizen's presentation at the public hearing. *In response, Loudoun Water is willing to commit, through a development condition associated with the special exception, that all construction traffic will access the site from the south, thereby eliminating construction traffic on Red Hill Road.* This issue is critical to the neighbors and Loudoun Water has worked to attain a level of confidence that this access arrangement can be worked out with the property owner/contract purchaser. This commitment should completely eliminate any concerns about Red Hill Road, as once construction is complete, the one trip per week associated with maintenance of the tanks should not pose an issue.

The attached information hopefully provides the necessary clarifications and explanations regarding the issues raised at the public hearing. Again, please do not hesitate to contact me if additional information would be helpful prior to the work session.

Sincerely,

Lori R. Greenlief
Senior Land Use Planner
McGuireWoods LLP

Attachments: A/S

cc: Judi Birkitt, Project Manager
Fred E. Jennings, General Manager, Loudoun Water

SPEX-2013-0040/CMPT-2013-0015 Loudoun Water 600 Zone Water Storage Tanks

Response to Planning Commission Questions

1. **How did Loudoun Water come to the decision to propose the water tanks in the current location?** Loudoun Water's decision was guided by two major factors, guidance provided by the Loudoun County Comprehensive Plan and analysis resulting from Loudoun Water's utility planning process.

Loudoun Water is guided by the Comprehensive Plan

Loudoun Water is guided in its design and provision of central water and waste water services by the County's Comprehensive Plan (Plan). The Plan consists of several related documents, including the *Revised General Plan* and amendments, and specific area plans such as the *1993 Dulles South Area Management Plan* (Chapter 1, Introduction). Plan references are discussed below.

- *Water Storage Facility Shown on Plan Document.* Policy language in the Plan specifically acknowledges Figure 4 of the *1993 Dulles South Area Management Plan.* This Figure is titled "Dulles South Planning Area – Current LCSA Water Plans", and it identifies a water storage tank in approximately the same location as the one now being proposed by Loudoun Water in this water storage tanks application. Please refer to Attachment A.
- *Plan Policy Language Guides Loudoun Water.* Water and wastewater policies within Chapter 2 (Planning Approach) and Chapter 8 (Transition Policy Area) of the Plan guide Loudoun Water in the provision of water and wastewater facilities in the Transition Policy Area. Chapter 8 policy guidance specifically embraces water policies found in Chapter 2. Together these policies provide the basis for numerous water and wastewater decisions and planning efforts undertaken by Loudoun Water over the years.

    - Plan language states:

      "Water and wastewater are the responsibilities of the Loudoun County Sanitation Authority (Loudoun Water)…The County will plan for development of central sewer and water facilities and allow for the orderly extension of these facilities in the Suburban and Transition Policy Areas. **The County will encourage LCSA to serve this area in the most efficient and effective manner possible. In particular, the County will work with LCSA to encourage the extension of central utilities to existing communities within the Suburban Policy Area and promote the use of the best utility system in the Transition Policy Area**" (Chapter 2, Infrastructure), and: "LCSA will continue to be responsible for the provision and extensions of public water and sewer service in the Suburban Policy Area and Transition Policy Area" (Chapter 2, General Water and Wastewater Policies, Policy #7). These Plan recommendations guide not only where water service is to be provided, but also highlights the responsibility of Loudoun Water to provide that service in the most efficient and effective manner possible. The best utility system for the Transition Policy Area is one that is fully integrated with the rest of the system in the Suburban Policy Area. Loudoun Water recognizes that elevated water storage is the most efficient and effective means of storing

water because it substantially reduces the amount of pumping required; therefore providing the most reliability in water service and minimizing maintenance and operations costs. The use of elevated storage has been acknowledged by the Board of Supervisors through the many legislative approvals in both the Suburban and Transition Policy areas. It is for these reasons that elevated water storage has been used by Loudoun Water for as long as it has been providing water service to its Loudoun County customers, and as its central system has been expanded per the Plan throughout the Suburban Policy Area with the Broadlands and Brambleton elevated tanks, and into the Transition Policy Area with the Dulles South elevated tanks.

- "Central water and sewer service is planned for all the subareas of the Transition Policy Area" (Chapter 2.5.c.) "Central utilities may be extended to all subareas" [of the Transition Policy Area] (Chapter 8, Water and Wastewater).

  With the Plan-recommended extension of central services to all of the Transition Policy Area in 2004, Loudoun Water determined that an additional water pressure zone was needed in the Central System. The "600 [water pressure] Zone" was established to ensure that future customers in the expanded service area, especially those living at the highest elevations in the Lenah Run and Woodlands Rural Village/Greene Mill Preserve developments, would be provided water delivery pressures comparable to those provided throughout the rest of the system. The location of elevated water storage which had been planned to serve a more limited area in the southwest portion of the Transition Policy Area now had to be replanned and relocated northward to a more central location within the enlarged service area. Studies determined that the best locations for elevated water storage were areas of high elevation between Route 50/Red Hill Road and Evergreene Mill Road/western edge of the Transition Policy Area (Attachment B). Consultant planning studies in 2006, 2009, 2011, and 2013 identified various potential tank locations within this central area, and the proposed water storage tank site is located within it (please see next section below for an expanded explanation relative to tank selection).

- Plan policy language supports development within the Transition Policy Area that features *both* suburban and rural characteristics:

  "The Revised General Plan clarifies the distinction between the Suburban Policy Area and the Rural Policy Area. One of the most significant new tools for achieving that distinction is the creation of the Transition Policy Area that lies, for the most part, directly between the two. By providing a transition in terms of development pattern, the Transition Policy Area offers the opportunity to **incorporate visual and spatial characteristics of both rural and suburban development into new projects**" (**Chapter** 2, General Plan Strategy #5c.), and "A hard utility edge (marking the limits of central water and sewer) is maintained by the western boundary of the Transition Policy Area to establish an urban growth boundary. In addition the area included as part of the Woodland Rural Village may be served by central utilities from the adjacent Transition Policy Area…" (Chapter 2.5.c.)

The Plan acknowledges that features of both the suburban and rural area will be part of new development as it occurs in the Transition Policy Area. It is the western edge of the Transition Policy Area, not the eastern edge that is identified as the boundary for urban growth. Features that are visible in the suburban landscape can be appropriate within the landscape of the Transition Policy area if visual and spatial characteristics of rural development are incorporated into the proposed development. Loudoun Water's proposed development of elevated water storage reflects Plan policy: elevated water storage is an existing feature within Loudoun County's suburban area, and the open space that will surround the proposed tanks is a spatial feature that exists in the rural area. Loudoun Water has committed to providing more open space than is required by the Zoning Ordinance, and has agreed to provide a solid evergreen buffer at the perimeter of the property as a way of enhancing the open space area. Loudoun Water's proposal is consistent with the County's approval for the Dulles South tanks; another elevated storage tank facility already permitted and built in the Transition Policy Area.

- Plan language emphasizes Loudoun Water's responsibility to plan and provide central water service for all portions of the Transition Policy Area:

  "The County will encourage existing residences and communities served by on-site facilities to hook into public water or sewer facilities when such facilities become available within 300 feet of a residence" (Chapter 2, General Water and Wastewater Policies, Policy #8), and "Central and communal utility systems are encouraged over individual wells and septic systems in the Transition Policy Area" (Chapter 2, Infrastructure), and "Central and communal water and wastewater systems are preferred over individual utility systems" (Chapter 8.A.3, Community Design – Upper Broad Run and Upper Foley Subareas), and "The County encourages the retrofitting of existing or approved communal water systems within the Transition Policy Area with central utilities to solve the potable water problems or the public health problems of existing developments" (Chapter 8 Water and Wastewater, Policy #5). Per the Plan, Loudoun Water is responsible for planning and implementing a central water supply system capable of serving all properties within the Transition Policy Area. This includes parcels currently served by individual wells and existing community systems; parcels currently served by individual wells must be able to connect to planned service extensions. Water lines have been both planned and constructed with this responsibility in mind. For example, an existing water line extends along Red Hill Road and Stone School Lane, between the Greene Mill Preserve and The Grant at Willowsford (Willowsford) developments. It provides an opportunity for homes on the north side of Stone School Lane that are within the Transition Policy Area to connect to the central system. (Attachment C). Even though these homes are not connected to the central system at the present time, the system is planned (as required) for eventual service to them. Nonetheless, even unconnected, the existing homes still benefit from their proximity to a series of fire hydrants along the water line and the fire protection that is afforded by such proximity.

The responsibility to plan for the inclusion of Lenah Run and Woodland Rural Village/Greene Mill Preserve in the central system led to the decision to create the 600 Zone in order to ensure water delivery pressure to the higher elevations within each development.

- "Water and wastewater treatment and conveyance facilities will be planned, designed, and maintained to be compatible with County development and environmental goals while functioning at a high level of efficiency. " (Chapter 2, General Water and Wastewater Policies, Policy #3), and "New central wastewater and water lines and facilities should be constructed in a manner that causes the least environmental risk and visual disruption" (Chapter 2, General Water and Wastewater Policies, Policy #12).

  Elevated water storage, as proposed for the 600 Zone Tanks site and as exists throughout Loudoun Water's integrated central water supply system, ensures a high level of operating efficiency *and reliability* because daily customer water needs and emergency/fire protection can be fulfilled via a gravity flow system that supplies water without the significant expense and possible service interruptions associated with additional pumping.

  Environmental goals of the Plan are satisfied in that no wetlands, floodplains, endangered species or archeological features or trees exist on the storage tanks site.

  Compatibility issues have been addressed in a number of ways and have been augmented by new commitments. Loudoun Water has worked with the landowner and contract purchaser of the "parent tract" parcel to address citizen concerns as to vehicular access along Red Hill Road. Access to Red Hill Road is already proposed to be relocated so that it will not conflict with the Stone School Lane/Red Hill Road intersection and the adjacent school bus stop and community mail box location. Further, Loudoun Water is now committing to eliminating all construction traffic along Red Hill Road. Only the option for permanent access remains, with such access consisting of an average of one vehicle trip per week to the tank site. With this commitment, potential issues related to school children safety, road safety, construction traffic, and impacts to mature trees along Red Hill Road have been resolved.

  Other commitments have also been made to address compatibility. Loudoun Water is willing to commit to buffer plantings in excess of requirements in terms of type and planted height. The required Type 4 buffer will be all evergreen trees, sized 10 -12 feet high at planting. When combined with the relocated site entrance, the tanks will be better screened from Stone School Lane and Red Hill Road (Attachment D). On-site open space is also provided in excess of Zoning Ordinance requirements (84% provided, 50% required), and security fencing has been pulled closer to the storage tanks pad so that the landscape buffering will screen it from view.

Storage Tank location is guided by Loudoun Water's Utility Planning Process

Elevated storage tanks are not sited solely for the benefit a particular development but for the efficient operation and water quality enhancement of the entire central water supply system. From 2005 to the present, Loudoun Water consultants have studied the Transition Policy Area to determine the most efficient, cost effective means of integrating future facilities with existing infrastructure in the Suburban Policy Area. In the 2005-2006 study period, Loudoun Water determined the need for a higher service pressure zone in the Transition Policy Area and ultimately identified the need for elevated water storage that would provide a hydraulic grade line 600 feet above sea level. This 600 Zone comprises approximately 12,000 acres, roughly half of the 23,000 acre Transition Policy Area. Elevated storage built for the 600 Zone will provide for emergency/fire flow requirements and adequate water pressure for all future customers in the Transition Policy Area, including those at the highest elevations in the expanded system (for example, areas in the existing the Lenah Run and Greene Mill Preserve developments).

Elevated water storage, which prior to 2004 had been planned to serve a more limited area in the southwestern portion of the Transition Policy Area, had to be replanned and relocated northward to a more central location once the central system was enlarged per the Comprehensive Plan. Utility planning studies determined that the best locations for elevated water storage were areas at the highest possible elevation between Route 50/Red Hill Road and Evergreene Mill Road/western edge of the Transition Policy Area (Attachment B). Storage tanks so located would be generally equidistant to two water source feeds for the 600 Zone: the Brambleton and Dulles South pumping stations. Such a location would also be ideal for maintaining water quality because water flowing from either source would spend minimal time as it was transmitted to the tank, thus minimizing "water aging".

A location at a high elevation minimizes tank height and parcel size, and contributes to cost savings in tank construction. It is desirable to limit tank height to a maximum of 200 feet due to construction, permitting and cost considerations. Attachment E illustrates topographical contours within the 600 Zone that are at or above 400 feet in elevation. Tank construction at or above an approximate elevation of 420 feet is preferred so as to limit tank height to a maximum of 200 feet.

Consultant planning studies in 2006, 2009, 2011, and 2013 identified various locations within this central area. Selection of the ultimate site was dependent on land availability. Question #2 provides additional information in this regard. A timeline of events for the 600 Zone Tanks site identification process is included as Table 1.

2. **What other sites have been looked at and what are the reasons as to why a different site was not chosen?**

Attachments F-M illustrate general locations and specific sites that were identified in the County Plan in 1993 and by Loudoun Water consultants in utility planning studies between 2006

and 2013. Reasons for not choosing designated sites are highlighted on the attachments and summarized below:

- A 2006 facility planning study conducted by Hazen and Sawyer identified two viable locations within the Broad Run Village development that were located north of Route 50 (Attachment G). At the time, there was potential for acquiring one of these sites by proffer (at no cost to Loudoun Water) through the rezoning process. Other sites identified in the study that were eliminated from consideration were either not located in this central location, were not of sufficient size, or were not available through proffered development. The chance to acquire one of the sites in Broad Run Village by proffer was lost when the property was not rezoned.

- By 2009 ownership of Broad Run Village changed hands and was being developed as a by-right subdivision known as The Grant at Willowsford. Two sites were identified by the landowner for Loudoun Water to study (Attachment H). Each site had advantages and the consultant preliminarily recommended the one in the northeastern portion of the development, but also recommended additional analysis to confirm suitability. Ultimately it was determined that this site overlapped the boundary line between the Rural Policy Area and the Transition Policy Area and would not be an acceptable option.

- By 2011 two more potential sites in Willowsford had been identified (Attachment I). These were near the ones identified in 2009 but were located at slightly higher elevations. The site located in the southwestern portion of the subdivision was open farmland, set within but not quite at the edge of the Transition Policy Area. The one located in the northeastern portion of the subdivision was located within an area of mature trees at the edge of the Transition Policy Area. While both sites had advantages, the study recommended the one in the southwestern portion of the subdivision because it was an open field (no clearing necessary). And although initial access could likely prove costly to develop, a future public road network would eventually provide better vehicular access to the site. Loudoun Water negotiated a purchase contract with the landowner for land in the southwest portion of the subdivision. This site was the subject of Loudoun Water's first land use application to the County for the proposed water storage tanks. The site in the northeastern part of the subdivision was placed under a conservation easement and now serves as open space for the development.

- In 2012 Loudoun Water met with the local community just before filing a special exception/commission permit for the elevated water storage tank site that was recommended in the 2011 study. The community identified a number of concerns, including the visual impact of the tanks upon the Route 50 tourist corridor that included Civil War battlefield sites and Mt. Zion Church (Attachment J), and the site's proximity to the Rural Policy Area where existing nearby homes would not be able to benefit from water service in the Transition Policy Area. The community and Supervisor Clarke requested that alternative locations be studied in the hope that a site could be found

where the proposed tanks would not be visible from Route 50 and Mount Zion Church, and where surrounding parcels/homes would be in the central system and capable of being served by the proposed tanks.

- In early 2013 an alternatives analysis was conducted. The consultant was tasked with identifying potential alternative locations in the central portion of the 600 Zone that met key criteria for the proposed elevated water storage tanks. This was done by reviewing all areas within the 600 Zone above 400 feet in elevation that were of sufficient size to accommodate the tanks, had adequate access, appeared to have minimal environmental constraints, and were centrally located between Red Hill Road/Route 50 (north/south) and Evergreen Mills Road/western edge of the Transition Policy Area (east/west). Please refer to Attachment K.

  These potentially viable alternative locations consisted of one area within Willowsford subdivision near the originally proposed tank site, two areas within Brambleton located along Evergreen Mills Road and two areas on property owned by Randolph Rouse south of Red Hill Road. Loudoun Water compared these locations to the site already under contract in Willowsford and in the context of community criteria identified at the first community meeting. Two additional locations were identified in coordination meetings with Supervisor Clarke: a parcel near the western edge of the Transition Policy Area and acreage located in Hal and Bernie Hanson Regional Park. Meetings were arranged to discuss various locations with the landowners.

  The Willowsford location was dismissed from further consideration because tanks would still be visible from Route 50, and initial access to the site would still be costly to construct. The Brambleton locations were dismissed because the owner was not willing to allocate additional acreage for public use sites. The parcel near the western edge of the Transition Policy Area was dismissed because of its proximity to the Rural Policy Area and the fact that it was located in the Watson Historic District. Acreage within Hal and Bernie Hanson Regional Park was dismissed because it was not located within the 600 Zone and representatives of the Park Authority determined that contract provisions did not permit parkland to be used for water storage tanks (Attachment L).

  Only the locations on the Rouse property appeared to be viable and available for purchase after initial meetings. Eventually a site near the northwestern corner of the property was offered for sale. This site proved to be a better location for Loudoun Water because of the proximity of existing public road access. It also addressed community concerns regarding visibility from the Route 50 tourist corridor and Civil War sites in its vicinity (Attachment M).

3. **Why is elevated storage proposed? Why not ground storage or underground storage? How would a power outage affect the tanks/system? What is the potential for a shorter tank?**

Water storage tanks store water to supply peak demands and provide additional water for fire protection and other emergencies. Having sufficient water storage in the central system in turn reduces the size and cost of transmission and pumping facilities that would otherwise need to be sized to accommodate those needs.

Loudoun Water's central water system serves 84,290 acres (131.7 square miles) of land that varies in elevation from a low of 200 feet Mean Sea Level (MSL) to a high of 490 feet MSL. The central system is divided into three separate pressure zones allowing for efficient delivery and consistent water service in each zone. Zone boundaries are based upon ground elevations in the central system and the required height (elevation) needed for adequate water pressure.

Elevated storage has been the chosen method for the central system for as long Loudoun Water has been providing water service to its customers. Since that time, Loudoun Water has planned and constructed seven elevated water storage tanks in the central system. Elevated storage has been used because it is more effective for reliable service, more efficient in operation and subsequently more economical than the alternative of ground (pumped) storage.

Elevated Storage

Elevated water tanks are considered to be "floating storage" where the hydraulic grade line (HGL) in the tank is generally the same as the HGL in the system (Attachment N).

Pumping into the 600 Zone with floating storage is more efficient as the supply pumps located in lower pressure zones do not need to respond to constant changes in the 600 Zone water usage throughout the day. Water will freely flow in or out of the elevated tank adjusting to fluctuations in the zone demands, allowing the pumps to deliver water at a steady (efficient) rate. Should a large volume of water be needed in the 600 Zone for fire-fighting or other emergency purposes, water will be provided from the tank and will not impact the supply pump requirements.

At night, when water usage is at its lowest the supply pumps will fill the 600 Zone tank and shut off. Therefore having floating storage in the 600 Zone avoids the need for continuous pumping. With a full elevated tank, adequate water pressure is supplied to the 600 Zone customers by gravity flow and pumping is not resumed until the water in the tank drops to a set level. Operating the system in this manner is most efficient and more effective than any pumped storage system. Moreover, filling the tanks during off peak hours is cost effective because energy costs are typically less.

In the event of a temporary power outage near the 600 Zone elevated tank, water service in the area is maintained as water is supplied to customers by gravity flow; the elevated tank does not require power to operate. Similarly, should the temporary power outage span to the supply

pumps located in the lower pressure zone, water service in the 600 Zone would also be maintained because of the gravity flow from the tank.

Ground (Pumped) Storage

With ground (pumped) storage, the HGL in the tank is lower than the HGL required by the system, so water must be pumped out of the tank to be used. Continuous pumping into the 600 Zone would be required at all times to maintain any pressure with ground storage in the 600 Zone and an additional pump station would be needed (Attachment N). Relying on ground storage in a similar manner as elevated storage, pumps must be capable of adjusting to daily changes in water usage and simultaneously supply water for fire-fighting or other emergency needs. Pumps must accommodate a wide range of flows and generally require use of multiple and various sizes, complex and expensive control systems and often sacrifice efficiency in design and operation. Also, because the HGL in the zone is higher than the water surface elevation in the tank, filling the ground storage tank wastes supplied energy that must be added again when the water is pumped out of the ground tank. This increases energy costs and further reduces the effectiveness and efficiency of the system when compared to elevated storage.

In the event of a temporary power outage at a 600 Zone ground storage tank, back-up systems would be relied upon to power the pumps and provide water service to customers. Features such as emergency generators, transfer switches, etc. must be included with the pumps adding substantial capital and operating costs. Even though the reliability of pumped system can be increased with these features, it is less economical and still not as reliable as elevated storage due to its dependence on additional mechanical/power systems. Similarly, should a temporary power outage span to the supply pumps; similar back-up power systems for those pumps must be relied upon to restore water service to the customers.

Underground (Pumped) Storage

Underground (pumped) storage would likely be designed and operated in similar fashion as 600 Zone ground storage and share all the same disadvantages discussed above. However, placing tanks lower in the ground (underground) would increase the energy wasted while filling the tanks and increase energy needed to pump out of the tanks. It would also add significantly to capital construction costs given the need for relatively deep (~50 feet) excavation and more robust tank designs necessary to withstand ground and groundwater forces.

Operationally, this system has even higher energy costs and less efficiency when compared to ground (pumped) tanks. Also, water quality concerns make underground storage undesirable and use of it has been discouraged by the Virginia Department of Health due to the added potential of contamination from groundwater and surface water infiltration. Since the tank would be located underground, it would be the most difficult to inspect, maintain and repair if a crack or leak is detected.

The increased reliability of elevated tanks over ground (pumped) tanks provides a greater assurance that proper water quality can be maintained in the event of an unplanned prolonged outage. Since water freely flows out of an elevated storage tank, the tank can drain without external power thereby minimizing the tank "water-age." Water-age in the system is generally relatable to water quality, the longer the water sits in the system the water quality is reduced. Should a ground (pumped) tank experience a similar unplanned outage, there is a greater likelihood that water quality will be reduced.

Potential for a Shorter Tank

The hydraulic grade line (HGL) for the 600 Zone has been set at 600 feet MSL to provide standard service pressure to the high ground elevations in Lenah Run (490 feet MSL) and Woodlands Rural Village/Greene Mill Preserve (485 feet MSL). Building a shorter tank would unacceptably lower the water pressure for customers at higher elevations to below the standard level of service provided by Loudoun Water. If this approach was considered, the only way to provide proper service pressure to the high grounds would be to pump to the knobs scattered throughout the zone; and the disadvantages of pumped service are addressed thoroughly in the section on ground (pumped) storage.

