St. Charles County Board of Zoning Adjustment

VARIANCE REQUEST # VAR19-06

VARIANCE REQUEST – 530 KNAUST ROAD
Application: VAR19-06
Owner: Missouri American Water Company
Applicant: Crawford, Murphy & Tilly, Inc.
Variance Requested: Section 405.090.D.1 of the Ordinances of St. Charles County (OSCCMo) - To vary the maximum height requirement for the Single-Family Residential District from 40 feet to 140 feet, to allow for the construction of an elevated water storage tank
Property Zoning: R1A, Single-Family Residential District
Area: 2.95 acres
Location: Approximately 400 feet north of the intersection of Berkshire Downs Drive, adjacent to the City of O'Fallon
Council District: 3
Account No.: 409410A000

CONTENTS:

➢ Staff Recommendation Report & Site Photos
➢ Aerial photo
➢ Zoning map
➢ Topographical Map
➢ Applicant Statement of Hardship
➢ Site Plan
➢ Letters Received:
  • None
REPORT TO BOARD OF ZONING ADJUSTMENT

To: County Board of Zoning Adjustment  
Prepared by: Mark Price Jr., A.I.C.P.
Application No.: VAR19-06  
Date: December 23, 2019

BACKGROUND

Owners/Applicant: Missouri American Water / Crawford, Murphy & Tilly, Inc.
Requested Action: To vary Section 405.090.D.1 of the Ordinances of St. Charles County (OSCCMo); to vary the maximum height requirement in the R1A, Single-Family Residential District from 40 feet to 140 feet, to allow for the construction of an elevated water storage tank
Zoning: R1A, Single Family Residential District
Location: 530 Knaust Road, Approximately 400 feet north of the intersection of Berkshire Downs Drive and Knaust Road, adjacent to the City of O’Fallon
Parcel Size: 2.95 acres
Current Land Use: Booster pump station for Missouri American Water
Adjacent Land Use and Zoning:

<table>
<thead>
<tr>
<th>Direction</th>
<th>Zoning</th>
<th>Land Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>R1A, Single Family Residential</td>
<td>Single Family Dwelling Unit</td>
</tr>
<tr>
<td>East</td>
<td>R1A, Single Family Residential</td>
<td>Single Family Dwelling Unit</td>
</tr>
<tr>
<td>South</td>
<td>R1A, Single Family Residential</td>
<td>Single Family Dwelling Unit</td>
</tr>
<tr>
<td>West</td>
<td>R-1, Single Family Residential (City of O’Fallon Zoning)</td>
<td>Single Family Dwelling Units</td>
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Request Summarized:
The applicant proposes to construct a 2 million gallon elevated storage tank. Such a tank is allowable as a permissive use in the R1A, Single Family Residential District. The applicant is requesting to elevate this tank to a height not to exceed 140 feet. This exceeds the district's height limit of 40 feet, by 100 feet, thus generating this request for a variance.

Site Characteristics:
The parcel is approximately 450 feet deep at its shallowest and approximately 246 feet wide. The site has an elevation of approximately 600 feet above mean sea level at the
entrance to Knaust Road and rises to approximately 607 feet in height where the tank is to be erected. The site then slopes down towards the southwest to a low point of 574 feet in the southwest corner of the lot. The lot does contain a significant stand of trees. During construction, some of those trees would be removed while clearing the building pad for the elevated tank. There is currently a gravel drive accessing the site. This is not proposed to be changed.

**Relevant Property History:**
This property has no relevant history with the County.

**Applicant’s Statement of Hardship:**
The applicant states the following in their hardship letter:

“Due to continued growth in the western St. Charles region, the existing pumped storage facilities alone are no longer adequate to meet maximum day equalization and fire reserve. Low pressure complaints have arisen within the west side of the zone during peak hour periods. In order to alleviate these problems, it is necessary to construct a new booster station and install a 2.0 MG elevated storage tank and all required yard piping. Additional options were considered including installation of a 0.75 MG elevated storage tank, however equalization and fire/emergency reserve dictated the need for the 2.0 MG storage tank. Elevated storage can maintain more constant system pressures without relying on mechanical pumping.

There is less potential of main breaks and better customer service when constant system pressures can be maintained. In addition, the use of elevated storage is more energy efficient than mechanical pumping.

System hydraulics dictate the target water level for an elevated storage tank and at this location the system water pressure equates to an elevation of 740 feet HGL. At the site location, the base elevation of the elevated storage tank is approximately 610 feet USGS, with a riser height of 88 feet (698 feet HGL), an overflow height of 130 feet (740 feet HGL), overall height of approximately 140 feet and bowl diameter of approximately 100 feet. The recommended height of the tank is necessary to operate appropriately with the existing system hydraulics and stabilize customer service pressures for the surrounding area during peak hour periods.

