Statement of Justification
CMPT-2009-0006
SPEX-2009-0020
SPEX-2009-0033
SPMI-2009-0009
Commission Permit and Special Exception Application for
Future Water Storage in an Existing Quarry (Water Storage Tank);
Special Exception for the Location of a Use Required for the Operation of a Public Utility in the Floodplain
Minor Special Exception Modifying Requirements for Required Type 4 Buffer
Parcel 29 (TM 61; MCPI# 114-25-6156)
Loudoun Water - Applicant
June 1, 2009
Revised October 19, 2009
Revised January 8, 2010

Summary of Project Proposal

Loudoun Water (Applicant) proposes to use "Quarry A" (Property), an existing diabase rock quarry totaling 34.71 acres for water storage once mining operations are completed. This quarry comprises the special exception application area and is part of the 80.61-acre Parcel 29 located to the east of Goose Creek and north of the W&OD Trail. Other quarry- related commercial uses are located on the same parcel to the east and are not included in this special exception application.

Parcel 29 is zoned MR-HI as are adjacent parcels to the north and south, beyond the W&OD Trail. Existing residential and non-residential structures are located to the north while a second quarry, "Quarry B", is located to the south. Goose Creek is located between 70/150 feet west of the Property and forms the western boundary of Parcel 29. Jack Pit Lane, a private road, provides access to the Property from Belmont Ridge Road, Rt. 659 farther to the east.

Quarries A and B are part of Luck Stone Corporation's Leesburg Plant mining operation which also includes an approved, future quarry to the west, across Goose Creek. Loudoun Water has an agreement with Luck Stone Corporation to utilize Quarry A for water storage when mining operations have been completed, currently estimated to be in the 2017-2020 timeframe. Quarry A is a key component of Loudoun Water's Central Water Supply Program, as described below, and it provides the potential for Loudoun Water to store up to 1 billion gallons of water for future use in the area served by the Central Water Supply System.

Background

Loudoun Water's Long-Range Planning Efforts to Satisfy Anticipated Needs for the Central Water Supply System

Loudoun Water currently provides public water to residential and non residential customers within an area identified by Loudoun County as the Central Water Supply System (See Exhibit 1). Loudoun Water obtains 57 million gallons per day (MGD) of water to serve this area from Fairfax Water and the City of Fairfax. Loudoun County land use plans and related demographic projections have been used by Loudoun Water to forecast that more water will be needed to meet future demand in the Central Water Supply System by 2035-2040 (total estimate needed: 90 MGD) even as efforts continue to reduce peak demands through implementation of a wise water use program and proactive demand management strategies. On December 11, 2008, the

Loudoun Water Board of Directors gave approval for the proposed Potomac River Water Supply and Raw Water Storage Program ("Central Water Supply Program"), a two-phased program to meet current and projected needs for the next 30 years by withdrawing raw, non-potable water directly from the Potomac River, storing it for future use in existing quarries, and processing finished drinking water at a new water treatment facility.

Loudoun Water's Central Water Supply Program

The Loudoun Water Board of Directors' action was a culmination of years of effort that included long-range planning, alternatives analysis, negotiation between potential partners and outreach to community interests. Alternatives included increasing the amount of water purchased from Fairfax Water, and the purchase and upgrade of an existing water treatment plant owned and operated by the City of Fairfax.

Fairfax Water utilizes an integrated system to provide Loudoun Water up to 50 MGD of water from the Potomac River and the Occoquan Reservoir. This system provides a dependable source of water and was evaluated as an alternative to the proposed water storage option. However, significant costs are associated with the water volume necessary to meet Loudoun County's needs and include the cost of upgrading Fairfax Water's existing intake on the Potomac River, extending and additional 35 miles of finished water lines through both developed and natural areas of Loudoun and Fairfax Counties (instead of the of the 8 miles contemplated with the proposed Central Water Supply Program) and incurring ongoing operating costs of a system that requires the pumping of water between elevations that differ by as much as 340 feet.

The City of Fairfax obtains water from the Goose Creek Reservoir and existing agreements allocate up to 7 MGD to Loudoun Water as available. Droughts in recent years have diminished stream flow in Goose Creek, however, and Loudoun Water has only been able to reliably depend upon 3 MGD from this source. While Loudoun Water has approached the City with offers to purchase and upgrade the existing water treatment plant, the City remains committed to ownership and operation of its own water treatment facility.