Summary of Elevated versus Ground (Pumped) Storage

Consistent with Loudoun Water's long term planning and the policies of the Revised General Plan, the central system is a fully integrated, efficiently designed and operated system serving the Suburban and Transition Policy Areas of the County. The primary factor in the central system's efficiency is the use of elevated "floating" water storage because elevated tanks:

- Are "floating" storage allowing supply pumps to operate at a steady (efficient) rate,
- Do not require continuous pumping to provide service to customers resulting in less energy used and reduced costs,
- Involve lower power costs as tanks can be filled during off peak hours when energy costs are less,
- Respond to daily (peak) fluctuations in water demands without the need for added energy, larger transmission facilities and the associated costs,
- Are most dependable during temporary power outages and can serve as emergency supplies when pumps are out of service,
- Are simpler and less expensive to maintain and operate since they do not rely on additional mechanical equipment and associated systems and controls.

Over the life of the facility, 600 Zone elevated tanks will be less expensive than any other storage alternative when considering long-term capital, maintenance and operation costs.

4. **Question: Is a "hybrid" water storage system (elevated and ground tanks) possible for Loudoun Water's Central System? Cost impact?**

Elevated storage has been the chosen method for the central system and the planning, design and extension of the central system has always advanced accordingly. Elevated storage has been approved by the Board of Supervisors numerous times and each time has affirmed to Loudoun Water the continued use in accordance with the Revised General Plan.

It is the responsibility of Loudoun Water to plan for and have a water system in place and ready when service is requested. The planning, design and construction of the central system and its components takes years to complete. Major facilities are often planned a decade or more in advance of construction which must precede corresponding requests for service. Exact locations for major facilities (storage, pump stations, transmission mains, etc.) are not critical in the early planning stages; but certain features such as quantity, type, size, height (for elevated storage) are for master planning of the system.

600 Zone planning began nearly ten years ago assuming it would be an integrated "floating" zone using elevated storage. The 600 Zone tanks serve the entire zone (not just new development) and for efficient hydraulic design and good water quality need to be centrally located (between Route 50 and Red Hill Road). Minor location adjustments would not impact zone design and layout; however changing features such as quantity, size or type of storage (floating to pumped) could impact other central system facilities, many of which are already built. Within the 600 Zone itself, well over 50,000 feet of water main is already in the ground and much more has been approved for construction.

Replacing floating storage with pumped storage would involve evaluation of alternatives and impacts on design and operation of the central system. Engineering analysis would determine potential changes to the central system master plan (transmission main size and quantity, storage needs, pump facilities, water quality, etc.) and on system operation (electricity, labor, etc.) and maintenance costs. Until such analysis, it is not possible to affirm the impacts to the central system nor quantify the cost ramifications to Loudoun Water's customers and the development community.

Regarding potential cost impacts of using ground storage, previous discussions centered around a net present value (NPV) analysis presented by Loudoun Water. For clarification, the analysis only estimated impacts realized at the tank site itself. When developed, it was intended to provide a feasibility-level evaluation for comparison of concepts. It was not intended to represent a comprehensive assessment of the financial impacts of making a fundamental change in the way the central system is planned and built.

5. **Question: Why was the proposed design of the elevated storage tank chosen? What are the different designs?**

   Different elevated storage tank designs are illustrated in Attachments O-1 through O-4. The proposed tank design was chosen because piping necessary for operation of the tank is in an enclosed area and therefore protected from weather and unauthorized use. Maintenance costs are lower because there are fewer surfaces that require repainting.

6. **Discuss evaluation criteria and how Loudoun Water uses it in locating a site for water storage tanks.**

   Loudoun Water and its consultants use a number of criteria to assist in the site selection process. A few criteria are key: site elevation and parcel size are extremely important. Site elevation determines the ultimate height of the storage tank because the water level in the tank must be at a high enough elevation (hydraulic grade line) to enable water to flow by gravity to homes/businesses and with sufficient pressure. A high ground elevation satisfies system design requirements and may reduce overall costs if elevated storage tank height can be minimized. Parcel size must be sufficient to accommodate County setback requirements (1 foot of setback for every foot of tank height as measured from the tank wall).

   Other environmental, land use and economic criteria are also considered in the site selection process. A number of non-economic screening criteria were highlighted in a preliminary siting analysis performed by Hazen and Sawyer in 2009 for two sites in the Willowsford development. They are listed in Table 2 along with Loudoun Water's current comments relative to the Rouse property. In general, Loudoun Water concluded that the Rouse property satisfied key criteria for locating the proposed water storage tanks.

7. **Question: Please provide a map of the County showing where all tanks exist and with views included.**

   Please see Attachment P

8. **Question: What was the difference between the citizen outreach process with the Dulles South Tanks and the outreach process for the 600 zone Tanks?**

   When Loudoun Water planned, designed and built the Dulles South storage tanks, we had the following campaign goals to guide the outreach component of the process. The goals were: Educate stakeholders on the following topics: (1) the need for the water storage tanks in this area (and in general); (2) the requirements of an effective tank site; (3) the process for approval and construction; (4) construction factors; (5) the anticipated impact of the tanks on the view shed, as well as water service reliability and consistency; and (6) the consequence of not building the tanks in this area. These are the same goals that guide the outreach efforts with regards to our current process of planning, designing and implementing elevated storage in the 600 zone.

While the goals that guided outreach efforts for the Dulles South tanks and the 600 Zone tanks were the same, a very different set of circumstances regarding the process of land acquisition creates the distinction. As it related to the Dulles South tanks, the land that the tanks were built on was proffered to Loudoun Water in the rezoning process for the Stone Ridge development. With a proffered site already in hand, Loudoun Water explored possibilities for a potential second site in an effort to provide a choice to the surrounding community. Because of the uncertainty of cost, both in terms of acquisition and development, and the uncertainty in successfully acquiring a contract on the second site, the proffered site was ultimately the property on which land use approvals were secured and the tanks were built.

Regarding the 600 Zone, with no possibilities for proffered sites in the area, Loudoun Water had to acquire land on the open market. This factor made the opportunity to create "choices" for site selection very unlikely. The Dulles South public participation process was undertaken with the luxury of knowing that a proffered site was already available. In the case of the 600 Zone tank site, however, potentially available sites shifted a number of times because of changes in ownership and development programming for the by-right subdivision. Getting a site under contract was the only way to secure a site.

The process of land acquisition includes: finding a potential site that appears to meet minimum criteria, negotiating a fair and reasonable contract with a willing landowner, confirming that the site meets minimum criteria during a defined feasibility study period, and securing land use approval within the limited time period as established by contract. It is the responsibility of Loudoun Water to plan for, design, and have a water system in place when service is needed. Community outreach has historically been a component of this complicated process and Loudoun Water has consistently provided for public engagement as part of it while being mindful of its responsibility to build and maintain necessary facilities in a time-sensitive manner for the benefit of a growing community.

9. Question: What is the plan for construction?

Response: If approved, the project will enter into the design and permitting phase, and then proceed to construction with each phase taking roughly one year. It is anticipated that one tank will be in operation by late 2016-early 2017.

10. Question: What are VDOT safety requirements for construction traffic?

The Applicant is willing to commit, as a condition of the Special Exception, to eliminate all construction traffic from Red Hill Road and only use this public road for permanent access (an average of 1 vehicle trip weekly). Traffic safety during construction along Red Hill Road should no longer be a concern.

Index of Attachments and Tables

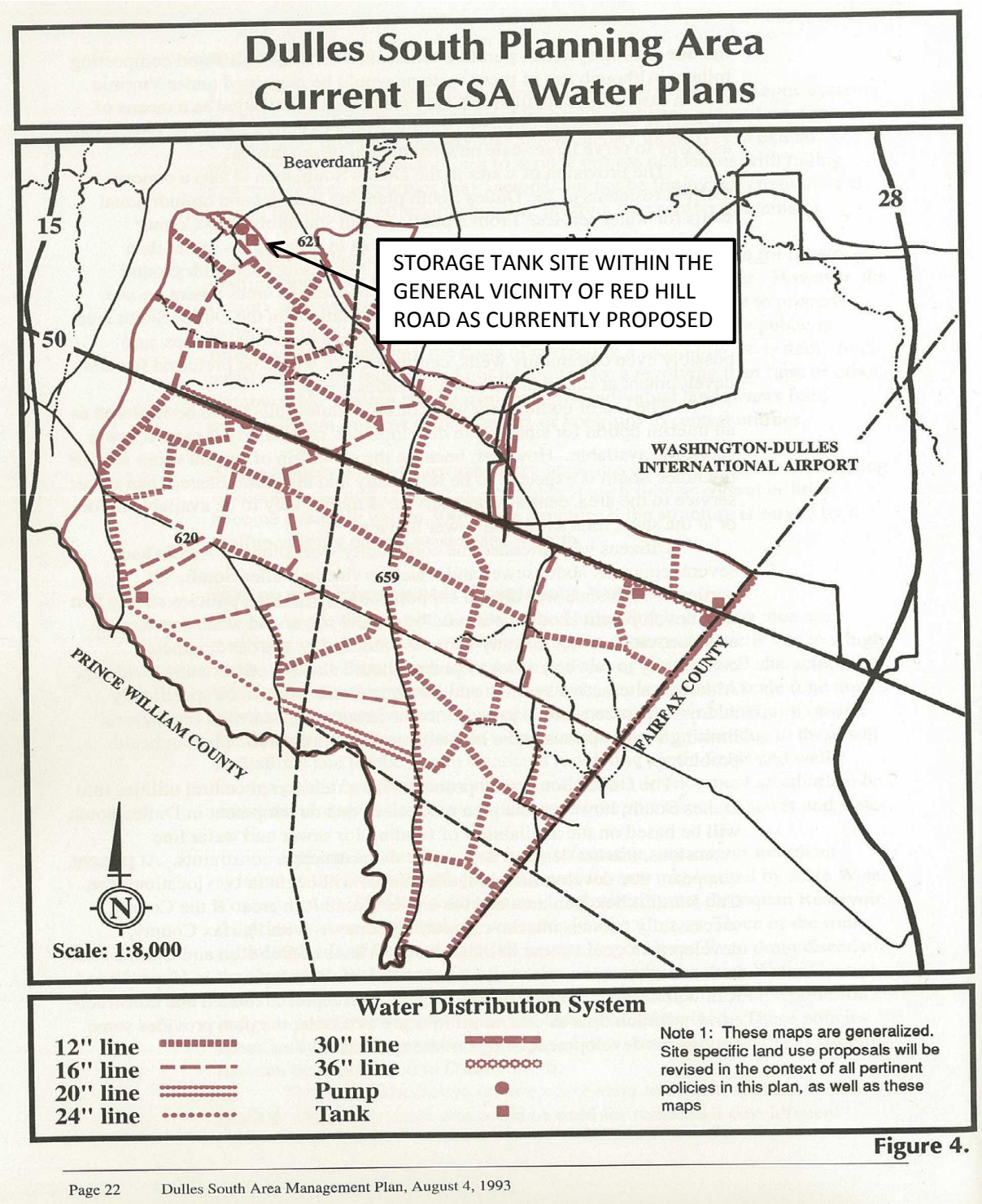
Attachments

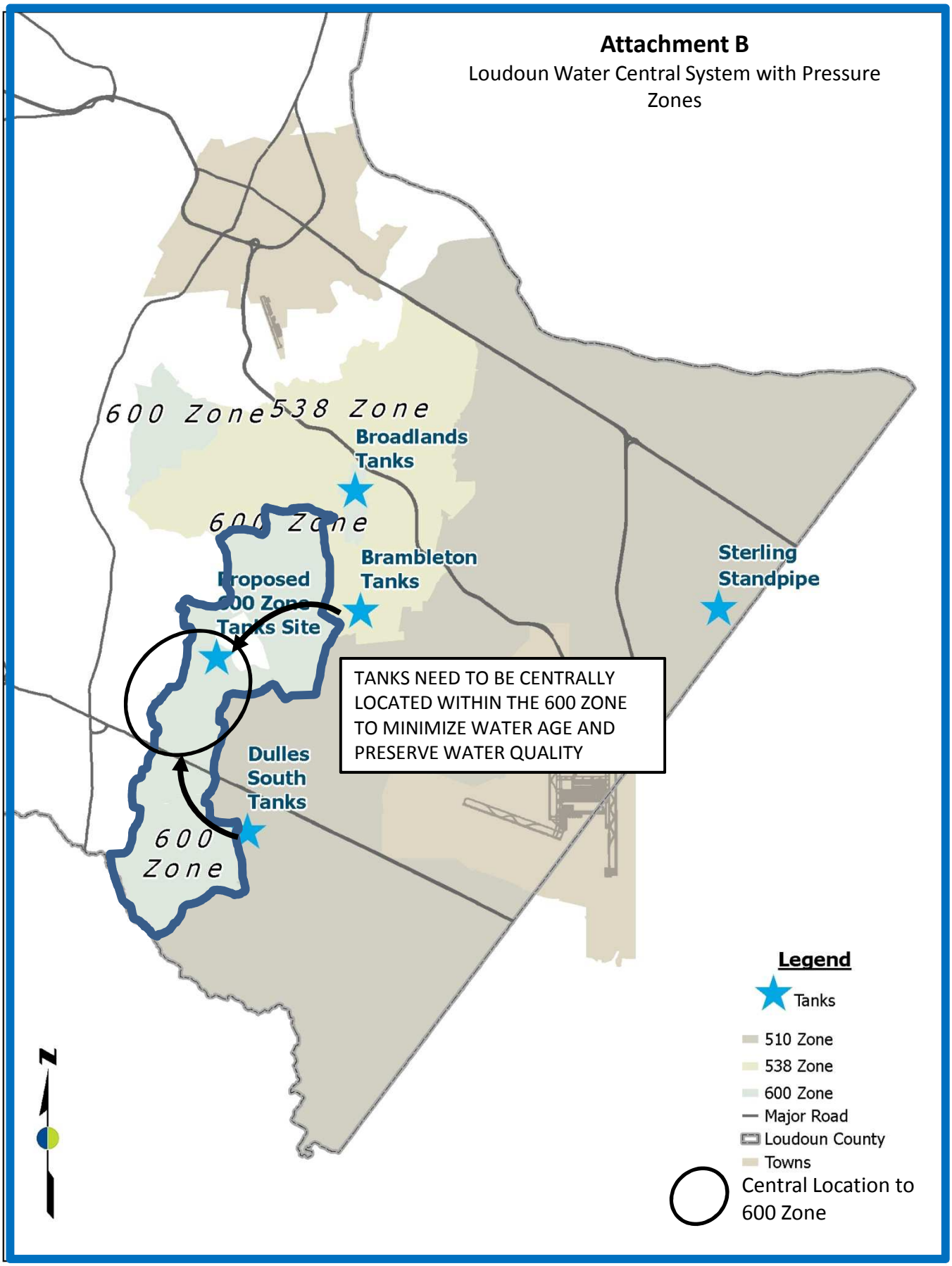
Tables

Attachment A

1993 Dulles South Area Management Plan (DSAMP)

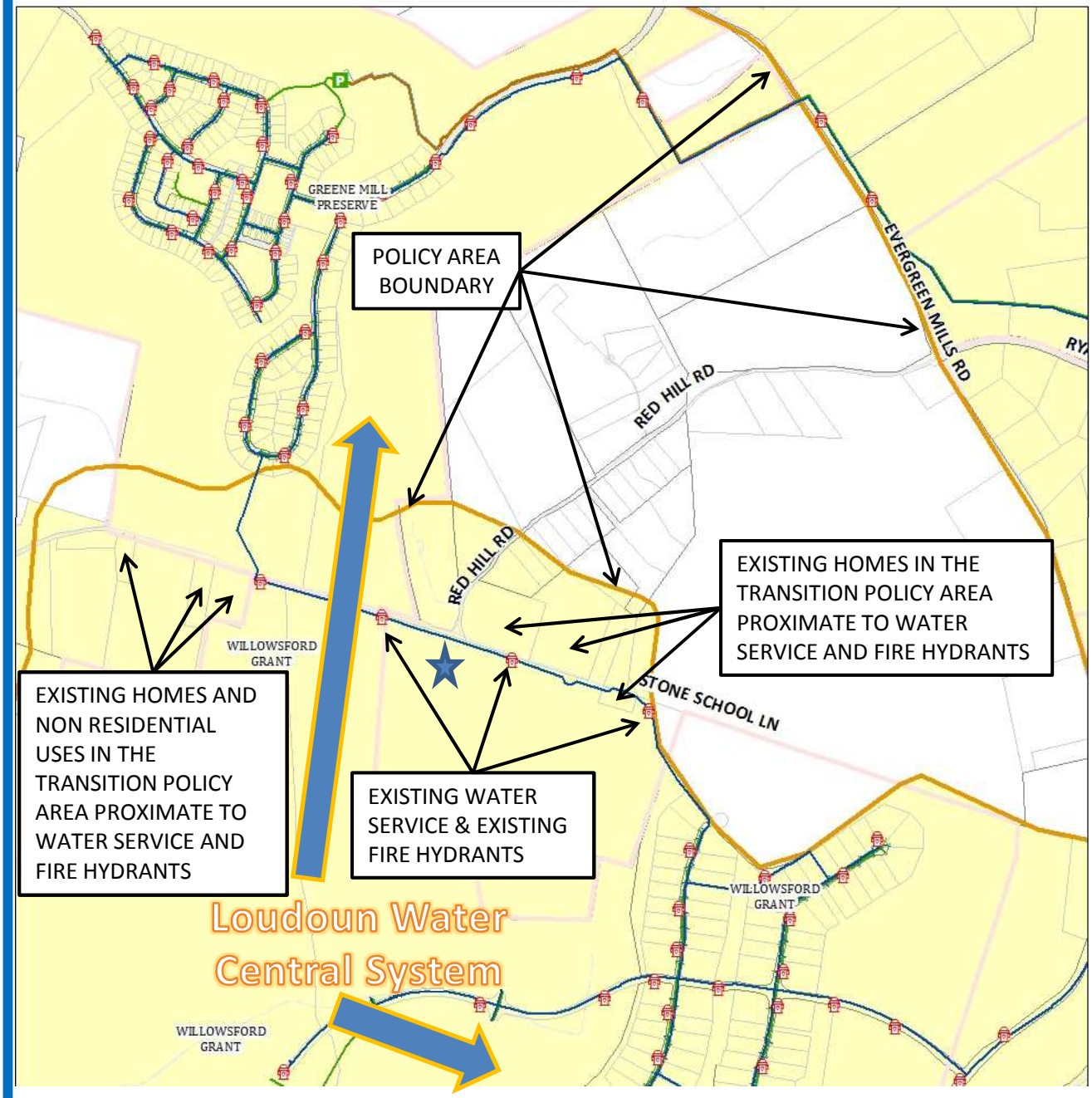
- THIS DOCUMENT IS IDENTIFIED AS A COMPONENT OF THE REVISED GENERAL PLAN.
- A STORAGE TANK IS SHOWN ON THIS MAP FROM THE 1993 DSAMP IN THE SAME VICINITY AS THE ELEVATED TANK SITE CURRENTLY PROPOSED BY LOUDOUN WATER.




Attachment B
Loudoun Water Central System with Pressure Zones
600 Zone
538 Zone
Broadlands Tanks
600 Zone
Brambleton Tanks
Proposed 600 Zone Tanks Site
Sterling Standpipe
TANKS NEED TO BE CENTRALLY LOCATED WITHIN THE 600 ZONE TO MINIMIZE WATER AGE AND PRESERVE WATER QUALITY
Dulles South Tanks
600 Zone
N
Legend
Tanks
510 Zone
538 Zone
600 Zone
Major Road
Loudoun County
Towns
Central Location to 600 Zone

Attachment C

Loudoun Water Central System Services in the Transition Policy Area and Rural Policy Area: Available Water Service Including Fire Hydrants



