

Final Report healthy Lakes Grant LPT 62119

Submitted by: John Harwood President Blue Island Resort Inc.

Approved by: Glenn J. Speich Jr. President Little Arbor Lake District

Final Report Healthy Lakes Grant LPT 62119

Blue Island Resort

Two Rain Gardens and One Rock Infiltration structure

The grant was initially for one rain garden and two rock infiltration structures. The projects were larger than previous rain garden projects and outside contractor help would be needed. After contacting 3 landscape contractors and getting prices it was decided to request a change to make one of the rock infiltration projects a larger rain garden. There is more opportunity to do work in house with volunteers on a rain garden than on a rock infiltration project.

Blue Island Resort and Condominiums is located on rolling land on the Southeast side of Little Arbor Vitae Lake. The terrain is sloping with grades of 10% to 20%, with the general slope being downward from Blue Island road to the lake. All roadways in the lower resort are asphalt being impervious surface run off areas from Blue Island Road to the lake. One rain garden was constructed to contain a portion of the direct runoff from Blue Island Road and the Main Resort entrance

The second rain garden was constructed to capture the roof run off of one of the homes and the adjoining 15% sloped yard.

The rock infiltration project was constructed at the end of Sunset lane which is the access to the upper resort. Sunset Lane is a gravel 20 foot wide road providing access to the lake for 5 homes. It will also capture some of the roof water from a home and two garages.

Project 1: Rain Garden

The rain garden would be the continuation and completion of a previous project. The rain garden was sized to capture $\frac{1}{2}$ of the rain water from the up hill home and part of the adjoining yard. The soil is mostly sand and the topsoil had been worn away from using vacuum collection on the mowing equipment and the use of high powered blowers during spring and fall yard clean up.

Uncontrolled run off also contributed to erosion. The lawn consisted of a light covering of scattered lawn grass.

The owner of the home had gutters installed to lower the water flowing across the lawn but created a concentrated flow. The project consisted of the construction of a rock drainage way from the rain gutters down the hill through a small rain garden previously built, an over flow to a much larger rain garden at the bottom of the slope was built. Normal construction of a level berm on the upper rain garden to create a sheet flow of over flow water was not deemed reasonable in this case due to the concentrated water coming from the rain gutters in a larger rain.

The lawn was re top soiled and shaped as much as possible to direct natural run off to go to the rain garden. Due to the location of a storage building and asphalt drive way rock filled over flow drains were built to direct water round the building and along the driveway.

Complete control of the combined run off from the lawn and the rain gutter was not possible due to the slopes, storage building and the asphalt drive way. Based on the first rain received since being completed it is capable of containing an 1 inch per hour rain through the rain gutters and about 50% of the yard runoff. Time will tell what the largest rain that the rain garden and the rock over flows can handle before water just flows through the rain garden and the drains directly in route to the lake. Any water over flowing will need to flow over a flat area of lawn before reaching the lake (see addendum picture).

Cost are included in the addendum as well as additional pictures

Project 2: Rain Garden

Rain garden 2 was constructed to capture the run off from Blue Island Road and a section of the main asphalt driveway to Blue Island Resort

Water from the roadways currently concentrates at the side of the driveway and flows unrestricted through the resort for ----- feet before crossing the 35 foot buffer to the lake. Due to the volumes of water conveyed it will take additional diversions to control the water before reaching the lake. This is will control the water from the town road and the intersection of the driveway as well as part of the yard slopping up to the town road.

A new rock lined channel was dug adjacent to the asphalt drive way to capture the water coming off of the asphalt so it would not be eroding the edge of the asphalt. The water then could be directed to the rain garden. Based on the calculated run off the rain garden was placed as far down hill as it could and be able to handle the run off. Run off was based on the best practices guide lines. It seems that we are seeing more storms that are shorter than historical and more intense. It may be a cycle or an indication of the future. Wisconsin is seeing rain amounts higher than average. The rain garden was constructed larger than the minimum size determined by the guide lines.

Pictures and cost are included in the addedum

Project 3: Rock infiltration structure

The project is located at the dead end of Sunset Lane. It ends with 2 garages and a cabin that control how water is conveyed past them. The garage floor elevations control how much grading can be done while directing water past the cabin.

The road had been graded to divert as much water of the road to a low area away from the lake. The remaining water from the road and roof water from the lake side of the garages needed to be handled. There is a 4 foot drop in elevation where the road ended and the cabin, this had badly eroded from the water being channelized. There was a large bare spot in the lawn that had been washed clean of top soil creating a location to build the infiltration structure.

