MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: File

FROM: Clarence Jones, Project Manager

DATE August 18, 2011

SUBJECT: State Revolving Fund (SRF) Project No. 5387-01
Township of Spring Lake Project Plan
Green Project Reserve (GPR) Qualifying Costs

In the Part III Application for the above-referenced project, the accompanying bid information was used to determine the final qualifying GPR amounts to be included in the Order of Approval package.

The following items eligible for GPR qualification are from the bid proposal of the successful low bidder, (Jackson-Merkey Construction Associates) on the Spring Lake Township Pump Station rehabilitations and Sanitary Sewer replacement project.

Pump Controllers (Can pump stations)	$73,416
Variable Frequency Drives (VFD) (Can pump stations)	$33,663
SCADA (Can Pump Stations)	$21,293
SCADA (Submersible Pump Stations)	$17,784
GPR Total	$154,925

Based on the information supplied by Prein&Newhof, the new controllers and VFD's will allow the new pumps and motors to operate at lower speeds that translates into less energy usage at each pump station. The overall energy usage reduction for the sixteen stations with new pumps and motors with VFD's is 32 percent, resulting in an estimated annual savings of $2,507. Installing SCADA will provide an estimated annual electrical savings of $10,568.

Attached is a copy of the bid proposal. The total eligible construction costs for this project is $2,267,500. Therefore the percentage of green construction is $154,925 ÷ $2,267,500 = 0.0683. Since the SRF loan amount is $2,565,000, the total green cost (construction and non-construction) is $2,565,000 x 0.0683 = $175,189.50.

Because 50 per cent of the GPR eligible costs qualify for "principal forgiveness," the maximum amount usable for this purpose is $175,189.50 multiplied by 50 percent = $87,594.75.

Please note that the eligibility of the two GPR items was documented in categorical a case presentation letters dated June 29, 2010 (VFD component) and July 15, 2010 (SCADA component). These letters were submitted by Mr. Kevin Kieft of Prein&Newhof Engineers of Muskegon on behalf of The Township of Spring Lake and supported by Mr. Keith Zahn of the Grand Rapids District Office, Water Bureau, in his memorandum dated on August 12, 2011.

Attachment □

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: Clarence Jones, Environmental Quality Analyst, Revolving Fund Section
Environmental Resource Management Division

FROM: Keith Zahn, Environmental Engineer, Grand Rapids District Office
Water Resources Division

DATE: August 12, 2011

SUBJECT: Spring Lake Township – State Revolving Fund project No. 5387-01
Qualification for Green Project Reserve Funding

The purpose of this memo is to confirm the basis for determining that the Spring Lake Township (Township) State Revolving Fund Project No. 5387-01 qualifies for the green project funding under Public Law 111-88. This project is replacing 8 steel can pump stations with more efficient pumps and motors, which will all have variable frequency drives (vfds). These changes will allow the pump stations to operate more efficiently which will save energy. Additionally, the eight (8) steel can pump stations and eight (8) submersible pump stations will be connected to a Supervisory Control and Data Acquisition (SCADA) system which will not only save energy by allowing the pump stations to run more efficiently by alerting operators of pump problems, but will also reduce the amount of labor costs. The Township has made several submittals to us to outline the energy and labor savings that could be realized through implementation of these proposed projects. The submittals were dated June 29 and July 15, 2010.

Based on the information provided by Prein & Newhof on behalf of the Township, this project can save up to 33% in energy consumption for the upgraded steel can pumps, motors, and vfds. The project can save an additional 35% in energy consumption for the SCADA installation. Therefore, the project does qualify for the green project reserve funding.