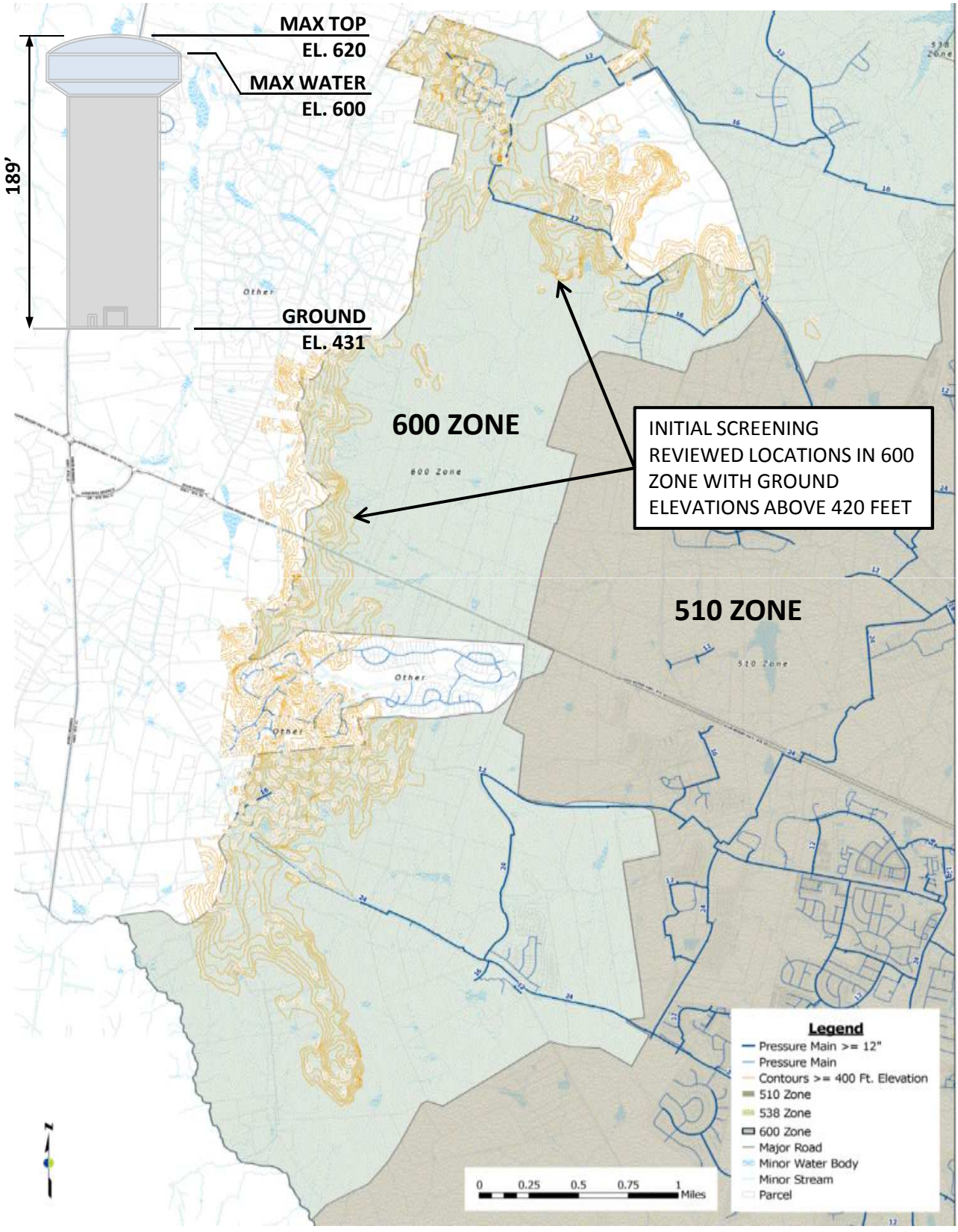
Attachment D
Tanks Photo Simulations

UPDATED TANK PHOTO SIMULATION WITH MODIFIED BUFFER, RELOCATED ACCESS AND EXISTING TREES PRESERVED

ORIGINAL TANK SIMULATION WITH DECIDUOUS BUFFER, ACCESS TO RED HILL ROAD, AND EXISTING TREES ALONG RED HILL ROAD CLEARED

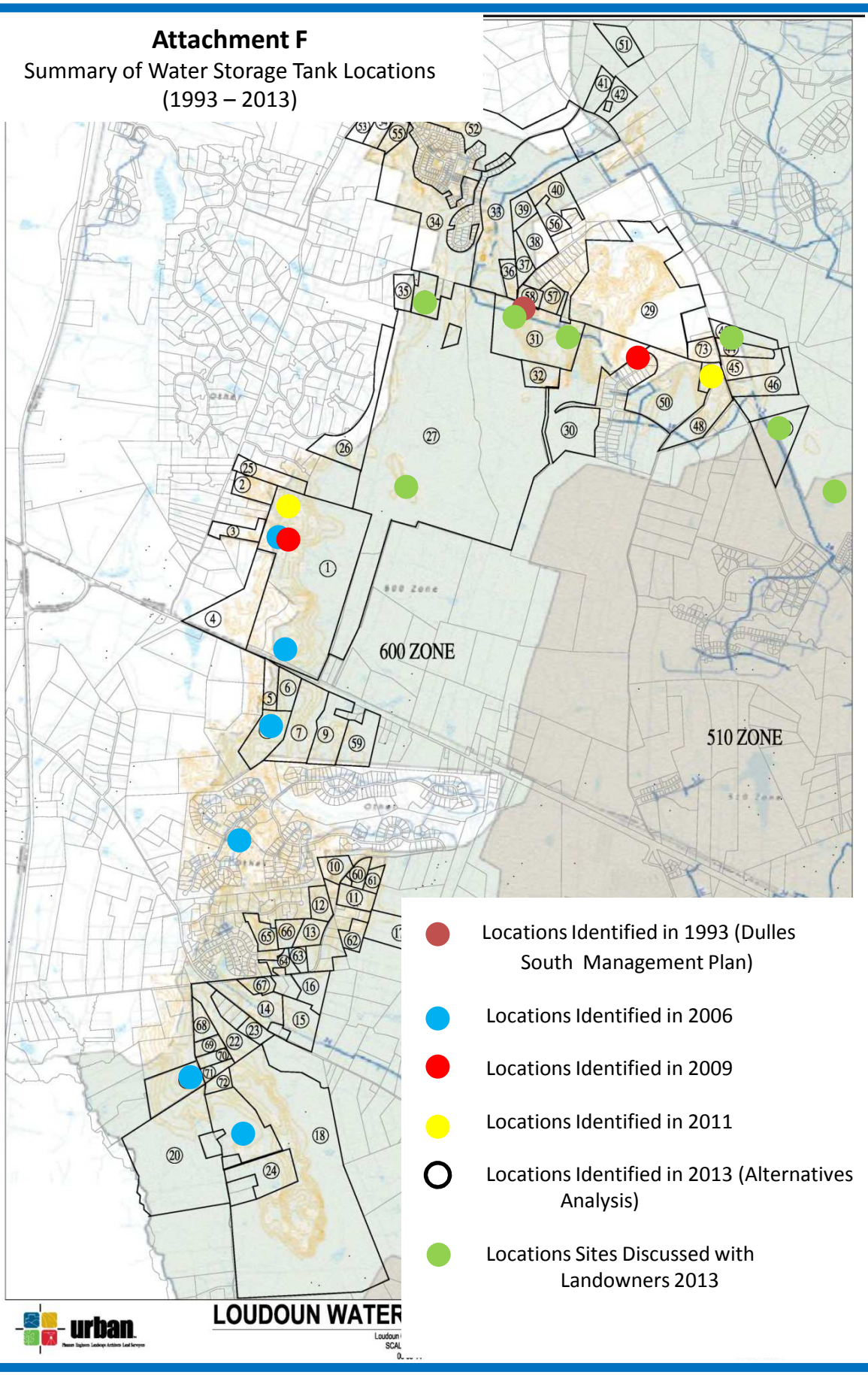
Attachment E

600 Zone Contours At or Above 400 Feet Elevation



Attachment F

Summary of Water Storage Tank Locations
(1993 – 2013)



- Locations Identified in 1993 (Dulles South Management Plan)
- Locations Identified in 2006
- Locations Identified in 2009
- Locations Identified in 2011
- Locations Identified in 2013 (Alternatives Analysis)
- Locations Sites Discussed with Landowners 2013

Attachment G

600 Zone Facility Plan Exhibit (2006)

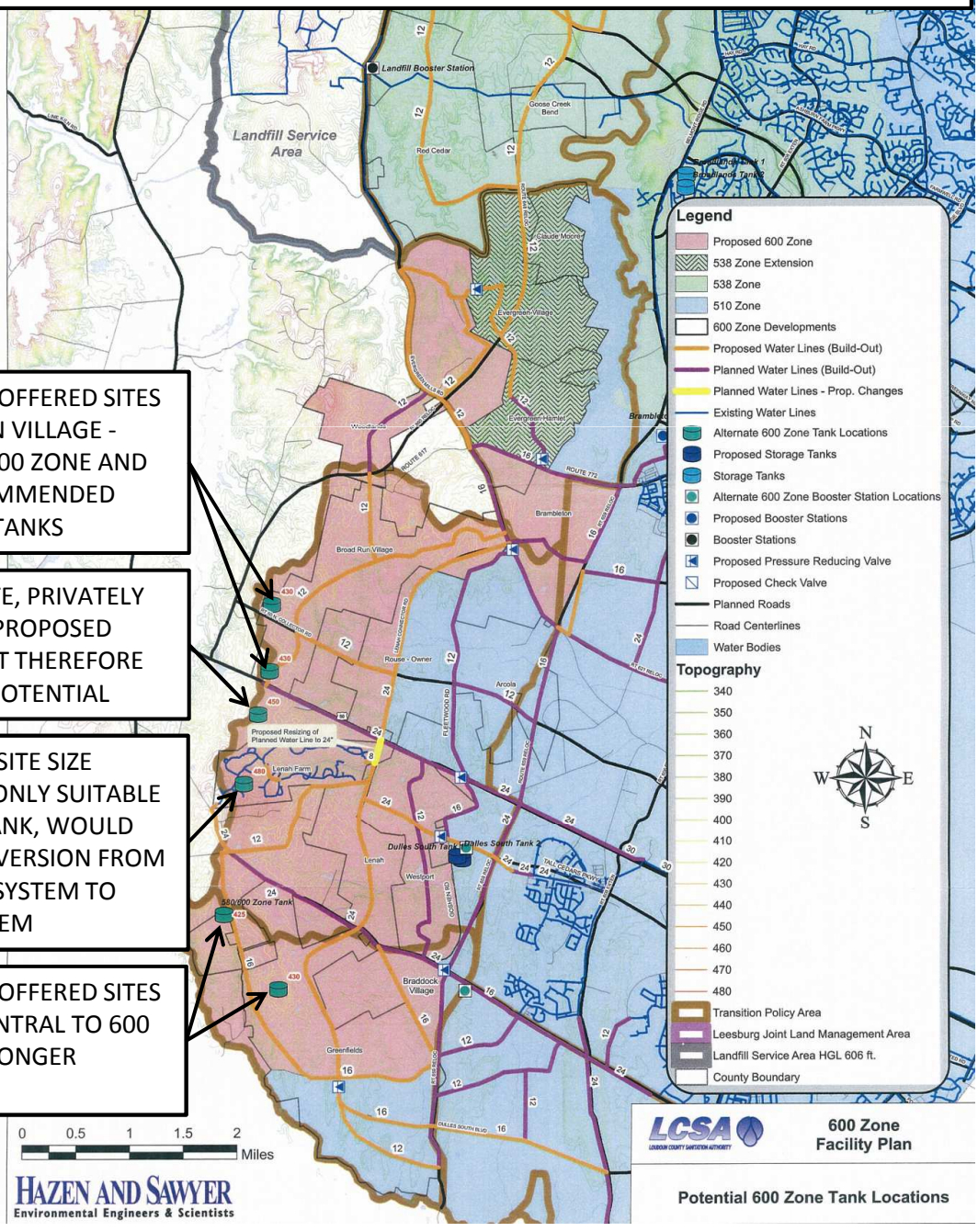
- THE 600 PRESSURE ZONE WAS CREATED TO PROVIDE ADEQUATE SERVICE, PARTICULARLY TO HIGHER GROUND ELEVATIONS IN GREENE MILL PRESERVE (WOODLANDS RURAL VILLAGE) AND LENAH RUN COMMUNITIES
- POTENTIAL FOR OBTAINING PROFFERED SITES AND DESIRED LOCATION FOR CENTRAL STORAGE IN THE ZONE SUGGEST BROAD RUN VILLAGE AS THE PREFERRED TANK LOCATION
- DETAILED TANK SITING STUDY RECOMMENDED AS A NEXT STEP FOR LOCATING 600 ZONE STORAGE

POTENTIAL PROFFERED SITES IN BROAD RUN VILLAGE - CENTRAL TO 600 ZONE AND WITHIN RECOMMENDED VICINITY FOR TANKS

POTENTAIL SITE, PRIVATELY OWNED - NO PROPOSED DEVELOPMENT THEREFORE NO PROFFER POTENTIAL

LENAH RUN – SITE SIZE RESTRICTION ONLY SUITABLE FOR A 1MG TANK, WOULD REQUIRE CONVERSION FROM COMMUNITY SYSTEM TO CENTRAL SYSTEM

POTENTIAL PROFFERED SITES – BUT NOT CENTRAL TO 600 ZONE SO NO LONGER CONSIDERED

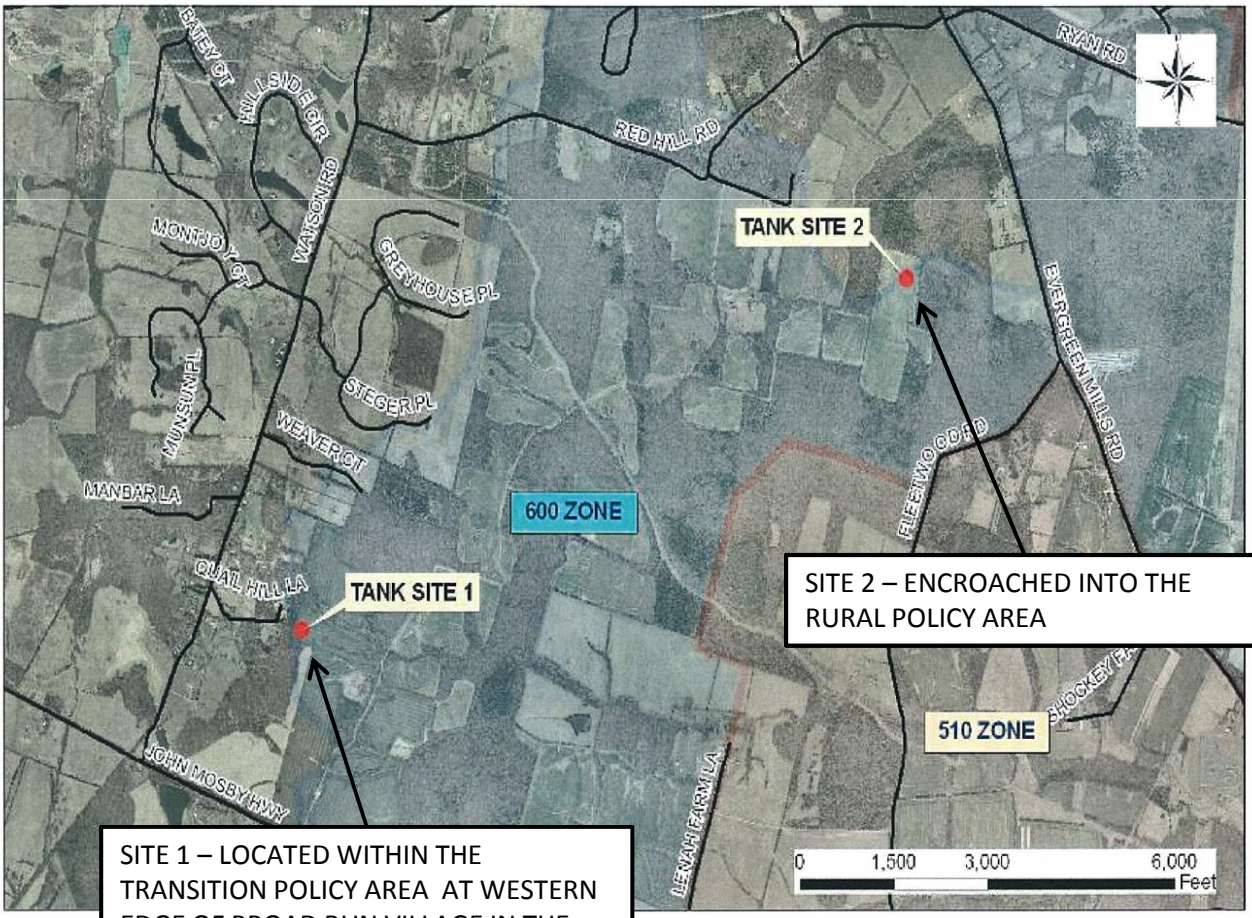


Attachment H

Preliminary Siting Analysis Exhibit for
600 Zone Tanks (2009)

- BOTH SITES WERE INITIALLY IDENTIFIED AS POTENTIALLY AVAILABLE VIA PROFFERS – BROAD RUN VILLAGE;
- BOTH SITES DEEMED FEASIBLE WITH WESTERN SITE (SITE 1) RATED BETTER HYDRAULICALLY AND EASTERN SITE (SITE 2) RATED BETTER BASED ON NON-ECONOMIC CRITERIA. WHILE REPORT RECOMMENDED EASTERN SITE, IT ALSO RECOMMENDED ADDITIONAL SITE ANALYSIS;
- SUBSEQUENTLY, EASTERN SITE WAS DEEMED NOT ACCEPTABLE BECAUSE THE TANK SITE ENCROACHED INTO THE RURAL POLICY AREA

Figure 1-1
Aerial Photograph of Proposed Tank Locations



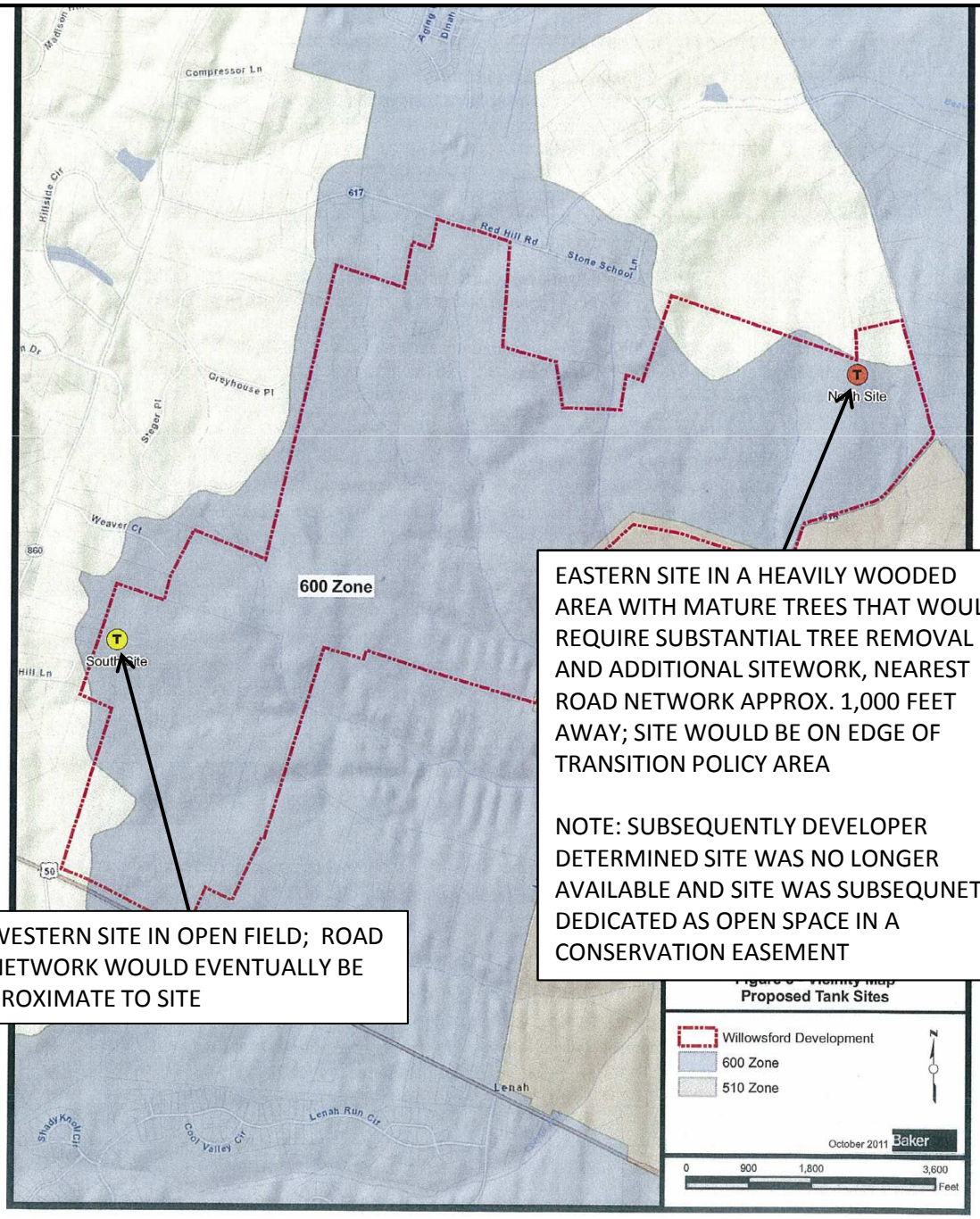
SITE 2 – ENCROACHED INTO THE RURAL POLICY AREA

SITE 1 – LOCATED WITHIN THE TRANSITION POLICY AREA AT WESTERN EDGE OF BROAD RUN VILLAGE IN THE VICINITY OF QUAIL HILL LANE

Attachment I

Final Site Selection Study Exhibit (2011)

- TWO SITES LOCATED IN SIMILAR VICINITY AS PREVIOUS ANALYSIS IN 2009, BUT THESE SITES AT SLIGHTLY HIGHER ELEVATIONS;
- SITES GENERALLY LOCATED NEAR THE EDGE OF THE TRANSITION POLICY AREA AND CENTRAL SERVICE AREA
- EASTERN SITE: NO UTILITY EXTENSION PERMITTED TO THE NORTH WITHIN THE RURAL POLICY AREA



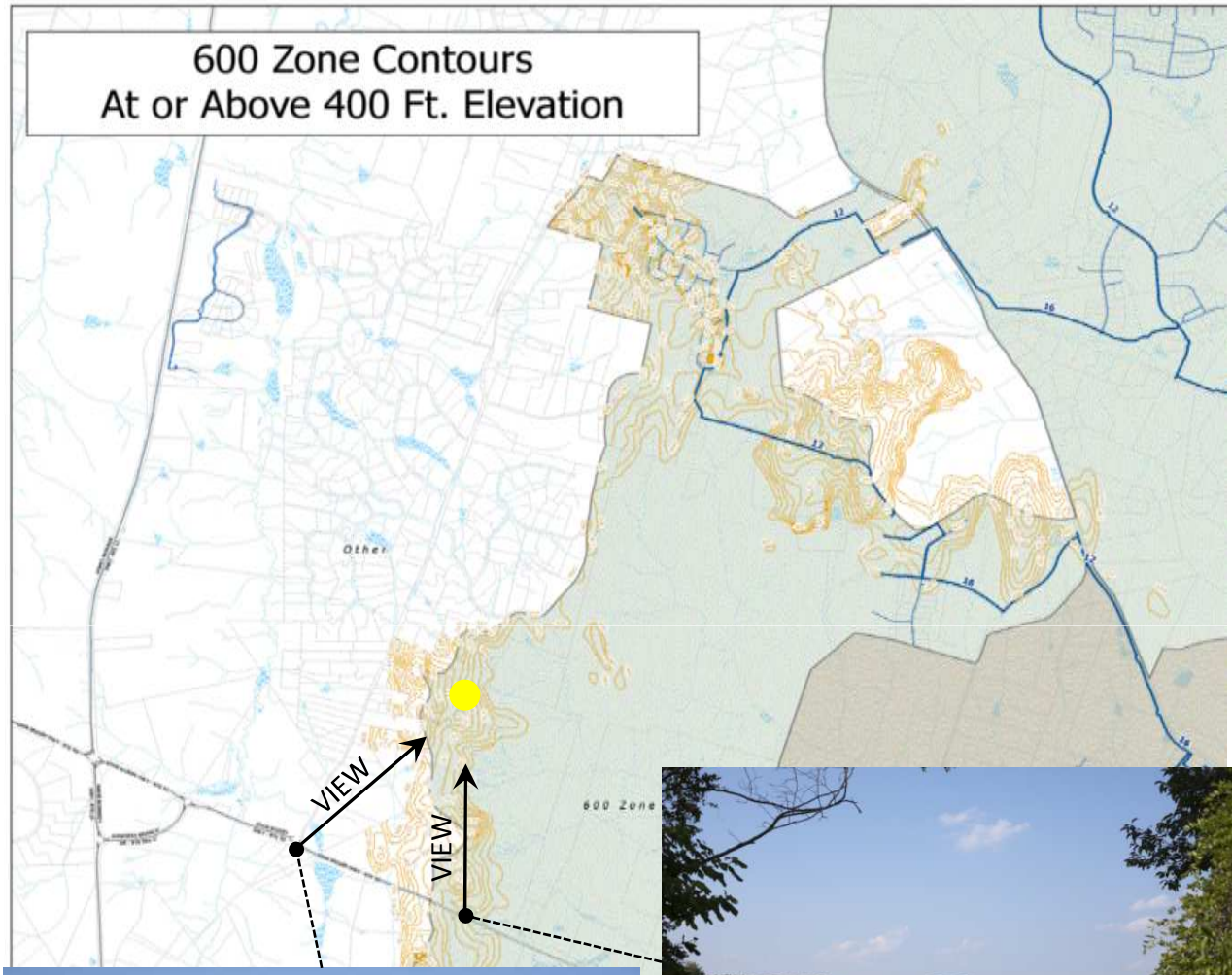
EASTERN SITE IN A HEAVILY WOODED AREA WITH MATURE TREES THAT WOULD REQUIRE SUBSTANTIAL TREE REMOVAL AND ADDITIONAL SITEWORK, NEAREST ROAD NETWORK APPROX. 1,000 FEET AWAY; SITE WOULD BE ON EDGE OF TRANSITION POLICY AREA

