



## Projects and Practices Application

**Grant Name - Pump-controlled iron enhanced sand filter basin at the Golden Lake Stormwater Treatment Pond**

**Grant ID - C17-3550**

**Organization - Anoka CD**

Allocation	<b>Projects and Practices 2017</b>	Grant Contact	<b>Mitch Haustein</b>
Total Grant Amount Requested	\$467,968.00	County(s)	Anoka
Grant Match Amount	\$116,992	12 Digit HUC(s)	070102060305
Required Match %	25%	Applicant Organization	Anoka CD
Calculated Match %	25%	Application Submitted Date	
Other Amount			
Project Abstract	<p>This pump-controlled iron enhanced sand filter (IESF) basin will protect, enhance, and restore water quality in an impaired water – Golden Lake. The project is estimated to remove 40-60 lbs-TP/yr from water entering Golden Lake. This project, paired with two previously installed upstream BMPs, will achieve on average 84% of the total external TP load reduction identified in the approved TMDL.</p> <p>Golden Lake is within a developed area of Anoka County, just north of the Twin Cities metro area. It is surrounded by residential land use, and the focal point of a city park. The approved Golden Lake TMDL requires reductions in phosphorus from external and internal loading sources. This project will focus on reducing external phosphorus sources. The proposed IESF basin was identified in the Golden Lake Subwatershed Stormwater Retrofit Analysis to be one of the most cost effective remaining practices for reducing external phosphorus loads to Golden Lake.</p> <p>The IESF basin will be installed on property owned by the City of Circle Pines near an existing stormwater</p>		

treatment pond adjacent to Golden Lake. This pond receives stormwater runoff from a 6,426-acre drainage area via County Ditch 53-62. The pond currently provides treatment through retention and settling. However, the addition of an IESF will increase removal of phosphorus, particularly dissolved phosphorus, which the pond does not effectively treat.

The IESF basin will incorporate a pumping system to move water from the pond outlet to the IESF basin, which will be split between two zones. The IESF will be designed with sufficient binding sites to sequester up to 50 lbs-TP/yr for 25 years. Estimated reductions are 40-60 lbs-TP/yr; the range is based on known and predicted temporal variations in TP concentrations of incoming water.

## Narrative

### Questions & Answers

#### **What organization will serve as the Fiscal Agent for this grant?**

The Anoka Conservation District (ACD) will serve as the fiscal agent for this grant. ACD has successfully administered several Clean Water Fund awards.

#### **Did your organization receive CWF grant dollars in FY 2014, FY 2015 and/or FY 2016? If less than 50% of the total grant amount awarded from FY 2014, FY 2015 and FY 2016 grants have been spent, please explain your organization's capacity (including available FTEs or contracted resources) to effectively implement additional Clean Water Fund dollars.**

ACD has received and successfully implemented several CWF grants. The following outlines the anticipated status of each award as of December 31, 2016.

2014 – Coon Lake Retrofits: This project was successfully completed in 2016 in accordance with the work plan.

2014 - Golden Lake IESF: This project was successfully completed in 2015 in accordance with the work plan.

2014 – Oak Glen Creek Pond and IESF: Less than 50% of the total grant award has been spent, but feasibility analysis and cost estimates are complete along with 90% of the design. The project stalled during the acquisition of property access rights due in part to changes in ownership and agency staffing but is now moving forward. Project construction is anticipated for the early winter of 2016 and will be overseen by a contracted engineering firm.

2015 – Ditch 20 Wetland Restoration Feasibility Study: Less than 50% of the total grant award has been spent, but DEM conditioning is

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complete and a calibrated SWAT model prepared. Potential project sites have been identified through project-specific subwatershed information, modeling efforts, and communication with affected landowners. Additionally, research has been initiated into the regulatory and political landscape as it pertains to wetlands and ditch law. A consulting firm will soon be retained to begin hydrologic and hydraulic analysis related to the identified project suite.