KRZ

Green Project Reserve Summary

Owner:
Spring Lake Township

Project Title:
SRF Project No. 5387-01

Date: 20-Jul-11

Project #: 2100797

	PS No. 2	PS No. 9	PS No. 10	PS No. 12	PS No. 13	PS No. 18	PS No. 28	PS No. 32	Totals:
Can Pump Station Cost	$194,500	$169,000	$151,000	$135,500	$173,000	$158,000	$130,000	$196,000	$1,307,000.00
Green Project Reserve Eligible Items:									
Pump Controller	$9,177	$9,177	$9,177	$9,177	$9,177	$9,177	$9,177	$9,177	$73,416.00
VFD's	$4,130	$3,174	$5,732	$3,174	$4,195	$5,042	$3,174	$5,042	$33,663.00
Alarm Monitoring	$5,732	$2,223	$2,223	$2,223	$2,223	$2,223	$2,223	$2,223	$21,293.00
							Can Pump Stations:	GPR Total (w/o taxes)	$128,372.00
								Taxes:	$7,702.32
								Subtotal:	**$136,074.32**

	PS No. 8	PS No. 11	PS No. 15	PS No. 16	PS No. 20	PS No. 24	PS No. 25	PS No. 26	
Submersible Pump Station Cost	$110,000	$104,000	$105,000	$106,000	$105,000	$104,500	$106,000	$105,500	$846,000.00
Green Project Reserve Eligible Items:									
Alarm Monitoring	$2,223	$2,223	$2,223	$2,223	$2,223	$2,223	$2,223	$2,223	$17,784.00
							Submersible Pump Stations:	GPR Total (w/o taxes)	$17,784.00
								Taxes:	$1,067.04
								Subtotal:	**$18,851.04**
								Green Project Reserve Eligible Amount:	**$154,925.36**

Bid Proposal

Owner:	Spring Lake Township
Owner Address:	106 S. Buchanan Street, Spring Lake, MI 49456
Project Title:	SRF Pump Station Improvements
Bid Date & Time:	July 18, 2011, 10:00am Project #: 2100797

The undersigned, being familiar with the site, plans, specifications, and related documents, proposes to furnish all required labor, materials, tools and equipment to construct the project in accordance with the base bid lump sum price as follows:

Date Prepared: 07.18.2011

Receipt of Addenda

Receipt of Addenda 1 through 1 is hereby acknowledged.

Summary of Bids

Amount of Base Bid Two Million, Two Hundred Sixty Seven Thousand Five Hundred Dollars($ 2,267,500-)

The Owner reserves the right to accept or reject any or all bids and to waive any irregularities in the bidding.

Contractor's Signature

Jackson-Merkey Contractors, Inc.		231-728-8344
Contractor's Name		Telephone Number
555 E. Western Ave.	Muskegon	49442
Business Address	City	Zip Code
Stephen J. Jackson	President	07.18.2011
Signature	Title	Date

Seal (if bidder is a corporation)

Bid Proposal

Owner:	Spring Lake Township
Owner Address:	106 S. Buchanan Street, Spring Lake, MI 49456
Project Title:	SRF Pump Station Improvements
Bid Date & Time:	July 18, 2011, 10:00am Project #: 2100797

I. MAJOR EQUIPMENT

The various major items are listed below with provisions for alternative manufacturers. The lump sum bid shall include equipment listed below as "Base Bid". Alternate will be considered if offered under "Alternate" with an increase "Add" or reduction "Deduct" below.

All cost associated with utilizing equipment provided by other manufacturers shall be included in the add or deduct including all building, electrical, mechanical or any other changes necessary to install the equipment.

The Owner may elect to choose any of the alternates, and the contract amount shall be adjusted accordingly.

	BASE BID COST	ALTERNATE Add	ALTERNATE Deduct
1. Pumping Units			
Flygt	$ 217,345		
_____		$_____	$_____
2. Eccentric Plug Valves			
DeZurik	$ 28,010		
_____		$_____	$_____
3. Swing Check Valves			
M&H	$ 25,510		
_____		$_____	$_____

4. Gas Engine Generators

Cummins $ 42,200

_____ $_____ $_____

Owner:	Spring Lake Township
Owner Address:	106 S. Buchanan Street, Spring Lake, MI 49456
Project Title:	SRF Pump Station Improvements
Bid Date & Time:	July 18, 2011, 10:00am Project #: 2100797

II. SUPPLEMENTAL INFORMATION

A. (BREAKDOWN PER SITE)

The Owner is requiring the supplemental information below for the improvement costs for each pump station, for internal bookkeeping purposes. In addition, in order to determine project portions eligible for Green Project Reserve funding, the Contractor shall provide all costs associated with the equipment, labor and installation for each item listed.