NOTE: SUBSEQUENTLY DEVELOPER DETERMINED SITE WAS NO LONGER AVAILABLE AND SITE WAS SUBSEQUNETLY DEDICATED AS OPEN SPACE IN A CONSERVATION EASEMENT

WESTERN SITE IN OPEN FIELD; ROAD NETWORK WOULD EVENTUALLY BE PROXIMATE TO SITE

Attachment J

Previous Tank Simulations for Site in
The Grant at Willowsford (2011)



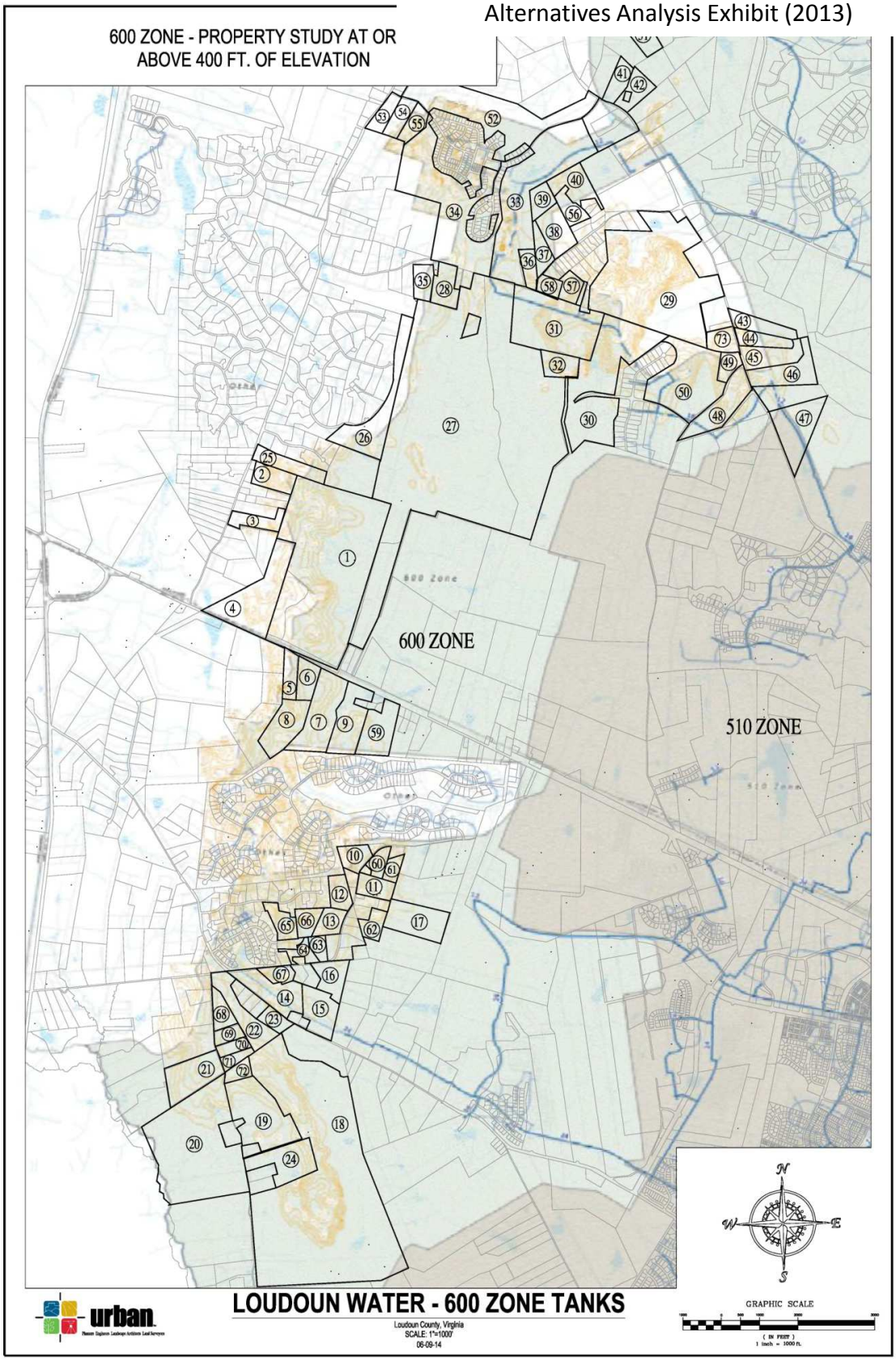
SOUTHERN WILLOWSFORD SITE: VIEW FROM SUBDIVISION ENTRANCE ALONG ROUTE 50

SOUTHERN WILLOWSFORD SITE: VIEW FROM MT. ZION CHURCH ALONG ROUTE 50

PROPOSED TANK SITE IN WILLOWSFORD

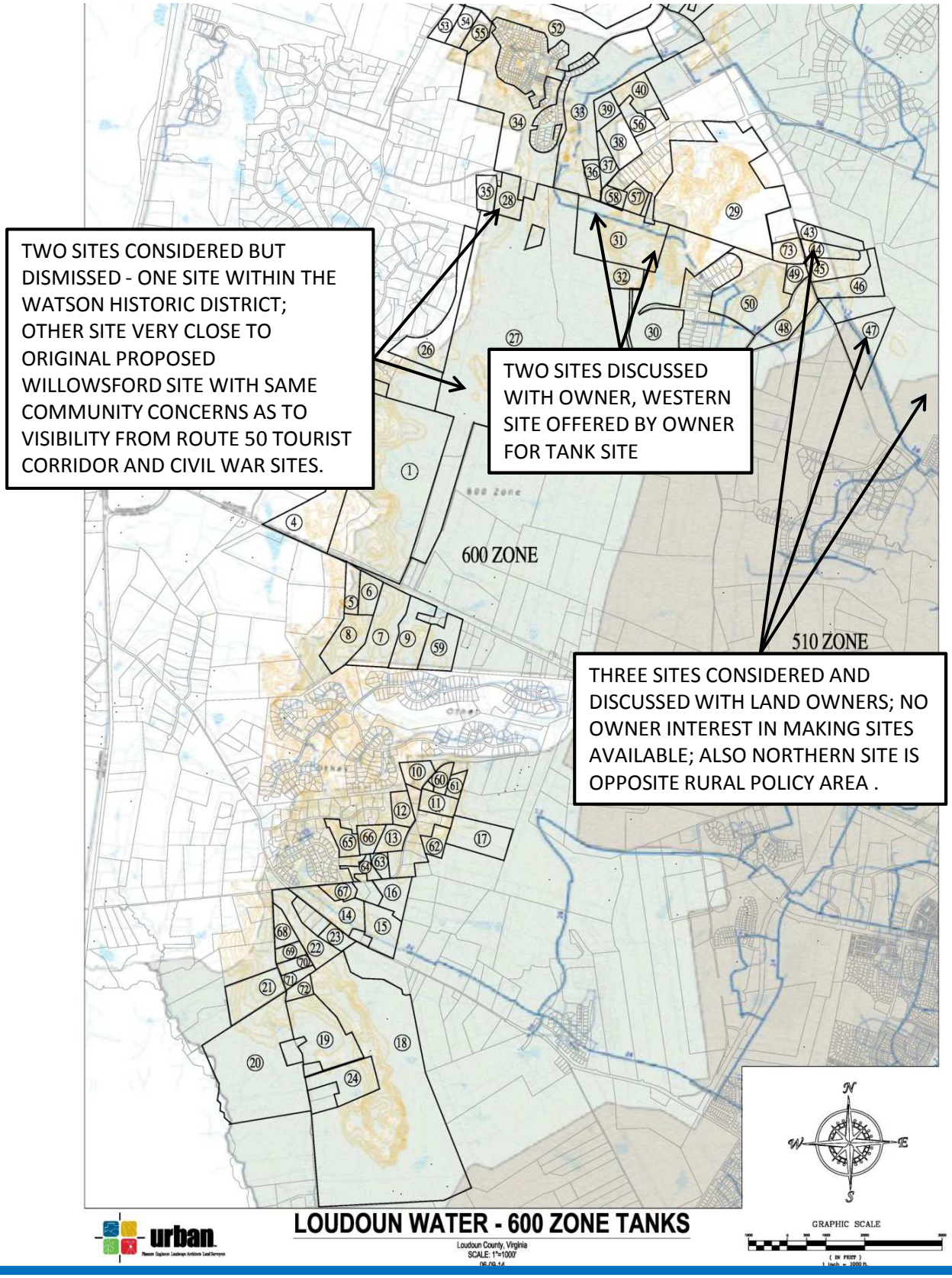
Attachment K

Alternatives Analysis Exhibit (2013)



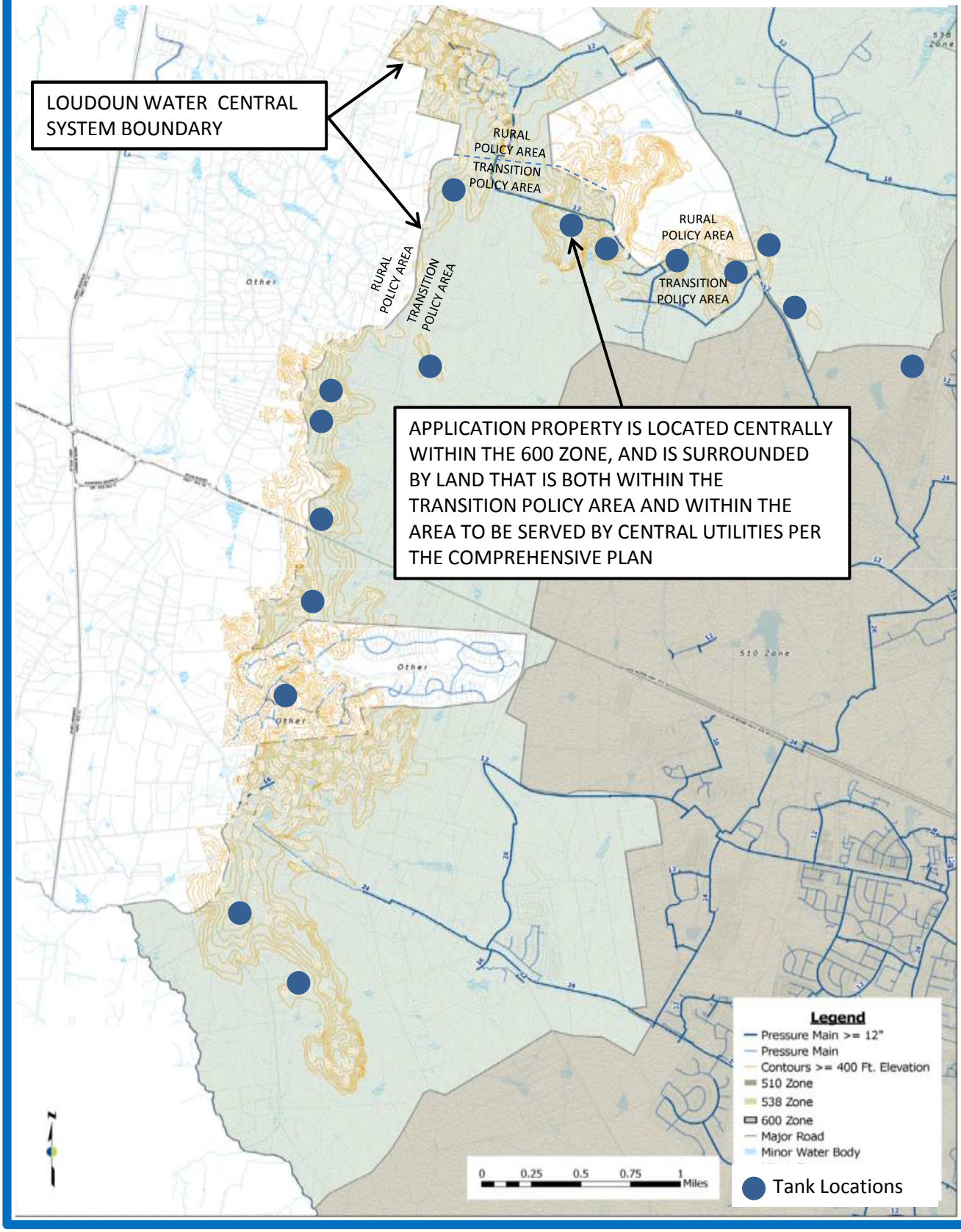
Attachment L

Alternatives Analysis – Loudoun Water Findings



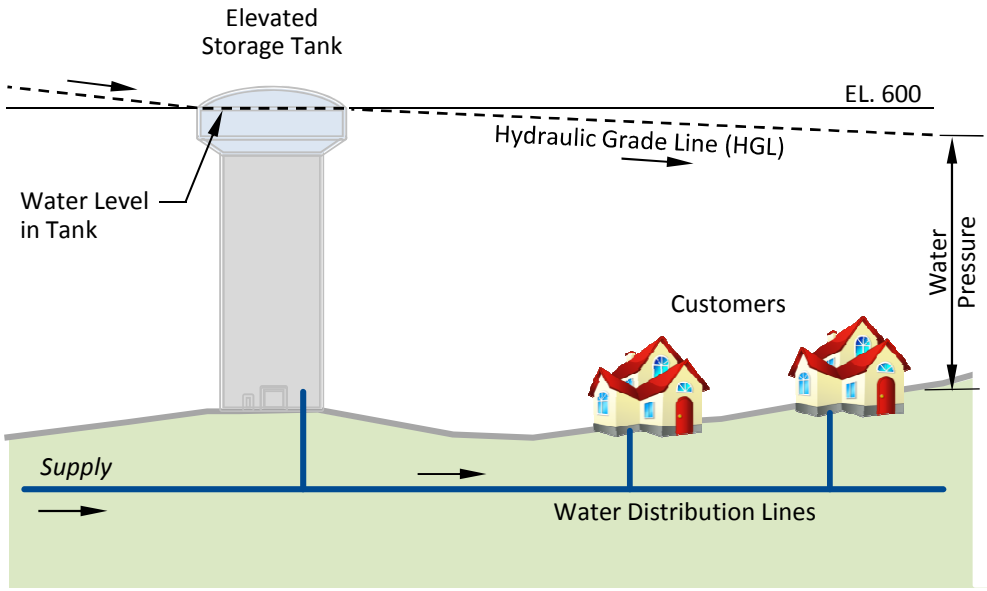
Attachment M

Application Property in Context

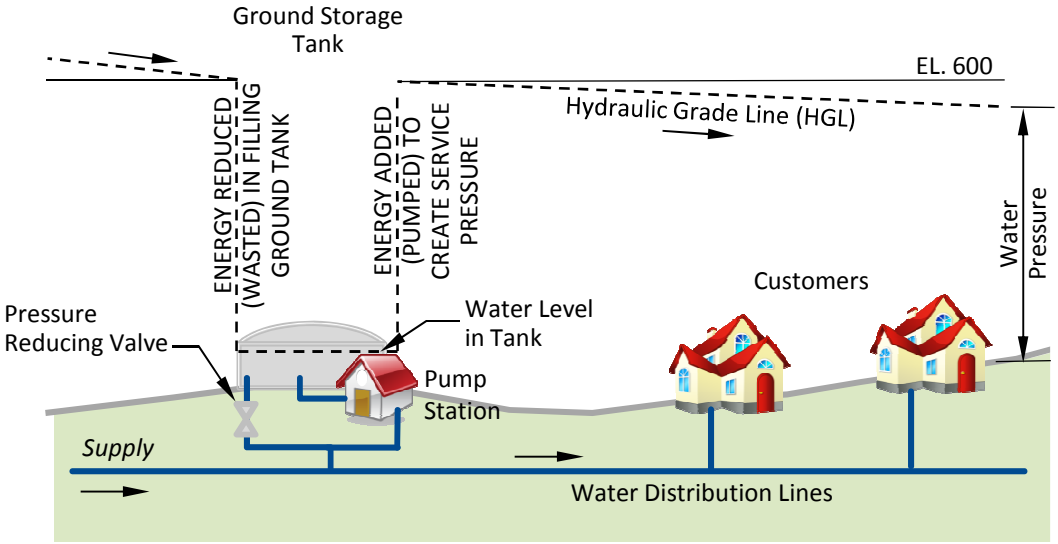


Attachment N

Distribution System Hydraulics with Elevated and Ground Storage

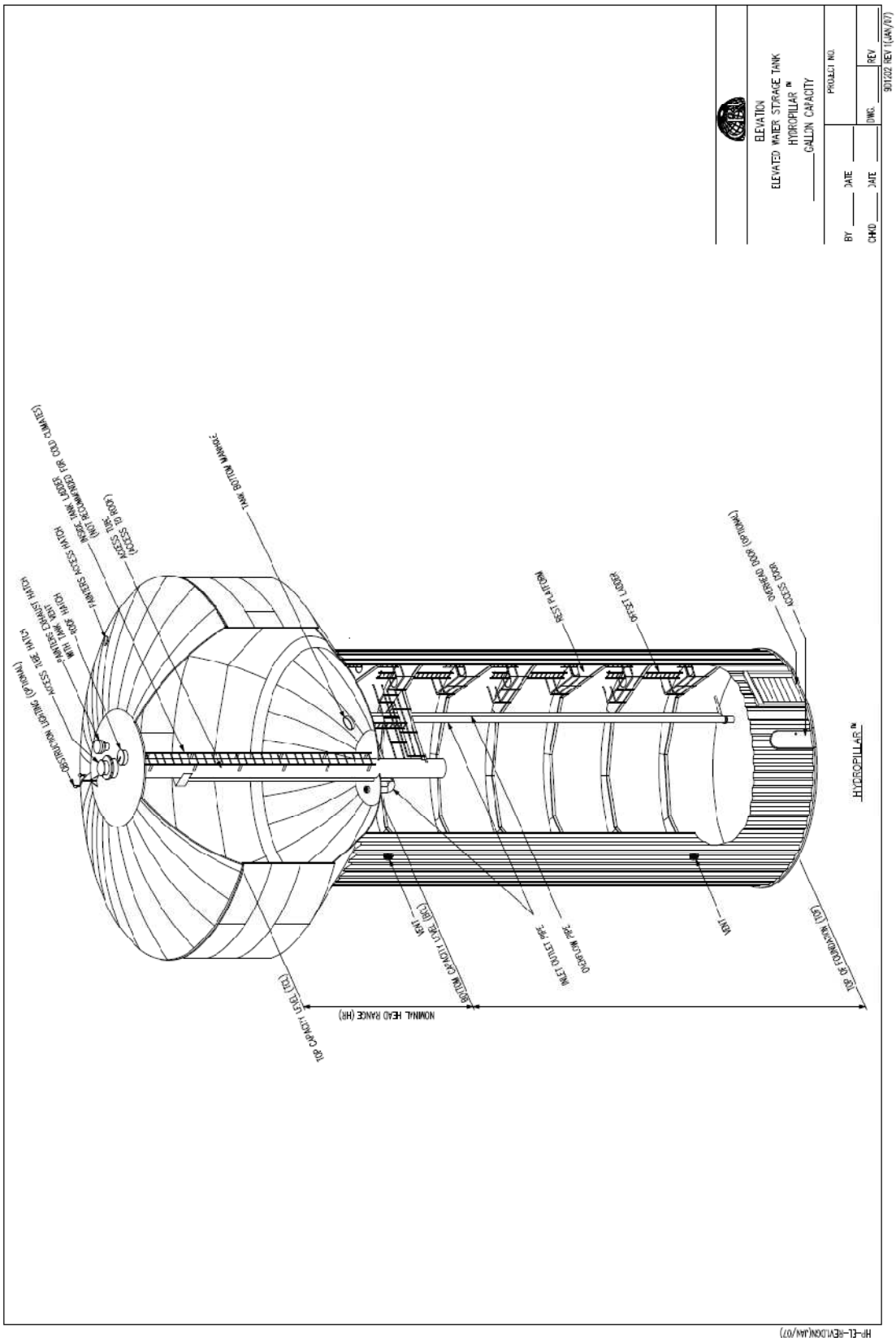


Distribution System Hydraulics with Elevated (Floating) Storage



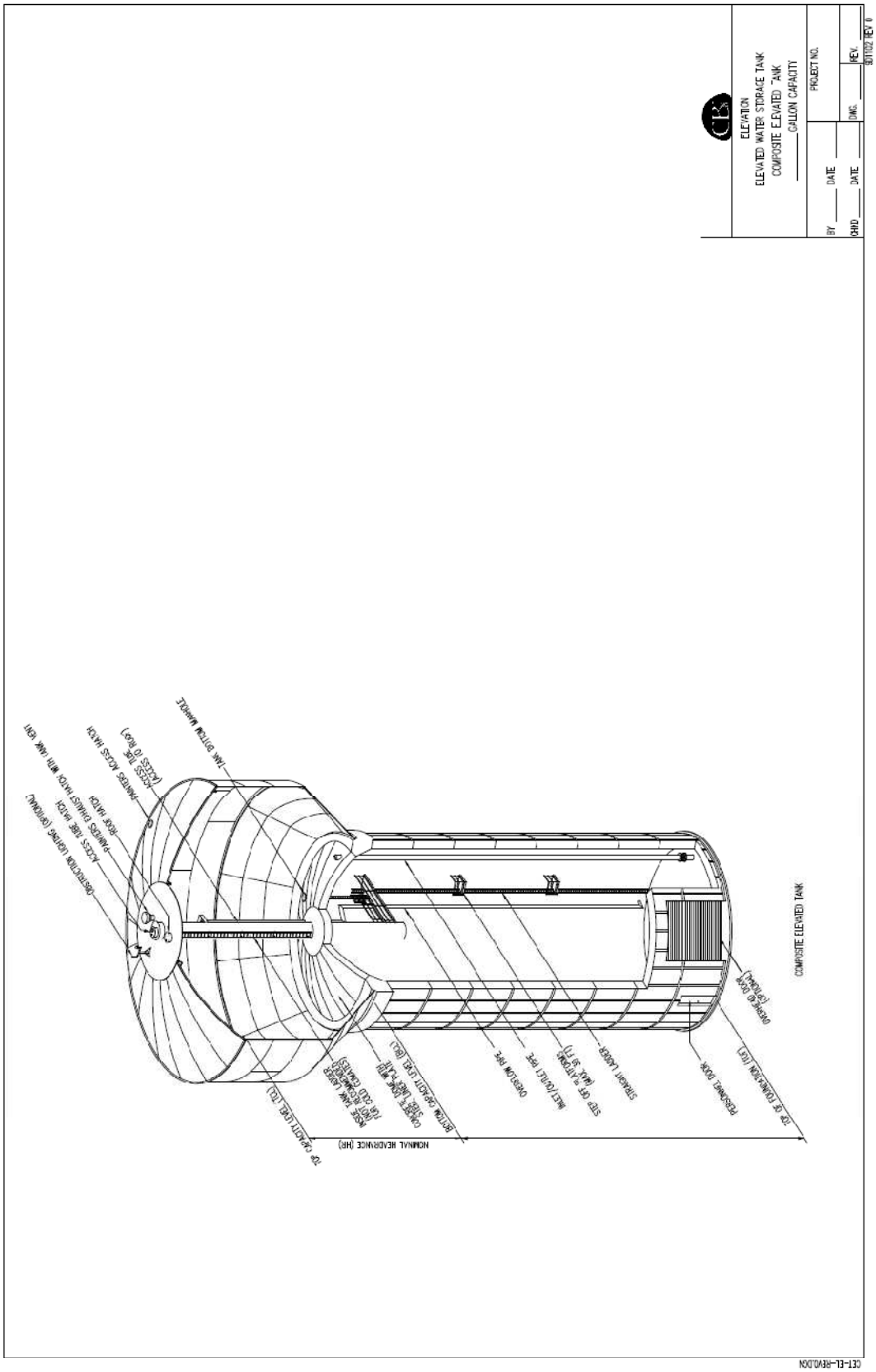
Distribution System Hydraulics with Ground (Pumped) Storage