Based on the best practices guide to provide storage and surface area to infiltrate the amount of water (see addendum) about 100 square feet of surface area would be needed. The area was excavated 3 feet deep and backed filled with 10 cubic yards of 1 ½ inch clean round rock. This created a depression over which a layer of 2 to 4 inch crushed rock was placed. The crushed rock was chosen for the water way down the 4 foot change in elevation as it binds together better than round rock. In high flow conditions round rock will tumble when placed on a slope like the drainage way. This rock was also place over the round rock as it will act as an energy dissipater as the water flows into the structure. A low berm was constructed around the down slope ½ of the structure to add additional storage. It was covered by 4 inches of wood mulch and wood chips.

Due to being late in the growing season the edges of the drainage way were seeded and native grass plants and some native wild flowers will be planted during the spring of 2021 along the berm.

Pictures and cost are in the addendum

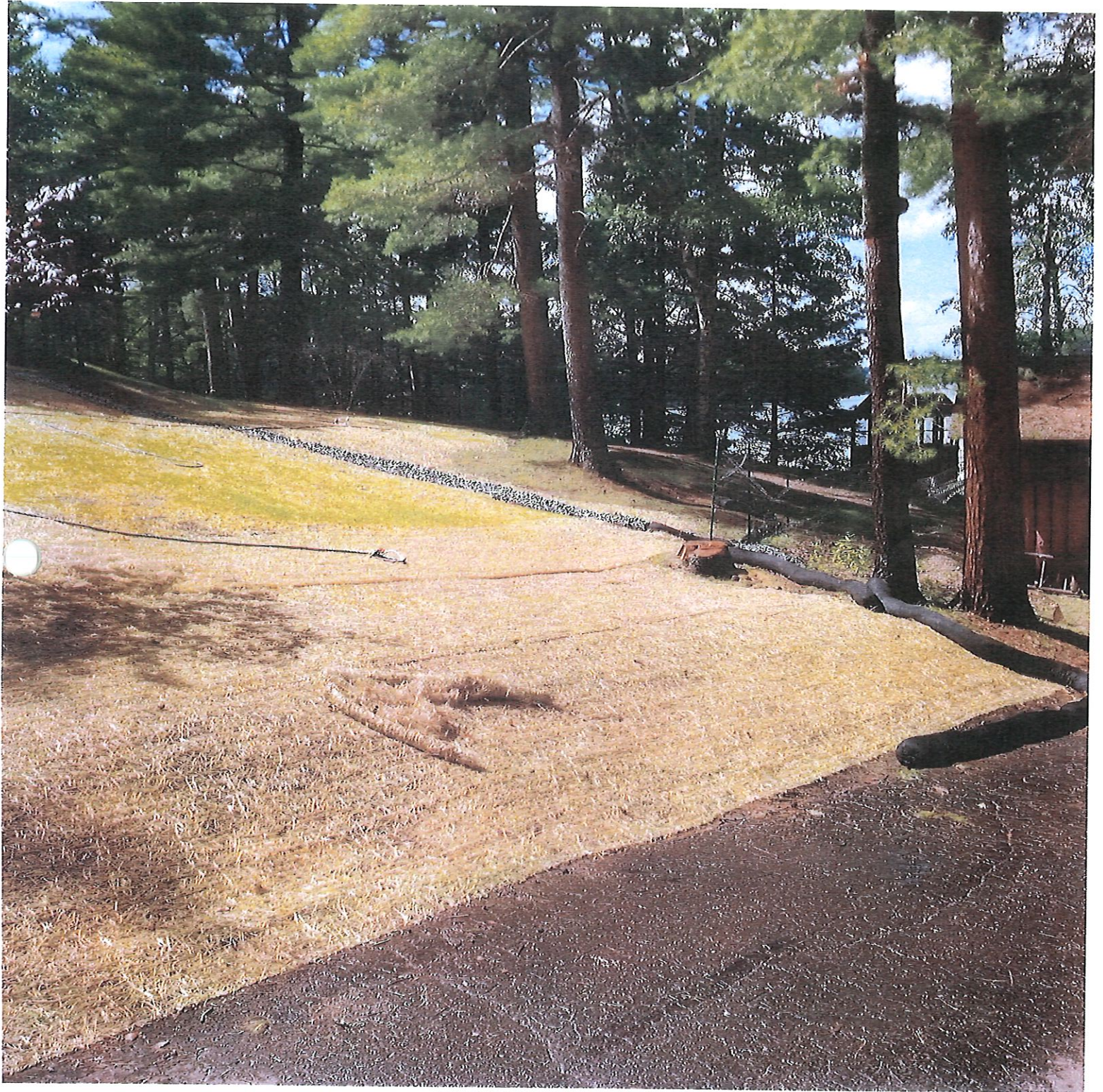
additional area and increasing restoration cost. Top soil was distributed on the slopes above the garden with a skid loader on tracks. It was further distributed by hand as there is a septic in the area between the rain gutters and the rain garden. Material excavated from the basin was used as the berm. In addition to the top soil purchased some additional top soil came from the Condo owned stock pile.