2016 – Lake George Watershed Targeted BMP Analysis: Less than 50% of the total grant award has been spent, but monitoring for model calibration will be complete by the end of 2016, watershed boundaries have been delineated, and field work to ground truth boundaries and culvert locations has been completed. The unspent funds are primarily for modeling, which will be calibrated with the monitoring results currently being collected, and project identification. The bulk of this work will be completed prior to the execution of grant agreements for the FY2017 funds.

### **Water Resource of Concern: Identify the water resource of concern the proposed project is targeting.**

Golden Lake

**Project Description: 1. (5 points) A) What nonpoint pollution concerns will be the focus of this action(s)? B) Describe the public benefits of this action(s) to the water resource of concern from a local and state perspective. C) Describe how the resource of concern aligns with at least one of the statewide priorities referenced in the “Projects and Practices” section of the RFP.**

The IESF basin will remove dissolved phosphorus from stormwater that otherwise flows directly to the target water body, Golden Lake. Golden Lake is currently listed on Minnesota’s 303(d) impaired waters list for excess nutrients (phosphorus).

Golden Lake is a valuable public resource at both the regional and state level. Regionally, the lake is used recreationally for fishing as well as non-motorized boating via public access from Golden Lake Park. Additionally, the Golden Lake TMDL found that Golden Lake likely recharges the local water table based on its elevation relative to the water table and the surficial geology of the region.

At the broader state level, improvements to Golden Lake’s water quality will benefit the Mississippi River, which is a resource of local, regional, statewide and even national priority. Golden Lake discharges to Rice Creek, which is a subwatershed of the Upper Mississippi River Watershed. The Mississippi River is not only critical for wildlife as an ecological corridor and important economically for transportation, fisheries, and recreation, it also serves as the primary drinking water source for the City of Minneapolis, portions of St. Paul and many other entities. There are several municipal water intakes immediately downstream of the project area.

The installation of this IESF basin paired with two previously installed upstream projects will provide on average 84% of the annual external phosphorus reduction identified in the approved TMDL. Therefore, this project meets the statewide priority identified in the CWF RFP to ‘restore those waters that are closest to meeting state water quality standards’. Additionally, Golden Lake, Rice Creek, and the Mississippi River are all important water resources in the state. Therefore, this project also meets the statewide priority identified in the CWF RFP to ‘restore

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and protect water resources for public use and public health, including drinking water’.

**Relationship to Plan: 2a. (15 points) Describe why the water resource of concern was identified in the plan as a priority resource. For the proposed project, identify the specific water management plan reference by plan organization (if different from the applicant), plan title, section, and page number. In addition to the plan citation, provide a brief narrative description that explains: whether this application fully or partially accomplishes the referenced activity, the estimated scale of impact that the activity in the plan has on the problem identified and the estimated scale of impact of the proposed project.**

City of Circle Pines, Water Resource Management Plan, November 2015:

Section 6 Implementation Program, Table 6.1, page 39: “Installation of an iron sand filter will be completed to remove phosphorus from Golden Lake...Highest Priority...”

Section 1.3.2.2, page 3: “Golden Lake is of primary concern. A TMDL has been developed and implementation is paramount. The impairment of Golden Lake has large negative effects on water quality and recreational opportunities within the City...”.

Minnesota Pollution Control Agency, Golden lake TMDL Report, approved by EPA September 2009:

Section 3 Loading Capacity, C. Results, page 38: “To reach the in-lake water quality goal..., the total phosphorus load to the lake must not exceed 264 lbs (0.72 lbs/day).”

Section 5 Load Reductions and Allocation, A. Load Reductions, page 42 – The load reduction relative to 2020 conditions is 103 lbs/yr for watershed loading.

Rice Creek Watershed District, Resource Management Plan for Anoka County Ditch 53-62, September 2006:

Section V: Other Regional Obligations, page 14: “Golden Lake is currently listed by the Environmental Protection Agency as a TMDL nutrient-impaired water. Once a water body is listed, a plan must be developed to determine pollutant reductions needed to bring the water body into compliance and the reductions must be allocated among point and non-point pollutant sources. Unmanaged development within the RMP will further degrade the water quality of Golden Lake.”