Attachment O-1



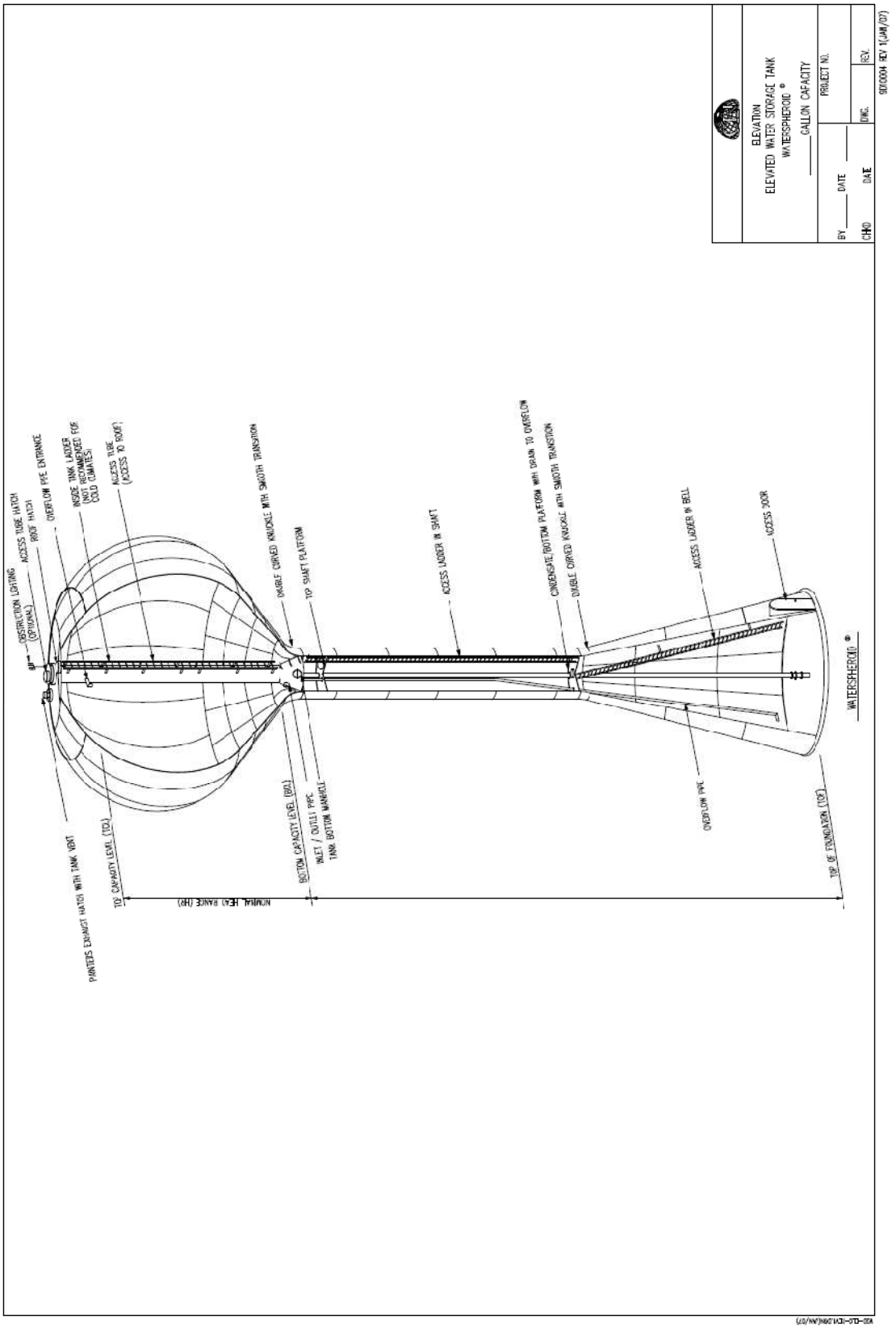
Elevated Water Storage Tank
Hydropillar (Steel)

Attachment O-2

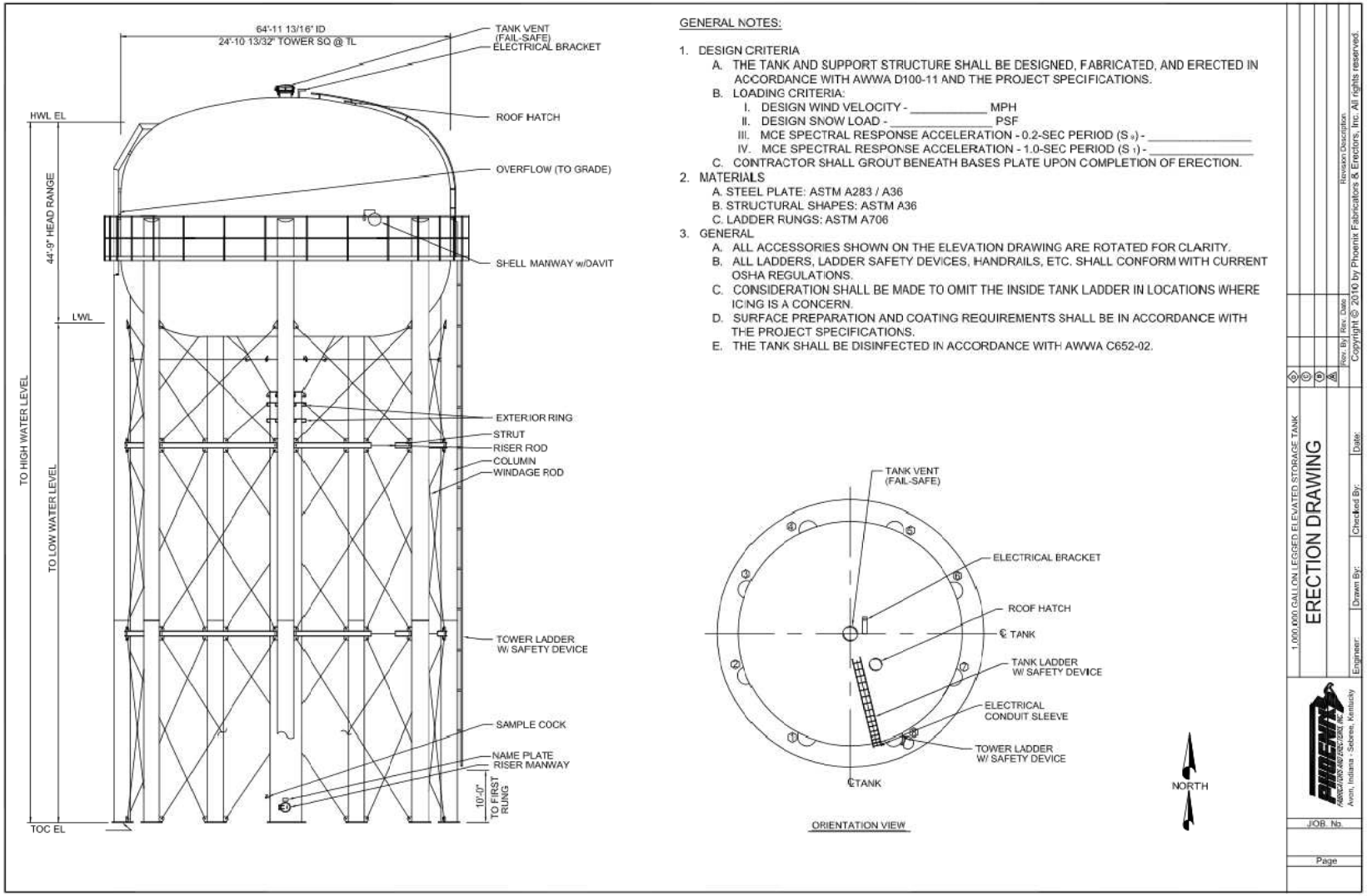


Elevated Water Storage Tank
Composite (Concrete & Steel)

Attachment O-3



Elevated Water Storage Tank
Watersheroid (Steel)

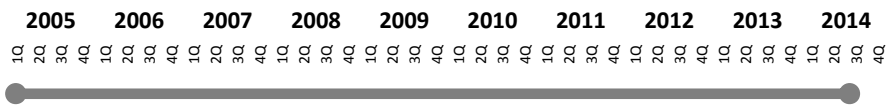


Elevated Water Storage Tank
Multi-Column (Steel)

Attachment O-4

Attachment P: Types of Water Storage Tanks in Loudoun County

Table 1: Timeline of Key Events in the 600 Zone Tanks Site Identification Process



Milestones in Loudoun Water's Analysis for a Water Storage Tank Site in the 600 Zone	
Loudoun Water's "Transition Policy Area (TPA) Utility Master Plan" is developed reflecting County's decision to allow extension of central utilities to the entire TPA	
Loudoun Water's "600 Zone Facility Plan" establishes new water pressure zone to serve high ground elevations in the TPA (including within Green Mill Preserve and Lenah Run); elevated storage tank site for 600 Zone recommended in Broad Run Village given northward extension of central system	
Loudoun Water conducts analysis on two potential sites in Broad Run Village possibly available by proffer with rezoning	
Loudoun Water conducts analysis on two additional potential sites [in former Broad Run Village] with change in ownership to *The Grant at Willowsford (Willowsford)* ; contract is negotiated with new owners for site in southwestern corner of *Willowsford* and land use applications are prepared	
Loudoun Water conducts first community meeting: proposed site is in *Willowsford;* community has concerns of visibility from Route 50 tourist corridor, visibility from adjacent homes in Rural Policy Area that cannot benefit from proximity to tank, and visibility from Civil War battlefield sites; community asks Supervisor Clarke to represent them in addressing these concerns with Loudoun Water	11/19/12
Loudoun Water files Commission Permit (CMPT) and Special Exception (SPEX) applications is for site in *Willowsford*	11/20/12
Supervisor Clarke addresses Loudoun Water Board in letter expressing concerns	12/10/12
Loudoun Water conducts another Alternatives Analysis; meets with Supervisor Clarke to present alternative sites that Loudoun Water will further investigate; follow-up meetings with Supervisor Clarke are held to share results of landowner meetings; one landowner is willing to consider offering a site for the elevated tanks	
Loudoun Water conducts contract negotiations with landowner *(Rouse property)*	
Loudoun Water conducts second community meeting: proposed site is alternative site on *Rouse property;* land use applications are prepared	11/19/13
Loudoun Water files Commission Permit (CMPT) and Special Exception (SPEX) applications for site on *Rouse property*	12/12/13
Loudoun Water conducts third community meeting: details of the CMPT and SPEX applications on *Rouse property* are reviewed; community voices concern over visual impact, location of construction access at the intersection of Red Hill Road and Stone School Lane, bus stop and mail box conflicts with construction traffic, general construction safety and impacts to historic road bed (Red Hill Road)	3/18/14
Loudoun Water modifies SPEX application to address community and staff concerns: evergreen buffering and tank color address visual impacts, relocation of access road addresses prior conflict at Red Hill Road and Stone School Lane	
Planning Commission Public Hearing	5/20/14
Loudoun Water modifies SPEX application to address community concerns: commitment to eliminate construction traffic along Red Hill Road addresses construction safety concerns	
Planning Commission Work Session	7/1/14

Table 2: Non-Economic Screening Criteria from the 2009 Storage Tank Preliminary Siting Analysis

Non-Economic Screening Criteria	Proposed Elevated Water Storage Tanks on Rouse SIte Loudoun Water Comment
Ground Elevation: Water storage facilities are typically located in areas with height elevation as the facilities can supply water by gravity to meet pressure and flow requirements with minimum facility height and capital costs	Topography and elevation are conducive to elevated storage.
Parcel Size	Parcel size exceeds minimum standard needed, provides more open space.
FAA Regulations	FAA has determined that the tanks pose no hazard to aviation.
Land Use, Development, Zoning of Site	Loudoun County permits elevated water storage tanks by Special Exception. Measures taken to address compatibility include providing a solid evergreen buffer and open space in excess of Zoning Ordinance Requirements, relocating vehicular access, eliminating all construction traffic on Red Hill Road, and committing to a neutral or blue paint color per staff recommendation.
Adjacent Land Use, Development, and Zoning	Site is within a vacant field and adjacent to site under contract for a future new subdivision. It is surrounded by property both within the Transition Policy Area and within Loudoun Water's Central System as designated by the County Comprehensive Plan. Measures taken to address compatibility include providing a solid evergreen buffer and open space in excess of Zoning Ordinance requirements, relocating vehicular access, eliminating all construction traffic on Red Hill Road, and committing to a neutral or blue paint color per staff recommendation.
Accessibility	Site is accessible via Red Hill Road. Permanent site access (one vehicle trip weekly on average) is currently proposed via Red Hill Road. Construction access will be eliminated from Red Hill Road.
Visual Impact	Tanks will be visible from various vantage points, but varied topography and tree cover helps to shield the tanks from view in other locations. Visual impacts near the tanks will be reduced with the proposed solid buffer of evergreens made possible by the relocated access.
Clearing	No tree clearing on the Site or at Red Hill Road/Stone School Lane is necessary.
Buffering/Screening	A solid evergreen buffer and open space in excess of Zoning Ordinance requirements is proposed.
Setback Availability	Proposed setback exceeds requirements.
Historical / Archeological Sites	No historic/archeological sites are located on the Site.
Endangered Species/Critical Habitat	No endangered species/critical habitat exist on the Site.
Floodplain	No floodplains exist on the Site.
Wetlands	No wetlands exist on the Site.
Soil conditions	Soil conditions do not pose a hindrance to site development.
System Performance/Proximity to major pipes and population centers	System performance is enhanced because tank property is centrally located within Loudoun Water's 600 water pressure zone and generally equidistant from two water sources (Brambleton and Dulles South pumping stations). Proposed tanks are proximate to existing piping and to existing and future development within the Central System to be served.
Time to Implement	Site is available and is under contract. Site can be developed in accordance with Loudoun Water timeline.

Loudoun County, Virginia
www.loudoun.gov
Board of Supervisors
1 Harrison Street, S.E., 5th Floor, MSC #1, Leesburg, VA 20175
Telephone (703) 777-0204 • Fax (703) 777-0421 • email: bos@loudoun.gov

December 10, 2012

Loudoun Water Board of Directors
44865 Loudoun Water Way
PO Box 4000
Ashburn, VA 20146

Dear Board Members,

I would like to take this opportunity to express several concerns I have on behalf of the residents of the Blue Ridge District, namely, system-wide water rates and placement of water towers.

I was heartened to see that the Loudoun Water Board unanimously elected to reschedule the public hearing for County Sponsored Community Systems rather than take action on the proposed rates the day following your final public information session to your customers. I believe this action shows that you are serious about taking into consideration the thoughts of Loudoun Water customers. I am also relieved as this gives a chance for the customers in Willisville to participate in these discussions as I understand there were issues with notification to some of those residents.

Water Rates

The history of the communities of Willisville, St. Louis, and Howardsville go back to the civil war era and some landowners in these communities are descendants of the slaves who purchased land within these communities upon receiving their freedom. Unfortunately, the poor soils on portions of these lands are such that they are not compatible with the installation of traditional septic systems to dispose of wastewater. Together, the Board of Supervisors and Loudoun Water have stepped up to provide the citizens of Willisville and St. Louis with a healthy and safe sanitation system. I feel it is also important to acknowledge that there are still homes in Loudoun County that use privies as a means of waste disposal and that we are working with Loudoun Water to remedy this situation.

Unfortunately, there has been residential development where soils are not compatible with drainfields and in some cases, sufficient water and wastewater treatment has not been made available. I believe it to be in everyone's best interest for Loudoun Water and the Board of Supervisors to work toward a universal rate for all customers served by Loudoun Water, in perpetuity. Forcing residents on communal systems to bear the full cost of those systems when the communal system is 90% built out or if the system has more than 15 lots that will be served by the system would cause undue hardship for these Loudoun's families.

Please let me know if you would support consideration of one standard wastwater rate for all Loudoun Water users in addition to a single water rate, much like neighboring jurisdictions such as Prince William County Service Authority and Fairfax Water have instituted.

Proposed Water Towers in Willowsford

I am formally requesting that the Loudoun Water Board look at alternative locations for the two 1-million gallon water tanks that are proposed to be installed at the northernmost edge of the transition zone. I request that the water towers serving the community follow Loudoun Water's model for the Brambleton Community's water towers: place water towers in the communities they serve. The suggested placement of these towers is in the backyards of citizens who are served by well and septic and live in Loudoun's Rural Policy Area and are thus prohibited from benefitting from Loudoun Water's infrastructure.

What was clear from the Loudoun Water public input session I attended at Creighton Corner Elementary School last month, was that there are other placement options for the proposed water towers. I appeal to you to look at the land near the Willowsford cell tower which is closer to Evergreen Mill Road. It was pointed out during the meeting that a water tower was indicated on a county plan years ago.

Also, please consider the possibility of installing shorter water towers such as those on Belmont Ridge Road near Broadlands Parkway.

Lastly, I appeal to you to consider holding public information sessions earlier in the process. It was disappointing to the people that attended the hearing to find out that the feasibility study period was concluding within 24 hours of that evening's meeting: the only public information session conducted on the proposed location.

Additionally, please note that the Northern Virginia Regional Parks Authority has expressed their opposition to the sighting of the water tanks as presented at the community meeting. They have stated that the effects of the placement of the towers should be carefully considered, since it is not just the archeology of the area that will be affected by Loudoun Water's construction, but also the cultural landscape and viewshed that will affect Gilberts Corner Regional Park. This park includes historic battlefield lands and Mt. Zion Church, which is on the historic registry. The primary goal of this new parkland is to preserve the historic and scenic values of the area.

I would also like to take the opportunity to thank you for your dedicated service to our community by serving on the Loudoun Water Board and thank you for taking into consideration my requests on behalf of the communities I serve. Please do not hesitate to call or email me to further discuss these matters. I am also attaching copies of emails from citizens and stakeholders regarding the proposed water towers.

Respectfully,

Janet Clarke
Vice Chairman and Blue Ridge District Supervisor
Loudoun County Board of Supervisors
703.777.0210
janet.clarke@loudoun.gov

cc: Chairman Scott York
BOS

Attachments:
Constituent emails

SPECIAL EXCEPTION
(SPEX 2013-0040)
COMMISSION PERMIT
(CMPT 2013-0015)
MINOR SPECIAL EXCEPTION
(SPMI 2013-0010)

LOUDOUN WATER

600 ZONE WATER STORAGE TANKS

BLUE RIDGE ELECTION DISTRICT
LOUDOUN COUNTY, VIRGINIA

GENERAL NOTES

1. THE SUBJECT PROPERTY SHOWN ON THIS PLAN IS:

MCPI#	OWNER	AREA (AC.)	INSTR.# OR DB./PG.	ZONING
243-45-9310	RANDOLPH D ROUSE	72.90	#200303270035411	TR3-UBF

THE APPLICATION AREA SUBJECT TO THIS SPEX INCLUDES: THE TANK PARCEL (5.1081 AC) AS WELL AS AN ACCESS ROAD TO RED HILL ROAD (1.4025 AC). TOTAL SPEX AREA IS 6.5105 ACRES.

2. THE PROPOSED PARCEL SHALL BE CREATED AS PART OF A SEPARATE SUBDIVISION OR BOUNDARY LINE ADJUSTMENT PROCESS.

3. THE PURPOSE OF THIS SPECIAL EXCEPTION AND COMMISSION PERMIT APPLICATION IS TO OBTAIN APPROVAL OF A WATER STORAGE TANK USE PER SECTION 2-1502 AND 6-1100 OF THE REVISED 1993 LOUDOUN COUNTY ZONING ORDINANCE.

4. THE PURPOSE OF THE MINOR SPECIAL EXCEPTION APPLICATION IS TO OBTAIN APPROVAL FOR A MODIFICATION TO THE TYPE 4 BUFFER YARD FENCE. IN LIEU OF A 6-FOOT HIGH FENCE OR BERM IN THE BUFFER YARDS, THE APPLICANT REQUESTS APPROVAL TO PROVIDE A BLACK VINYL CHAIN LINK FENCE WITH BARB WIRE AT THE TOP, A MAXIMUM OF 10' HIGH, FOR SECURITY REASONS. FENCING WILL HAVE BLACK WEBBING/SLATS TO ACHIEVE 95% OPACITY. THE FENCE WILL BE LOCATED OUTSIDE THE BUFFER BETWEEN BUFFER LANDSCAPING AND THE WATER STORAGE TANKS. FINAL LOCATION TO BE DETERMINED WITH FINAL ENGINEERING. AT THE REQUEST OF THE COUNTY, ALL BUFFER PLANTINGS SHALL CONSIST OF EVERGREEN TREES.