COST

Care taker labor to dig basin	\$ 200.00 donated
Rock for the drainage way	150.00
Wood chip mulch	\$ 40.00
Top soil	\$ 573.65
Flowers	\$ 156.97
Fence	\$ 75.00
Seed, fertilizer, straw	\$ 202.50
Straw/netting	\$ 58.01
Seed 5 pounds	\$ 29.52
Total	\$1485.65

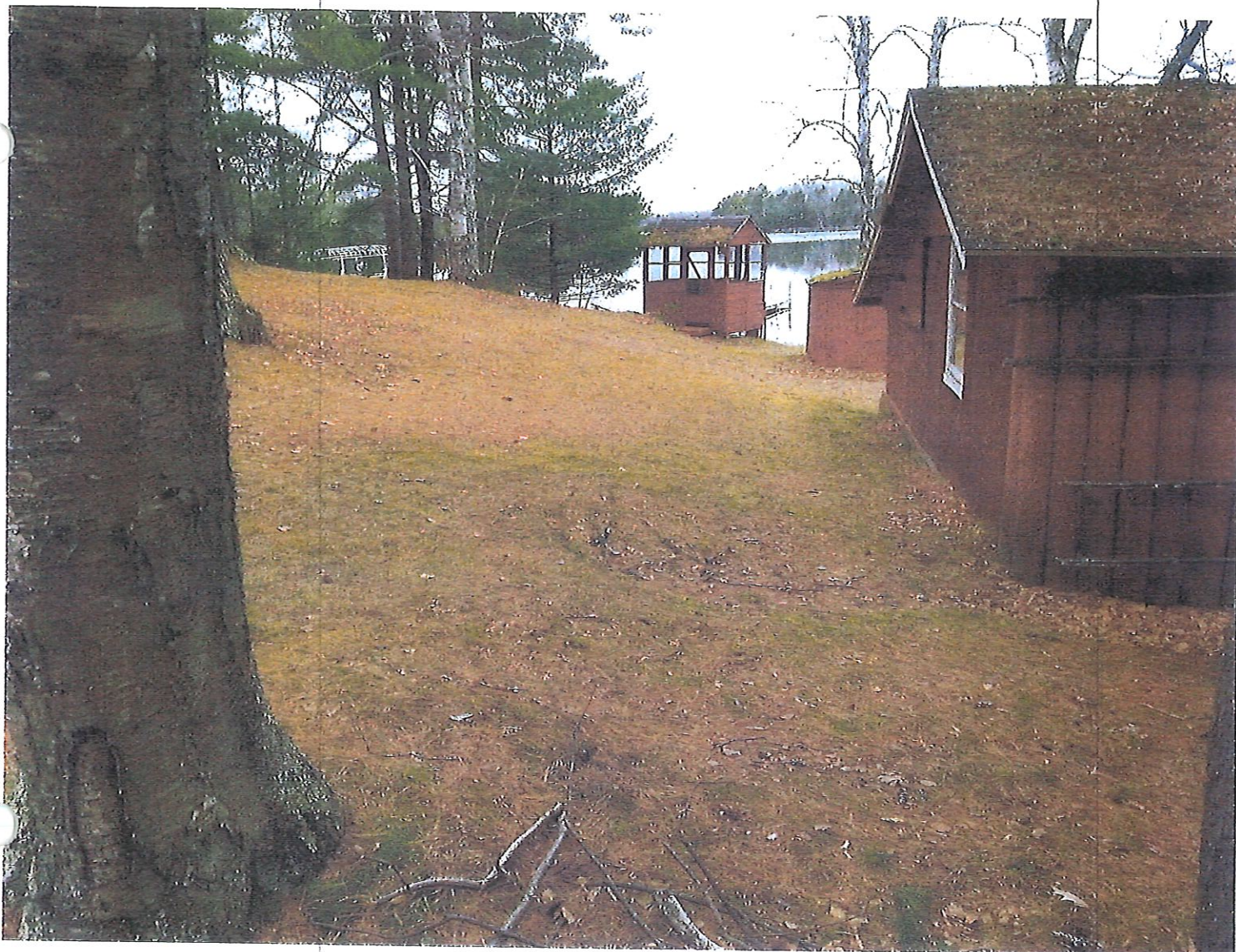
Volunteer hours 23 @ \$12 = \$276













Volunteer Labor Worksheet Used as Grant Match (Required for Federal \$)

Form 8700-349B (R 08/16)

Notice: Some DNR grant programs allow volunteer labor to count as the sponsor's match to grant funds provided by the Department. If you have a grant from one of those programs and choose to use volunteer labor as part of your match, use this form to document volunteer labor. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31-19.39, Wis. Stats.).