BASE BID COST

CAN PUMP STATIONS:

1. **Pump Station No. 2** $ 194,500

   Pump Controller $ 9,177

   Variable Frequency Drives (2 Total) $ 4,130

   Alarm Monitoring RTU & Wireless Data Service $ 5,732

2. **Pump Station No. 9** $ 169,000

   Pump Controller $ 9,177

   Variable Frequency Drives (2 Total) $ 3,174

   Alarm Monitoring RTU & Wireless Data Service $ 2,223

3. **Pump Station No. 10** $ 151,000

   Pump Controller $ 9,177

   Variable Frequency Drives (2 Total) $ 5,732

   Alarm Monitoring RTU & Wireless Data Service $ 2,223

4. **Pump Station No. 12** $ 135,500

Pump Controller $ 9,177

Variable Frequency Drives (2 Total) $ 3,174

Alarm Monitoring RTU & Wireless Data Service $ 2,223

5. **Pump Station No. 13** $ 173,000

Pump Controller $ 9,177

Variable Frequency Drives (2 Total) $ 4,195

Alarm Monitoring RTU & Wireless Data Service $ 2,223

6. **Pump Station No. 18** $ 158,000

Pump Controller $ 9,177

Variable Frequency Drives (2 Total) $ 5,042

Alarm Monitoring RTU & Wireless Data Service $ 2,223

7. **Pump Station No. 28** $ 130,000

Pump Controller $ 9,177

Variable Frequency Drives (2 Total) $ 3,174

Alarm Monitoring RTU & Wireless Data Service $ 2,223

8. **Pump Station No. 32** $ 196,000

Pump Controller $ 9,177

Variable Frequency Drives (2 Total) $ 5,042

Alarm Monitoring RTU & Wireless Data Service $ 2,223

SUBMERSIBLE PUMP STATIONS:

1. **Pump Station No. 8** $ 110,000
2. **Pump Station No. 11** $ 104,000
3. **Pump Station No.15** $ 105,000
4. **Pump Station No. 16** $ 106,000
5. **Pump Station No. 20** $ 105,000
6. **Pump Station No. 24** $ 104,500
7. **Pump Station No. 25** $ 106,000
8. **Pump Station No. 26** $ 105,500

Provide Labor, Equipment and Installation for :

Alarm Monitoring RTU & Wireless Data Service (PER SUMBERSIBLE STATION)

$ 2,223

WILDFIELD DRIVE SANITARY SEWER REMOVAL AND REPLACEMENT:

1. Wildfield San. Sewer $ 114,500

B. (UNIT PRICES FOR WILDFIELD DRIVE SANITARY SEWER)

The Owner is requiring the supplemental information below for the improvement costs for several items required to complete the construction of the Wildfield Drive Sanitary Sewer. The Owner is obtaining this information, in order to be able to have pricing in case additional quantities are warranted as determined by the Owner and Engineer.

	UNIT	UNIT COST
1. Remove 4' diameter Sanitary Manhole	Each	$ 475
2. Place 4' diameter Sanitary Manhole	Each	$ 6,770
3. Remove & Replace 8" San. Sewer and Appurt.	L.F.	$ 97
4. Reconnect Sanitary Lateral	Each	$ 650
5. Remove & Replace Concrete Drive	Syd.	$ 60.50
6. Remove & Replace HMA Pavement (152nd)	Syd.	$ 37.85
7. Remove & Replace HMA Pavement (Wildfield)	Syd.	$ 18.50

Prein&Newhof
Engineers ▪ Surveyors ▪ Environmental ▪ Laboratory

July 15, 2010
2090152

Mr. Clarence Jones,
Michigan Department of Natural Resources and Environment
Constitution Hall – 3rd Floor South Tower
525 West Allegan Street
Lansing, MI 48933

