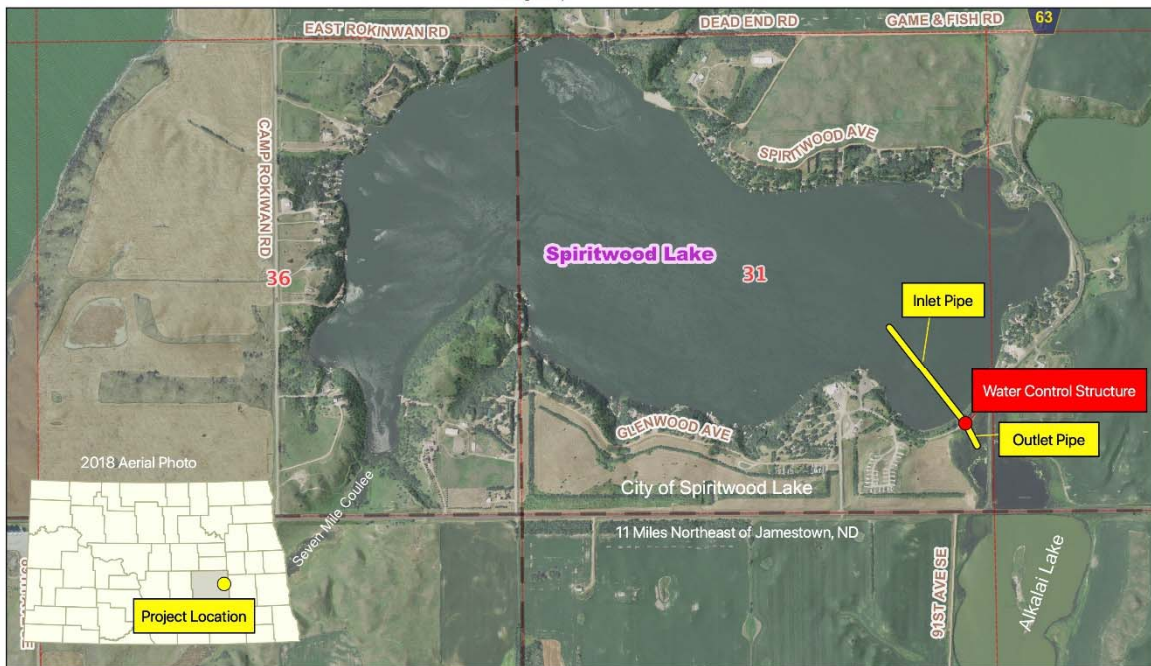


**Engineering Review of Application For Surface Drain
Hypolimnetic Drawdown
For
Spiritwood Lake - Southeast Outflow
Stutsman County, North Dakota**



Date: 7/21/2020
Prepared by: CWN

Drain Permit Application No. 5362
Stutsman County Water Resource District
Spiritwood Lake Hypolimnetic Drawdown



SE 1/4 of Section 31, T141N, R63W, Stutsman County

**Completed By:
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NDAC Section 89-02-01-09.2

Evaluation of application – Factors considered

Conditions Considered:

The engineering review of the proposed control structure is based upon the implementation of the following conditions:

- There shall be permanent elevation control that is non-leaking up to the current outlet elevation.
- There shall be an adequate air gap to prevent siphoning conditions.
- The system shall have a planned means of stopping flow under high water conditions.

Factors Considered:

1. **The water volume proposed to be drained and its impact upon the watercourse into which it will be drained.**

The City has verified that the proposed structure would be constructed to only allow water flow once the water elevation exceeded the current overflow elevation (fish weir overflow). This could be constructed in multiple configurations that would help assure that incidental flow below the current overflow elevation would not occur.

The fish weir overflow has been surveyed so that if an event would disturb or destroy the current outflow conditions, the area could be reconstructed to the same conditions.

Recommend that final location and design details be submitted for concurrence to assure that the structure will not allow outflow below the current overflow elevation.

2. **Adverse effects that may occur to downstream landowners. This factor is limited to the project's hydrologic effects, such as erosion, flood duration, sustained flows impacts, and downstream water control device operation impacts.**

The City has verified that the proposed structure is not intended to increase or decrease the flows through the current southeast outlet area. Therefore, there would be no adverse effects to downstream landowners for those items listed above.

Since this could be accomplished a number of ways, it is recommended that the final location and design details be submitted for concurrence to assure the structure will not measurably increase or decrease the existing outflow characteristics.

3. The engineering design and other physical aspects of the drain.

The applicant information included a proposed structure that would act as an “Inline Water Level Structure”™. In addition, there have been multiple correspondence regarding referenced operating elevations and elevations related to differing sources and datums. No detailed information was provided as to the precise location or detailed drawings of the system components. As such, the engineering review of the design and other physical aspects of the drain are based upon the above referenced concept that the constructed system will only allow water flow once the water elevation exceeds the current overflow elevation.

See attachment of the submitted control structure with added notations regarding proposed conditions.

4. The project's impact on flooding problems in the project watershed.

Since the proposed control structure would be constructed as to not increase nor decrease the elevation or volume of outflow from the lake, the project would have no flooding impacts on upstream capacity nor the downstream flows.

Since this could be accomplished a number of ways, it is recommended that the final location and design details be submitted for concurrence to assure the structure will not measurably increase or decrease the existing outflow characteristics.

5. The project's impact on ponds, sloughs, streams, or lakes having recognized fish and wildlife values.

Since the proposed control structure would be constructed as to not increase nor decrease the elevation or volume of outflow from the lake, the project would have no hydrologic impacts as there would be no impacts to upstream capacities nor the downstream flows, therefore no impacts on any features having recognized fish and wildlife values.

Since this could be accomplished a number of ways, it is recommended that the final location and design details be submitted for concurrence to assure the structure will not measurably increase or decrease the existing outflow characteristics.

6. The project's impact on agricultural lands.

Since the proposed control structure would be constructed as to not increase nor decrease the elevation or volume of outflow from the lake, the project would have no hydrologic impacts to the upstream capacity nor the downstream flows, therefore there would be no impacts on agricultural lands.

Since this could be accomplished a number of ways, it is recommended that the final location and design details be submitted for concurrence to assure the structure will not measurably increase or decrease the existing outflow characteristics.

7. Whether easements are required.

The proposed system would cross properties Owned by Stutsman County which would require an easement.

It is the responsibility of the applicant to obtain any other permits and approval for the project from local, state, or federal agencies.

Figure 1 – Control Structure Schematic

Low Water Drawdown Stop Log Type - passive