Anoka Conservation District, 2015–2019 Comprehensive Plan:

Section: Project Priorities, page 50 – “ACD and its partners are continuously working to identify the most cost effective opportunities to improve water quality...”

The proposed IESF basin and two other previously installed projects upstream will provide an estimated 84% of the annual external phosphorus load reduction identified in the approved TMDL.

**Relationship to Plan: 2b. Provide web links to all referenced plans.**

## Questions & Answers

City of Circle Pines, Water Resource Management Plan, November 2015

[http://www.ci.circle-pines.mn.us/vertical/sites/%7BEF567A3D-21B2-43D8-AD9B-EC198D426DD6%7D/uploads/Water\\_Resource\\_Plan.pdf](http://www.ci.circle-pines.mn.us/vertical/sites/%7BEF567A3D-21B2-43D8-AD9B-EC198D426DD6%7D/uploads/Water_Resource_Plan.pdf)

Minnesota Pollution Control Agency, Golden lake TMDL Report

<https://www.pca.state.mn.us/sites/default/files/wq-iw8-16e.pdf>

Rice Creek Watershed District, Rice Creek Watershed District Resource Management Plan for Anoka County Ditch 53-62, September 2006

<http://www.ricecreek.org/vertical/Sites/%7BF68A5205-A996-4208-96B5-2C7263C03AA9%7D/uploads/%7BB5883FCD-851C-4509-B38D-B383786D2055%7D.PDF>

Anoka Conservation District, 2015 – 2019 Comprehensive Plan

[http://www.anokaswcd.org/images/AnokaSWCD/About/Reports%20and%20Publications/2015\\_19AnokaCDCompPlan.pdf](http://www.anokaswcd.org/images/AnokaSWCD/About/Reports%20and%20Publications/2015_19AnokaCDCompPlan.pdf)

**Targeting: 3. (18 points) Describe the methods used to identify, inventory, and target the most critical pollution sources or threats (root cause) done to date and describe any additional efforts that will be completed prior to installing projects or practices.**

A Golden Lake TMDL was approved in September 2009 and the implementation plan was approved in March of 2013. The TMDL work included monitoring, modeling, and an investigative study that prioritized all water quality improvement efforts needed to achieve State water quality standards. Watershed phosphorus loading is responsible for 52% of the annual total phosphorus load in Golden Lake utilizing 2020 predicted conditions. The TMDL identified a 41% or 103 lbs/yr reduction in watershed phosphorus loading is needed to achieve the water quality goal.

In addition, the Anoka Conservation District completed a Golden Lake Stormwater Retrofit Analysis (SRA) in 2011. This study used WinSLAMM modeling to estimate stormwater volume and pollutant generation from areas with direct stormwater discharge into Golden Lake. Possible stormwater retrofits were identified and volume and pollutant reductions were modeled. Eleven projects were ranked relative to the amount of phosphorus reduced per dollar spent. Two IESFs were ranked overall as the most cost effective. Of the remaining projects, the IESF basin that is the focus of this application is among the most cost-effective and will reduce TP by 40-60 lbs/yr.

One of the top ranked projects from the SRA, an IESF pond bench, was installed at Centennial Green Park in the fall of 2015 by the Rice Creek Watershed District (RCWD), City of Blaine, and ACD thanks to a Clean Water Fund grant. That project resulted in a reduction of 27 lbs-TP/yr. The City of Circle Pines has also installed a system which works to reduce TP by pumping stormwater out of County Ditch 53-62 and into an infiltration basin. The project is upstream of the proposed IESF and results in an additional 10 lbs-TP/yr reduction. Cumulatively, the two previously installed BMPs paired with the IESF basin proposed in this application will remove on average 87 lbs-TP/yr (i.e. 84% of the goal).