RE: Spring Lake Township
SRF Project Plan: SRF No. 5387-01

Dear Mr. Jones:

The purpose of this letter is to provide further documentation on the Green Project Reserve information submitted on June 29, 2010. Additional clarification was requested by Wendy Jansma in a July 6, 2010 email, which you were copied on. We discussed the proposed improvements with her and determined that the variable frequency drives and SCADA system were eligible for the Green Project Reserve. The pumps and motors were eliminated from consideration for the Green Project Reserve funding, although the energy savings will still be seen as previously submitted. We were not able to show that the combined energy savings of the pumps and motors pay for the components within their design life but still are necessary to upgrade to maintain the system reliability.

We were able to document a payback for the variable frequency drives (VFD's) and SCADA system. The vfd's will allow the pumps and motors to operate at lower speeds which correlates to less energy usage as documented previously. These savings equated to a 20 percent energy savings. In addition, the vfd's provide for longer run times and less starts over the life of the pump and motor. The vfd's have been estimated to cost $77,000. This includes the cost of 2 VFD's at each of the steel "can" stations at a cost of $51,400 for materials and $25,689 for labor and installation. We reviewed the original operations and maintenance costs for the selected alternate and have estimated an annual power savings of $1,513 per year, a decrease in manpower of 1 hour per week ($2,080 per year), and an annual savings of $4,000 in equipment and replacement costs. This $7,593 per year savings has a present worth of $133,000 and the payback is 10 years.

Similar savings are anticipated with incorporation of a SCADA system. The SCADA system has been upgraded recently in a station similar to the proposed station upgrades. This station was experiencing problems with clogging from rags. The Township was able to monitor on a daily, rather than weekly basis the number of pump starts and runtimes. When a pump showed additional runtimes, they were able to address and reduce the amount of pump runtime. The energy consumption decreased by 35 percent from the previous year.

Installing SCADA at all 16 stations will provide for increase monitoring capabilities and reduced maintenance and electrical costs. To be conservative we have estimated an electrical savings of 50 percent from that of the station experience clogging. The overall SCADA system cost estimate is $123,000 for the 16 stations with $5,780 per station in equipment costs and $1,900 in labor and installation costs. We have estimated an annual energy savings of $2,407 based on the previous scenario, a decrease in manpower of 2 hours per week ($4,160 per year), and a savings of $4,000 in equipment and replacements costs. A total annual savings of $10,568 results in a present worth of $185,000 and a payback in just over 11.5 years.

We feel we are being very conservative with the estimate on the number of hours of manpower per week for both the vfd's and SCADA cost analysis. If a station experiences problems it typically requires 3 men approximately 2-3 hours to address. Additional time and expense occur if a condition develops requiring contracted sources to address. SCADA will minimize this from occurring as problems can be discovered and addressed sooner.

As requested, below is a summary of the costs and GPR amount requested.

Project Description	SRF Amount	GPR : VFD Equipment and Installation Costs	GPR: SCADA Equipment and Installation Costs	GPR Total Amount
Steel Can Stations	$1,695,000	$77,000	$61,440	$138,440
Submersibles	$805,000	Not Eligible	$61,440	$61,440
Wildfield Sanitary	$100,000	Not Eligible	Not Eligible	Not Eligible
	$2,600,000	**$77,000**	**$122,880**	**$199,880**

Please review the above information and if you have questions or need additional information, please do not hesitate to contact us.

Sincerely,

Prein&Newhof

Kevin S. Kieft, P.E.

