TOWN OF HOLDEN BEACH
STORMWATER MASTER PLAN

mcgill 40 YEARS OF Shaping Communities Together

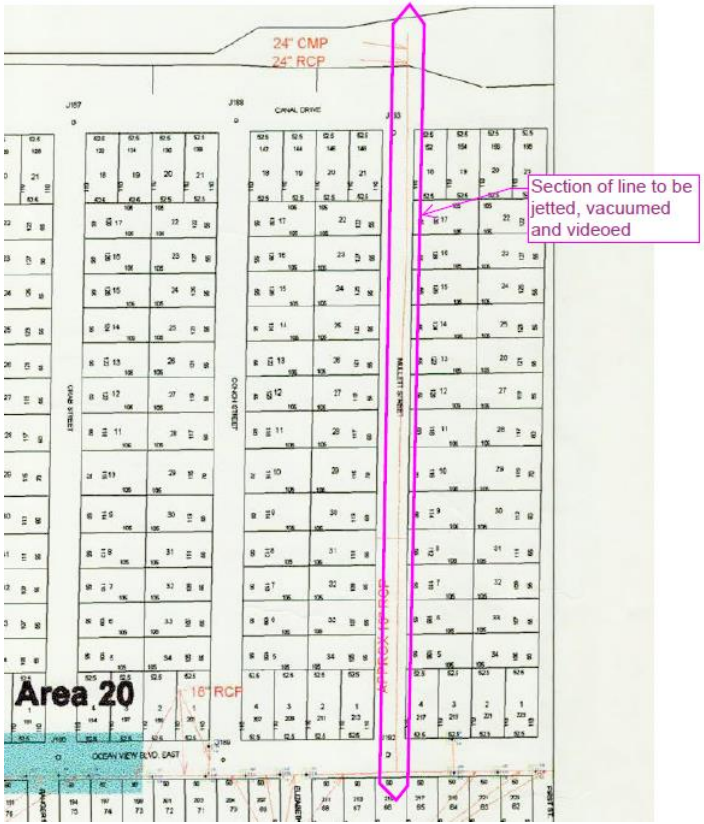
Project Background

Develop a Stormwater Management Plan and evaluate the feasibility of developing a stormwater utility (SWU).

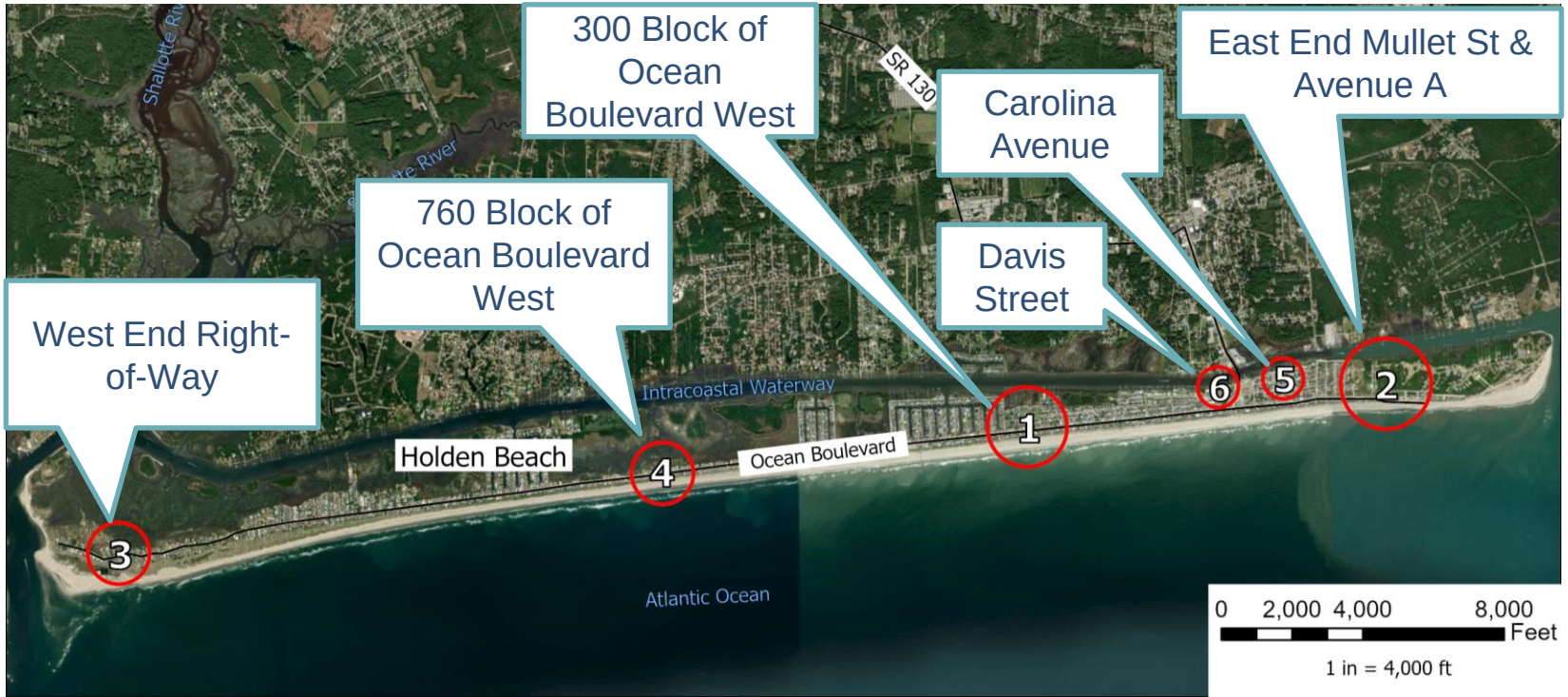
- Inventory and assessment of the existing condition of Town's stormwater system
- Survey, analysis/modeling and evaluation of alternatives for 6 key areas of concern
- GIS system inventory map and maps identifying flood prone areas
- Feasibility of a SWU to address the specific needs of the Town
- Stormwater Management Plan