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**Targeting: 4. (7 points) A) How does this application advance an overall groundwater, watershed protection, and/or restoration strategy implemented by your organization and your partners? Listing in a plan does not necessarily constitute an overall strategy. B) Describe activities other than those funded by this application that you and other partners have or will implement that affect the water resource of concern including but not limited to: other financial assistance or incentive programs, easements, regulatory enforcement, or community engagement activities that are indirectly related to this proposal.**

The project aligns with the core purpose of ACD and SWCDs in general. ACD's mission is to conserve and enhance the natural resources of Anoka County. We achieve this by: conducting monitoring and analysis, informing landowners and local government in natural resources management, and leveraging technical and financial resources to promote natural resource stewardship practices. ACD's highest natural resource priority is water quality and continuous efforts are made by the District to identify the most cost effective opportunities to achieve this goal. Additionally, in MN Stat. 103C.005 Soil and Water Conservation Policy of the state is to "encourage land occupiers to conserve soil, water and the natural resources they support through the implementation of practices that: ... 3) protect water quality; 8) protect public lands and waters."

This also advances the overall groundwater, watershed protection and restoration strategy of the City of Circle Pines. The City's 2030 Comprehensive Plan outlines goals that include... "Maintain or improve the quality of water in lakes, streams or rivers within or immediately downstream of the City of Circle Pines...Protect and enhance recreational facilities and fish and wildlife habitat...Manage surface water runoff to the degree necessary to provide groundwater recharge and to prevent groundwater contamination." The proposed IESF will help to advance all of these goals.

The proposed IESF basin will be an addition to an existing watershed protection and restoration strategy implemented by this application's partners. No one effort will rehabilitate this lake and therefore a suite of efforts is needed. Past efforts have included another IESF installed in 2015 to an existing pond within the City of Blaine, lake aeration, fish population manipulation, restricting motorized boat traffic, excavation of sediment at the primary stormwater discharge point into the lake, and new stormwater treatment basins.

**Measureable Outcomes: 5. (10 points) A) What pollutant(s) of concern (For groundwater: bacteria, untreated sewage, nitrate, pesticides, etc.; For surface water: dissolved phosphorus, nitrogen, sediment, etc.) does this project specifically address? B) Has there been a pollutant reduction goal set in relation to that pollutant of concern or the water resource of concern that is the subject of this application? C) If so, what is that goal and what process was used to set this goal? If no pollutant reduction goal has been set, describe the water quality trends or other management goals that have been established. D) For protection projects, indicate measurable outputs such as acres of protected land, number of potential contaminant sources removed or managed, etc.**

Golden Lake is impaired for excess phosphorus, which is the sole target for removal by the proposed IESF basin. The Golden Lake TMDL calls for a 41% (103 lbs/yr) reduction in TP from the surrounding watershed. An IESF pond bench installed in 2015 at an existing pond in Centennial Green Park removes 27 lbs-TP/yr. Another BMP was also installed in 2015 just upstream of Lake Drive and pumps water from County Ditch 53-

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62 to an infiltration basin, resulting in a removal 10 lbs-TP/yr. The IESF basin proposed in this application will remove an additional 40 to 60 lbs-TP/yr. Together these projects will accomplish on average 84% of the annual phosphorus reduction needed to meet State water quality standards for external loading and allow for internal loading to be more effectively addressed.

**Measureable Outcomes: 6. (15 points) A) Describe how this project directly addresses the water resource of concern or potential pollution sources and how much effect the project will have on the root cause of the most critical pollution problems or threats. B) What is the annual reduction in pollutant(s) that will be achieved or avoided for the water resource of concern after this project is completed?**

Golden Lake is impaired for nutrients (phosphorus), of which 52% of the load originates from the surrounding watershed. The IESF basin will be placed on the northeastern side of the Golden Lake Stormwater Treatment Pond. This pond has a 6,436-acre contributing drainage area, which drains to the pond via Anoka County Ditch 53-62. This ditch was originally constructed for agricultural drainage but as the area has urbanized, it now primarily conveys stormwater. In the Golden Lake TMDL, it was reported that this ditch will contribute 299 lbs-TP/yr by 2020. This necessitates a 103 lbs/yr reduction.