KSK/ksk

cc: Mr. Gordon Gallagher, Spring Lake Township
Ms. Wendy Jansma, Spring Lake Township
Mr. Keith Zahn, MDEQ

Prein&Newhof
Engineers ▪ Surveyors ▪ Environmental ▪ Laboratory

June 29, 2010
2090152

Mr. Clarence Jones, Project Manager/EQA
Michigan Department of Natural Resources and Environment
Water Bureau Field Services Division/Revolving Loan and Operator Certification Section
Constitution Hall – 3rd Floor South Tower
525 West Allegan Street
Lansing, MI 48933

RE: Spring Lake Township
SRF Project Plan: SRF No. 5387-01

Dear Mr. Jones:

The purpose of this letter is to provide documentation for your review to determine that the Spring Lake Township, SRF Project Plan No. 5387-01, qualifies for the green project reserve funding under the ARRA. The original basis for completing the project was for increased reliability in the system and increased energy efficiencies. This project will replace 16 wastewater pump stations, with the majority constructed in the early 1980's. Significant energy savings will be achieved with new pumps and motors operating at their best efficiency point. Original pump selections in the early 1980's were limited and efficiencies have improved. In addition variable frequency drives will be incorporated into the design to achieve additional energy savings.

The attached spreadsheet breaks down the energy savings for both the proposed steel can stations and the submersible stations. The majority of the energy savings is found in replacement of the larger pumps and motors associated with the can stations. Preliminary pump selections were completed for each of the can stations and determined that horsepower rating will be reduced for the majority. This was converted into energy savings and determined that a reduction in energy of 13 percent can be achieved with the new pump selections. Based on 2009 usage for each of the stations, this equated into an annual energy savings of $994.02 for actual usage and delivery charges.

In addition to the reduced horsepower ratings, the can stations will be equipped with variable frequency drives (vfd's). An analysis was run for these stations operating with and without vfd's. A 20 percent reduction in energy is achieved with the use of vfd's. This equates to an additional annual energy savings of $1,513.22 with the use of vfd's.

A review of the energy usage of the submersible stations was also completed. The submersible pump stations are smaller in size and preliminary pump selections indicate the same size horsepower rating. No savings are anticipated with these selections needed to meet the flow conditions. Vfd's were also reviewed and although it was determined that a 8 percent decrease in energy usage may be achieved with vfd's, it is not cost effective. The annual savings for installing vfd's would be only $42.76.

The overall energy usage reduction for the 16 stations for new pumps and motor selections with vfd's on the can stations is 32 percent and an estimated $2,507.24 annual savings and meets the green project reserve categorical energy efficiency requirements outlined in 3.2.2 for achieving a 20% or more reduction in energy consumption.

New controls and SCADA will also be added to allow for additional monitoring of the stations. This monitoring will allow maintenance personnel to determine if there are possible clogs occurring or other items that may need maintenance. This results in energy savings as pumps can be unclogged and operate at their most efficient point. New equipment such as blowers, heaters, sump pumps, and

dehumidifiers will also be replaced. Replacement of this outdated equipment will also have a positive effect on the energy usage at each station.

We have broken out the cost components in the $1,695,000 steel can pump station portion of the project and have determine approximately 65 percent or $1,101,750 of these upgrades is eligible for the green project reserve. This includes pumps, motors, controls, monitoring system, and electrical upgrades. Items such as site improvements, bypass pumping, piping and valves have not been included. Additional review and determination of this amount can be completed following design and bidding of the project. No costs for the green project reserve are included for the submersible stations or the Wildfield sewer replacement.

If you have questions or need additional information, please do not hesitate to contact us.

Sincerely,

Prein&Newhof

Kevin Kieft

Kevin S. Kieft, P.E.

KSK/ksk

Enclosure(s): Spring Lake Township 5387-01 Green Project Reserve Worksheet

cc: Mr. Gordon Gallagher, Spring Lake Township w/enclosures
Ms. Wendy Jansma, Spring Lake Township w/enclosures
Mr. Keith Zahn, MDEQ w/enclosures

Spring Lake Township
Wastewater Collection System Improvements
SRF Project No. 5387-01

Green Project Reserve Worksheet
I. Steel "Can" Pump Stations - Energy Savings
A. Horsepower Reduction Savings