Loudoun Water could construct a water treatment plant on land it owns along the Potomac River, to the west of the River Creek community. However, development constraints associated with this property as well as its size (less than half the acreage of the proposed site) limits the amount of open space that can be used to augment minimum buffer requirements along the property's boundary, next to existing residential development. Moreover, the parcel is not located near current and future Loudoun Water customers who will need to be served by the expanded water supply. Nor is it located in proximity to raw water storage sites and finished water storage tanks that are part of the Central Water Supply System.

Loudoun Water's decision to build its own Potomac River water supply, to better locate its future water treatment plant near an existing/future customer base, and to utilize quarries for water storage was made in light of the factors cited above.

Components of the Central Water Supply Program

Loudoun Water's Central Water Supply Program consists of individual components: a raw water intake and pump station at the Potomac River, a water treatment plant on a parcel located approximately 1 mile southwest of the Application Property, and raw water storage (Water Banking – see below) in one or more quarries owned by Luck Stone Corporation that are located in between the two other components. Exhibit 2 is provided for illustrative purposes only, to portray the manner in which components of the proposed Central Water Supply Program relate

to each other and to other quarry sites that may provide potential opportunities for Water Banking opportunities in the future.

Raw Water Intake and Pump Station

The Central Water Supply Program includes a water intake to be located in the Potomac River and on a 23 acre riverfront property that Loudoun Water acquired in 1993. Raw water will be pumped from the river and conveyed to the remaining components of the system. Revised General Plan policy recommends that Loudoun Water may provide its own water supply option along the Potomac River. Use of this parcel for an intake was shown on an approved concept plan associated with the River Creek rezoning (ZMAP 1989-0015), and the pump station that is part of the intake component is permitted as a by-right use per the Loudoun County Zoning Ordinance. As a result, neither a commission permit nor a special exception is required for this use. However State and Federal permits are required for the intake and other system components, and these will be obtained.

Water Banking: Raw Water Storage in Existing Quarries

Key to the Central Water Supply Program is a unique concept described as Water Banking; using retired quarries that have been fully mined for water storage. Raw, non potable water is deposited in the quarries during times when Potomac River flows are normal to high, and then withdrawn in lieu of continued withdrawals from the river during times of drought or excess turbidity. In this way sufficient water can be treated to serve the demands of Central Water Supply System customers without impacts to the river or to the water supply needs of other jurisdictions.

Loudoun Water's public/private partnership and business agreements with Luck Stone are instrumental to implementing the Water Banking concept. Four quarries situated in proximity to each other as well as to Loudoun Water's proposed water treatment plant afford the opportunity to store up to eight billion gallons of water and minimize Loudoun Water's withdrawals from the Potomac during less optimal times. An agreement between Loudoun Water and Luck Stone provides Loudoun Water the opportunity to use Luck's quarry located north of the W&OD Trail and east of Goose Creek ("Quarry A") for Water Banking. It is Quarry A that is currently the subject of this set of applications. It is anticipated that approximately 1 billion gallons of water will be able to be stored in this quarry alone once mining operations are complete in the 2017-2020 timeframe. In this manner, Loudoun Water will be able to use quarries for a beneficial public purpose.

Water Treatment Plant

The Central Water Supply Program envisions a water treatment plant being constructed in two phases on a parcel located approximately one mile southwest of the Application Property. Phase I will result in the construction of a 20 MGD facility by approximately 2016 to serve the short term water needs of the Central Water Supply System. The fully expanded 40 MGD facility will provide for future needs to the 2035-2040 timeframe. Water from either the Potomac River or Water Banking site(s) will be processed into finished drinking water at the treatment facility. From there it will enter the Central Water Supply System via a finished water line that extends under Goose Creek to an existing water line along Belmont Ridge Road, Rt. 659, connecting to local water lines and to Loudoun Water's Broadlands and Brambleton water tanks located approximately 1.6 and 4 miles to the south, respectively.

Comprehensive Plan and Policy Considerations Relative to the Proposed Commission Permit and Special Exception; Compliance with Plan Objectives

The Property is located in the Suburban Policy Area per the Loudoun County Revised General Plan. Quarries in the Suburban Policy Area are governed by the Green Infrastructure Policies of

the Plan, and those policies specifically recommend that the County encourage the innovative and sensitive reuse of quarries and resource extraction sites (Chapter 5, Mineral Resource Extraction Policy #8. In 2008, Loudoun County's Environmental Policy and Program Assessment recognized that quarries could be converted for water storage purposes (page 66).

