



Grant All-Detail Report Projects and Practices 2017

Grant Title - Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment

Grant ID - C17-2953

Organization - Comfort Lake-Forest Lake WD

Original Awarded Amount	\$824,000.00	Grant Execution Date	4/5/2017
Required Match Amount	\$206,000.00	Original Grant End Date	12/31/2019
Required Match %	25%	Grant Day To Day Contact	Mike Kinney
Current Awarded Amount	\$824,000.00	Current End Date	12/31/2019

Budget Summary

	Budgeted	Spent	Balance Remaining*
Total Grant Amount	\$824,000.00	\$714,033.78	\$109,966.22
Total Match Amount	\$206,000.00	\$235,203.31	\$-29,203.31
Total Other Funds	\$0.00	\$0.00	\$0.00
Total	\$1,030,000.00	\$949,237.09	\$80,762.91

*Grant balance remaining is the difference between the Awarded Amount and the Spent Amount. Other values compare budgeted and spent amounts.

Budget Details

Activity Name	Activity Category	Source Type	Source Description	Budgeted	Spent	Last Transaction Date	Matching Fund
Alum Dosing	Technical/Engineering Assistance	Current State Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System ..	\$8,800.00	\$5,355.40	11/30/2019	N
Alum Dosing	Technical/Engineering Assistance	Local Fund	CLFLWD	\$2,200.00	\$1,338.85	11/30/2019	Y

Activity Name	Activity Category	Source Type	Source Description	Budgeted	Spent	Last Transaction Date	Matching Fund
Alum Treatment	Non-Structural Management Practices	Current State Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System ..	\$108,000.00	\$81,867.60	11/12/2019	N
Alum Treatment	Non-Structural Management Practices	Local Fund	CLFLWD	\$27,000.00	\$20,466.90	11/12/2019	Y
Field Data Collection/Meetings	Monitoring/Data Collection	Current State Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System ..	\$22,640.00	\$22,640.00	12/31/2017	N
Field Data Collection/Meetings	Monitoring/Data Collection	Local Fund	CLFLWD	\$5,660.00	\$6,680.36	12/31/2017	Y
Grant management and reporting	Administration/Coordination	Current State Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System ..	\$6,400.00	\$6,400.00	12/31/2018	N
Grant management and reporting	Administration/Coordination	Local Fund	CLFLWD	\$1,600.00	\$28,879.86	12/31/2019	Y
O&M and Educational Materials	Education/Information	Current State Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System ..	\$5,920.00	\$4,608.05	11/30/2019	N
O&M and Educational Materials	Education/Information	Local Fund	CLFLWD	\$1,480.00	\$1,660.28	12/31/2018	Y
Reuse System Engineering	Technical/Engineering Assistance	Current State Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System ..	\$92,240.00	\$92,240.00	12/31/2018	N
Reuse System Engineering	Technical/Engineering Assistance	Local Fund	CLFLWD	\$23,060.00	\$50,946.38	12/31/2019	Y
Stormwater Harvest and Irrigation Reuse Construction	Urban Stormwater Management Practices	Current State Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System ..	\$580,000.00	\$500,922.73	12/31/2019	N
Stormwater Harvest and Irrigation Reuse Construction	Urban Stormwater Management Practices	Local Fund	CLFLWD	\$145,000.00	\$125,230.68	12/31/2019	Y

Activity Details Summary

Activity Details	Total Action Count	Total Activity Mapped	Proposed Size / Unit	Actual Size / Unit
378 - Pond for Water Use	1	1	1 COUNT	COUNT
155M - Storm Water Retention Basins	1	1	1 AC	AC
563M - Alum addition - In Lake	1		1 COUNT	COUNT

Proposed Activity Indicators

Activity Name	Indicator Name	Value & Units	Waterbody	Calculation Tool	Comments
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Final Indicators Summary

Indicator Name	Total Value	Unit
PHOSPHORUS (EST. REDUCTION)	77.00	LBS/YR

Grant Activity

Grant Activity - Alum Dosing

Description

Paleolimnological sediment core data will be reviewed and analyzed to develop an appropriate dosing plan.