For this request of \$467,968 in grant funds matched by \$116,992 from the City of Circles Pines, an IESF basin will be installed that will reduce TP loading by 40-60 lbs/yr. This reduction will be accomplished by pumping approximately 1 ac-ft/day of water from the outlet of the Golden Lake Stormwater Treatment Pond to the IESF basin. Water will be pumped from the southern end of the stormwater treatment pond to the IESF from April 14 to October 31 and for every two days of pumping the system will be allowed to empty for a half day in order to allow for the system to drain, dry, and rust to create sorption sites for phosphate.

The IESF basin will be placed on City-owned property to the northeast of the existing pond. It will be composed of up to 1,350 tons of media containing 6.5% iron by weight. This project will allow for the treatment of particulate and dissolved constituents but is primarily intended to treat dissolved phosphorus, which is not treated by the existing stormwater treatment pond. The IESF basin is designed to retain up to 1,250 lbs of TP, over a 25-year lifespan.

**Measureable Outcomes: 7. (10 points) Will the overall project have additional specific secondary benefits, including but not limited to measured or estimated hydrologic benefits, enhancement of aquatic and terrestrial wildlife species, drinking water protection, enhancement of pollinator populations, or protection of rare and/or native species? If so, specifically describe, or quantify if possible, what those benefits will be.**

Reduced phosphorus concentrations in the Lake will result in increased water clarity and an increase in submerged vegetation growth, which provides habitat for invertebrates, fish, and a food source for migratory waterfowl. Golden Lake also serves to recharge groundwater. Therefore, improved conditions in Golden Lake will result in cleaner regional groundwater. Additionally, Golden Lake is within the Upper Mississippi River watershed and is directly upstream of the municipal water intakes for Minneapolis and St. Paul. A reduction in pollutants will lessen the treatment requirements for these purposes.

## Questions & Answers

Internal phosphorus loading is a significant factor causing the Golden Lake nutrient impairment. Internal loading contributes 260 lbs-TP/yr and the TMDL identified this needs to be reduced by 86% to reach a goal internal load of 36 lbs-TP annually. Alum has been proposed to reduce the internal loading. However, because Golden Lake is a flow-through system (i.e. Ditch 53-62 enters Golden Lake, which then outlets to Rice Creek), continual TP inputs from the watershed must also be addressed in order to meet State water quality standards. Therefore, first reducing the external load may result in a more effective, longer-lasting alum treatment. This proposed project in conjunction with two other recently installed upstream BMPs will achieve an estimated 84% of the required reduction for the external phosphorus load.

**Cost Effectiveness: 8. (5 points) Describe why the proposed project(s) is considered to be the most cost effective and reasonable means to attain water quality improvement or protection benefits. Consider such factors as, but not limited to BMP effectiveness, timing, site feasibility, practicality, and public acceptance. If any, what other alternatives were considered to achieve the same type and amount of benefit outlined in the proposed project?**

The Anoka Conservation District completed a Golden Lake Stormwater Retrofit Analysis in 2011. This study used WinSLAMM modeling to estimate stormwater volume and pollutant generation from areas with direct stormwater discharge into Golden Lake. Possible stormwater retrofits were identified and volume and pollutant reductions were modeled. Eleven projects were ranked relative to their amount of phosphorus reduced per dollar spent. An IESF on City of Circle Pines owned property at the Golden Lake Stormwater Treatment Pond was ranked as one of the most cost effective ways to reduce watershed phosphorus loading.

The IESF basin will treat stormwater runoff at the end of the 6,426 Golden Lake drainage area and is designed with sufficient binding sites to sequester up to 50 lbs-TP/yr for 25 years. Estimated reductions are 40-60 lbs-TP/yr; the range is based on known and predicted temporal variations in TP concentrations of incoming water. The project location is immediately upstream of the lake and therefore will treat water that is flowing directly into Golden Lake. The pump-controlled system will enable prolonged inputs to the IESF whereas gravity-fed systems rely solely on water level fluctuations from storm events.

The IESF will be installed on City property that is available for use, eliminating the land acquisition step. The site is also adjacent to a road, thereby providing unrestricted accessibility. Additionally, there is significant support from the City of Circle Pines and residents to improve water quality in Golden Lake.