- *Compliance with Plan Policies: Use of the Property for water storage is an opportunity to reclaim Quarry A for a beneficial public purpose once mining operations have been completed.*

The Revised General Plan recommends that Loudoun Water continue to be responsible for the provision and extension of public water service in the Suburban Policy Area and Transition Policy Area (Chapter 2, General Water/Sewer Policy # 7). It notes that other water supply options to those that already exist (i.e. water from Fairfax City and Fairfax Water) can be considered for the Suburban and Transition Policy Areas (Chapter 2, General Water Policy #2). A Potomac River water facility is an identified option. The Plan includes a recommendation for the County and Loudoun Water to cooperate in developing long-range plans for water supply and impoundment sites (General Water Policy #6).

- *Compliance with Plan Policies: The proposed use supports Loudoun Water's responsibility to insure the adequate and efficient supply of water for the Central Water Supply System that serves the Suburban and Transition Policy Areas of the County. Water from the Potomac River will be stored in accordance with Loudoun Water's adopted Potomac River Water Supply Program as described above.*

The Revised General Plan notes that open space is to be located so as to create and supplement a 300 foot buffer along Goose Creek (Community Design Policy #13; Scenic Rivers and Potomac River Policy #1).

Compliance with Plan Policies: The water feature that will result once Quarry A is reclaimed in accordance with the proposed use will supplement the Plan-recommended Goose Creek no-build buffer.

Zoning and Related Conditions Relative to the Proposed Water Storage Facility

The Property has been a quarry since the 1880's and it became an unintended water impoundment area when Hurricane Agnes caused Goose Creek to overflow its boundaries and flood quarry in 1972. The water remained in the quarry for approximately twenty-one years until Luck Stone Corporation pumped the water out in order to resume mining operations.

Use of the Property for water storage will become effective only after mining operations have ceased. At that time the quarry cavity will have the potential to hold over one billion gallons of water. Exhibit 3 illustrates the status of the Quarry A mining operation in early 2008, the manner in which the quarry will be mined over time, and the total water volume that can be anticipated upon completion of quarry operations. Luck Stone estimates that it will take between eight and eleven years to fully mine the Property.

Welded wire black fencing will be provided around the perimeter of the Property as described below with regard to the proposed Type 4 Buffer modification. This type of fencing provides for necessary security for the water supply and a safety measure for the general public.

Zoning Requirements

Two special exception applications and a minor special exception application have been filed in accordance with these Zoning Ordinance provisions in support of the proposed water storage use. The use of a quarry for water storage meets the Zoning Ordinance definition for a "water storage tank" as it is a ".... other facility for the storage of water for supply to a water system";

- The proposed use is permitted in the MR-HI District by Special Exception.
- The proposed use is also a "structure or use required for the operation of a public utility", permitted by Special Exception in a Floodplain Overlay District per Section 4-1506D.
- Section 5-621 of the Zoning Ordinance requires a Type 4 Buffer for Loudoun Water (LCSA) facilities, but the requirement can be modified with approval of a minor special exception pursuant to Zoning Ordinance Section 5-600.

The proposed use complies with the provisions of Sec. 6-1310 of the Zoning Ordinance as follows:

(A) Whether the proposed special exceptions are consistent with the Comprehensive Plan.

- *Response: Specific references to Plan compliance have been cited in the section entitled "Comprehensive Plan and Policy Considerations Relative to the Proposed Commission Permit and Special Exception; Compliance with Plan Objectives". Use of the Property for water storage is an opportunity to reclaim an existing quarry once mining operations have been completed and to do so in a way that supports the Plan's public water supply policies. Reclaiming the quarry for water storage will not increase flood heights or velocities and may reduce impacts from flooding because the fully mined quarry will have at least twenty feet of unused volume even after the water storage facility is fully operational.*

(B) Whether the proposed special exceptions will adequately provide for safety from fire hazards and have effective measures of fire control.

Response: *By the very nature of the proposed water storage use, fire hazards and fire control should not be a concern.*

(C) Whether the level and impact of any noise emanating from the site, including that generated by the proposed use, negatively impacts the uses in the immediate area.