Plans and specs will be completed for all components of the alum dosing to be bid. This task will include preparing project bidding documents, advertising for bids, conducting a pre-bid meeting, answering bidding questions, and providing bid packages for alum application. This task will include observation and documentation of the alum application and management of the alum application contract. Construction contract management will include the processing of pay requests and project close out documentation.

This activity will be primarily carried out by EOR. Tasks include permitting, dosing design, contract documents, bidding, application oversight, and development of the alum treatment OM&M plan. EOR staff dedicated to this activity:

- Project Manager & District Engineer – Greg Graske, PE
- Principal Oversight – Cecilio Olivier, PE
- Water Quality Scientist & Limnologist – Meghan Funke, Ph.D.
- Dosing Support – Joe Pallardy

Regarding design standards, the alum dose will be based on the best available science and methods, developed and published from several decades of alum treatment experience, presented at the North American Lake Management Society Lake & Pond Phosphorus Inactivation & Interception Workshop Training, and attended by EOR's Meghan Funke on November 6, 2012. In addition, the alum dose will be calculated to account for other compounds that affect the binding efficiency of alum to phosphorus in the sediments (recently published in James and Bischoff, 2015. Relationships between redoxsensitive phosphorus concentrations in sediment and the aluminum:phosphorus binding ratio. Lake and Reservoir Management 31: 339-346), and in-depth sediment core sampling.

SCWRS collected discrete depth samples from a deep sediment core in 2016 and analyzed the sediment for all fractions of phosphorus that are needed to determine the alum dose.

Category

TECHNICAL/ENGINEERING ASSISTANCE

Start Date

27-Jul-17

End Date

Has Rates and Hours?

Yes

Actual Results	<p>2017 Results: Began initial alum dosing discussions - cost-benefit and timing of alum treatments; discussed feasibility study with CLFLWD Board of Managers</p> <p>6/30/18 Update: Continued alum dosing and contract bidding preparations</p> <p>2/1/19 Update: Continued alum dosing and contract bidding preparations</p> <p>6/30/19 Update: Continued alum dosing, including sediment analyses.</p> <p>2/1/20 Update: Finished alum dosing, oversaw alum treatment round 1.</p>
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Grant Activity - Alum Treatment

Description	<p>This task will include application of alum treatment according to dosing determined during the alum dosing phase of this project. This activity will be carried out by a contractor awarded the construction project through a public bidding process. Completion of the whole-lake alum treatment is estimated to result in a reduction of roughly 913 pounds per year in the phosphorus load to Shields Lake, reducing internal sediment phosphorus loading to natural background levels. This is anticipated to achieve the CLFLWD's long-term water quality goal for Shields Lake and result in a clear water state for the lake. Additionally, completion of this project is anticipated to reduce phosphorus loads to Forest Lake by up to 250 pounds per year.</p> <p>Match funds will be provided by CLFLWD. In addition, the CLFLWD has applied for a CWA Section 319 grant to cover some of the match for alum dosing and alum treatment.</p>	
Category	NON-STRUCTURAL MANAGEMENT PRACTICES	
Start Date	25-Oct-19	End Date
Has Rates and Hours?	No	
Actual Results	2/1/20 Update: HAB Aquatic Solutions performed alum treatment October 25-27. Treatment reporting from HAB included: jar test log, application log, bill of lading (BOL) log, application coverage map.	

