

VILLAGE OF BEAR LAKE
SAW Grant Project No. 1309-01

EXECUTIVE SUMMARY

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Owner: Village of Bear Lake

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On September 23, 2016, the Village of Bear Lake entered into an agreement with the Michigan Finance Authority for grant funds issued under Public Act No. 511 of 2012 for the *Stormwater, Asset Management, and Wastewater (SAW)* program. The Village received the follow grants:

<i>Stormwater Asset Management Plan (SWAMP) – 90% Grant</i>	<i>\$267,488</i>
Stormwater Management Plan (SWMP) – 90% Grant	<u>\$79,840</u>
Eligible Cost Subtotal	\$347,328
LESS Local Match – 10%	<u>(\$34,733)</u>
Total Grant Amount	\$312,595

The Asset Management Plans (AMPs) needed to be completed within three years of the date of agreement; Dec 2019.

Each AMP has the following key components:

- Part 1: Asset Inventory and Condition Assessment
- Part 2: Level of Service Determination
- Part 3: Critical Assets (Risk)
- Part 4: Revenue Structure
- Part 5: Capital Improvement Plan

Part 1: Storm Water Asset Inventory and Condition Assessment

For the collection system, Spicer Group, Inc. completed conventional survey of the entire Village, and used the survey information to develop a comprehensive Geographic Information System (GIS). It is considered a detailed “smart” mapping system with databases, utilizing the ArcGIS Online (AGOL) platform by ESRI (Environmental Systems Research Institute). This system can be accessed in the field by DPW staff from new iPads supplied as part of the SAW grant project. The Village will also have multiple external hard drives to access the GIS data set in-house, as needed. It is the intent of the Village to have Manistee County display, house, and edit GIS data as need. From the GIS, asbuilt plans,

pipe/manhole condition ratings, materials, year installed, inspection records, CCTV (closed circuit television) pipe inspections etc. can be accessed. This information can also be queried to provide specific lists and maps and updated easily when future improvements are made.

The Village owned and operated storm water collection system is approximately 2.0 miles in length and consists of storm sewer pipes predominantly ranging in diameter sizes from 6” to 30”. The storm sewer pipes consist of mainline sewer, catch basin leads, and culverts. There were approximately 102 culverts that were identified in the system. Culverts were not evaluated unless they were identified as connecting to the mainline sewer. In addition, the Village has approximately 77 structures consisting of manholes and catch basins. The Village’s storm system utilizes five outlet locations to ultimately discharge into Bear Lake.

Summary tables are listed below for Village owned and operated structures and pipes.

Table ES-1: Village-Owned Storm Sewers by Diameter Size

PIPE DIAMETER BY LENGTH			
Diameter	Number of Pipes	Percent	Length(ft)
1"	1	0.3%	36.2
4"	4	1.7%	178.1
6"	16	4.9%	524.6
8"	3	1.1%	116.8
10"	1	0.2%	21.2
12"	54	41.6%	4409.7
15"	4	2.1%	221.1
18"	21	21.3%	2254.5
24"	10	7.3%	771.2
30"	3	2.0%	207.3
24" X 30"	9	7.6%	810.0
Unknown	23	10.0%	1058.6
TOTAL	149	100.0%	10609.3

Table ES-2: Village-Owned Storm Sewer by Material Type

STORM SEWER PIPE MATERIAL			
Material	Number of Pipes	Percent	Length
CMP	23	14.3%	1520.4
Concrete	21	14.3%	1522.1
Corrugated Plastic	3	0.8%	80.6
VCP	5	1.5%	158.7
DI	3	1.7%	180.2
HDPE	18	14.8%	1570.6
PVC	12	3.3%	347.9
RCP	41	39.3%	4170.2
Unknown	23	10.0%	1058.6
TOTAL	149	100.0%	10609.3

Table ES-2: Village-Owned Storm Sewer Structures by Type

Structure Type	Number
Catch Basin	65
Manhole	12
TOTAL	77

Every pipe and structure owned and operated by the Village could not be investigated/inventoried due to funding limitations and sewer conditions. Emphasis was placed on performing condition assessments for the mainline sewers and mainline structures.