Response: No noise impacts are anticipated from the proposed water storage use.

(D) Whether the glare or light that may be generated by the proposed use negatively impacts uses in the immediate area.

Response: Lighting will be provided for safety and security measures only. Lighting will be directed downward so as to reduce glare and spillover unless safety and security measures dictate otherwise.

(E) Whether the proposed use is compatible with other existing or proposed uses in the neighborhood and adjacent parcels.

Response: The proposed water storage facility will be compatible with uses on adjacent parcels.

(F) Whether sufficient existing or proposed landscaping, screening and buffering on the site and in the neighborhood to adequately screen surrounding uses.

Response: Sufficient landscaping exists to screen and buffer surrounding uses from the proposed use, particularly in light of the fact that future water storage will be at an elevation that is at least twenty feet below the quarry rim. Existing mature trees and vegetation, and an existing embankment both to the north and west completely screen the proposed use from a residential use (north) and Goose Creek (west). Existing mature trees and vegetation along the parcel boundary to the south screens the proposed use from the W&OD Trail. To the east, very little landscaping exists. However, landscaping would not be effective in screening the water in the quarry from existing quarry-related industrial and commercial uses because they have been developed on land that is at a higher elevation than the quarry. Water storage in a retired quarry will be a passive use and one that is less intensive than surrounding uses, both existing and permitted. It is for these reasons that a minor special exception has been filed to permit existing vegetation north, west and south of the quarry to satisfy buffer requirements for the proposed use.

(G) Whether the proposed special exceptions will result in the preservation of any topographic or physical, natural, scenic, archaeological or historic feature of significant importance.

Response: None of the above-cited features exist because the Property is a stone quarry and the site of an active mining operation.

(H) Whether the proposed special exceptions will damage existing animal habitat, vegetation, water quality (including groundwater) or air quality.

Response: The proposed use will not damage these features because the Property is a stone quarry and the site of an active mining operation.

(I) Whether the proposed special exceptions at the specified location will contribute to or promote the welfare or convenience of the public.

Response: The proposed use will promote the general public welfare by insuring that a sufficient supply of water is available to meet current and projected demands for water in the Central Water Supply System, that it is done in the most cost effective manner for the benefit of Loudoun Water customers who obtain water through that system, and that it is done without negative impacts to the environment or surrounding land uses.

(J) Whether the traffic expected to be generated by the proposed use will be adequately and safely be served by roads, pedestrian connections and other transportation services.

Response: Anticipated traffic generated by the proposed water storage use is minimal, estimated to be an average of one trip per day from Belmont Ridge Road when water is being stored or withdrawn from the quarry. Pedestrian access within the Property will not be permitted for security and safety reasons.

(K) Whether, in the case of existing structures proposed to be converted to uses requiring a special exception, the structures meet all code requirements of Loudoun County.

Response: The Property is an actively mined stone quarry. None of the mining-related structures will be converted under the proposed use.

(L) Whether the proposed special exceptions will be served adequately by essential public facilities and services.

Response: The proposed water storage use does not require public facilities and services. Water lines to and from the facility will be extended by Loudoun Water as necessary to connect the water storage use to other Central Water Supply Program components.

(M) The effect of the proposed special exceptions on groundwater supply.

Response: Groundwater impacts are not anticipated with the water storage use because of the dense nature of the remaining diabase rock that will line the quarry cavity. Any existing fissures will be properly sealed prior to water storage activity.

(N) Whether the proposed use will affect the structural capacity of the soils.

Response: The proposed use will not affect the structural capacity of the rock that remains after quarry operations have been completed.

(O) Whether the proposed use will negatively impact orderly and safe road development and transportation.

Response: The proposed use will not negatively impact orderly and safe road development and transportation. Vehicle trips will average one trip per day during those times when water is either being pumped to or withdrawn from the facility.

(P) Whether the proposed special exception use will provide desirable employment and enlarge the tax base by encouraging economic development activities consistent with the Comprehensive Plan.

Response: The proposed water treatment facility is a public use which will not, in and of itself, enlarge the tax base. However it will provide employment opportunities during the time it is being reclaimed for the proposed use.

(Q) Whether the proposed special exception considers the needs of agriculture, industry, and businesses in future growth.

Response: The proposed use will more effectively provide for the future water supply needs of industry and business in the areas served by the Central Water Supply System.

(R) Whether adequate on and off-site infrastructure is available.