Inventory and Assessment

- Existing records collection/review
- Data collection & GIS mapping
- Field surveying
- Closed Caption Television (CCTV)
- Outfall pipe inspections – cleaning



Areas of Concern



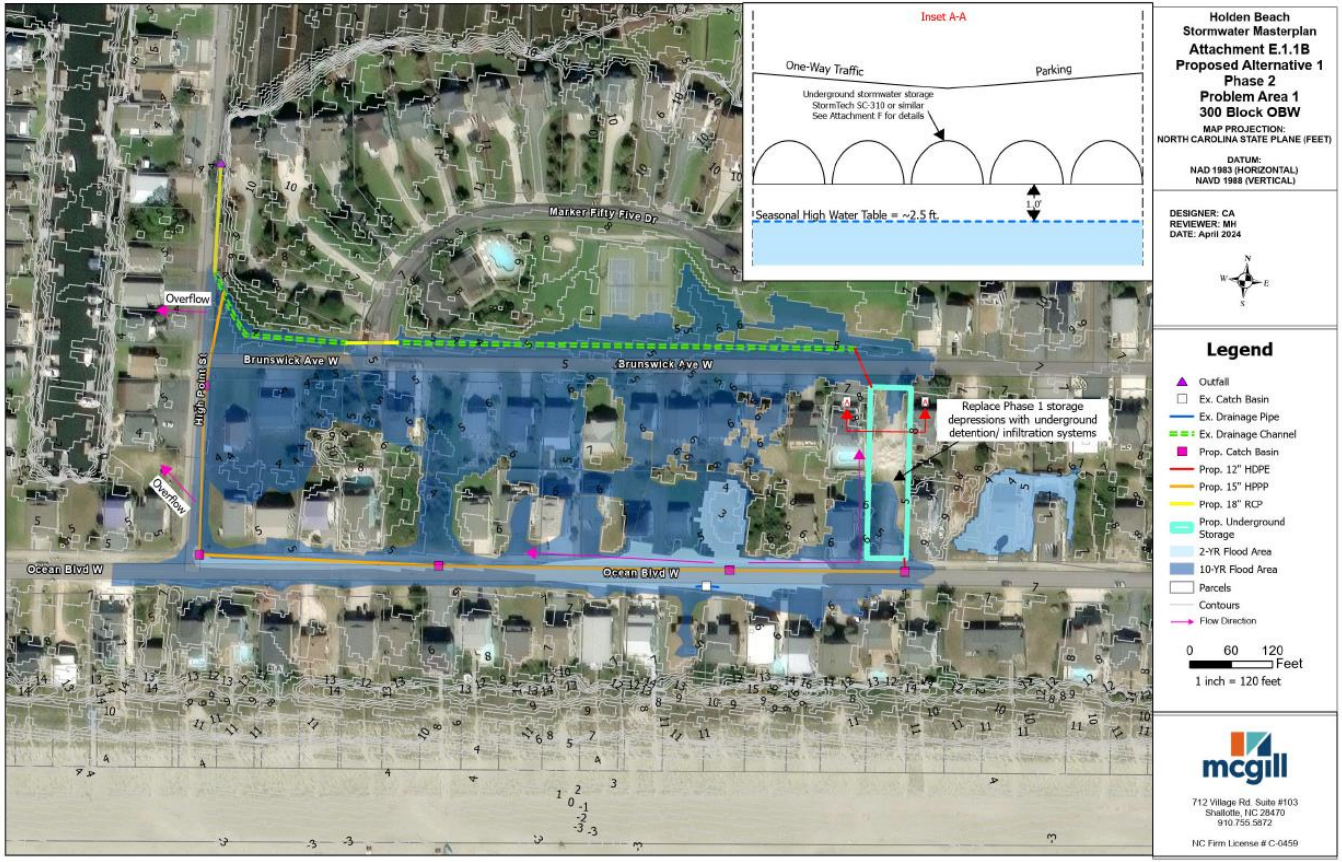
Areas of Concern Analysis

Analysis

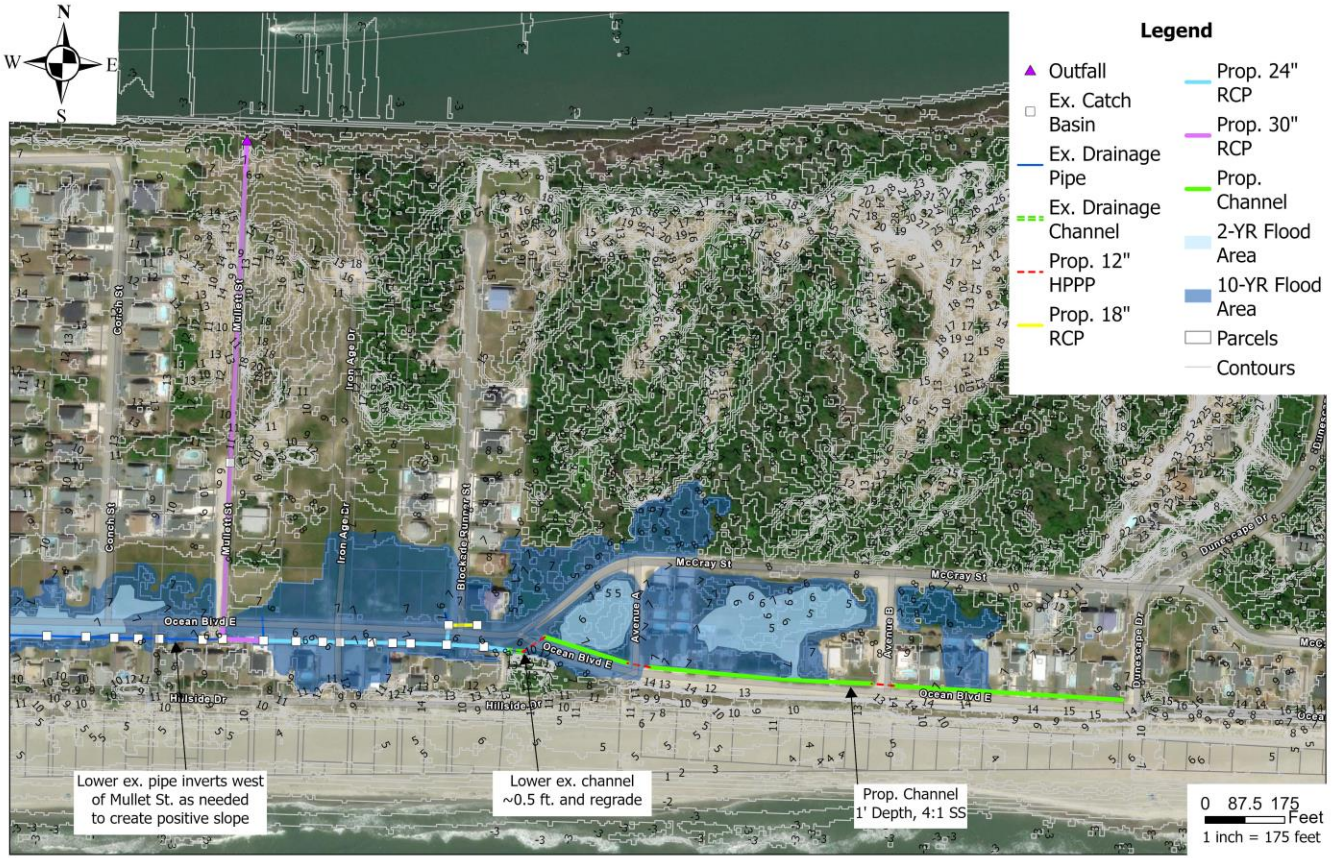
- Analyze the existing stormwater system and drainage conditions at each area of concern for the 2-year and 10-year rainfall events.
- Identify deficiencies in the network at these locations and evaluate available alternatives to remedy flooding.
- Develop probable estimates of construction cost
- Provide supporting documentation to Town for US Army Corps of Engineers (USACE) Federal 5113 Environmental Infrastructure Assistance grant