Plummer’s Environmental Services (PES) located in Byron Center, MI completed a televising program of approximately 63% of the Village owned storm sewer pipes. CSB Industries worked along Plummer’s and performed cleaning services to aid in the televising. Spicer Group performed manual inspections for most of the Village’s stormwater structures. The NASSCO Manhole/Pipeline Assessment Certification Program (MACP/PACP) standards was used to identify and code defects and apply standardized grading/scoring to provide overall condition ratings of the storm sewer assets.

Part 2: Level of Service (LOS)

What level of stormwater service does the Village want to provide to its residents? How are projects going to be prioritized and included in the CIP? What cost is the Village willing to endure to provide that level of service? These are all questions that were discussed as a part of the overall asset management plan. The Village’s Level of Service Statement/Goals are as follows:

The Village of Bear Lake strives to maintain a basic stormwater collection system that addresses the residents' wants and needs and upholds the local, State, and Federal regulatory requirements at a minimum cost to our residents with aspirations to achieve maintaining a level of service for the 10-yr 24hr design storm.

LOS - Basic Goals:

- Operate and maintain the stormwater system to minimize flooding and property damage.
- Review the condition of stormwater assets as a part of other infrastructure construction projects.
- Seek a funding source for operation & maintenance and repair/replacement of stormwater assets.
- Review the maintenance and capital improvement plans/projects annually to determine the lowest cost options for our residents.
- Implement storm sewer replacement program to capture and convey the 10 -yr 24-hr design storm

Level of Service criteria includes the following categories:

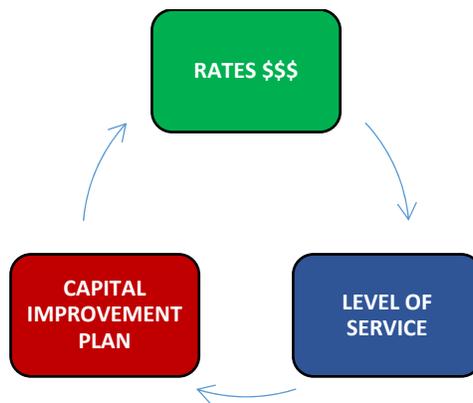
1. **“MINIMUM”** Level of Service
 - Address resident complaints as they come in.
 - Rehabilitation to storm sewers or structures (manholes / catch basins) with isolated structural deficiencies
 - Clean and maintain sewers for maximum capacity and to reduce debris and obstructions
2. **“MEDIUM”** Level of Service
 - Rehabilitation of storm sewers with significant structural and/or operations deficiencies through partial replacement, full replacement, or trenchless rehabilitation
 - Implement Storm Sewer Replacement Program targeting the 10-yr, 24-hr design storm
3. **“HIGH”** Level of Service
 - Increase capacity of existing stormwater infrastructure
 - Address areas in the Village with historic flooding or drainage issues
 - Implement the Storm Sewer Replacement targeting the 25-yr, 24-hr design storm

Generally, the “high” level of service projects will have a higher construction/initial cost but would provide a better long-term or life cycle cost for the Village. The “minimum” level of service projects would address the immediate concerns that residents bring to the Village’s attention as well as placing emphasis on the rehabilitating those structures and sewer pipes in

need of limited repair that would generally be of a lower construction cost. The Village will deliberate the findings and recommendations from the SAW to solidify the desired Level of Service, based upon the criteria above.

Typically, as a part of the asset management process, the Village would go through an exercise to determine a desired Level of Service, select the capital improvement projects that are needed to achieve that Level of Service, then review how those projects effect the Village’s finances to determine if possible rate increases may be required. Below is a diagram of the process.

ES-4: Asset Management Plan Evaluation Process



Michigan has not created a climate which would allow municipalities to create either an enterprise fund or a utility fee system for stormwater asset improvements. As such, funding is currently only available from the Village’s general fund. Act 51 monies received from the State for street/road improvements could also be used for stormwater improvements that affect the street projects directly. However, Act 51 funding is limited.