Response: Waterlines will connect the proposed water storage facility to a planned intake on the Potomac River and a proposed water treatment plant that is the subject of a companion special exception application.

(S) Any anticipated odors which may be generated by the uses on site, and which may negatively impact adjacent uses.

Response: No odors will be generated by the proposed use.

(T) Whether the proposed special exceptions use sufficient measures to mitigate the impact of construction traffic on existing neighborhoods and school areas.

Response: There will be limited construction activity associated with the proposed use.

Portions of Quarry A are currently shown to be located within a major and minor floodplain. The proposed water storage use is a "use required for the operation of a public utility", and is permitted by Special Exception in a Floodplain Overlay District per Section 4-1506D. The proposed use complies with the provisions of Sec. 4-1507 of the Zoning Ordinance (Standards for a Special Exception) as follows:

(A) The proposed use will not increase the danger to life and property due to increased flood heights or velocities.

Response: The proposed use will not increase danger to life and property due to increased flood height or velocities. When the existing quarry is fully mined, the water level of the proposed water storage facility will be at the same approximate level as the water in Goose Creek (elevation 210). That elevation is over twenty feet below the lowest elevation of the quarry rim.

(B) The proposed use will not increase the danger that materials may be swept downstream to the injury of others.

Response: There will be no obstructions constructed within the floodplain, and therefore no materials will be swept downstream.

(C) The proposed water supply and sanitation systems are designed to prevent disease, contamination, and unsanitary conditions.

Response: There will be no sanitation system or potable water supply system constructed with the proposed use.

(D) The proposed use or structure must be located and designed to limit its susceptibility to flood damage, and available alternative locations, not subject to flooding, for the proposed use must be considered.

Response: Quarry A's walls consist of hard diabase rock and will not be susceptible to flood damage. Other nearby quarries have been considered and may be used in the future for water storage, but they cannot meet Loudoun Water's need for water storage by the 2017-2020 timeframe.

(E) The proposed use is compatible with existing and planned development.

Response: The proposed use is compatible with existing and planned development. The entire parcel is planned, zoned, and used for quarry and quarry-related uses. Reuse of the quarry for water storage is also consistent with the provisions of the Revised General Plan, and is less intensive than other existing or permitted uses in the MR-HI District.

(F) The proposed use is in harmony with the comprehensive plan.

Response: Reuse of retired quarries for water storage is in harmony and consistent with the provisions of the Comprehensive Plan. The Property is located in the Suburban Policy Area per the Loudoun County Revised General Plan. Quarries in the Suburban Policy Area are governed by the Green Infrastructure Policies of the Plan, and those policies specifically recommend that the County encourage the innovative and sensitive reuse of quarries and resource extraction sites (Chapter 5, Mineral Resource Extraction Policy #8. In 2008, Loudoun County's Environmental Policy and Program Assessment recognized that quarries could be converted for water storage purposes (page 66).

(G) The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters expected at the site should not cause significant damage.

Response: When the existing quarry is fully mined, the water level of the proposed water storage facility will be at the same approximate level as the water in Goose Creek (elevation 210). That elevation is over twenty feet below the lowest elevation of the quarry rim. The proposed use should not, therefore, affect expected heights, velocity, duration, rate of rise and sediment transport of any flood waters expected at the site and should therefore not cause significant damage