Area 1 – Phase 1

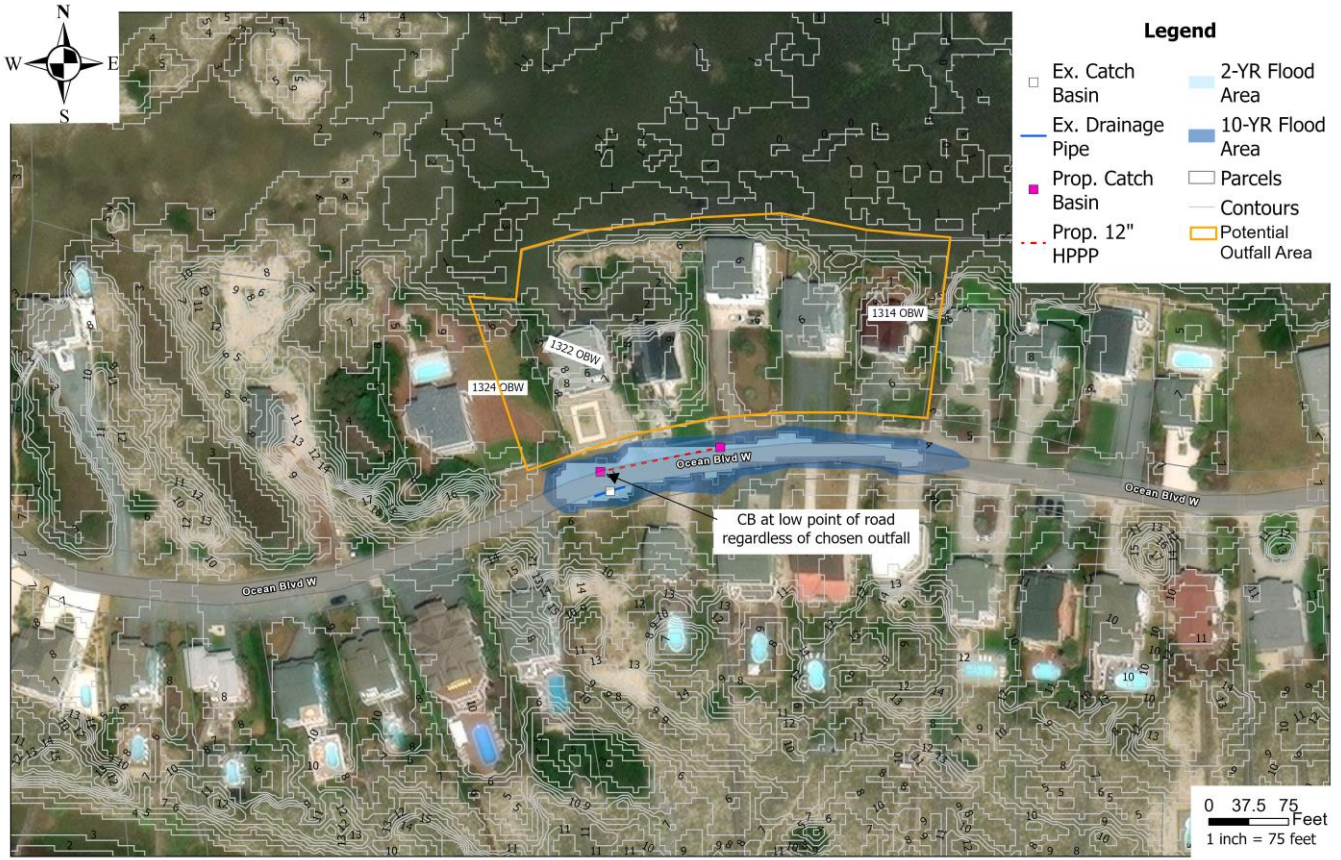
Area 1 – Phase 2



Area 2


N
W
E
S
Legend
Outfall
Ex. Catch Basin
Ex. Drainage Pipe
Ex. Drainage Channel
Prop. 12" HPPP
Prop. 18" RCP
Prop. 24" RCP
Prop. 30" RCP
Prop. Channel
2-YR Flood Area
10-YR Flood Area
Parcels
Contours
Conch St
Mullett St
Iron Age Dr
Blockade Runner St
Ocean Blvd E
McCray St
Avenue A
Avenue B
Dunscape Dr
Hillside Dr
Lower ex. pipe inverts west of Mullet St. as needed to create positive slope
Lower ex. channel ~0.5 ft. and regrade
Prop. Channel 1' Depth, 4:1 SS
0 87.5 175
Feet
1 inch = 175 feet

Area 3


N
W
E
S
Legend
Ex. Catch Basin
Ex. Drainage Pipe
Prop. Catch Basin
Prop. 12" HPPP
2-YR Flood Area
10-YR Flood Area
Parcels
Contours
Potential Outfall Area
1314 OBW
1322 OBW
1324 OBW
Ocean Blvd W
Ocean Blvd W
Ocean Blvd W
CB at low point of road regardless of chosen outfall
0 37.5 75
Feet
1 inch = 75 feet

Area 4


N
W
E
S
Legend
New Outfall
Ex. Catch Basin
Ex. Drainage Pipe
Prop. Catch Basin
Prop. 15" RCP
Prop. 24" RCP
2-YR Flood Area
10-YR Flood Area
Parcels
Contours
Overflow
Ocean Blvd W
Ocean Blvd W
Ocean Blvd W
0 60 120
Feet
1 inch = 120 feet

Area 5


N
W
E
S
Legend
New Outfall
Ex. Catch Basin
Ex. Drainage Pipe
Prop. Catch Basin
Prop. Junction Box
Prop. 24" RCP
Parcels
Contours
Southshore Dr
Halstead St
Carolina Ave
Brunswick Ave E
Golden Dune Way
0 37.5 75
Feet
1 inch = 75 feet

Area 6

Probable Cost of Construction Estimate

Holden Beach Stormwater Improvements