Instructions: Completed form or form developed by sponsor showing the same required information must be submitted with each reimbursement request (both partial and final) to verify volunteer labor.

VOLUNTEER LABOR WORKSHEET						
Volunteer Last Name		First	MI	Grant Project Number		
SPEIGH		GLENN	J	LPT 62119		
Project Name:				<input type="checkbox"/> Check Box if Federal Funding		
RAIN GARDEN 1						
Date	Description of Work Performed	Hours		Rate*	=	Total
6/22/2019	DIG RAIN GARDEN	3	X	12 ⁰⁰	=	36 ⁰⁰
6/23/2019	HAUL TOP SOIL FROM STOCK PILE	2	X	12 ⁰⁰	=	24 ⁰⁰
6/23/2019	RAKE TOP SOIL - SPREAD WOOD CHIPS	1	X	12 ⁰⁰	=	12 ⁰⁰
6/24/2019	HAUL AND SPREAD MULCH	2	X	12 ⁰⁰	=	24 ⁰⁰
6/24/2019	DIG OVERFLOW ALONG BUILDING	2	X	12 ⁰⁰	=	24 ⁰⁰
7/23/2020	WORK WITH CONTRACTOR	2	X	12 ⁰⁰	=	24 ⁰⁰
7/24/2020	RAKE TOP SOIL + LEVEL STONE	2	X	12 ⁰⁰	=	24 ⁰⁰
7/28/2020	SEED AND SPREAD STRAW	1.5	X	12 ⁰⁰	=	18 ⁰⁰
7/29/2020	SPREAD STRAW AND SET UP SPRINKLERS	1.0	X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
Total Value of Services Performed:		16.5		12 ⁰⁰		198 ⁰⁰

*Rate is typically a flat rate set by admin. code, Federal Minimum wage, or WI minimum wage.

I certify that the volunteer labor above has been performed and that this claim is true and correct.

Signature of Volunteer		Date Signed
G. Glenn Speigh Jr.		9/07/2020
Volunteer Email	and/or	Volunteer Phone Number
glennspeigh@gmail.com		715-216-9352

Volunteer Labor Worksheet Used as Grant Match

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VOLUNTEER LABOR WORKSHEET

Volunteer Last Name Harwood First John MI A Grant Project Number LPT 62119

Project Name: Blue Island Resort Rain Garden #1 ☐ Check Box if Federal Funding

Date	Description of Work Performed	Hours	Rate*	Total
7/28/20	Spreading Straw	1	X \$12.00	= \$12.00
7/28/20	Seeding	.5	X \$12.00	= \$6.00
7/28/20	Watering	1	X \$12.00	= \$12.00
7/29/20	Spreading Straw	1	X \$12.00	= \$12.00
		X		=
		X		=
		X		=
		X		=
		X		=
		X		=
		X		=
		X		=
		X		=
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		X		=
		X		=
		X		=
		X		=
		X		=
		X		=
Total Value of Services Performed:		<u>3.5</u>	<u>\$12.00</u>	<u>\$42.00</u>

*Rate is typically a flat rate set by admin. code, Federal Minimum wage, or WI minimum wage.

I certify that the volunteer labor above has been performed and that this claim is true and correct.

Signature of Volunteer John Harwood Date Signed 9-8-2020
Volunteer Email johnharwood71@gmail.com and/or Volunteer Phone Number 715-499-0471

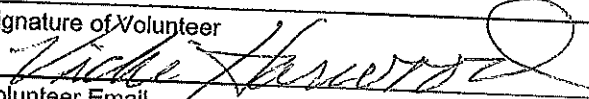
Volunteer Labor Worksheet Used as Grant Match (Required for Federal \$) Form 8700-349B (R 08/16)


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VOLUNTEER LABOR WORKSHEET						
Volunteer Last Name Harwood		First Vicki		MI D	Grant Project Number LPT 62119	
Project Name: Blue Island Resort Ram Garden #1					<input type="checkbox"/> Check Box if Federal Funding	
Date	Description of Work Performed	Hours		Rate*	=	Total
7/29/20	Spreading straw	1	X	\$12.00	=	\$12.00
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
			X		=	
Total Value of Services Performed:		1	X	\$12.00	=	\$12.00

*Rate is typically a flat rate set by admin. code, Federal Minimum wage, or WI minimum wage.
 I certify that the volunteer labor above has been performed and that this claim is true and correct.