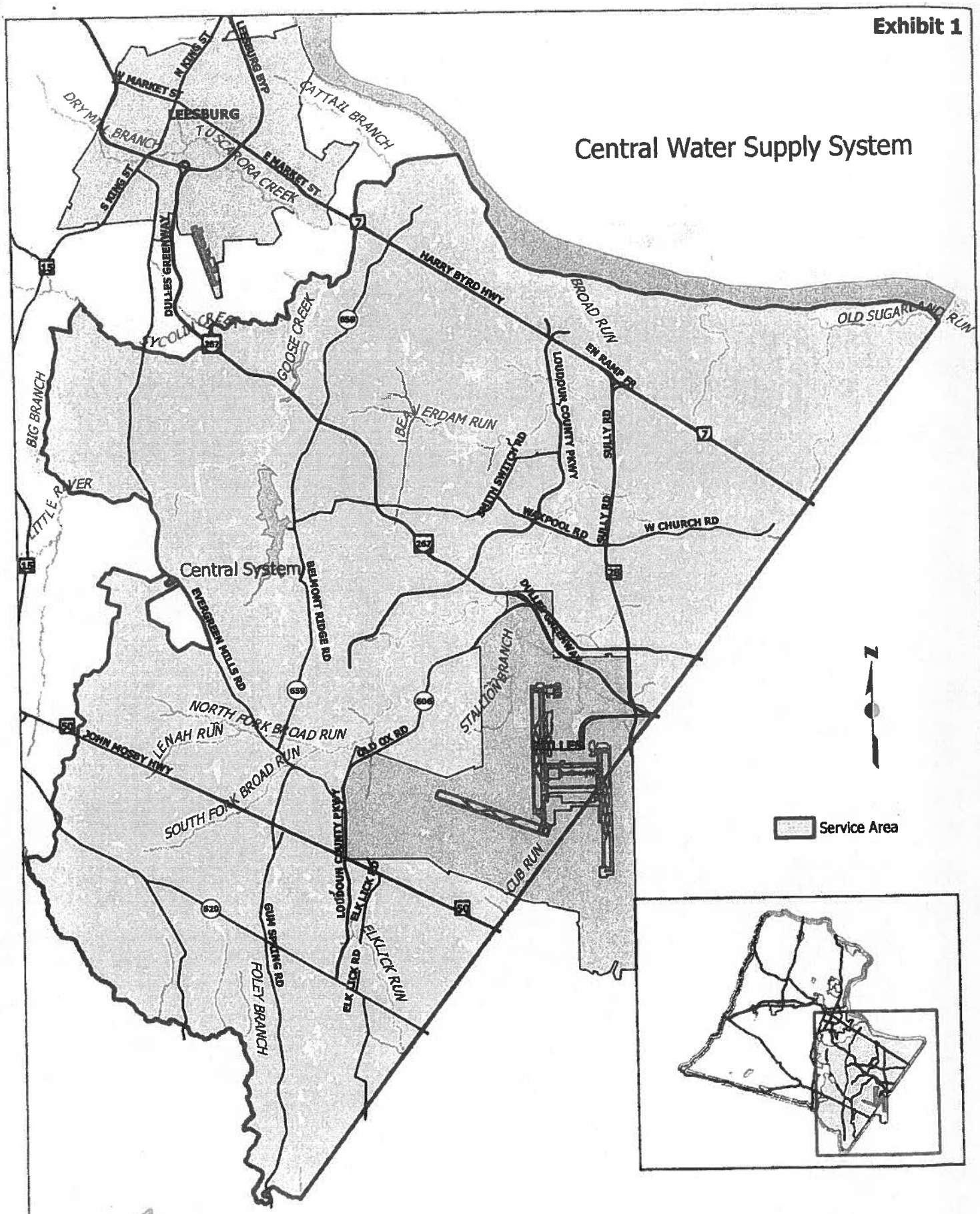
As previously mentioned, Section 5-621 of the Zoning Ordinance requires a Type 4 Buffer for Loudoun Water (LCSA) facilities, but the requirement can be modified with approval of a minor special exception pursuant to Zoning Ordinance Section 5-600. The minor special exception included in the application requests that existing vegetation be permitted in lieu of a standard Type 4 buffer and that a ten foot black vinyl coated chain link fence as described below be permitted in lieu of six foot fencing that provides for a minimum of 95% opacity. There are several factors which have led to the request for this modification:

- The buffering requirements in Section 5-621 do not differentiate between a heavy public utility such as a sewage treatment plant and a use as proposed in this application which is storing water in an existing quarry. The concept of a water storage facility is usually associated with above ground structures rising up to 175 feet above ground rather than in a quarry pit where water storage will largely go unseen. The impacts of this type of public utility are far less than those of all other public utility uses, so the Applicant requests that some discretion be used when applying the buffer requirements in Sect. 5-621.
- The same buffers that have provided screening for an active quarrying operation will remain in place for the more passive water storage use once the quarry has been retired. Existing vegetation along the northern and western boundaries of the parcel and the fact that the quarry rim is at a higher elevation than the parcel boundaries in these areas insures that the proposed water storage use will be screened from adjacent properties and Goose Creek. Along the southern boundary, existing mature trees and vegetation and the fact that that the ultimate water level elevation will be well below the quarry rim provide sufficient landscaping and buffering to screen the water storage use from the W&OD Trail.
- To the east, very little landscaping exists between the quarry and existing quarry-related commercial and industrial uses that are located on a hill above the quarry. Additional landscaping would be ineffective in screening the quarry from these uses because of the difference in elevation between uses. Water storage as proposed is the more passive use and it also does not seem necessary to screen this use from those that are more intensive. There is also very little activity associated with the proposed water storage use– possibly one vehicle trip per day for maintenance and inspection purposes. Further, as staff has noted, there is adequate vegetation and screening in most areas surrounding the special exception area, "more intensive than the required type 4 buffer in some areas".
- There are no structures associated with this public utility other than a water pump station which is a permitted use in the MR-HI District. Neither use will be visible to the north, south, or along Goose Creek to the west.
- The fencing that is proposed- ten foot high, black vinyl coated chain link with double strand barb wire - is standard fencing used by Loudoun Water to provide for safety and security around its facilities. Eliminating the requirement for a minimum of 95% opacity provides an additional security/safety measure to observe the water storage area from all directions at the quarry rim.

Conclusion

For the reasons cited above, use of the Property for water storage is appropriate, particularly in light of Revised General Plan recommendations which encourage the innovative reuse of existing quarries and in light of Loudoun Water's responsibility to provide an adequate supply of water to the Central Water Supply System in the most effective and cost efficient manner possible.