300 Block OBW - Alternative 2 Phase 1
Opinion of Probable Construction Cost
May 29, 2024

Item No.	Description	Qty	Unit	Unit Cost	Total Cost*
1	MOBILIZATION	1	LS	$ 21,300	$ 21,500.00
2	MAINTENANCE OF TRAFFIC	1	LS	$ 12,780	$ 13,000.00
3	EROSION CONTROL	1	LS	$ 12,780	$ 13,000.00
4	CLEARING & GRUBBING	1	LS	$ 1,500	$ 1,500.00
5	REMOVE & REPLACE CATCH BASIN	1	EA	$ 9,000.00	$ 9,000.00
6	INSTALL NEW CATCH BASIN	4	EA	$ 5,000.00	$ 20,000.00
7	CONTROL OF WATER/ DEWATERING	1	LS	$ 3,000.00	$ 3,000.00
8	BREAKING OF EXT ASPH PVMT	2,433	SY	$ 3.00	$ 7,500.00
9	REMOVAL OF EXT ASPHALT PVMT	2,433	SY	$ 9.50	$ 23,500.00
10	2" ASP CONC SURF CRS S9.5B OR S9.5C	219	TON	$ 60.50	$ 13,500.00
11	8" ASP CONC BASE CRS B25.0C	876	TON	$ 79.00	$ 69,500.00
12	REMOVE & REPLACE SIDEWALK	167	SY	$ 122.00	$ 20,500.00
13	12" HDPE	120	LF	$ 160.00	$ 19,500.00
14	15" HPPP	1,365	LF	$ 95.00	$ 130,000.00
15	18" CLASS III RCP	230	LF	$ 87.00	$ 20,500.00
16	REMOVE & REPLACE TIDE GATE	1	EA	$ 10,000.00	$ 10,000.00
17	CLASS B RIP RAP 18" THICK	1.0	TON	$ 80.00	$ 500.00
18	GEOTEXTILE FOR DRAINAGE	3,183	SY	$ 3.50	$ 11,500.00
19	SEEDING AND MULCHING	1.11	AC	$ 2,900.00	$ 3,500.00
20	EXCAVATION	2,033	CY	$ 6.60	$ 13,500.00
21	GRADING	5,382	SY	$ 3.00	$ 16,500.00
22	HAULING EXCESS MATERIAL	2,033	CY	$ 28.00	$ 57,000.00
				Subtotal*	**$ 498,000.00**
	*Contingencies (30%)**				$ 149,400.00
	*Price Escalation Factor (20%)**				$ 99,600.00
				Total*	**$ 747,000.00**
Opinion of Probable Construction Cost Range*: $498,000.00 to $747,000.00					