Signature of Volunteer 	Date Signed 09/08/2020
Volunteer Email JohnHarwood71@gmail.com	and/or Volunteer Phone Number 715-499-0471

Signature of Volunteer 	Date Signed 9/9/20
Volunteer Email Bev T 1113 @ 9 mail, com	and/or Volunteer Phone Number 847-363-9002

Project 2 Rain Garden

Rain Garden At Entrance to Blue Island Resort

The project was shown in the grant application as a rock infiltration project, a request was made to the DNR to change it to a rain garden project. Contractor bids made the original project cost prohibitive. A rain garden would take care of the majority of the storm water and condo association would need to build an addition rain garden further down slope .

Water from Blue Island Road drains down the main entrance to the resort and across all of the lawn between the road and lake. This project will intercept some of the road run off which tends to be the dirtiest storm run off from reaching the lake.

The original calculations showed that it would take 536 square feet of rain garden. It would take a 20 by 27 rain garden while a 20 by 15 rock infiltration basin would have been enough. Both options exceeded the maximum that could be budgeted. A rain garden 13 by 27 was built being 65% of what was calculated to meet the run off needs which is 3 times larger that what was in the revised application. A garden with 108 square feet was in the revised grant application. A deeper basin was created by raising the berm. It is difficult to calculate what the actual capacity of the higher berm is. It will lessen the over flow and the down slope lawn maybe able to absorb more water with less flow.

A drainage way 2 feet wide was built along the edge of the black top from Blue island down slope a distance of 60 feet and 30 feet over to the rain garden. It is filled with 2 inch minus crushed hard rock. The crushed hard rock will resist rolling down the channel under hard flow conditions. It will also create some disturbance to absorb energy and the coarse rock will allow some water to infiltrate. Both factors are difficult to calculate and only observations during actual rains will provide actual benefits.

CONSTRUCTION

The basin and the drainage way were contractor constructed The topsoil was placed as best as a machine could place it. The final shaping of the rock drainage way and all topsoil leveling and raking out was done by volunteer labor. Seeding, fertilizer and straw mulch placement was done with volunteer labor. After the plants were placed a wood chip mulch was placed on the interior walls and floor of the garden to protect the top soil until the plants can provide that protection.

An additional length of the shoulder of the driveway will receive a similar rock drainage way for a length of 40 feet to direct addition road water to the basin.

The contractor who did the work had signed a contract in June 2019 to do the work on the Rock infiltration Project in the grant detailed as project 3 in this report. This project had not been included in his contract. After receiving a down payment he failed to show up in 2019. Under pressure to complete all of the work contracted for he showed up in Mid July 2020. As a good will jester he agreed to do the work on this project and only charge for material needed. The Condo association had purchased the crushed hard rock from a quarry directly anticipating this project as proposed would be done by the care taker and volunteers. With his assistance the project was built larger than proposed but closer to what was calculated.