Since there is no real funding mechanism for stormwater assets, the Village has been maintaining a *Minimum* Level of Service. This has resulted in a reactionary operation and maintenance practice. Until a funding mechanism for stormwater improvements is found, the City is forced to continue this reactionary policy.

Part 3: Criticality (Risk)

For each asset in the Village’s stormwater system, a criticality/risk analysis was performed to determine and prioritize the Village’s key components. Based on the condition assessments and the field inspections, the Likelihood of Failure (LoF) was calculated for every asset; including pipes, manholes, and drainage structures, etc. Next, the Consequence of Failure (CoF) was calculated and scored for each asset based on the economic, social, and environmental consequences. Finally, the Criticality (Risk) score was calculated using:

$$\text{RISK} = \text{LoF} \times \text{CoF}$$

For the Village’s stormwater collection system, approximately 15% of sewer pipes and 31% of the structures exhibited High Risk scores. LoF and Risk of failure scores were utilized to evaluate and develop rehabilitation and replacement projects identified in the Capital Improvement Plan (Part 5)

Part 4: Revenue Structure

This section introduces the rate sufficiency study. The study is typically conducted for governmental entities, to determine the sufficiency of their funds to meet current and future expenses, of the entity. A proactive capital improvement plan (CIP), as discussed in Part 5, would ensure that the Village maintains a level of service into the future while maximizing the life of its assets. A rate sufficiency study should be conducted to determine if current and future Village funds would provide sufficient revenues to cover those costs. Therefore, we suggest that the Village engage with a qualified third party to perform the rate sufficiency study and determine the sufficiency of Village funds to meet the needs of the stormwater AMP plan. At this time, a rate sufficiency study is not required by EGLE for stormwater AMP’s.

Part 5: Capital Improvement Plan

The Capital Improvement Plan (CIP) is the culmination of all the parts of the Asset Management Plan (AMP). Reviewing the results of the storm water system Inventory & Condition Assessment, Level of Service (LOS) determination, Criticality (Risk), Revenue Structure, and preliminary CIP project lists, a process was worked through to categorize and prioritize the final CIP. The resulting CIP plan includes the following projects:

Stormwater System Capital Improvement Plan	LOS	Cost
Sewer Replacement: Segment 3320, 3410, & 3420 Stuart (Wise to Lynn)	Medium	\$ 116,000.00
Sewer Replacement: Segment 1210 Lynn (Stuart to Main) *	Medium	\$ 30,000.00
Sewer Replacement: Segment 1030 & 3370 Lynn (Intersection of Cody)	Medium	\$ 36,000.00
Sewer Replacement: Segment 1170 Virginia (Stuart to Main)	Medium	\$ 78,000.00
Sewer Replacement: Segment 1350 Virginia (Under Fire Station)	Minimum	\$ 65,000.00
Sewer Rehabilitation: Cured In Place Pipe (CIPP) Spot Liner	Minimum	\$ 93,000.00
Sewer Rehabilitation: Cured In Place Pipe (CIPP) Entire Sewer Segment	Medium	\$ 65,000.00
Sewer Rehabilitation: Spot Repair (Point Repair / Dig Up)	Minimum	\$ 78,000.00
Structure: Replacement	Medium	\$ 75,000.00
Structure: Rehabilitation	Medium	\$ 170,000.00
Operations & Maintenance: Sewer Cleaning and Inspection	Minimum	\$ 77,000.00
Storm Sewer Replacement Program	Medium	\$ 1,412,000.00
	Total:	\$ 2,295,000.00

Other operations and maintenance (O&M) considerations included annual budgeting for maintenance and revision of the GIS system and staff training

Conclusion

The Village of Bear Lake's stormwater system is a typical, aging municipal infrastructure system. Since there has been no funding mechanism for stormwater assets, the Village has been maintaining a Minimum Level of Service for its residents. The Village is encouraged to include in future budgets, funds designated for stormwater maintenance. Annually, the Village should review and update their finances to identify funding options for the future capital needs in the stormwater system. At this time, the CIP projects have not been included into the current fiscal year budget or forecasted in future FY's. The Village will evaluate where these projects should be included during the next planning cycle