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## Stormwater Management Memorandum

**Date:** July 28, 2026  
**To:** Construction Services, City of Mankato  
**From:** Alec Pietz, P.E. – Land Development Project Manager  
**Subject:** Spirits at Rest  
BMI Project No.: 26X.144614

### I. Project Introduction

The following report provides a summary and analysis of the existing and proposed hydrology for the proposed Spirits at Rest project on Lot 1 Block 3 of Wolfe Addition No. 2 in Mankato, Minnesota. The proposed project consists of a building, parking and pavement construction, site grading, utilities, and drainage improvements. An existing parking lot from a prior project exists on the lot and is considered new impervious area for the purposes of this memo. A planned regional stormwater basin from the Wolfe Addition No. 2 project will accommodate the impervious area of this project, however, on site management is still necessary to conform to overall planned storage within the subdivision. The SCS TR-20 hydrology method was utilized in Autodesk Storm and Sanitary Analysis (SSA) for the project. NOAA Atlas 14 rainfalls for Blue Earth County, Minnesota and MSE 3 distribution curves were used to develop rainfall events. The 2-yr (2.87"), 10-yr (4.29"), and 100-yr (7.20") events are reported for relevant data in this report.

### II. Existing/Previously Planned Site Hydrology

The site currently exists as farm field and the mentioned parking lot. For purposes of this study, the proposed site will be compared to the improvements as shown in the Wolfe Addition No. 2 Drainage Report, which is provided as an attachment to this memo. The original plan included a primarily impervious parcel with a shared stormwater basin (Pond D).

For purposes of modeling, the parcel as previously proposed in the subdivision report will be treated as a single catchment with its corresponding curve number. This results in an area of 6.12 acres with 4.87 acres of impervious area yielding a curve number of 94.32. Time of concentration is assumed to be 9 minutes.

| Peak Flows of Subdivision Lot Improvements (cfs) |              |              |              |
|--------------------------------------------------|--------------|--------------|--------------|
| Location                                         | 2-yr         | 10-yr        | 100-yr       |
| Lot as Proposed in Subdivision Report            | 21.65        | 33.94        | 58.74        |
| <b>Total</b>                                     | <b>21.65</b> | <b>33.94</b> | <b>58.74</b> |

The reported peak flows do not take stormwater management into consideration. The purpose of this is to establish a basis for the difference between direct runoff rates of the parcel as shown in the subdivision report and the proposed project.

### III. Proposed Site Hydrology

The Utility Plan from the submittal civil drawings is provided with this memo to illustrate the site, grading, and storm sewer proposed for the project. Modeling the project like the prior planned improvements (a single catchment) results in the same area of 6.12 acres but significantly reduced impervious area of 1.79 acres yielding a curve number of 85.26. A 9-minute time of concentration was also used for the proposed catchment, but some areas may realistically have a larger time of concentration. No onsite stormwater management was taken into consideration for the peak flow.

Proposed peak flow rates for the design storms were determined in SSA to be:

| Proposed Peak Flows (cfs) |              |              |              |
|---------------------------|--------------|--------------|--------------|
| Location                  | 2-yr         | 10-yr        | 100-yr       |
| Proposed Project          | 15.30        | 27.50        | 53.07        |
| <b>Total</b>              | <b>15.30</b> | <b>27.50</b> | <b>53.07</b> |

As expected, the peak flow is reduced for each event due to the decrease in impervious areas.

#### Water Quality Volume Analysis

The following exercise is to demonstrate the proposed project conforms to the provided water quality volume of regional ponding in the Wolfe Addition No. 2 plans. This would eliminate the water quality design criteria of on-site stormwater management.

Referring to Table 2 of the Wolfe Addition No. 2 report, the total water quality volume required and provided is reported for the entire subdivision. The required volume is **2.11 ac-ft** which equates to the **23.11 acres** of impervious as reported in Table 1. A total of **2.93 ac-ft** of water quality volume is reported to be provided, which accounts for **31.96 acres** of new impervious area. A calculation error for Pond B was discovered in review of this report that ultimately yields additional provided water quality volume, this will be detailed further.