Exhibit 1



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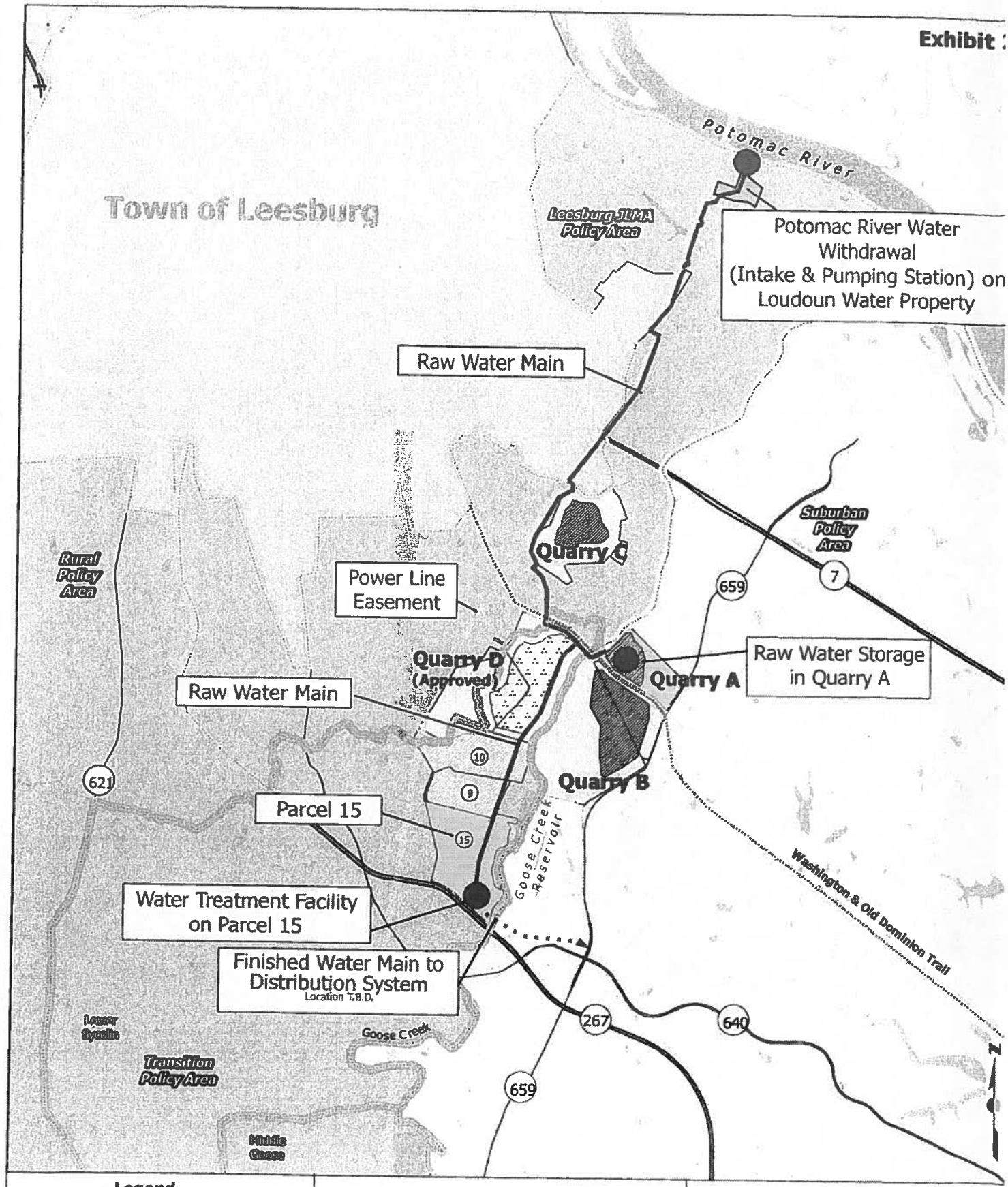
Exhibit 1
Potomac River
Town of Leesburg
Leesburg JLMA Policy Area
Potomac River Water Withdrawal (Intake & Pumping Station) on Loudoun Water Property
Raw Water Main
Suburban Policy Area
Rural Policy Area
Quarry C
Power Line Easement
659
7
Quarry D (Approved)
Raw Water Storage in Quarry A
Quarry A
Raw Water Main
10
621
9
Quarry B
Parcel 15
15
Goose Creek Reservoir
Washington & Old Dominion Trail
Water Treatment Facility on Parcel 15
Finished Water Main to Distribution System
Location T.B.D.
Lower Sycolin
Goose Creek
267
640
Transition Policy Area
659
Middle Goose
N
Legend
Parcels
Town
Major Powerline Easement
River/Stream
Central Water Supply Components
Existing Pit Based on 2008 Info
Future Pit
Policy Areas
JLMA
Rural
Suburban
Transition Area
LOUDOUN WATER
0 1,500 3,000 6,000 9,000 Feet
Central Water Supply Program
February 2009
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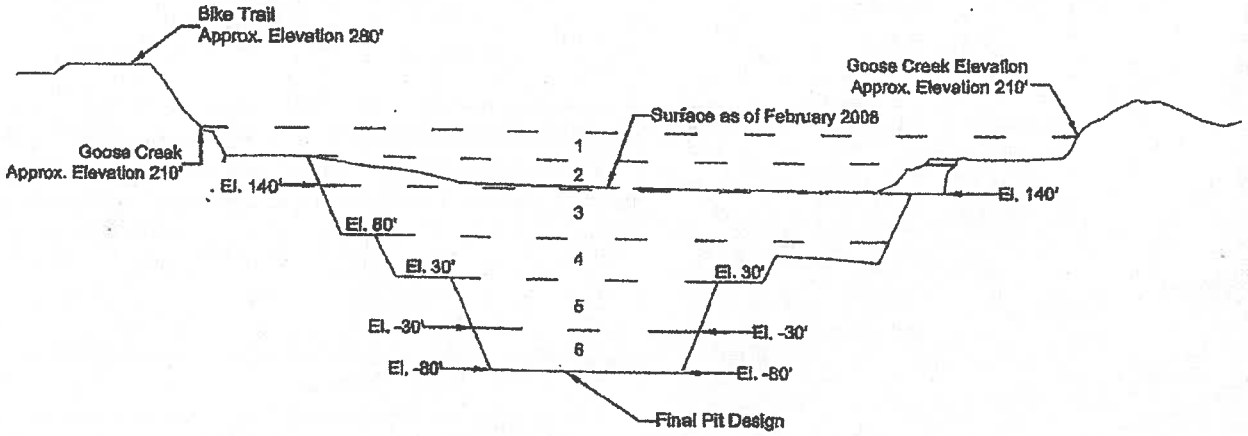
Reserves and Water Volume by Lift			
Section	Lift	Volume (cu. ft)	Volume (gallons)
1	210 to 176	38,915,500	291,087,940
2	176 to 140	29,257,000	218,842,360
3	140 to 80	37,085,000	277,395,800
4	80 to 30	23,298,500	174,272,780
5	30 to -30	15,201,000	113,703,480
6	-30 to -80	8,862,000	66,287,760
Total		152,619,000	1,141,590,120

EXHIBIT 3



QUARRY "A"
ILLUSTRATIVE MINE PLAN

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