COST

Excavation, topsoil placement and stone placement donated by Contactor

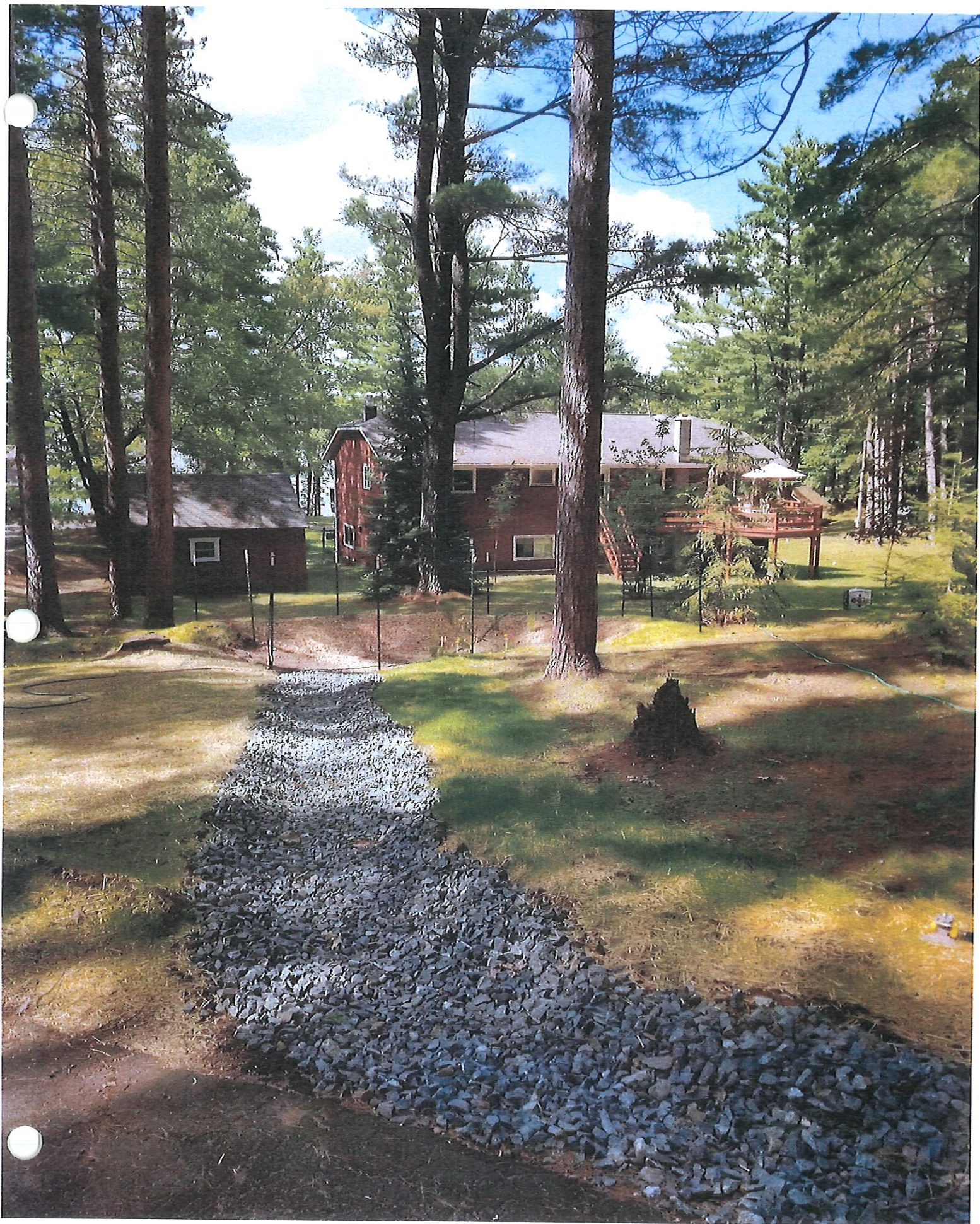
Excavation	\$ 0.00 donated contractor
Top soil 20 cubic Yards	\$ 573.65
Crushed Hard Rock 5 Cubic yards	\$ 257.16
Seed, fertilizer and straw mulch	\$ 225.54
Seed 2 pounds shade mix	\$ 6.32
Fence	\$ 125.00
Plants	\$ 56.97
Total	\$1244.64

Volunteer hours 24 @ \$12 = \$288



















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VOLUNTEER LABOR WORKSHEET

Volunteer Last Name Harwood First John MI A Grant Project Number _____

Project Name:

Blue Island Resort Rabn Garden #2

☐ Check Box if Federal Funding

Date	Description of Work Performed	Hours	Rate*	Total
7/28/20	Seeding	0.5	X \$12.00	= \$6.00
7/28/20	Spreading Straw Mats	1	X \$12.00	= \$12.00
7/28/20	Putting In Fence Posts	0.5	X \$12.00	= \$6.00
7/28/20	Putting Up & Fastening Fence	0.5	X \$12.00	= \$6.00
7/28/20	Watering	1	X \$12.00	= \$12.00
8/3/20	Watering	1	X \$12.00	= \$12.00
8/4/20	Watering	1	X \$12.00	= \$12.00
8/5/20	Watering	1	X \$12.00	= \$12.00
8/6/20	Watering	1	X \$12.00	= \$12.00
8/7/20	Watering	1	X \$12.00	= \$12.00
8/8/20	Watering	1	X \$12.00	= \$12.00
		X		=
		X		=
		X		=
		X		=
		X		=
		X		=
		X		=
		X		=
Total Value of Services Performed:		9.5	X \$12.00	= \$114.00

*Rate is typically a flat rate set by admin. code, Federal Minimum wage, or WI minimum wage.

I certify that the volunteer labor above has been performed and that this claim is true and correct.