**Project Readiness: 9. (8 points) Describe steps and actions already taken to ensure that project implementation can begin soon after grant award including preliminary discussions with permitting authorities (if applicable) and the status of any state, federal or local permits that may be required for the project (Conditional use, NPDES, WCA, EAW, USACE, Public Waters, archeological surveys, etc.). Also describe any preliminary discussions with landowners/occupiers, status of agreements/contracts, contingency plans, and other project development activities to date that will ensure a smooth start to the project and minimize administrative or other critical delays.**

The City of Circle Pines is eager to install this project. The IESF is specifically identified as a "Highest Priority" in the City's 2015 Water Resource

## Questions & Answers

Management Plan. Furthermore, previous efforts to secure funding for the project have been made, so the City is committed to making this project a reality.

The IESF will be installed on City of Circle Pines property so no private land acquisition is required. The project will require a land use alteration permit from the City of Circle Pines. This permit has already been discussed with the City, who is a project partner. Less than one acre of land will be disturbed during construction. Therefore, neither a NPDES construction permit nor a SWPPP will be required from the Minnesota Pollution Control Agency. ACD's wetland specialist has been to the site and approximated a wetland boundary to confirm that this project will not impact any wetlands. Additionally, using available GIS from the Minnesota Department of Health, it was confirmed the proposed IESF basin will not affect any well protection or vulnerable drinking water protection areas.

Additionally, ACD staff have successfully installed an IESF at an existing pond in Centennial Green Park (City of Blaine) and are currently working on the installation of an IESF at Oak Glen Creek Pond (City of Fridley). These projects have given ACD experience with the entire process of IESF installation from rough concept and budget estimates through to construction. The protocols, forms and policies are in place and have been tested, which will streamline this IESF project.

**Project Readiness: 10. (2 points) Newsletters, signs and press releases are standard communication tools. Beyond those basics, describe any additional project activities that would be added to the grant workplan aimed at engaging your local community on the need, benefits, and long term impacts of this project.**

In addition to highlighting the project in press releases, city newsletters, and having signs at the site, the City of Circle Pines will conduct a neighborhood meeting to inform residents about the project and its benefits to the water quality of Golden Lake. ACD will maintain an "active project" section on the [www.AnokaSWCD.org](http://www.AnokaSWCD.org) website to ensure up-to-date information is readily available for interested citizenry. Project details will also be included on the City of Circle Pines and RCWD websites. Additionally, ACD sends out routine project milestone updates in the form of emails to local and state elected officials within the jurisdiction.

**BBR: 11. (5 points) Did your organization submit a Biennial Budget Request (BBR) to BWSR in 2014?**

Yes, the Anoka Conservation District submitted a Biennial Budget Request to BWSR in 2014.

**The Constitutional Amendment requires that Amendment funding must not substitute traditional state funding. Briefly describe how this project will provide water quality benefits to the State of Minnesota without substituting existing funding.**

This is a one-time water quality improvement project installation that is estimated to remove 40 to 60 pounds of phosphorus annually. It is not a recurring task that has been funded previously by traditional sources. The project is recognized in local water planning and TMDL documents. Traditional funding sources at the local level are only sufficient to provide the match listed in this grant application. Without a FY2017 Clean Water Fund grant, this project will not be installed.

## Application Budget

Activity Name	Activity Description	Category	State Grant \$ Requested	Activity Lifespan (yrs)
<b>Grant Administration and Reporting</b>	Staff time for grant administration and reporting. Tasks include annual eLINK reporting (e.g. activity progress and budget updates), coordination of expense reports and payments, and project financial management.	ADMINISTRATION /COORDINATION	\$4,400.00	
<b>Pump-controlled IESF basin at the Golden Lake Stormwater Treatment Pond construction</b>	Construction costs for pump-controlled IESF (e.g. labor, materials, grading, equipment, site restoration, and temporary erosion control).	URBAN STORMWATER MANAGEMENT PRACTICES	\$406,368.00	25
<b>Project Development for the pump-controlled IESF basin at the Golden Lake Stormwater Treatment Pond</b>	Coordination meetings with all partners (i.e. Anoka Conservation District, project engineer, watershed management entities, and participating cities) to discuss preliminary information gathering, concept designs, project schedule, and progress updates.	PROJECT DEVELOPMENT	\$13,200.00	
<b>Tech./Eng. Assistance for the pump-controlled IESF basin at the Golden Lake Strmwtr Trtmnt Pnd</b>	Engineered construction plans including site assessment and surveys, permit applications and regulatory coordination, bidding, construction management, and final project inspection.	TECHNICAL/ENGINEERING ASSISTANCE	\$44,000.00	