5. A TYPE 4 BUFFER WILL BE PROVIDED AS REQUIRED BY SECTION 5-621 (B) OF THE ZONING ORDINANCE. SEE MODIFICATION REQUESTED IN NOTE #4.

6. BOUNDARY INFORMATION AS SHOWN HEREON WAS OBTAINED FROM URBAN LTD., NOVEMBER 2013. THE BOUNDARY IS IN THE NAD 1983 DATUM AND IS REFERENCED TO THE VIRGINIA COORDINATE SYSTEM OF 1983, NORTH ZONE.

7. TOPOGRAPHIC INFORMATION SHOWN HEREON WAS OBTAINED BY URBAN, LTD. VIA FIELD SURVEY. DATUM: NAVD 1988.

8. SOILS INFORMATION SHOWN HEREON IS TAKEN FROM DIGITAL MAPS PROVIDED BY LOUDOUN COUNTY.

9. DEVELOPMENT OF THE SUBJECT SITE SHALL CONFORM TO ALL COUNTY AND VDOT STANDARDS INCLUDING THE PERFORMANCE STANDARDS INCLUDED IN ZONING ORDINANCE SECTION 5-1500.

10. ALL STRUCTURES WITHIN 500 FEET OF THE SUBJECT PROPERTY HAVE BEEN SHOWN ON THE EXISTING CONDITIONS MAP.

11. THE PROPOSED IMPROVEMENTS GENERATE A MINIMAL INCREASE IN TRAFFIC. THEREFORE, A VDOT 527 STUDY IS NOT WARRANTED. THE APPLICANT HAS REQUESTED A MODIFICATION OF THE COUNTY TRAFFIC STUDY REQUIREMENT.

12. THERE ARE NO ARCHEOLOGICAL SITES WITHIN THE SPECIAL EXCEPTION AREA PER A STUDY BY THUNDERBIRD ARCHEOLOGY, A DIVISION OF WETLAND STUDIES AND SOLUTIONS, DATED DECEMBER, 2013. CONTACT: BOYD SIPE, MA, RPA.

13. ENDANGERED AND THREATENED SPECIES HABITAT EVALUATION AND RARE SPECIES/ COMMUNITY ASSESSMENT WAS PERFORMED BY WETLAND STUDIES AND SOLUTIONS. CONTACT: RICHARD DAVIS, WPIT. THERE ARE NO ETS SPECIES WITHIN THE SPECIAL EXCEPTION AREA.

14. ALL LIGHTING WILL CONFORM TO THE REQUIREMENTS SET FORTH IN SECTION 5-1500 (PERFORMANCE STANDARDS) OF THE REVISED 1993 LOUDOUN COUNTY ZONING ORDINANCE AND CHAPTER 7 OF THE FACILITIES STANDARDS MANUAL. LOCATIONS WILL BE DETERMINED AT THE SITE PLANNING STAGE.

15. THERE ARE NO KNOWN HAZARDOUS OR TOXIC SUBSTANCES ON THE SITE.

16. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED IN ACCORDANCE WITH THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" AND THE LOUDOUN COUNTY EROSION AND SEDIMENT CONTROL ORDINANCE, CHAPTER 1220 OF THE CODIFIED ORDINANCES OF LOUDOUN COUNTY.

17. PER A FIELD STUDY ON NOVEMBER 14, 2013 BY MICHAEL KOPANSKY, WPIT, CAE & RICHARD DAVIS, WPIT OF WETLAND STUDIES & SOLUTIONS, INC. (WSSI), THERE ARE NO WETLANDS OR OTHER WATERS OF THE U.S. (WOUS) WITHIN THE SPECIAL EXCEPTION AREA.

18. THERE ARE NO MODERATELY STEEP SLOPES (15%-25%) OR VERY STEEP SLOPES (>25%) WITHIN THE LIMITS OF THE SPECIAL EXCEPTION ACCORDING TO URBAN'S FIELD SURVEY.

19. ACCESS TO THE WATER TANK SITE IS PROVIDED VIA A PROPOSED GRAVEL SURFACED CATEGORY C PRIVATE ROAD. ACCESS IS FROM RED HILL ROAD, AN EXISTING PUBLIC STREET.

20. THE PLANNED LIMITS OF DISTURBANCE WILL GENERALLY FOLLOW THE LIMITS OF THE SPECIAL EXCEPTION APPLICATION AREA. FINAL LIMITS OF DISTURBANCE WILL BE DETERMINED WITH FINAL SITE PLAN.

21. THE APPLICANT IS RESPONSIBLE FOR OBTAINING ALL REQUIRED LOCAL, STATE, AND FEDERAL PERMITS REQUIRED FOR OPERATION OF WATER STORAGE TANKS AT THIS LOCATION.

22. POTENTIAL ACCESSORY USES WHICH ARE ANTICIPATED INCLUDE A SCADA ANTENNAE.

23. THE SITE WILL BE SERVED BY PUBLIC WATER AND SEWER.

24. THE DEVELOPMENT OF THE SPEX AREA WILL BE IN COMPLIANCE WITH SECTION 5-1507 (NOISE STANDARDS) OF THE REVISED 1993 ZONING ORDINANCE.

25. THE SUBJECT PROPERTY AND THE SPEX AREA LIE OUTSIDE THE LDN60 1-MILE BUFFER NOISE CONTOUR AIRPORT OVERLAY DISTRICT.

26. THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE OWNER, APPLICANT, OR HIS AGENT OF ANY OTHER APPLICABLE LOCAL, STATE AND FEDERAL REQUIREMENTS. ALL REQUIRED PERMITS SUCH AS VPDES SHALL BE OBTAINED FOR THIS SITE.

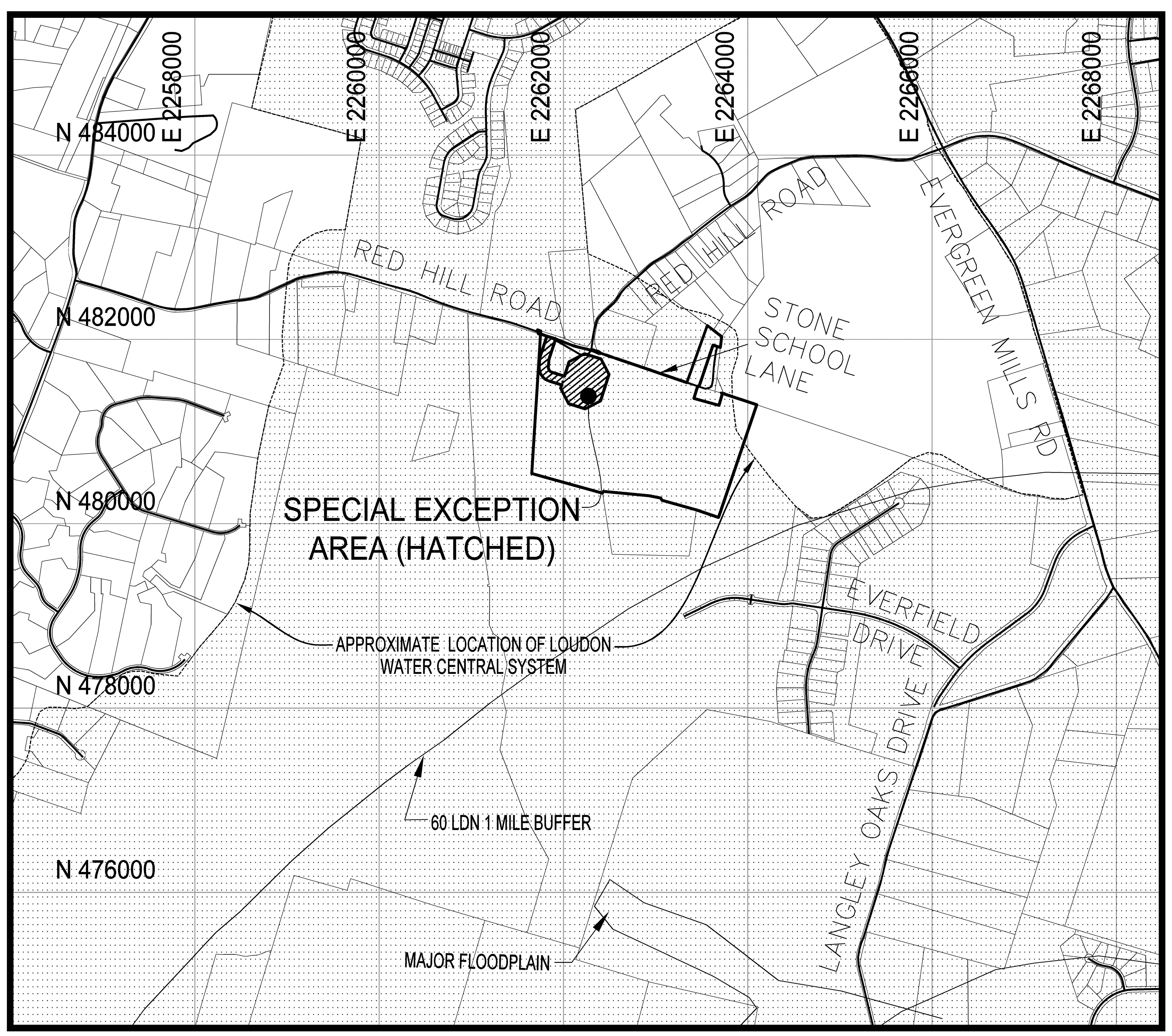
27. THE APPLICANT RESERVES THE RIGHT TO PHASE THE CONSTRUCTION OF THE TANKS DUE TO DEMAND. A MAXIMUM OF TWO WATER STORAGE TANKS WILL BE CONSTRUCTED ON SITE WITH TIMING OF TANK CONSTRUCTION PHASED ACCORDING TO DEMAND.

28. THE APPLICANT RESERVES THE RIGHT TO OBTAIN POSSIBLE CONSTRUCTION AND/OR SITE ACCESS FROM LAND TO THE SOUTH OF THE APPLICATION AREA VIA EVERFIELD DRIVE, IF AVAILABLE IN THE FUTURE. SEE NOTE ON SHEET #4.

29. THE APPLICANT SHALL COMPLY WITH ALL VDOT PERMIT REQUIREMENTS RELATED TO ANY CONSTRUCTION ACCESS FROM RED HILL ROAD, INCLUDING ANY REQUIRED TRAFFIC MANANGEMENT PLANS.

LEGEND:

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING TREE LINE
- PROPOSED LIMITS OF CLEARING & GRADING
- BRL LINE
- PROPOSED FENCE
- 25.6 EXISTING SPOT ELEVATION
- +25.60 PROP. SPOT ELEVATION
- EXISTING WETLANDS
- EXISTING CURB (CG-6)
- EXISTING FLOODPLAIN
- 74B SOIL LINE AND DESIGNATION
- EXISTING ACCESS ROAD
- PROPOSED STORM DRAIN
- PROPOSED ACCESS DRIVE
- LOUDON WATER CENTRAL SYSTEM AREA



VICINITY MAP
SCALE : 1"= 1000'

ZONING TABULATIONS

1. CURRENT ZONE: TR-3UBF (TRANSITIONAL RESIDENTIAL-3 DISTRICT)
2. PROPOSED USE: PUBLIC UTILITY, WATER STORAGE TANKS
3. MINIMUM PARCEL AREA: 1/2 ACRE (PER SECTION 5-621 (A))
4. TOTAL LOT AREA = 5.1081 ACRES (TANK PARCEL ONLY, SEE GENERAL NOTE #1)
5. YARDS: (BASED ON ZONING - SEE SHEET #5 FOR TANK SETBACKS AND SHEET #7 FOR HEIGHTS)
   FRONT YARD: 12 FEET MIN
   REAR YARD: 25 FEET MIN
   SIDE YARD: 7 FEET MIN
6. OPEN SPACE REQUIRED: 50% (2.59 AC)
   OPEN SPACE PROVIDED: 84% (4.78 AC)
7. MAXIMUM BUILDING HEIGHT: 40 FEET - (HEIGHT REQUIREMENT DOES NOT APPLY PURSUANT TO SECTION 1-103(D)(2). WATER TANKS ARE SETBACK FROM THE PROPERTY LINE A DISTANCE EQUAL TO THE HEIGHT)
8. MAXIMUM HEIGHT OF WATER TANKS: 189 FEET - (WATER TANKS ARE SETBACK AT LEAST 189 FEET FROM THE PROPERTY LINE)
9. A MIN. TYPE 4 BUFFER YARD IS REQUIRED PURSUANT TO SECTION 5-621(B). IN LIEU OF A 6-FOOT HIGH FENCE OR BERM IN THE BUFFER YARDS, THE APPLICANT REQUESTS APPROVAL TO PROVIDE A BLACK VINYL CHAIN LINK FENCE WITH BARB WIRE AT THE TOP, A MAXIMUM OF 10' HIGH, FOR SECURITY REASONS. FENCING WILL HAVE BLACK WEBBING/SLATS TO ACHIEVE 95% OPACITY. THE FENCE WILL BE LOCATED OUTSIDE THE BUFFER BETWEEN BUFFER LANDSCAPING AND THE WATER STORAGE TANKS. FINAL LOCATION TO BE DETERMINED WITH FINAL ENGINEERING. AT THE REQUEST OF THE COUNTY, ALL BUFFER PLANTINGS SHALL CONSIST OF EVERGREEN TREES.

NOTE: WATER STORAGE TANKS ARE SUBJECT TO SECTION 5-621, PUBLIC UTILITY STANDARDS

PARKING TABULATIONS

USE: PUBLIC UTILITY, WATER STORAGE TANKS

PARKING SPACES REQUIRED
REGULAR PARKING SPACES = MAXIMUM # OF VEHICLES ANTICIPATED ON SITE AT ONE TIME = 1

LOADING SPACES = 1

PARKING SPACES PROVIDED
REGULAR PARKING SPACES = 1
LOADING SPACES = 1

SHEET INDEX

OWNER

RANDOLPH D. ROUSE
6407 WILSON BLVD
ARLINGTON, VA 22205-1506

SIGNATURE: RANDOLPH D. ROUSE

APPLICANT

LOUDOUN COUNTY SANITATION AUTHORITY D.B.A.
LOUDOUN WATER
44865 LOUDOUN WATER WAY
ASHBURN, VIRGINIA 20146
MAILING ADDRESS: P.O. BOX 4000
ASHBURN, VIRGINIA 20146
(571) 291-7700

SIGNATURE: FRED JENNINGS, LCSA GENERAL MANAGER

No.	DATE	DESCRIPTION
		REVISIONS

PLAN DATE
12-12-13
01-13-14
03-28-14

urban
Planners Engineers Landscape Architects Land Surveyors
Urban, Ltd.
4200-D Technology Court
Chantilly, Virginia 20151
Tel. 703.642.2306
www.urban-ltd.com

COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
3/28/14
PROFESSIONAL ENGINEER

COVER SHEET
LOUDOUN WATER
600 ZONE WATER STORAGE TANKS
BLUE RIDGE ELECTION DISTRICT
LOUDOUN COUNTY, VIRGINIA

SCALE: AS NOTED | C.I.: N/A | DATE: MAR, 2014

SHEET 1 OF 8

SE-12729

Urban, Ltd. - J:\JOBS\Loudoun Water\Willowsford\Rouse Property Studies\SPEX\12729-01-Cover.dwg [COVER-1] March 28, 2014 - 12:37pm aharms

Attachment 7

Urban, Ltd. – J:\JOBS\Loudoun Water\Willowsford\Rouse Property Studies\SPEX\12729-02- Adjacent Property Owners.dwg [Adj Property Owners] March 28, 2014 – 12:38pm aharms

LEGEND

AREA OF PARCEL NOT SUBJECT TO THIS APPLICATION

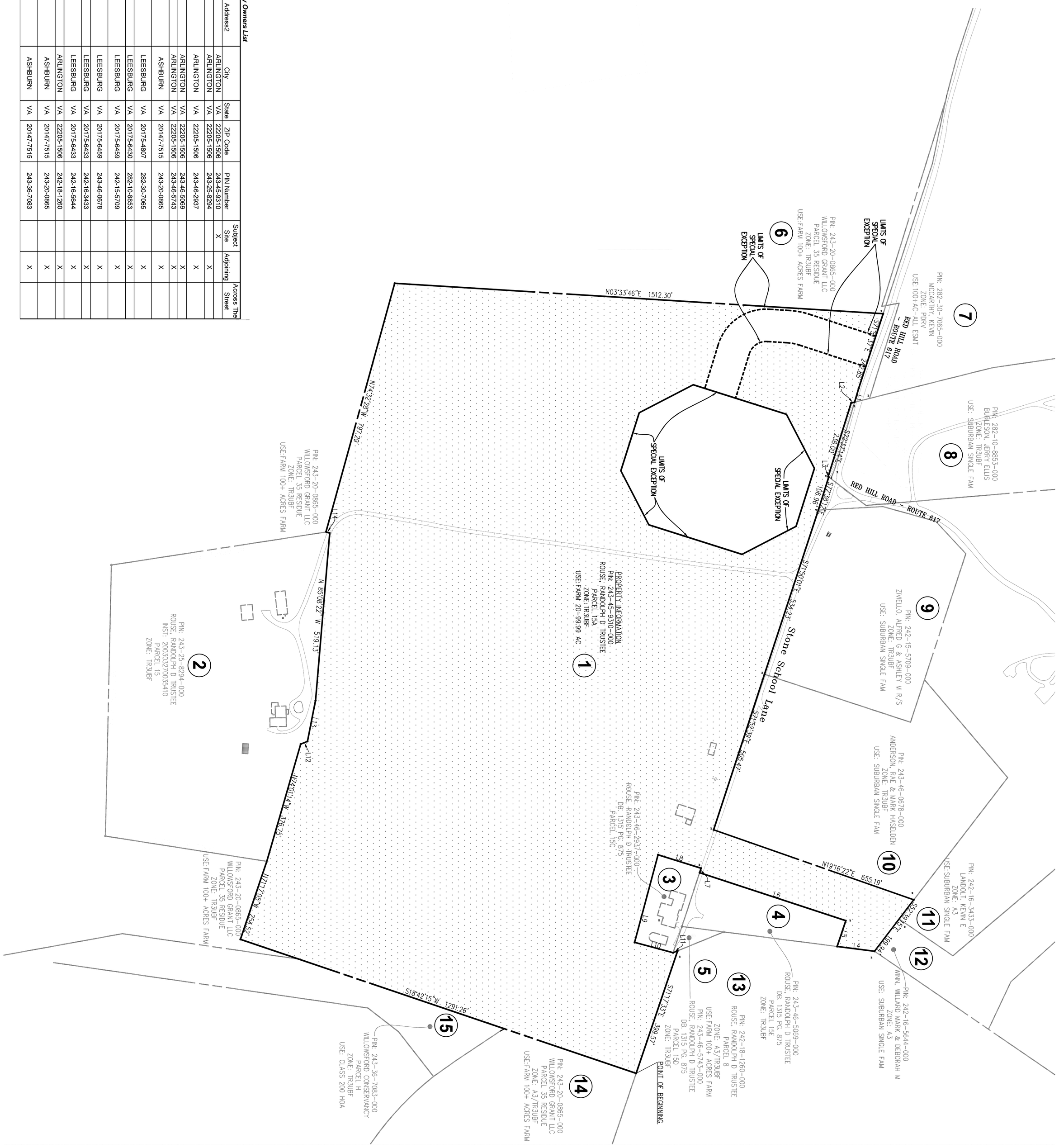
VA. STATE GRID NORTH

0 75 150 300 450

SCALE – 1 inch = 150 ft.