Signature of Volunteer John Harwood Date Signed 09/08/2020
Volunteer Email johnharwood71@gmail.com and/or Volunteer Phone Number 715-499-0471

Volunteer Labor Worksheet Used as Grant Match

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VOLUNTEER LABOR WORKSHEET

Volunteer Last Name Harwood First Vicki MI D Grant Project Number

Project Name: Blue Island Resort Rosa Garden #2 ☐ Check Box if Federal Funding

Date	Description of Work Performed	Hours		Rate*	Total
7/28/20	Spreading Straw	0.5	X	\$12.00	\$6.00
7/28/20	Putting Up & Fortening Fence	0.5	X	\$12.00	\$6.00
8/2/20	Planting Flowers & Shrubs	0.5	X	12.00	\$6.00
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
Total Value of Services Performed:		1.5		\$12.00	\$18.00

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I certify that the volunteer labor above has been performed and that this claim is true and correct.

Signature of Volunteer Vicki Harwood Date Signed 09/08/2020
Volunteer Email johnharwood71@gmail.com and/or Volunteer Phone Number 715-499-0471

Project 3 Rock Infiltration

Listed as Rock Infiltration 1 in the application

Sunset Lane is a gravel roadway 20 feet wide that connects 5 homes to Blue Island Road, Three of which are part of Blue Island resort. This project includes only the last 60 feet of roadway serving 2 homes of the resort.

This project was originally in a grant request in 2016. It was proposed to be a rain garden. A request was made to move this project to another part of the resort. Based on additional discussions with the condo owners it was decided a rock infiltration basin would be a better project for this location. With a large deer infestation there will be less vegetation to protect from being eaten.

The basin is 114 square feet with a rock depth of 3 feet. The 3 feet of rock is washed 1 ½ inch river rock, it is covered by a layer of 2 to 4 inch crushed hard rock. The crushed hard rock is desired for steeper slopes and the potential for quick surges of runoff. The angular rock will stay in place where as the round river rock could wash down the slope.

The weather pattern that we have seen the last few years does not fit the historical pattern. The rain storms are of a more intense rain over a shorter period or storms over several days with rains of 3 to 5 inches. This project was shaped and built to try meet the current rain patterns .

There is a 1 foot high berm 3 feet wide on the down slope side of the basin that adds additional holding capacity. The berm is covered with 4 inches of hardwood shredded mulch. Sedum plants have been placed along the top of the berm that should spread and cover the mulch. Two Barberry shrubs anchor the ends of the berm. The plantings should be deer resistant.

COSTRUCTION

This project was constructed by a contractor and final landscaping was done the owners of Blue island resort and its care taker.

The basin was excavated with a mini excavator on tracks. Access to the basin was by driving along what would be come the drainage way from the road to the basin. This lessened the amount of area disturbed. The excavation was used to create the berm first. Excess material was moved from the excavation one scoop at a time by backing the excavator up the slope to deposit the material in a dump truck for removal. While slow it minimized the disturbance and cost of restoration.

Once the excavation was created the rock was moved from the dump truck on scoop at a time and moved down the slope to the basin. Once the basin was full of the 1 ½ inch rock the 2 to 4 inch rock was placed on top of the basin and then on the drainage way as the excavator moved up the slope. Topsoil was placed along the edges. Final shaping of the rock was done by hand and the topsoil was leveled and raked. 4 inches of natural wood mulch was placed on the berm. As the mulch breaks down the sedum should spread to make ground cover. With size of the basin and the berm little over flow should occur.

additional area and increasing restoration cost. Top soil was distributed on the slopes above the garden with a skid loader on tracks. It was further distributed by hand as there is a septic in the area between the rain gutters and the rain garden. Material excavated from the basin was used as the berm. In addition to the top soil purchased some additional top soil came from the Condo owned stock pile.

COST

Care taker labor to dig basin	\$ 200.00 donated
Rock for the drainage way	150.00
Wood chip mulch	\$ 40.00
Top soil	\$ 573.65
Flowers	\$ 156.97
Fence	\$ 75.00
Seed, fertilizer, straw	\$ 202.50
Straw/netting	\$ 58.01
Seed 5 pounds	\$ 29.52
Total	\$1485.65