## Proposed Activity Indicators

Activity Name	Indicator Name	Value & Units	Waterbody	Calculation Tool	Comments
<b>Pump-controlled IESF basin at the Golden Lake Stormwater Treatment Pond construction</b>	PHOSPHORUS (EST. REDUCTION)	40.8 LBS/YR	Golden Lake	Literature Value	

## Activity Details

Activity Name	Question	Answer
<b>Grant Administration and Reporting</b>	Are you interested in applying for CWP Loans for this project?	Not Entered
<b>Grant Administration and Reporting</b>	Dollar amount requested for Ag BMP Loan Program:	Not Entered
<b>Project Development for the pump-controlled IESF basin at the Golden Lake Stormwater Treatment Pond</b>	Are you interested in applying for CWP Loans for this project?	Not Entered
<b>Project Development for the pump-controlled IESF basin at the Golden Lake Stormwater Treatment Pond</b>	Dollar amount requested for Ag BMP Loan Program:	Not Entered
<b>Tech./Eng. Assistance for the pump-controlled IESF basin at the Golden Lake Strmwtr Trtmnt Pnd</b>	Are you interested in applying for CWP Loans for this project?	Not Entered
<b>Tech./Eng. Assistance for the pump-controlled IESF basin at the Golden Lake Strmwtr Trtmnt Pnd</b>	Dollar amount requested for Ag BMP Loan Program:	Not Entered
<b>Pump-controlled IESF basin at the Golden Lake Stormwater Treatment Pond construction</b>	Are you interested in applying for CWP Loans for this project?	Not Entered
<b>Pump-controlled IESF</b>	Dollar amount requested for	Not Entered

Activity Name	Question	Answer
<b>basin at the Golden Lake Stormwater Treatment Pond construction</b>	Ag BMP Loan Program:	

# Application Image




## Pump-controlled iron enhanced sand filter basin at the Golden Lake Stormwater Treatment Pond



### PROJECT BACKGROUND

- Golden Lake is impaired for nutrients (total phosphorus—TP)
- To meet water quality standards, the TMDL calls for TP reductions from the watershed (103 lbs/yr) and internal lake loading (236 lbs/yr).
- Once watershed reductions are met, focus will be directed to in-lake sources.
- Prior projects within the watershed have achieved 37 lbs-TP/yr reductions from the watershed.

### PROJECT BENEFITS

- Stormwater retrofit analysis identified this project as one of the most cost-effective remaining opportunities to treat watershed sources of TP.
- This iron enhanced sand filter (IESF) will remove 40 to 60 lbs-TP/yr, depending on source water TP concentration variability.
- The IESF will largely treat dissolved phosphorus, an often untreated fraction of the total phosphorus pool

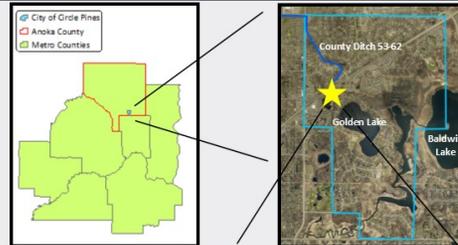
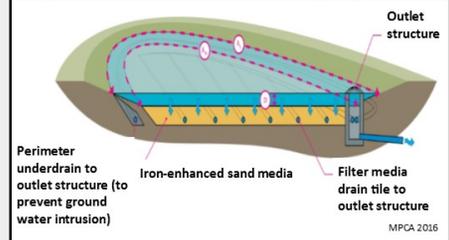


Diagram of Iron-Enhanced Sand Filter (IESF) Basin



## Map Image