Adjoining Property Owners List

Label	First Name	Last Name	Parcel	Company Name	Address1	Address2	City	State	ZIP Code	PIN Number	Subject Site	Adjoining	Across The Street
1	RANDOLPH D	ROUSE	15A		6407 WILSON BLVD		ARLINGTON	VA	22205-1506	243-45-9310	X		
2	RANDOLPH D	ROUSE	15		6407 WILSON BLVD		ARLINGTON	VA	22205-1506	243-25-8294		X	
3	RANDOLPH D	ROUSE	15C		6407 WILSON BLVD		ARLINGTON	VA	22205-1506	243-46-2937		X	
4	RANDOLPH D	ROUSE	15E		6407 WILSON BLVD		ARLINGTON	VA	22205-1506	243-46-5069		X	
5	RANDOLPH D	ROUSE	15D		6407 WILSON BLVD		ARLINGTON	VA	22205-1506	243-46-5743		X	
6			35	WILLOWSFORD LLC	44095 PIPELINE PLAZE STE 140		ASHBURN	VA	20147-7515	243-20-0865		X	
7	KEVIN	MCCARTHY			41181 BLACK BRANCH PKWY		LEESBURG	VA	20175-4807	282-30-7065		X	
8	JERRY	BURLESON			41202 RED HILL RD		LEESBURG	VA	20175-6430	282-10-8853		X	
9	ALFRED & ASHLEY	ZIVIELLO			41230 STONE SCHOOL LN		LEESBURG	VA	20175-6459	242-15-5709		X	
10	RAE & MARK	ANDERSON			41272 STONE SCHOOL LN		LEESBURG	VA	20175-6459	243-46-0678		X	
11	KEVIN	LANDOLT			41329 RED HILL RD		LEESBURG	VA	20175-6433	242-16-3433		X	
12	WILLARD & DEBORAH	WINN			41325 RED HILL RD		LEESBURG	VA	20175-6433	242-16-5644		X	
13	RANDOLPH D	ROUSE	8		6407 WILSON BLVD		ARLINGTON	VA	22205-1506	242-18-1260		X	
14			35	WILLOWSFORD LLC	44095 PIPELINE PLAZE STE 140		ASHBURN	VA	20147-7515	243-20-0865		X	
15			H	WILLOWSFORD LLC	44095 PIPELINE PLAZE STE 140		ASHBURN	VA	20147-7515	243-36-7083			



ADJACENT PROPERTY OWNERS LIST

LOUDOUN WATER
600 ZONE WATER STORAGE TANKS

BLUE RIDGE ELECTION DISTRICT
LOUDOUN COUNTY, VIRGINIA

SCALE: 1"=150' C.I. : N/A DATE: MAR, 2014

COMMONWEALTH OF VIRGINIA
ROBERT W. BROWN
Lic. No. 037041
3/28/14
PROFESSIONAL ENGINEER

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Planners Engineers Landscape Architects Land Surveyors

PLAN DATE
12-12-13
01-13-14
03-28-14

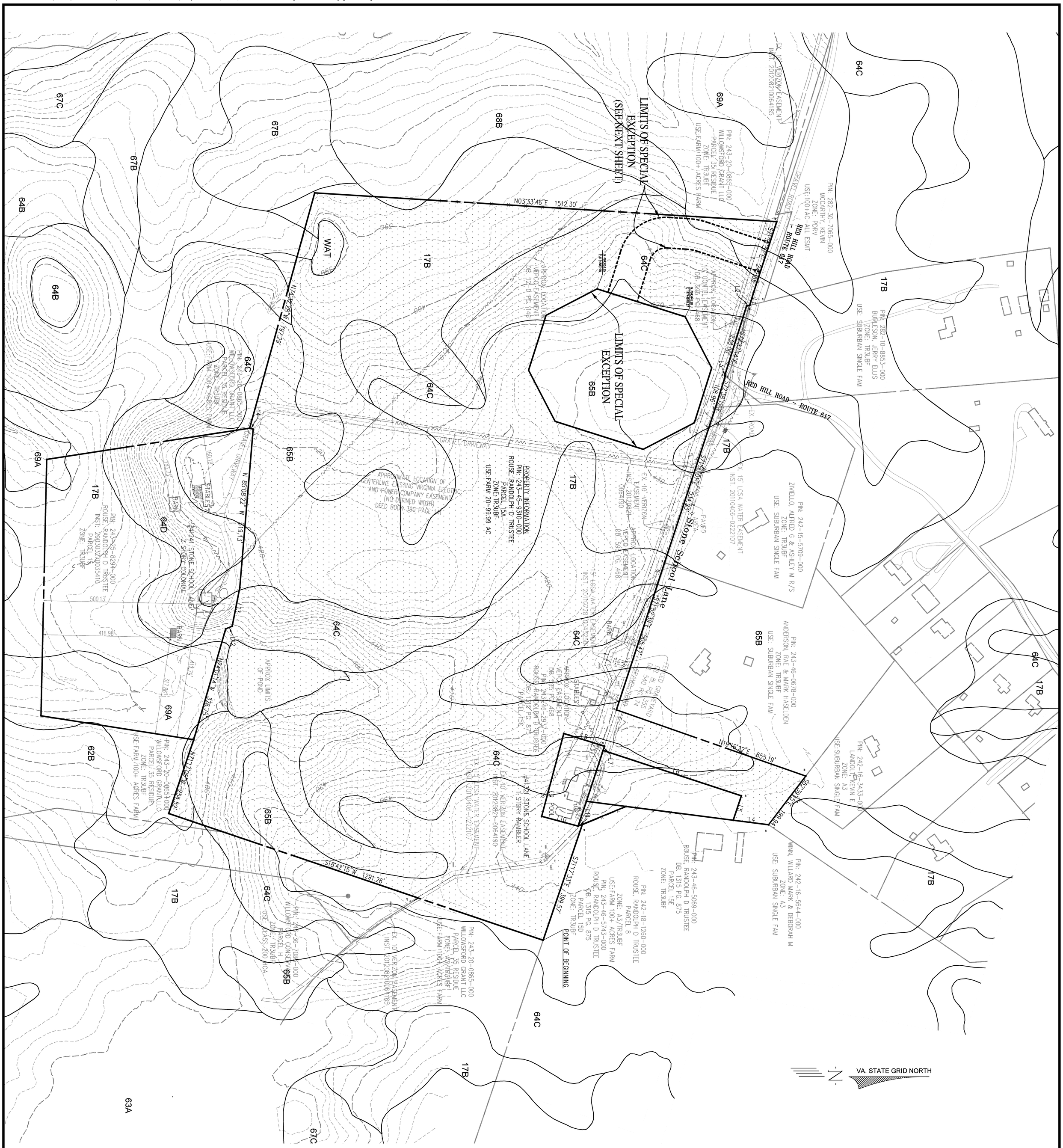
No.	DATE	DESCRIPTION

REVISIONS

SHEET 2 OF 8

SE-12729

Urban, Ltd. – J:\JOBS\Loudoun Water\Willowsford\Rouse Property Studies\SPEX\12729-03- Existing Conditions.dwg [ex. cond] March 28, 2014 – 12:38pm aharms



LEGEND

SEE ALSO LEGEND ON SHEET #1

AREA OF PARCEL NOT SUBJECT TO THIS APPLICATION

GROUND COVER INFORMATION

WITHIN THE LIMITS OF THE SPECIAL EXCEPTION IS ALMOST ENTIRELY FIELDS. FIELDS ARE IN THE LOCATION OF THE PROPOSED STORAGE TANKS. MIXED HARDWOODS ARE ALONG EXISTING STONE SCHOOL LANE AND RED HILL ROAD.

COVER MIXED HARDWOODS

COVER OPEN FIELD

SOILS INFORMATION

NUMBER	NAME	CLASS
17B	MIDDLEBURG SILT LOAM (1-7%)	III W
64C	LEGORE LOAM (8-15%)	III R
65B	MONTALTO SILTY CLAM LOAM (3-8%)	II I

SOILS NOTES :

1. THE SUBJECT DEVELOPMENT SITE CONTAINS CLASS III OR IV SOILS, PER THE LATEST COUNTY SOILS MAP AND AS IDENTIFIED BY THE INTERPRETATIVE GUIDE TO SOILS MAPS, LOUDOUN COUNTY, VIRGINIA.

0 75 150 300 450

SCALE – 1 inch = 150 ft.

EXISTING CONDITIONS PLAN

LOUDOUN WATER
600 ZONE WATER STORAGE TANKS

BLUE RIDGE ELECTION DISTRICT
LOUDOUN COUNTY, VIRGINIA

SCALE: 1"=150' C.I. : 2' DATE: MAR, 2014

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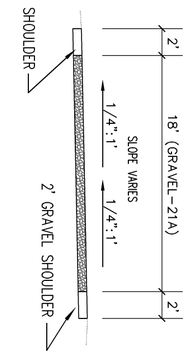
REVISIONS

SHEET 3 OF 8

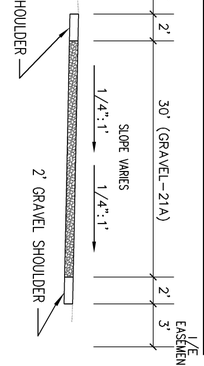
SE-12729

TYPICAL CROSS SECTION
PROP. ACCESS DRIVE NEAR TANK*



*NOTE:
GRAVEL DRIVE UNTIL SUCH TIME A FINAL ROAD LOCATION IS DETERMINED. DUE TO THE PRESENCE OF CLASS III OR CLASS IV SOILS PAVEMENT SECTION TO BE DETERMINED AT FINAL SITE PLAN BASED ON GEOTECHNICAL RECOMMENDATIONS.

TYPICAL CROSS SECTION
PROP. ACCESS DRIVE AT RED HILL ROAD



LINE	BEARING	DISTANCE
L1	S73°23'41"E	44.24'
L2	S13°56'29"E	10.95'
L3	N37°23'01"E	2.29'
L4	S07°18'49"W	116.48'
L5	N71°27'24"W	83.96'
L6	S18°11'03"W	475.48'
L7	N71°51'17"W	14.39'
L8	S17°17'17"W	139.21'
L9	S75°01'04"E	280.00'
L10	N15°02'39"E	123.21'
L11	N22°19'36"W	15.06'
L12	N22°10'14"W	22.81'
L13	N78°55'14"W	128.66'
L14	S13°50'50"W	12.00'

SHEET 4 OF 8

SE-12729

OVERVIEW PLAN

LOUDOUN WATER
600 ZONE WATER STORAGE TANKS

BLUE RIDGE ELECTION DISTRICT
LOUDOUN COUNTY, VIRGINIA

SCALE: 1":150' C.I. : 2' DATE: MAR, 2014

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REVISIONS

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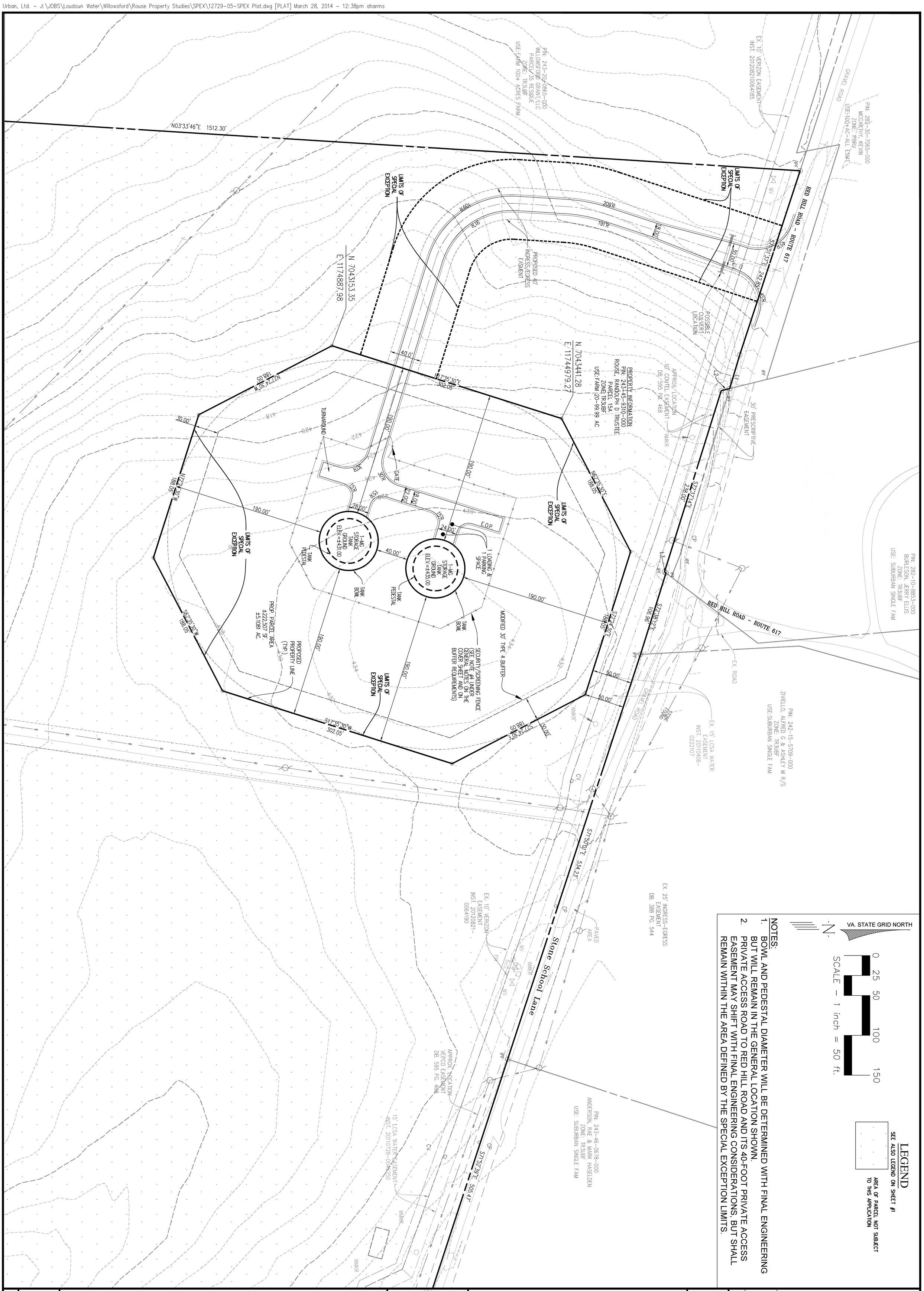

VA. STATE GRID NORTH

SCALE – 1 inch = 50 ft.

0 25 50 100 150

NOTES:

1. BOWL AND PEDESTAL DIAMETER WILL BE DETERMINED WITH FINAL ENGINEERING BUT WILL REMAIN IN THE GENERAL LOCATION SHOWN.
2. PRIVATE ACCESS ROAD TO RED HILL ROAD AND ITS 40-FOOT PRIVATE ACCESS EASEMENT MAY SHIFT WITH FINAL ENGINEERING CONSIDERATIONS, BUT SHALL REMAIN WITHIN THE AREA DEFINED BY THE SPECIAL EXCEPTION LIMITS.

LEGEND

SEE ALSO LEGEND ON SHEET #1

AREA OF PARCEL NOT SUBJECT TO THIS APPLICATION

SPECIAL EXCEPTION PLAT

LOUDOUN WATER
600 ZONE WATER STORAGE TANKS

BLUE RIDGE ELECTION DISTRICT
LOUDOUN COUNTY, VIRGINIA

SCALE: 1"=50' C.I. : 2' DATE: MAR, 2014

SHEET 5 OF 8

SE-12729

COMMONWEALTH OF VIRGINIA
Robert Brown
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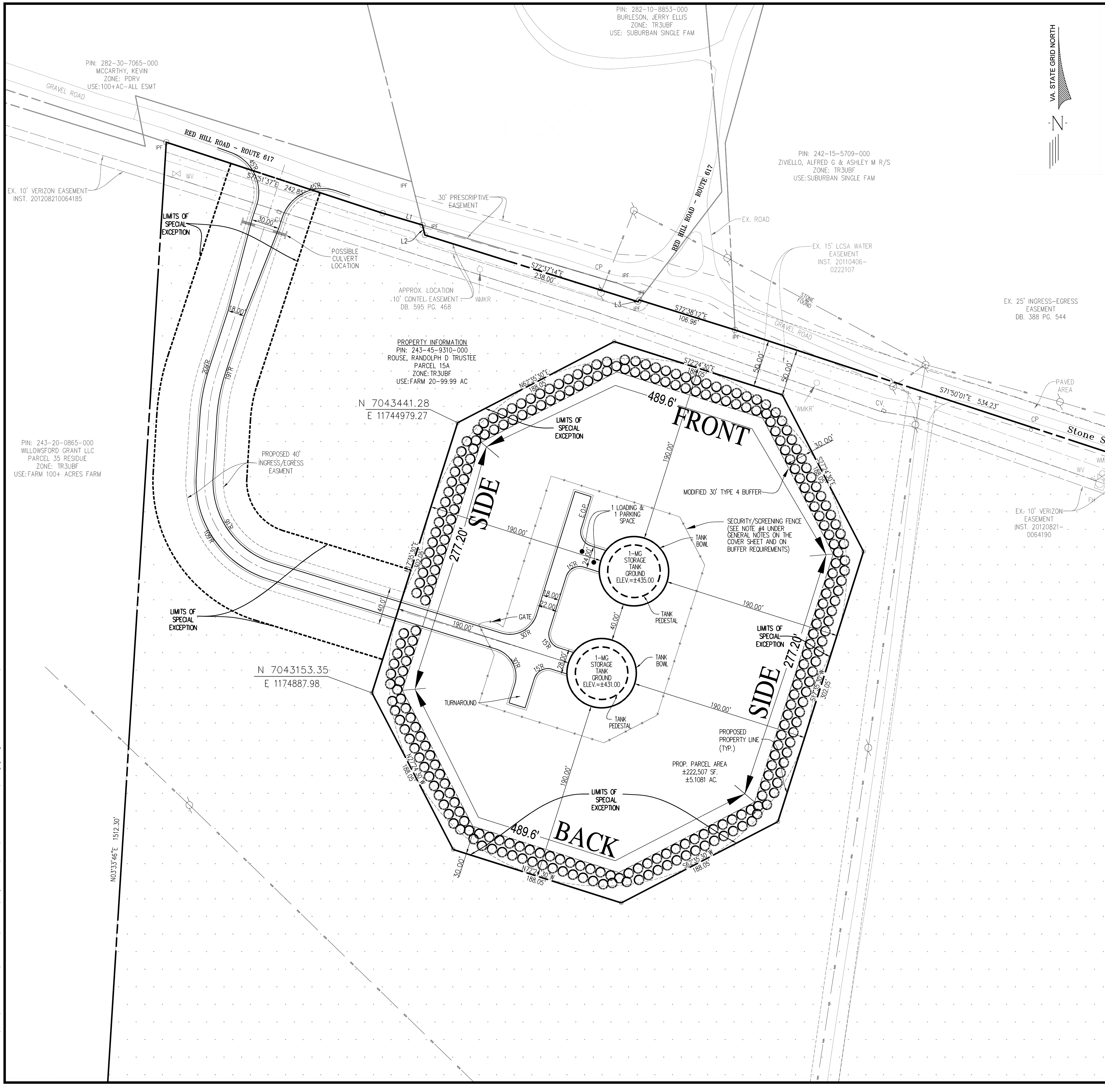

LEGEND:

SEE ALSO LEGEND ON SHEET #1

○ EVERGREEN TREE

AREA OF PARCEL NOT SUBJECT TO THIS APPLICATION

TYPE 4 BUFFER YARD REQUIREMENTS

PURSUANT TO SECTION 5-621(B)

FRONT YARD BUFFER WIDTH NORTH)	REQUIRED PLANT UNITS* PER 100 LINEAL FEET	PROVIDED PLANT UNITS* PER 489.6 LINEAL FEET
20' MINIMUM 30' MAXIMUM	4 CANOPY TREES 3 UNDERSTORY TREES 20 SHRUBS 0 EVERGREEN TREES	0 CANOPY TREES 0 UNDERSTORY TREES 0 SHRUBS 90 EVERGREEN TREES
SIDE YARD BUFFER WIDTH (EAST)	REQUIRED PLANT UNITS PER 100 LINEAL FEET	PROVIDED PLANT UNITS PER 277.20 LINEAL FEET
25' MINIMUM 30' MAXIMUM	2 CANOPY TREES 5 UNDERSTORY TREES 10 SHRUBS 8 EVERGREEN TREES	0 CANOPY TREES 0 UNDERSTORY TREES 0 SHRUBS 49 EVERGREEN TREES
SIDE YARD BUFFER WIDTH (WEST)	REQUIRED PLANT UNITS PER 100 LINEAL FEET	PROVIDED PLANT UNITS PER 277.20 LINEAL FEET
25' MINIMUM 30' MAXIMUM	2 CANOPY TREES 5 UNDERSTORY TREES 10 SHRUBS 8 EVERGREEN TREES	0 CANOPY TREES 0 UNDERSTORY TREES 0 SHRUBS 46 EVERGREEN TREES
REAR YARD BUFFER WIDTH (SOUTH)	REQUIRED PLANT UNITS PER 100 LINEAL FEET	PROVIDED PLANT UNITS PER 489.6 LINEAL FEET
25' MINIMUM 30' MAXIMUM	2 CANOPY TREES 5 UNDERSTORY TREES 10 SHRUBS 8 EVERGREEN TREES	0 CANOPY TREES 0 UNDERSTORY TREES 0 SHRUBS 90 EVERGREEN TREES

*SPMI 2013-0010 NOTE:
A SIX FOOT HIGH FENCE, WALL, OR BERM PROVIDING A MINIMUM OPACITY OF 95% IS REQUIRED WITH A TYPE 4 BUFFER YARD. IN LIEU OF A 6-FOOT HIGH FENCE OR BERM IN THE BUFFER YARDS, THE APPLICANT REQUESTS APPROVAL TO PROVIDE A BLACK VINYL CHAIN LINK FENCE WITH BARB WIRE AT THE TOP, A MAXIMUM OF 10' HIGH, FOR SECURITY REASONS. FENCING WILL HAVE BLACK WEBBING/SLATS TO ACHIEVE 95% OPACITY. THE FENCE WILL BE LOCATED OUTSIDE THE BUFFER BETWEEN BUFFER LANDSCAPING AND THE WATER STORAGE TANKS. FINAL LOCATION TO BE DETERMINED WITH FINAL ENGINEERING.

AT THE REQUEST OF THE COUNTY, ALL PROPOSE PLANT MATERIAL SHALL CONSIST OF EVERGREENS.

NOTES:
1. BOWL AND COLUMN DIAMETER WILL BE DETERMINED WITH FINAL ENGINEERING BUT WILL REMAIN IN THE GENERAL LOCATION SHOWN.
2. BUFFER PLANTINGS MAY BE ADJUSTED AT FINAL DESIGN TO ACCOMMODATE UNDERGROUND UTILITIES AND ACCESS.

0 25 50 100 150
SCALE – 1 inch = 50 ft.