Volunteer hours 34 @ \$12 = \$408

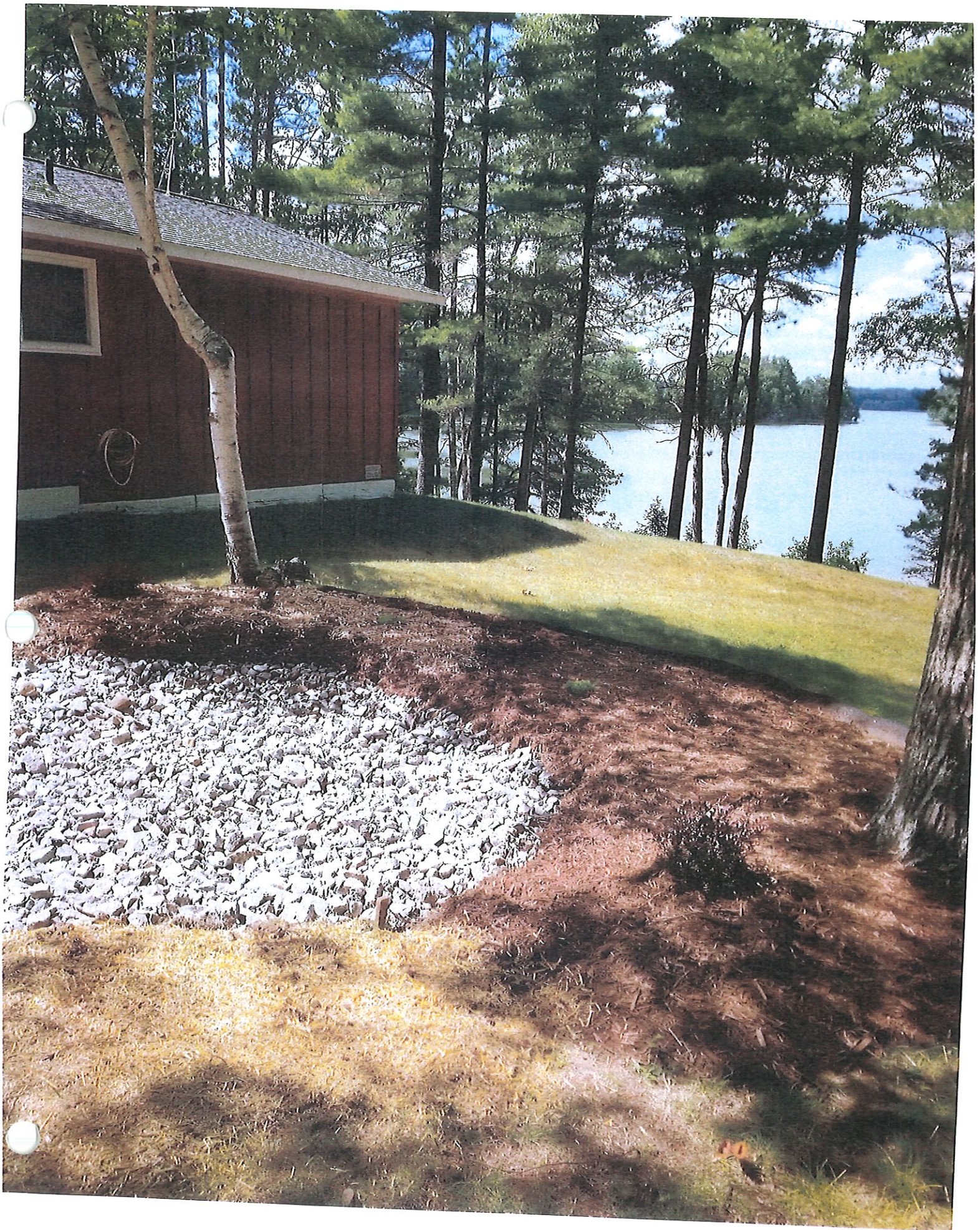














Erosion

Rain Garden

McMaster

Volunteer Labor Worksheet Used as Grant Match

(Required for Federal \$)

Form 8700-349B (R 08/16)

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VOLUNTEER LABOR WORKSHEET

Volunteer Last Name SPEICH First GLENN MI J. Grant Project Number LOT 62119

Project Name: INFILTRATION BASIN ☐ Check Box if Federal Funding

Date	Description of Work Performed	Hours		Rate*	Total
6/30/2020	RAKE TOP SOIL SEED - STRAW MULCH	3	X	12 ⁰⁰	36 ⁰⁰
8/04/2020	GET MULCH AND SPREAD	2	X	12 ⁰⁰	24 ⁰⁰
8/05/2020	GET PLANTS AND PLANT	1	X	12 ⁰⁰	12 ⁰⁰
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
			X		
Total Value of Services Performed:		6.0		12 ⁰⁰	\$72 ⁰⁰

*Rate is typically a flat rate set by admin. code, Federal Minimum wage, or WI minimum wage.

I certify that the volunteer labor above has been performed and that this claim is true and correct.

Signature of Volunteer Glenn Speich Jr. Date Signed 9/09/2020
 Volunteer Email glennspeich@gmail.com and/or Volunteer Phone Number 715-216-9392