Activity Action - Whole-Lake Alum Treatment			
Practice	563M - Alum addition - In Lake	Count of Activities	1
Description			
Proposed Size / Units	1.00 COUNT	Lifespan	10 Years
Actual Size/Units	COUNT	Installed Date	
Mapped Activities	No		

Grant Activity - Field Data Collection/Meetings			
Description	CLFLWD staff will collect field data necessary to determine the feasibility and specific design of the stormwater harvest and irrigation reuse system. Data collected includes, but is not limited to, field meeting with golf course representatives, soil borings and geotechnical report, wetland delineation, existing irrigation system design and capacity, and surveying with utility locate. Existing utility information within the project area will be requested from the City of Forest Lake, the golf course and known private utilities. Complete wetland delineation for all wetlands within the project area and finalize a delineation report based on site observations and monitoring data. Bring the delineation through the approval process with local WCA LGU (City of Forest Lake) and USACOE.		
Category	MONITORING/DATA COLLECTION		
Start Date	12-Apr-17	End Date	
Has Rates and Hours?	Yes		
Actual Results	2/1/18 Update: Field Data Collection and feasibility study has been completed. Feasibility study was presented to the Forest Hills Golf Club.		

Grant Activity - Grant management and reporting

<p>Description</p>	<p>CLFLWD staff will coordinate grant budgeting, reporting, and management. Minor support may be needed by the District Engineer. District legal counsel time needed to review contracts and landowner agreements are also included in this grant activity. CLFLWD staff, legal counsel, and EOR will enter into an agreement with the Forest Hills Golf Course for construction access, maintenance access, and O&M responsibilities for the stormwater harvest and irrigation reuse system. Forest Hills Golf Course was involved with the submittal of the grant application and provided a letter of support indicating their intent to enter into a formal agreement with the CLFLWD for this project (see attached). Currently the project is anticipated to be completed entirely on golf course property. If the feasibility assessment under Phase 3 determines that easements through private property would provide significant overall cost savings, then additional agreements and easements would be required. CLFLWD staff would work closely with the BWSR grant administrator to revise the work plan, if needed.</p> <p>This Activity is primarily carried out by the CLFLWD Administrator. Tasks include budgeting, reporting, and grant management. Minor support may be needed by the District Engineer. District legal counsel time needed to review contracts and landowner agreements are also included in this grant activity.</p>	
<p>Category</p>	<p>ADMINISTRATION/COORDINATION</p>	
<p>Start Date</p>	<p>12-Apr-17</p>	<p>End Date</p>
<p>Has Rates and Hours?</p>	<p>Yes</p>	
<p>Actual Results</p>	<p>2/1/18 Update: Contract with Forest Hills Golf Club was signed by both parties on November 20, 2017.</p> <p>6/30/18 Update: Worked on easements with legal counsel, grant reporting, ongoing project management</p> <p>2/1/19 Update: Worked on project bidding, design changes, coordination with Board of Managers and FHGC, grant reporting</p> <p>6/30/19: Updates to Board of Managers, coordination with FHGC, grant reporting.</p> <p>2/1/20 Update: Continued updates to Board of Managers as necessary, coordination with FHGC, grant reporting.</p>	

Grant Activity - O&M and Educational Materials

Description	<p>CLFLWD staff and EOR will develop an Operations & Maintenance Manual for the stormwater harvest and irrigation reuse system. As recommended in the Minnesota Stormwater Manual, this O&M manual will clearly state the responsibilities of the owner in operating and maintaining the system, identify which O&M activities need to be performed by a licensed plumber or electrician (if any), address how the transfer of responsibilities will be managed should ownership change in the future, and provide for an on-going Operation and Maintenance Plan as described below.</p> <p>CLFLWD staff and EOR will develop educational signs to be posted next to the stormwater harvesting pond and in high travel areas of the golf course to educate golf course members and staff on stormwater runoff impacts to Shields Lake and Forest Lake and an overview of how harvesting and reuse benefits the lake and local groundwater resources. The District will also work with golf course staff to host a project kick-off event for patrons and members to tour and learn about the project. The District will also present the benefits and long-term impacts of the proposed project to a Forest Lake Lake Association meeting.</p>		
Category	EDUCATION/INFORMATION		
Start Date	25-Aug-17	End Date	
Has Rates and Hours?	Yes		

Actual Results

2/1/18 Update: Operations and Maintenance Plan has been drafted and shared with Forest Hills Golf Club.