The proposed elevated storage tank will also provide much needed equalization storage to the western part of the St. Charles zone, which is anticipated to be the growth area and thereby reduce pressure swings during peak hour events. In addition to providing equalization storage, the elevated tank will also provide for emergency elevated storage to a zone which is otherwise without elevated storage.”
COUNTY STAFF ANALYSIS:
The applicant has stated that the height variance request for a water tank to be built at 140 feet in height is necessary in order to provide the necessary water pressure for approximately 375,000 residents in this portion of the County. Without sufficient water pressure, some homes may not have water during peak times and consequently, fire suppression may become a severe consequence of losing necessary water pressure.

When discussing a height variance request, site line vision can be a primary objection from surrounding property owners. There is a large subdivision (Berkshire Downs) located to the west of the proposed water tank location. This proposed, elevated water storage tower does have a potential for negatively impacting the sight lines of the community. Elevations towards this subdivision drop approximately 30 feet with existing trees located along this site line for approximately 200 feet. The tree line varies in height but an average of approximately 30-50 feet of additional canopy can be added to the drop in vertical elevation in regard to the line of site vision of the proposed water tank.

The applicant’s submittal includes a simulated image of what the proposed water tank will look like if placed in the proposed location. The tank would be painted white. Many utility apparatus such as water tanks and cell towers are painted blue or silver to blend more readily with the scenic view for residents. The Board may want to consider alternative colors to the white version presented.

The applicant has also indicated that they have consulted with the Federal Aviation Administration (FAA) in regard to the proposed height and have received a “Determination of No Hazard to Air Navigation”. No information regarding lighting of the water tank has been provided.

In summary, the Board must evaluate the need for a stable water source at the calculated, necessary water pressure versus the impact this tower may have on the scenic views of residents in the area.

VARIANCE CRITERIA:
The Board of Zoning Adjustment may vary the strict application of a regulation if the property owner proves all four of the following criteria:

1. The variance is requested due to unique circumstances inherent to the specific piece of property and not to personal considerations of the property owner.

Staff sees no exceptional situation or condition that applies to this specific property, other than that the water tower’s location is dictated by the service area and the elevation of the parcel.

2. The variance is not needed as the result of an affirmative act of the property owner that could have been avoided through a different course of action.
The applicant has provided written evidence for the Board to consider on this question. They provide the technical reasons for the request and why this location is necessary for the placement of the elevated tank. The specific height requested is for technical reasons – to provide the necessary water pressure for both consumption and fire flows for approximately 375,000 customers.

3. **The variance would not merely grant a special benefit to the property beyond what is enjoyed by other properties regulated by the same set of zoning regulations.**

The applicant could erect a ground storage tank at this location below the 40-foot height limit imposed by the zoning regulations; however, it would not provide the height necessary for proper water pressure to distribute water systemwide.

4. **The application of such non-use regulation would result in practical difficulties to the property owner.** In determining whether “practical difficulties” exist, relevant factors to consider include whether, or to what degree, the owner can pursue the permitted use without a variance; the financial hardship to the property owner from the strict application of the regulation; how substantial the variance request is in relation to the regulation; whether the difficulty can be obviated by some method other than a variance; and whether such relief can be granted without substantial detriment to the public good and without substantially impairing the intent, purpose and integrity of the zoning regulations as embodied in the Unified Development Ordinance and maps.

The applicant has provided documentation that there is no other alternative to constructing the water tank at the required height of 140 feet. Water pressure needs for their customers and for fire suppression require the height to be at 140 feet.

**STAFF RECOMMENDATION:**

The options of the Board of Zoning Adjustment are:

- Approve the requested variance without conditions
- Approve the requested variance with conditions, or
- Deny the requested variance.

County staff recommends that the Board of Zoning Adjustment approve this application subject to the following conditions:

1) This variance applies to the proposed elevated water tank only. The height limitation will be 140 feet.
2) The color of the tank may not vary from the colors determined by the Board to be appropriate.
Knaust Road looking north from subject site
VAR 19-06 – Zoning

Subject Property
December 13, 2019

Board of Zoning Adjustment
St. Charles County

Re: Height Restriction Variance Request

Dear Board of Zoning Adjustment Members:

Missouri American Water Company (MOAW) is proposing to replace an existing booster station and construct an elevated storage tank on MOAW owned property at the current Knaust Road Booster Station location at 530 Knaust Road in St. Peters, Missouri. The property is zoned R1A with a permissive use of “sewage treatment plants and related facilities, including lift stations, water supply plants, pumps, reservoirs, wells and elevated storage tanks, for the purpose of providing services to the public” per Section 405.090.B.12. However, construction on the site is subject to a maximum height of 40 feet per Section 405.090.D.1. As such, MOAW is requesting a variance to the maximum height restriction in order to construct the elevated storage tank.