* Rounded to the nearest $1000

Selected Alternatives

Project Area	Project Description	Selected Alternative	Cost Estimate
1	300 Block OBW	2	$498k - $747k
2	East End Mullet St. & East End Avenue A	2	$808k - $1.21 million
3	West End ROW	1	$121k - $241k
4	760 Block OBW	2	$273k - $409k
5	Carolina Ave	2	$204k - $327k
6	Davis St	-	$17.5k - $26.25k

Other Problem Areas

Island-wide Analysis

- Heat map of likely roadway or structure flooding
- Extents of the MHHW tide show impacts of sunny day tidal flooding
- Potential future projects

Stormwater Utility Feasibility Assessment

The SWU feasibility provides a conceptual evaluation of establishing a SWU to address administration, a stormwater capital improvement plan (CIP), annual maintenance, sinking fund, rate study, and ordinance and policy development.

Stormwater Utility Feasibility Assessment

Revenue

- Residential flat fee
- Rate comparison to 4 other NC beach communities

Expenses

- Administration
- Personnel
- Operations & maintenance
- Capital investment
- Debt service
- Transfers
- Repayment of the startup funding

Fund Balance managed to maintain minimum 90 days of Cash on Hand

Stormwater Utility Feasibility Assessment

- **Scenario A** - Assumes 100% of the projected capital investment needs are funded by user fees generated by the stormwater utility.
- **Scenario B** - assumes 75% of the projected capital investment needs are funded using US Army Corps of Engineers (USACE) Environmental Infrastructure Assistance.

Scenario A - Model Outputs and Tracking

Parameter	Year 1	Year 2	Year 3	Year 4	Year 5
Per-Parcel Monthly Fee	$7.20	$7.40	$7.60	$7.80	$7.90
Sinking Fund Balance	$ 62,000	$ 124,000	$ 154,000	$ 214,000	$ 269,000
Fund Balance	$ 458,000	$ 540,000	$ 567,000	$ 494,000	$ 362,000
Days Cash on Hand	1,076	821	678	435	276

Scenario B - Model Outputs and Tracking

Parameter	Year 1	Year 2	Year 3	Year 4	Year 5
Per-Parcel Monthly Fee	$5.30	$5.40	$5.60	$5.70	$5.90
Sinking Fund Balance	$ 62,000	$ 124,000	$ 154,000	$ 224,000	$ 299,000
Fund Balance	$ 375,000	$ 366,000	$ 382,000	$ 312,000	$ 199,000
Days Cash on Hand	882	546	613	356	195

Stormwater Utility Feasibility Assessment

Recommendations

Based on the project cost of capital stormwater projects and on-going and planned maintenance for the stormwater system we recommend proceeding with implementation of Scenario A with an initial flat rate of $7.20/month.

If pursuit of 5113 grant funding is favorable, the utility can easily be converted to Scenario B in the future and rates reevaluated at that time.

Both scenarios provide sufficient funds to cover the planned activities for the next ten years while maintaining a sufficient fund balance that suggests the utility will remain stable and fiscally healthy.

Questions?