6/30/18 Update: held the first of two local informational meetings for the project on May 15th. The purpose of this first meeting was to reach out specifically to the nine homeowners immediately adjacent to the proposed stormwater harvest pond site. Five people attended and were generally supportive of the project, especially considering how the pond and tall native prairie plants may reduce the amount of golf balls bouncing from the driving range into their yards. EOR prepared a digital rendering of the proposed plan view of the finished project. Staff prepared a meeting invite with a summary about the project and a handout explaining what to expect with the native plant restoration and temporary stabilization postconstruction. The second meeting will be later this summer, have a larger invite list, will be more of an open house format, and will display the project plans which EOR will have closer to completion by then.

2/1/19 Update: The second meeting, an open house at the District office, was held on August 28, 2018. It was well attended with about a dozen citizens who stayed for more than the two hours it was scheduled.

2/1/20 Update: Began work on operations and maintenance plan for stormwater harvest and irrigation reuse system. Continued regular outreach and coordination with FHGC and surrounding landowners including project update mailers, a public open house at the District office, a public field demonstration on the day of the alum treatment at Shields Lake Park. Aerial UAV footage was taken during the alum treatment and will be used in future alum treatment outreach.

Grant Activity - Reuse System Engineering

Description	<p>Includes: Feasibility Assessment, 60% Design, Final Design, Permitting/Review, and Bidding and Construction Admin.</p> <p>Reuse System Engineering: This activity will be primarily carried out by Emmons & Olivier Resources (EOR), currently serving as the CLFLWD Engineer. EOR staff dedicated to the project and their individual roles are identified below.</p> <ul style="list-style-type: none"> • Project Manager & District Engineer – Greg Graske, PE • Principal Oversight – Cecilio Olivier, PE • Water Quality Scientist & Limnologist – Meghan Funke, Ph.D. • Primary Design Engineer – Derek Lash, PE, CPESC • Supporting Design Engineer – Steve Pellinen, PE • Landscape Designer – Kevin Biehn, PLA • Design Support – Britta Hansen, PLA • Civil Technician & Field Services – Kyle Crawford, EIT • H&H Modeling Support – Mike Talbot, EIT • Hydrogeologist – Stu Grubb, PG • Wetland Permitting Lead – Jason Naber, WDC • Wetland Permitting Support – Joe Pallardy • Graphic Design Support – Sonya Carel, RA <p>Project Design and Construction Standards: The 2016 edition of the Minnesota Department of Transportation “Standard Specifications for Construction” and the latest version of the City Engineers Association of Minnesota “Construction Standards Specifications” and the City of Forest Lake “2013 Public Works / Engineering Standards” shall govern.</p>	
Category	TECHNICAL/ENGINEERING ASSISTANCE	
Start Date	1-May-17	End Date
Has Rates and Hours?	Yes	

Actual Results

2/1/18 Update: completed pond siting and pipe alignment options; obtained final wetland delineation approval; completed feasibility report and presented it to the Forest Hills Golf Club; on December 21, 2017 the CLFLWD board held a public hearing, ordered the project, and authorized the District Engineer to proceed with the final design.

6/30/18 Update: Completed 60% design, currently working on final design and specifications. Submitted wetland permits. Next steps: complete 90% design and prove to FHGC and City of FL for review. Construction anticipated for fall 2018.

12/31/18 Update: Completed final project design, completed construction bidding, awarded contract to Dresel Construction, construction of stormwater harvest and irrigation reuse system occurred in November. Worked through minor design changes with FHGC.

6/30/19 Update: Worked with Dresel Construction on final construction and site cleanup tasks including irrigation pond float installation and testing of system. Assisted with providing updates to the CLFLWD Board of Managers.

2/1/20 Update: Contracting and construction oversight with multiple contractors to bank stabilization, erosion control, and vegetation restoration to landowner specifications. Worked closely with FHGC.