Brief descriptions of each pond in the subdivision are below:

- Pond A – an anticipated basin for the westerly parcel adjacent to Excel Drive that ultimately drains to Pond B. This basin would be privately maintained and provide water quality and detention for its parcel.
- Pond B – A public filtration basin providing benefit to public improvements and private development. As mentioned, a calculation error was discovered that resulted in increased water quality volume compared to what was reported. Referring to the Pond B spreadsheet, it can be observed that the water quality volume was reported at elevation 1005.0 instead of 1005.5.
  - Interpolating the volume of 1005.5 yields a water quality volume of 1.29 ac-ft instead of 0.81 ac-ft (+0.48 ac-ft) which provides for an additional 5.24 acres of impervious area.
- Pond C – A public wet basin providing benefit to public improvements and private development.
- Pond D – Intended to be a shared private basin to accommodate additional retention for the project parcel and its western neighbor. This was planned based on the two parcels being vastly impervious. For the Spirits at Rest project, this shared basin is not proposed but a proportional amount of Pond D storage relative to its parcel size and the western parcel size is provided for conformance to the planned storage within the greater subdivision.

Summarizing the basin information above results in a modified total water quality volume within the subdivision:

- Wolfe Addition No. 2 Reported WQV = 2.93 ac-ft
- Pond B Calculation Correction = +0.48 ac-ft
- Elimination of Pond D = -1.15 ac-ft
- **Updated WQV = 2.26 ac-ft**

The updated WQV provides treatment for 24.65 acres of impervious area, still exceeding the requirement for the original 23.11 acres. The Spirits at Rest project currently proposes a decrease of 3.08 acres of impervious area from the original project leaving ample water quality volume for potential facility expansion.

#### On-Site Retention

As mentioned, water quality volume is accounted for within the public basins, but additional storage will be required to conform to the planned storage volume per the Wolfe Addition No. 2 report since Pond D is eliminated despite the drastic reduction of impervious area between the two plans.

A total of **4.03 ac-ft** of storage is provided in Pond D. The Spirits at Rest parcel is 6.12 acres and the neighboring property is 9.0 acres. By proportion of parcel area, the Spirits at Rest parcel will require **1.63 ac-ft** of storage volume. A sheet with storage curves for the two basins is provided with this memo showing a total volume of approximately **2.26 ac-ft** being provided, above the required volume.

## IV. Conclusion

The proposed stormwater management for Spirits at Rest conforms to the requirements of the City of Mankato and more specifically to the Wolfe Addition No. 2 drainage plan. This document may be referenced for future development within the subdivision to guide project proposers and their engineers based on the modifications described.

Please feel free to contact Alec Pietz, P.E. with any questions or comments at [Alec.Pietz@bolton-menk.com](mailto:Alec.Pietz@bolton-menk.com) or 507-766-3283.

**STORMWATER BASINS**  
**SPIRITS AT REST**  
**MANKATO, MINNESOTA**  
**BMI Project No. 26X.144614**

| East Basin     |             |              |                |
|----------------|-------------|--------------|----------------|
| Elevation (ft) | Area (sf)   | Volume (cf)  | Volume (ac-ft) |
| 1005           | 4430        | 0            | 0.00           |
| 1006           | 5593        | 5593         | 0.128          |
| 1007           | 6755        | 11185        | 0.257          |
| 1008           | 8213        | 19398        | 0.445          |
| <b>1009</b>    | <b>9670</b> | <b>27610</b> | <b>0.634</b>   |

| West Basin     |              |              |                |
|----------------|--------------|--------------|----------------|
| Elevation (ft) | Area (sf)    | Volume (cf)  | Volume (ac-ft) |
| 1006           | 6915         | 0            | 0.00           |
| 1007           | 12145        | 9630         | 0.221          |
| 1008           | 17500        | 24352        | 0.559          |
| 1009           | 22965        | 44585        | 1.024          |
| <b>1010</b>    | <b>29955</b> | <b>71045</b> | <b>1.631</b>   |

|                       |              |              |                  |
|-----------------------|--------------|--------------|------------------|
| <b>Total Provided</b> | <b>98655</b> | <b>2.265</b> | <b>Req'm Met</b> |
| Total Req'd*          | 71003        | 1.63         |                  |

\*Proportion of Subdivision Share