Need for the Project

MOAW provides potable water service to approximately 375,000 customers in the St. Louis Metro Service Area. The St. Charles County distribution system is hydraulically connected and supplied by the St. Louis County Central Plant through the Green Bottoms Pressure Reducing Station. All storage in the existing St. Charles zone is pumped storage and located on the eastern half of the system. Due to continued growth in the western St. Charles region, the existing pumped storage facilities alone are no longer adequate to meet maximum day equalization and fire reserve. Low pressure complaints have arisen within the west side of the zone during peak hour periods. In order to alleviate these problems, it is necessary to construct a new booster station and install a 2.0 MG elevated storage tank and all required yard piping. Additional options were considered including installation of a 0.75 MG elevated storage tank, however equalization and fire/emergency reserve dictated the need for the 2.0 MG storage tank. Elevated storage can maintain more constant system pressures without relying on mechanical pumping. There is less potential of main breaks and better customer service when constant system pressures can be maintained. In addition, the use of elevated storage is more energy efficient than mechanical pumping.

System hydraulics dictate the target water level for an elevated storage tank and at this location the system water pressure equates to an elevation of 740 feet HGL. At the site location, the base elevation of the elevated storage tank is approximately 610 feet USGS, with a riser height of 88 feet (698 feet HGL), an overflow height of 130 feet (740 feet HGL), overall height of
approximately 140 feet and bowl diameter of approximately 100 feet. The recommended height of the tank is necessary to operate appropriately with the existing system hydraulics and stabilize customer service pressures for the surrounding area during peak hour periods.

The proposed elevated storage tank will also provide much needed equalization storage to the western part of the St. Charles zone, which is anticipated to be the growth area and thereby reduce pressure swings during peak hour events. In addition to providing equalization storage, the elevated tank will also provide for emergency elevated storage to a zone which is otherwise without elevated storage.

Additional Considerations

As shown on the Plot Plan, the elevated storage tank is proposed to be located on the eastern portion of the property, approximately 320 feet from the Berkshire Downs subdivision located east of the property. The preliminary tank rendering drawing enclosed provide views of the elevated storage tank from various viewpoints. Modeling of the proposed tank location has shown that the tank shadow during various times of the day should not adversely affect the current residential houses.

The tank is also positioned such that the bowl is located within the setback requirements as required by code. The proposed pump station is considered an accessory structure and will be located as required to meet the applicable code regarding distances and setbacks.

Due to the height of the tank, concern may exist regarding interference with existing emergency communications. Provisions can be provided to install antennas to eliminate any interference, if needed.

In addition, due to the height of the tank consultation with the Federal Aviation Administration has been completed and a "Determination of No Hazard to Air Navigation" has been received for construction.

Thank you for consideration of our request and please do not hesitate to contact us should you have questions, comments or require additional information.

Sincerely,

MISSOURI AMERICAN WATER COMPANY
NOTE: TRACT IS ZONED R1A

PROPOSED 2 MG ELEVATED WATER TOWER (PEDESTAL DIA 54') (BOWL DIA 100')

EXISTING PUMP STATION (8.4' X 12.25')

PROPOSED GRAVEL DRIVE

KNAUST ROAD - PUMP STATION AND TANK

530 KNAUST ROAD
ST PETERS, MISSOURI

_DECEMBER 2019

CONSULTANTS
CRAWFORD, MURPHY & TILLY, INC.

DESIGNED BY:
APPROVED BY:

OWNER

DEVELOPMENT

PROJECT NO:

CAD DWG FILE:

DRAWN BY:
CHECKED BY:

COPYRIGHT:

DATE:

ואי: 530 KNAUST ROAD
ST PETERS, MISSOURI

License No. 000631

_LICENSE:
AMERICAN WATER

LICENSE:

.owner:

PLOT PLAN

SITE PLAN

1" = 30'

N

PROPOSED PRE-PACKAGED PUMP STATION (EST. 15' BY 30')

NOTE: TRACT IS ZONED R1A

PROPOSED 2 MG ELEVATED WATER TOWER (PEDESTAL DIA 54') (BOWL DIA 100')

EXISTING PUMP STATION (8.4' X 12.25')

PROPOSED GRAVEL DRIVE