Grant Activity - Stormwater Harvest and Irrigation Reuse Construction

Description	This task will include on-the-ground construction of project components as designed during the final design phase of this project. Components installed as part of this project will include installation of a stormwater harvest and irrigation reuse system. This activity will be carried out by a contractor awarded the construction project through a public bidding process. Installation of the stormwater harvest and irrigation reuse system is estimated to result in a reduction of 77 pounds per year to the phosphorus load entering Shields Lake.		
Category	URBAN STORMWATER MANAGEMENT PRACTICES		
Start Date	1-Nov-18	End Date	
Has Rates and Hours?	No		
Actual Results	<p>2/1/19 Update: Construction of stormwater harvest and irrigation reuse system occurred in November.</p> <p>6/30/19 Update: Worked on final construction and site cleanup tasks including irrigation pond float installation and testing of system. Note that second pay request from Dresel Contracting was received on July 12, 2019. Work occurred in Jan-Jun 2019.</p> <p>12/20/19 Update: Bank stabilization, erosion control, and and vegetation restoration to landowner specifications.</p>		

Activity Action - Stormwater Harvest Basin			
Practice	155M - Storm Water Retention Basins	Count of Activities	1
Description			
Proposed Size / Units	1.00 AC	Lifespan	25 Years
Actual Size/Units	AC	Installed Date	
Mapped Activities	1 Point(s)		

Final Indicator for Stormwater Harvest Basin			
Indicator Name	PHOSPHORUS (EST. REDUCTION)	Value	77
Indicator Subcategory/Units	WATER POLLUTION (REDUCTION ESTIMATES) LBS/YR	Calculation Tool	P8 Urban Catchment Model
Waterbody	Shields Lake		

Activity Action - Irrigation Reuse System			
Practice	378 - Pond for Water Use	Count of Activities	1
Description			
Proposed Size / Units	1.00 COUNT	Lifespan	25 Years
Actual Size/Units	COUNT	Installed Date	
Mapped Activities	1 Point(s)		

Grant Attachments

Document Name	Document Type	Description
2017 Clean Water Fund amendment EXECUTED	Grant Agreement Amendment	
2017 Competitive Grant	Grant Agreement	2017 Competitive Grant - Comfort Lake-Forest Lake WD
2017 Competitive Grant AMENDMENT - CLFLWD	Grant Agreement Amendment	
2017 Competitive Grant executed	Grant Agreement	2017 Competitive Grant - Comfort Lake-Forest Lake WD
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 02/04/2020
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 03/26/2018
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 03/21/2018
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 02/04/2020
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 02/03/2020
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 03/19/2019
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 05/23/2019
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 02/01/2019
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 02/23/2018
All Details Report	Workflow Generated	Workflow Generated - All Details Report - 01/29/2018
Application	Workflow Generated	Workflow Generated - Application - 08/08/2016
C17-2953_1 Reconciliation Checklist	Journal	Journal Dated - 04/12/2019
Financial Report - 40% Request	Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment

Document Name	Document Type	Description
Financial Report Reconciliation	Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment
Forest Hills Golf Course Letter of Support	Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment
Revised Work Plan Text 04032017	Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment
Revised Work Plan Text 04042017	Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment
Signed FHGC Agreement	Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment
Stormwater Harvest and Irrigation Reuse System Schematic	Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment
Work Plan	Workflow Generated	Workflow Generated - Work Plan - 03/20/2017
Work Plan	Workflow Generated	Workflow Generated - Work Plan - 04/03/2017
Work Plan	Workflow Generated	Workflow Generated - Work Plan - 03/31/2017
Work Plan	Workflow Generated	Workflow Generated - Work Plan - 12/14/2016
Work Plan Budget	Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment
Work Plan Text	Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment
grantmap_17094_2016-08-08_10-37-16-AM.jpg	Grant	Shields Lake Stormwater Harvest and Irrigation Reuse System and Alum Treatment