

Proposed Shooting Star Resort and Casino
Stormwater Summary
Star Lake, Minnesota

July 27, 2017

1. CURRENT CONDITIONS

Currently, the general direction of flow for the stormwater runoff over the project area is from north to south. Directly flowing in to the unnamed lake on the west side of CSAH 41 and on the east side of CSAH 41 stormwater runoff flows directly into wetlands or Star Lake. Current land use upland from the wetlands and lakes mentioned is a mixture of row crop farming, former farmstead and wooded areas. With much of this historical usage of the land being row crop farming and livestock pasture, land applied chemicals, biological fertilizer and untreated cattle waste was able to directly run off in to the lake.

The resultant water quality degradation of Star Lake due to these nutrients having an unfiltered path to the wetlands and lake degraded water quality as described in more detail in the wetland summary document. By eliminating these land uses and providing treatment of stormwater runoff, we anticipate that the water quality of the south arm of Star Lake will improve over time.

2. PROPOSED ACTIONS

- a. The project as proposed includes filling in the wetlands as detailed in the wetland summary document. These wetlands are being mitigated by the US Army Corps of Engineers for the Tribal Trust land and through the State of Minnesota for the Fee Land. Mitigation efforts have been ongoing following all agency requirements.
- b. The project as proposed will create approximately 20.5 acres of impervious surfacing which will be directed through the proposed stormwater ponding. Impervious surfaces are primarily composed of paved surfaces and building footprints.

3. REGULATORY CONTROLS

- a. All stormwater runoff during and post construction are regulated by the EPA for the Tribal Trust land and the MPCA for the Fee land. Otter Tail County does not have any requirements for this site that are more stringent than what is required by these two agencies. Both agencies follow the National Pollutant Discharge Elimination System (NPDES) permitting standards. These standards will be met or exceeded for construction stormwater runoff control BMPs as well as post construction runoff in the form of wet sedimentation basins.
- b. The NPDES permit states that that there is a permanent wet pool in each pond that provides 1,800 cubic feet of storage for each acre that drains to the pond. The live storage, or bounce in the pond that controls the release rate is called out as a volume equal to 1" of water over all new impervious surfacing that is created.
- c. In addition to the NPDES permitting requirements, the Minnesota Stormwater Manual has recommendations that are also incorporated in to the design. These include, but are not limited to:
 - i. Pretreatment via the vegetative buffer strips providing filtration and infiltration of the initial flush from paved surfaces.

- ii. Permanent pool design of having less than 8 feet of depth to limit the likelihood of stratification and the potential for bottom sediment to release phosphorus. (NPDES requirements are a maximum depth of 10' at the deepest points)
- iii. Providing over 12" of additional volume to equal the average snow melt.
- iv. Slopes do not exceed 1:2 (V:H) below the aquatic bench.
- v. Slopes of the pond are flatter than 1:3 (V:H) with a bench of even flatter bottom provided to encourage a shallow marsh littoral zone. (Cattails typically grow in this area)

4. STORMWATER MANAGEMENT DURING CONSTRUCTION

- a. During construction, there will be exposed soils that are susceptible to erosion. To prevent any sediment laden runoff from the site, a preliminary Storm Water Pollution Prevention Plan (SWPPP) has been developed for the site. The SWPPP document is intended to be a living document that may be changed as different BMPs are utilized on site.
- b. Prior to obtaining a Construction Stormwater Permit from the regulatory agencies, the SWPPP will be finalized for the final design to include perimeter control to ensure no sediment-laden runoff exits the site, temporary sedimentation basins that will be designed to the MPCA's standards, concrete washout areas, spill prevention measures, requirements on the amount of time that erodible soils can be exposed, stabilized construction exits, biorolls (wattles) for swales and ditches, silt fence, inlet protection and many other BMPs will be incorporated in to the final SWPPP.

5. POST-CONSTRUCTION STORMWATER POND DESIGN

- a. Stormwater ponds
 - i. The Civil Site Plan shows that the catch basins that are to take the runoff from the larger parking lots on the west side of the site are located in grassy areas between the paved surfaces. This provides pretreatment of the stormwater runoff from the parking lots as there will be a vegetative buffer strip between the point where the water leaves the paved surface and the catch basins. This vegetative buffer strip will capture much of the sediments that leave the parking lot and will also provide biofiltration of the initial flush of water from a rain event occurring after a dry period where much of the contaminants that leave paved surfaces are deposited. This will extend the life cycle of the ponds by holding back sediment and also will allow bioretention to absorb some of the runoff for infiltration purposes as there are no underdrains called out in the design. The infiltration that takes place in the vegetative buffer strip has not been factored in to the design of the ponds so it is additional treatment above and beyond ponding requirements.
 - ii. The National Pollution Discharge Elimination System (NPDES) permitting guidelines for wet sedimentation basins states that ponds need to be designed for a 1" rain event over all new impervious surface created. The proposed ponds are designed

for a 6.13" rain event. Below is a detailed description of how minute the proposed stormwater discharge is proposed to be as compared to what is allowable.

- iii. There are 3 stormwater ponds located on site. All are designed for the 100 year rain event which is the equivalent of a 6.13" of rainfall over a 24 hour period.
 - The northeast pond (modeled as Pond 1) has a normal water surface area of 0.49 acres. According to the requirements of the NPDES permit that regulates stormwater pond discharge, the allowable water quality discharge rate for a 1" rain event is allowed to be 2.75 cubic feet per second. The design for this pond provides a discharge rate for the 1" rain event of 0.09 cubic feet per second which is 3.27% of the allowed discharge rate.
 - The southwest pond (modeled as Pond 2) has a normal water surface area of 1.80 acres. According to the requirements of the NPDES permit that regulates stormwater pond discharge, the allowable water quality discharge rate for a 1" rain event is allowed to be 10.17 cubic feet per second. The design for this pond provides a discharge rate for the 1" rain event of 0.45 cubic feet per second which is 4.24% of the allowed discharge rate.
 - The southeast pond (modeled as Pond 3) has a normal water surface area of 0.12 acres. According to the requirements of the NPDES permit that regulates stormwater pond discharge, the allowable water quality discharge rate for a 1" rain event is allowed to be 0.67 cubic feet per second. The design for this pond provides a discharge rate for the 1" rain event of 0.03 cubic feet per second which is 4.48% of the allowed discharge rate.
 - **In summary, the cumulative allowable release rate that is required for a 1" rain event is a total of 13.59 cubic feet per second. The three proposed ponds are designed to discharge a total of 0.57 cubic feet per second which is 4.19% of the allowed water quality discharge rate for a 1" rain event. Another way to say this is that the proposed ponds could discharge 23 times more stormwater than what is being proposed and still fall within the limits of the allowable release rate for the ponds.**
- iv. It is recognized that water in stormwater ponds can achieve higher temperatures than downstream water bodies. This potential temperature increase has been mitigated by not lining the ponds with rip rap which can heat up water and combining that with a release rate of less than 5% of that actually allowed by the MPCA, the extremely low flows are not expected to have a temperature impact on Star Lake.