Pump Station No.	Existing Horsepower HP	Proposed Horsepower HP	Existing Energy Usage kW	Proposed Energy Usage kW	Energy Decrease	Existing Annual Usage (kWh)	Proposed Usage Decrease (kWh)	Usage Cost Savings ($0.085641/kwh)	Additional Delivery Charges ($.042681/kwh)
2	10 HP	12 HP	7.46	8.95	(0.20)	13650	(2730.04)	($232.50)	($116.52)
9	7.5 HP	6.4 HP	5.52	4.77	0.14	7249	979.61	$83.43	$41.81
10	10HP	12 HP	7.46	8.95	(0.20)	9707	(1941.43)	($165.34)	($82.86)
12	7.5 HP	6.4 HP	5.52	4.77	0.14	5915	799.34	$68.07	$34.12
13	15 HP	6.5 HP	11.19	4.85	0.57	6539	3703.27	$315.39	$158.06
18	15 HP	6.5 HP	11.19	4.85	0.57	3492	1977.65	$168.42	$84.41
28	5 HP	3.7 HP	3.73	2.76	0.26	2711	706.45	$60.16	$30.15
32	15 HP	7.4 HP	11.19	5.52	0.51	8448	4280.34	$364.53	$182.69
	Energy Reduction Based on Reduced Hp					57711	**7775.200315**	**$662.17**	**$331.85**
							0.13 Percent Savings		
							Savings (Reduced Horsepower):		**$994.02**

B. Variable Frequency Drives

Pump Station No.	Proposed Energy Usage w/o VFD (kWh/MG)	Proposed Energy Usage w/VFD (kWh/MG)	Energy Decrease	Existing Annual Usage (kWh)	Proposed Usage Decrease (kWh)	Usage Cost Savings ($0.085641/kwh)	Additional Delivery Charges ($.042681/kwh)
2	201.3	127	0.37	13650	5038.23	$431.48	$215.04
9	439.3	419	0.05	7249	334.98	$28.69	$14.30
10	351	219.5	0.37	9707	3636.67	$311.45	$155.22
12	409	391	0.04	5915	260.32	$22.29	$11.11
13	908.5	715.8	0.21	6539	1386.97	$118.78	$59.20
18	843	660.9	0.22	3492	754.32	$64.60	$32.20
28	232.6	232.6	0.00	2711	0.00	$0.00	$0.00
32	244	233	0.05	8448	380.85	$32.62	$16.26
Energy Reduction Based on Variable Frequency Drives				**57711**	**11792.33541**	**$1,009.91**	**$503.31**
							0.20 Percent Savings
					Savings (VFD's):		**$1,513.22**
					Total Savings:		**$2,507.24**

II. **Submersible Pump Stations**

A. **Existing Pumps are 4 HP. Proposed pumps to be 4 HP. No savings based on horsepower.**

B. **Variable Frequency Drives**

Pump Station No.	Proposed Energy Usage w/o VFD (kWh/MG)	Proposed Energy Usage w/VFD (kWh/MG)	Energy Decrease	Existing Annual Usage (kWh)	Proposed Usage Decrease (kWh)	Usage Cost Savings ($0.085641/kwh)	Additional Delivery Charges ($.042681/kwh)
8	290.8	270.6	0.07	1028	71.41	$6.12	$3.05
11	390.8	347.7	0.11	973	107.31	$9.19	$4.58
15	270.9	270.7	0.00	329	0.24	$0.02	$0.01
16	364.5	344.4	0.06	466	25.70	$2.20	$1.10
20	375	337	0.10	725	73.47	$6.29	$3.14
24	438	429	0.02	244	5.01	$0.43	$0.21
25	396	352	0.11	160	17.78	$1.52	$0.76
26	383	339	0.11	281	32.28	$2.76	$1.38
				4206	**333.20**	**$28.54**	**$14.22**
						0.08 Percent Savings	
					Savings (VFD's):		**$42.76**

Not Cost Effective to Install VFD's

III. Overall Energy Saving Summary

Existing Annual Usage (kWh)	Usage Decrease (kWh)	Total Reduction	Annual Energy Cost Savings
61917	19567.54	**0.32**	**$2,507.24**