LANDSCAPE PLAN AND COMPUTATIONS

LOUDOUN WATER
600 ZONE WATER STORAGE TANKS

BLUE RIDGE ELECTION DISTRICT
LOUDOUN COUNTY, VIRGINIA

SCALE: 1"=50' | C.I.: N/A | DATE: MAR, 2014

SHEET 6 OF 8

SE-12729

COMMONWEALTH OF VIRGINIA — ROBERT W. BROWN — Lic. No. 037041 — 5/28/14 — PROFESSIONAL ENGINEER

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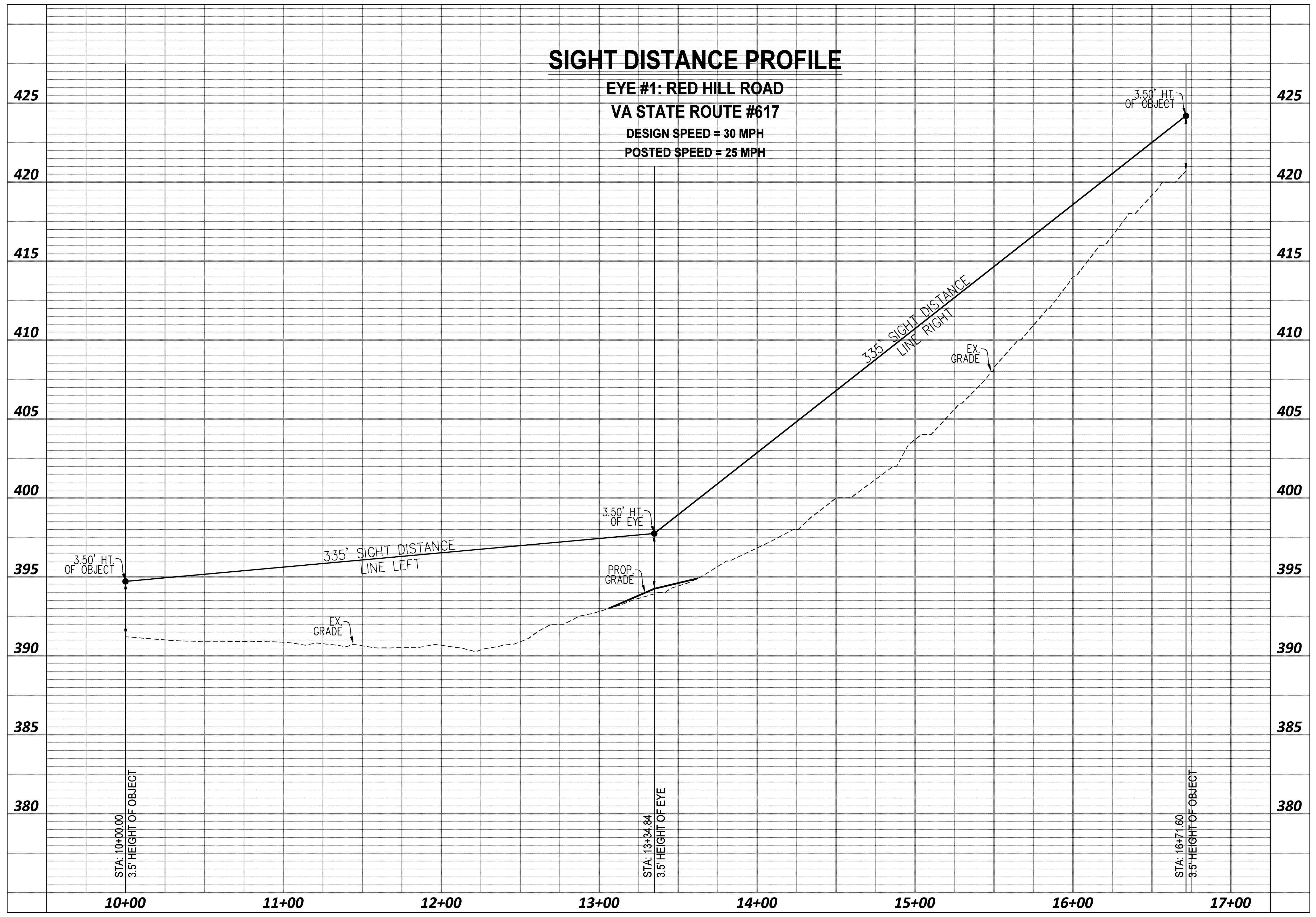
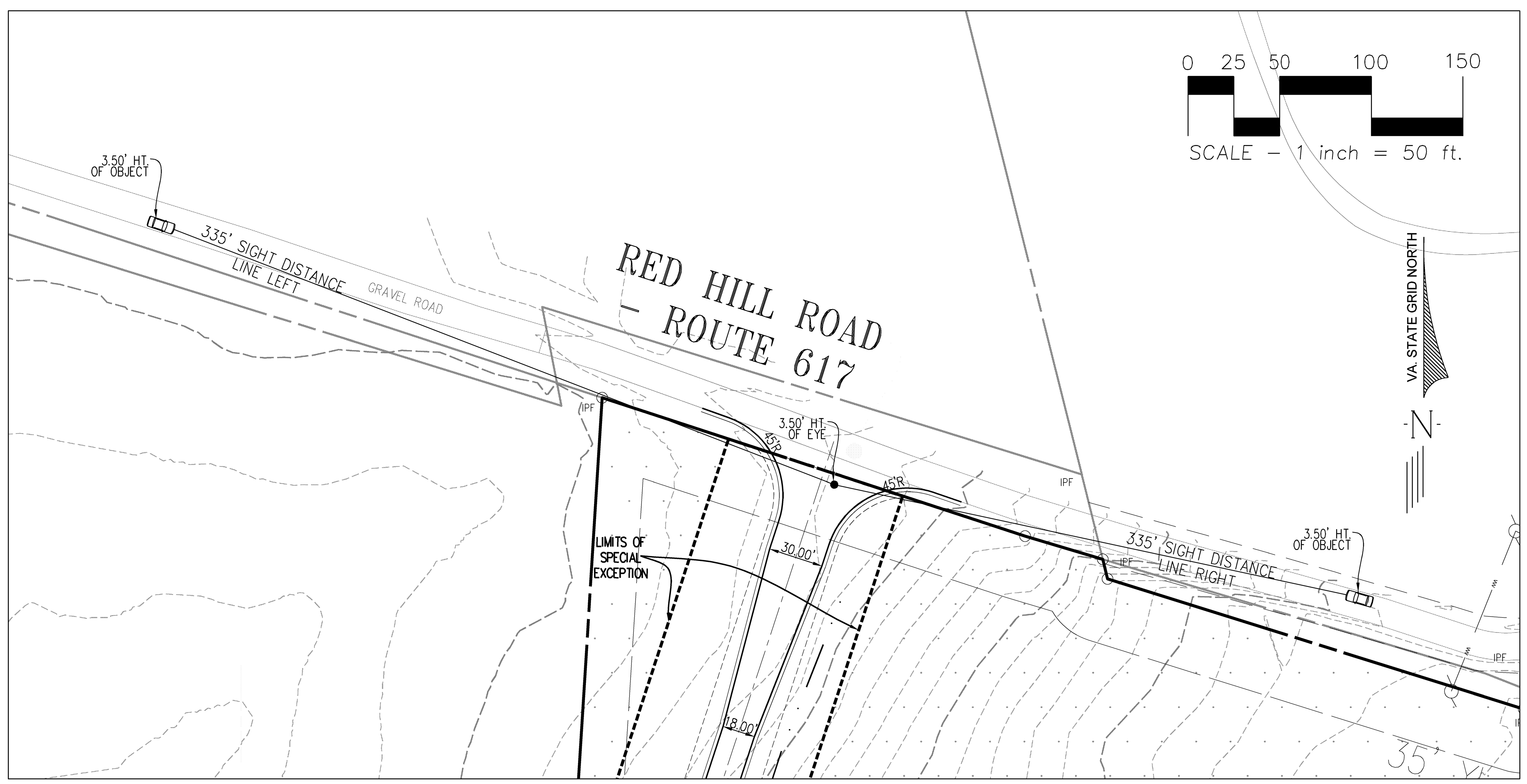
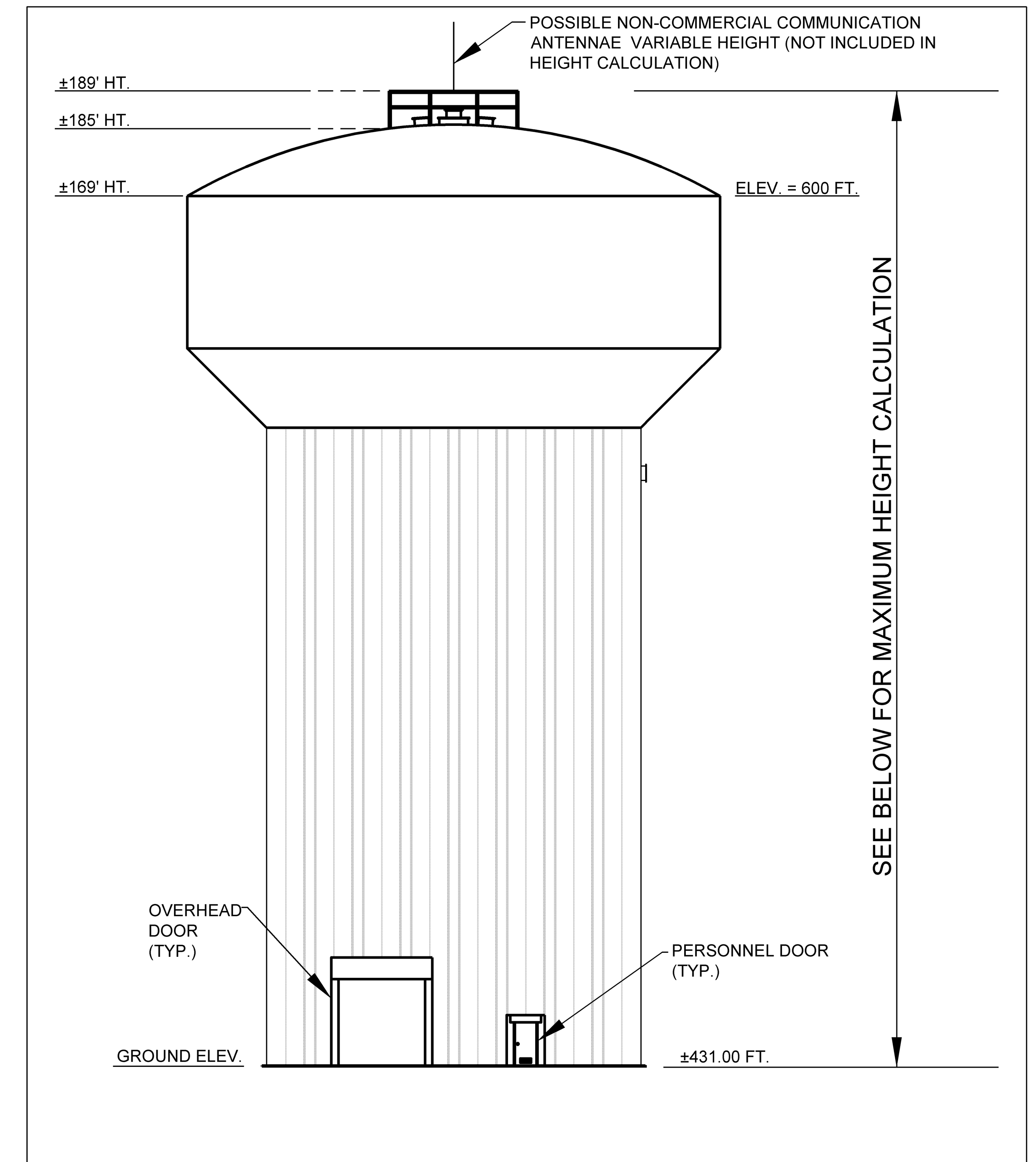
01-13-14
03-28-14

No.	DATE	DESCRIPTION
		REVISIONS





SIGHT-DISTANCE PLAN VIEW
SCALE 1"=50'



ELEVATION DETAIL
NOT TO SCALE

NOTE: THIS ELEVATION SHOWN IS ILLUSTRATIVE AND IS INTENDED TO CONVEY THE GENERAL ELEVATION CONCEPT OF THE FACILITY. THOUGH THE DETAILS OF THE ARCHITECTURAL DESIGN MAY BE MODIFIED AS THE PROJECT PROGRESSES THROUGH FINAL DESIGN, THE FINAL DESIGN WILL BE SIMILAR TO THAT SHOWN. THE MAXIMUM HEIGHT WILL NOT EXCEED: 189 FEET.

MAXIMUM HEIGHT CALCULATION:
620' TOP OF RAILING – 431' GROUND ELEV. = 189' MAX. HT.

*NON-COMMERCIAL COMMUNICATIONS ANTENNAE ATTACHED TO TOP OF HANDRAIL. MAX. HEIGHT 11-FEET (NOT INCLUDED IN HEIGHT CALCULATION)

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COMMONWEALTH OF VIRGINIA
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3/28/14
PROFESSIONAL ENGINEER

TANK ELEVATION DETAIL AND SIGHT DISTANCE EXHIBIT
LOUDOUN WATER
600 ZONE WATER STORAGE TANKS
BLUE RIDGE ELECTION DISTRICT
LOUDOUN COUNTY, VIRGINIA

SCALE: AS SHOWN C.I.: 2' DATE: MAR, 2014

SHEET 7 OF 8

SE-12729

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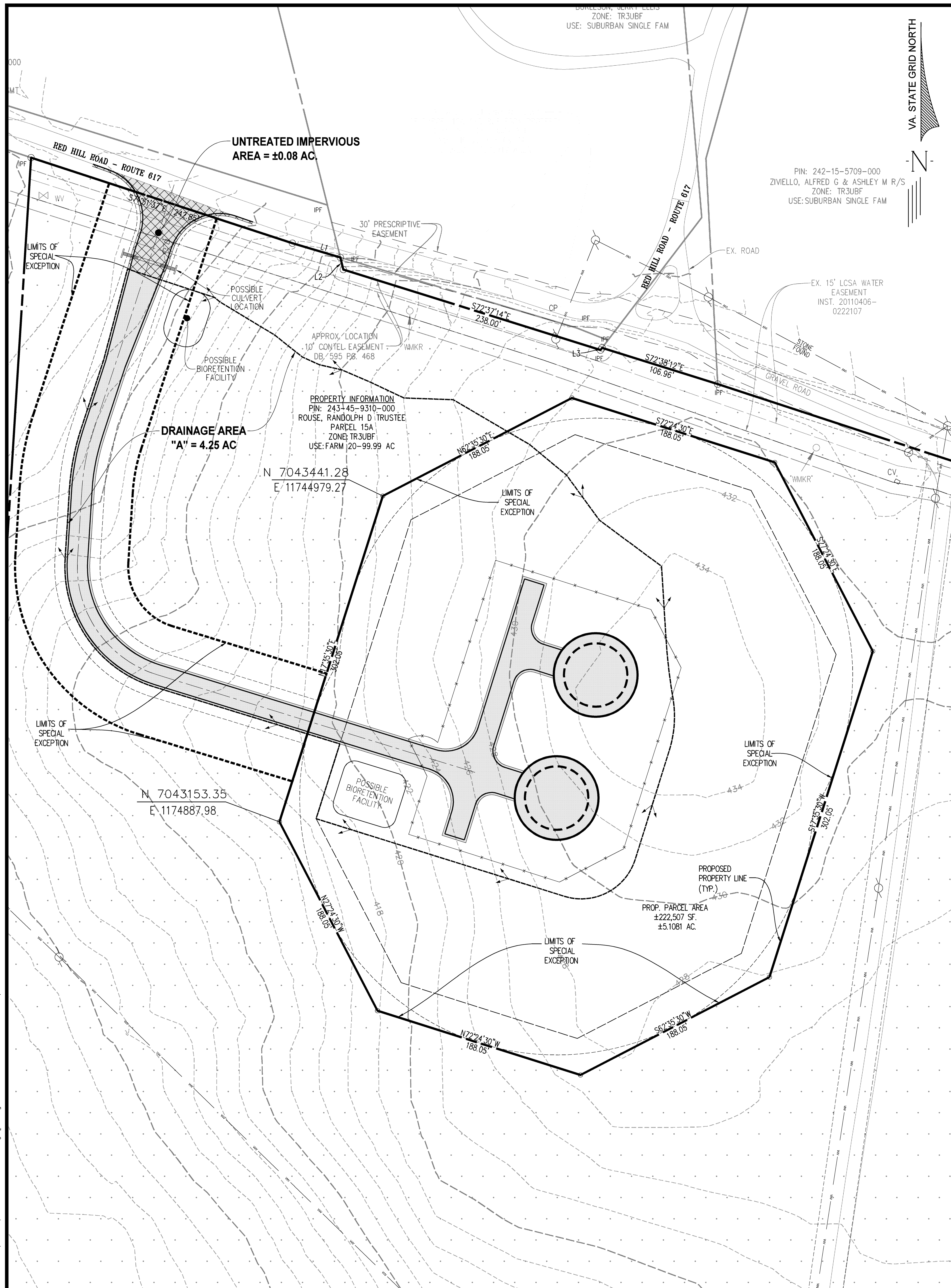

LEGEND

SEE ALSO LEGEND ON SHEET #1

0 30 60 120 180

SCALE - 1 inch = 60 ft.

AREA OF PARCEL NOT SUBJECT TO THIS APPLICATION

PROPOSED IMPERVIOUS AREA: 0.80 AC

PROPOSED UNTREATED IMPERVIOUS AREA: 0.08 AC

DRAINAGE DIVIDES

TOTAL PHOSPHOROUS REMOVAL REQUIRED ON SITE (lb/yr)	1.66
TOTAL RUNOFF REDUCTION IN D.A. A (cf)	2,162
PHOSPHORUS REMOVAL FROM RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	1.87

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

Virginia Runoff Reduction Method Worksheet -- Revised -- 03/25/2011 - Redevelopment
Site Data

Project Name: 600 Zone Water Storage Tanks Special Exception
Date: 3/28/2014

Post-Development Project & Land Cover Information

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Phosphorus EMC (mg/L)	0.26
Target Phosphorus Target Load (lb/acre/yr)	0.41
Pj	0.90

Nitrogen EMC (mg/L) 1.86

Pre-Development Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	1.88	2.45	0.00	4.33
Impervious Cover (acres)	0.00	0.00	0.00	0.00	0.00
				Total	4.33

Post-Development Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	1.54	1.99	0.00	3.53
Impervious Cover (acres)	0.00	0.34	0.46	0.00	0.80
				Total	4.33

Rv Coefficients

	A soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

Land Cover Summary
Pre-Development

Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	4.33
Weighted Rv(turf)	0.21
% Managed Turf	100%
Impervious Cover (acres)	0.00
Rv(impervious)	0.95
% Impervious	0%
Total Site Area (acres)	4.33
Site Rv	0.21
Pre-Development Treatment Volume (acre-ft)	0.0763
Pre-Development Treatment Volume (cubic feet)	3,321
Pre-Development Load (TP) (lb/yr)	2.09

Land Cover Summary
Post-Development

Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	3.53
Weighted Rv(turf)	0.21
% Managed Turf	82%
Impervious Cover (acres)	0.80
Rv(impervious)	0.95
% Impervious	18%
Total Site Area (acres)	4.33
Site Rv	0.35
Post-Development Treatment Volume (acre-ft)	0.1255
Post-Development Treatment Volume (cubic feet)	5,466
Post-Development Load (TP) (lb/yr)	3.43

Maximum % Reduction Required Below Pre-Development Load	20%
Total Load (TP) Reduction Required (lb/yr)	**1.66**

Pre-Development Load (TN) (lb/yr)	14.93
Post-Development Load (TN) (lb/yr)	24.57

Drainage Area A Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	1.46	1.99	0.00	3.45
Impervious Cover (acres)	0.00	0.34	0.46	0.00	0.80
				Total	4.25

Site Results
Phosphorous

TOTAL PHOSPHOROUS LOAD REDUCTION REQUIRED (LB/YEAR)	1.66	
RUNOFF REDUCTION (cf)	2162	
PHOSPHOROUS LOAD REDUCTION ACHIEVED (LB/YR)	1.87	
ADJUSTED POST-DEVELOPMENT PHOSPHOROUS LOAD (TP) (lb/yr)	1.57	
REMAINING PHOSPHOROUS LOAD REDUCTION (LB/YR) NEEDED		CONGRATULATIONS!! YOU EXCEEDED THE TARGET REDUCTION BY 0.2 LB/YEAR!!

SWM/BMP NARRATIVE

WATER QUALITY AND QUANTITY FOR THE SITE IS IN ACCORDANCE WITH THE REQUIREMENTS OF THE VIRGINIA RUNOFF REDUCTION METHOD (VRRM). SWM/BMP MEASURES SHOWN ON THIS SHEET ARE SUBJECT TO CHANGE WITH FINAL DESIGN ENGINEERING.

A MAJORITY OF THE SUBJECT SITE SHEET FLOWS EAST OF THE SITE INTO AN UNNAMED STREAM AND EVENTUALLY INTO A POND. NO TREATMENT IS NECESSARY AS THERE IS NO INCREASE IN IMPERVIOUS AREA. PLEASE REFERENCE THIS SHEET FOR DRAINAGE DIVIDE INFORMATION.

DRAINAGE AREA "A", AS DENOTED ON THIS SHEET, ACCOUNTS FOR THE REMAINDER OF THE SITE AND LIMITS OF SPECIAL EXCEPTION, AS WELL AS A LARGE MAJORITY OF THE PROPOSED IMPERVIOUS AREA. DRAINAGE AREA "A" ULTIMATELY FLOWS NORTHWEST TO THE PROPOSED ENTRANCE OF THE SPECIAL EXCEPTION AREA. THERE ARE TWO (2) POSSIBLE BIORETENTION AREAS SHOWN ON THIS SHEET - THE PROPOSED RUNOFF GENERATED WITHIN DRAINAGE AREA "A" WILL TRAVEL TO THESE POSSIBLE AREAS VIA DRAINAGE SWALES, AND OUTFALL TO THE WEST VIA A CULVERT LOCATED AT THE ENTRANCE OF THE SPECIAL EXCEPTION AREA.

PER VIRGINIA DCR STORMWATER DESIGN SPECIFICATION NO. 9, THE FACILITY PROVIDES A 40 PERCENT ANNUAL RUNOFF VOLUME REDUCTION AND A 25 PERCENT TOTAL PHOSPHOROUS REDUCTION BY BMP TREATMENT PROCESS. DUE TO THE POST DEVELOPMENT CONDITIONS OF THE SPECIAL EXCEPTION AREA, A PHOSPHOROUS LOAD REDUCTION OF 1.66 LB/YR IS REQUIRED. AS A RESULT OF CONSTRUCTING A POSSIBLE BIORETENTION FACILITY(IES) FOR THE SUBJECT SITE, A PHOSPHOROUS LOAD REDUCTION OF 1.87 LB/YR IS ACHIEVED. THEREFORE, THE FACILITY IS MORE THAN ADEQUATE TO HANDLE THE POST-DEVELOPMENT PHOSPHOROUS LOAD FROM THE SPEX AREA.

THE POSSIBLE BMP FACILITY(IES) SHALL BE PRIVATELY MAINTAINED BY THE PROPERTY OWNER. VIRGINIA'S STORMWATER MANAGEMENT REGULATIONS REQUIRE INSPECTIONS TWICE A YEAR, AND AFTER ANY STORM EVENT THAT EXCEEDS THE CAPACITY OF THE FACILITY TO ENSURE THAT THE FACILITIES REMAIN OPERATIONAL. A DETAILED INSPECTION SHALL BE PERFORMED ANNUALLY BY A QUALIFIED PROFESSIONAL IN ORDER TO ENSURE THAT THE FACILITIES ARE OPERATIONAL AS DESIGNED, AND TO PROVIDE AN OPPORTUNITY TO SCHEDULE ANY MAINTENANCE THAT THE FACILITIES MAY REQUIRE.

Apply Runoff Reduction Practices to Reduce Treatment Volume & Post-Development Load in Drainage Area A

Credit	Unit	Description of Credit	Credit	Credit Area (acres)	Volume from Upstream RR Practice (cf)	Runoff Reduction (cf)	Remaining Runoff Volume (cf)	Phosphorus Efficiency (%)	Phosphorus Load from Upstream RR Practices (lbs)	Untreated Phosphorus Load to Practice (lbs.)	Phosphorus Removed By Practice (lbs.)	Remaining Phosphorus Load (lbs.)	Downstream Treatment to be Employed
6.Bioretention													
6.a. Bioretention or Urban Bioretention (Spec #9)	impervious acres draining to bioretention	40% runoff volume reduction	0.40	0.80	0	1104	1655	25	0.00	1.73	0.95	0.78	
	turf acres draining to bioretention	40% runoff volume reduction	0.40	3.45	0	1059	1588	25	0.00	1.66	0.91	0.75	

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PRELIMINARY BMP COMPUTATIONS

LOUDOUN WATER
600 ZONE WATER STORAGE TANKS

BLUE RIDGE ELECTION DISTRICT
LOUDOUN COUNTY, VIRGINIA

SCALE: 1"=60' C.I.: 2' DATE: MAR, 2014

SHEET 8 OF 8

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