



VILLAGE OF KEY BISCAINE

Office of the Village Manager

Village Council
Franklin H. Caplan, *Mayor*
Michael F. Kelly, *Vice Mayor*

Michael W. Davey
Enrique Garcia
Robert Gusman
Mayra P. Lindsay
James S. Taintor

Village Manager
Genaro "Chip" Iglesias

MEMORANDUM

DATE: June 28, 2011
TO: Honorable Mayor and Council Members
FROM: Genaro "Chip" Iglesias, Village Manager
RE: Stormwater Master Plan Update

RECOMMENDATION

It is recommended that the Village Council approve the resolution to adopt the Stormwater Master Plan Update.

A resolution must be approved prior to July 1, 2011 to ensure compliance and maintain the current Community Rating System (CRS) Category of Class 7. Any future revisions to this updated plan will also need to be presented to Council for adoption.

BACKGROUND

The Stormwater Master Plan Update is necessary to meet regulatory requirement and is also one of the components required by the CRS in order to remain in compliance and maintain credit for the Drainage System Maintenance Activity. The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum National Flood Insurance Program requirements.

The Village's Stormwater Master Plan had not been updated since its adoption as prepared by Williams, Hatfield, & Stoner, Inc. in 1993.

On September 14, 2010 Tetra Tech was awarded the project through a selection process based on qualifications. On December 7, 2010 an overview of the CRS Program and the draft of the Stormwater Master Plan Update were presented to the Village Council.

On May 26, 2011 an Insurance Service Office (ISO) representative visited the Village and reviewed all documentation supporting the CRS activities for which the Village has received credits for recertification.

As part of another component of the CRS, on June 7, 2011 a recently updated project list for the Local Mitigation Strategy (LMS) was submitted to Miami-Dade County Department of Emergency Management for inclusion in their June 2011 publication.

This LMS list included the projects recommended in the Stormwater Master Plan Update.

RESOLUTION NO. 2011-

A RESOLUTION OF THE VILLAGE COUNCIL OF THE VILLAGE OF KEY BISCAYNE, FLORIDA, ADOPTING THE STORMWATER MASTER PLAN UPDATE, ATTACHED AS EXHIBIT “A;” AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, in 1993, the Village of Key Biscayne, Florida (the “Village”) adopted a Stormwater Master Plan (the “Master Plan”), which identified stormwater deficiencies and necessary improvements to the Village’s stormwater system; and

WHEREAS, the Village staff has recommended that a Master Plan update be prepared in order to meet current regulatory requirements and to remain in compliance and maintain a Community Rating System credit for the Drainage System Maintenance Activity; and

WHEREAS, on September 14, 2010, the Village Council selected Tetra Tech Inc. (the “Consultant”) to prepare the Master Plan update; and

WHEREAS, the Village Council desires to adopt the Master Plan update prepared by the Consultant, which is attached as Exhibit “A” to this Resolution; and

WHEREAS, the Village Council finds that this Resolution is in the best interest and welfare of the residents of the Village.

NOW, THEREFORE, BE IT RESOLVED BY THE VILLAGE COUNCIL OF THE VILLAGE OF KEY BISCAYNE, FLORIDA, AS FOLLOWS:

Section 1. Recitals Adopted. Each of the above stated recitals are hereby adopted, confirmed and incorporated herein.

Section 2. Master Plan Update Adopted. The Village Council hereby adopts the Master Plan update prepared by the Consultant, which is attached as Exhibit “A” to this Resolution.

Section 3. **Effective Date.** This Resolution shall be effective immediately upon adoption.

PASSED AND ADOPTED this ____ day of June, 2011.

MAYOR FRANKLIN H. CAPLAN

ATTEST:

CONCHITA H. ALVAREZ, MMC, VILLAGE CLERK

APPROVED AS TO FORM AND LEGAL SUFFICIENCY:

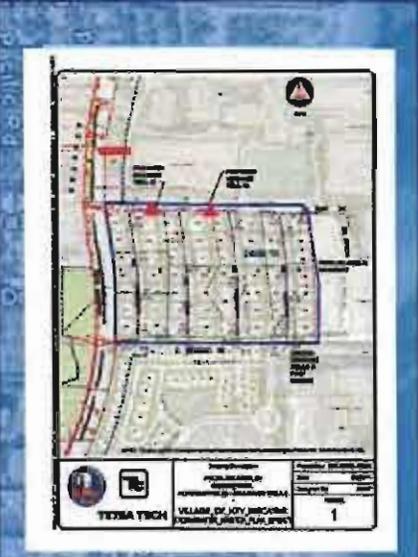
VILLAGE ATTORNEY



Presentation for adoption of Stormwater Management Master Plan Update



Village of Key Biscayne
June 28, 2011





Outline

- **Purpose**
- **NFIP/CRS overview**
- **Chronology**
- **Stormwater Master Plan Update (SWMP)**
- **Local Mitigation Strategy (LMS) Adoption**



Purpose

- **PRESENTATION:** For Village Council to adopt the final stormwater master plan update as presented*
 - **SWMP/FMP:**
 - To comply with regulatory requirements (FEMA, DERM, SFWMD, FDEP, EPA)
 - To maintain and maximize NFIP insurance premium rate reduction
 - To identify systems required for public safety and to reduce private property losses
- * ***Any requested additional changes will be adopted as an amendment***



Chronology

- **1991 – Village incorporated**
- **1993 - Adopted original master plan**
- **1995 - Completion of storm drainage system**
- **1998 – Adopted Floodplain Management Plan**
- **2001 – Application for CRS Participation – Class 6**
- **2006 – CRS Re-Certification – Class 7**
- **Aug 2010 – RFQ & Award for SWMP Update**
- **Dec 2010 – Presentation of Draft SWMP Update**
- **May 2011 – CRS Re-Certification Visit**
- **June 2011 – LMS Project List Update submitted**
- **June 2011 – Adoption of Final SWMP Update**



NFIP & CRS Programs

NFIP = National Flood Insurance Program

Goals:

- Provide flood insurance to property owners
- To encourage flood loss reduction activities by communities
- **Save taxpayers' money**

CRS = Community Rating System

- Provides tools to further the goals of the NFIP





LMS Projects Update

- Local Mitigation Strategy
- Establishes Miami-Dade County's overall mitigation policy.
- This document includes the strategy for mitigation, proposed mitigation projects and how they are prioritized, sources of funding, and other supporting information relative to mitigation.

■ Adopted Resolution on December 7, 2010 to obtain additional CRS credit for Activity 540

Village of Key Biscayne

Project 1: Comprehensive Review of Local Laws and Regulations

The Village completed the annual priority of the Floodplain Management Plan adopted in 1998 with respect to the review of related floodplain management laws and regulations. Additional ordinances have been adopted since the implementation of the original Storm Drainage Management Master Plan completed in 1997. This is an ongoing activity and is part of the scope of work for the Stormwater Master Plan Update currently being drafted for adoption by the Village. Those Local Regulations pertaining to the mitigation of hurricane and flooding hazards will be evaluated and updated, including analysis of issues, for opportunities and formulation of proposals with respect to the existing provisions related to "Base Flood Elevations", "Substantial Improvements", Flood Insurance Rate Maps (FIRM) and the consideration of a Freeboard Regulation. Estimated cost: \$3,000.00

Project 2: Stormwater Master Plan Update

The original Storm Drainage System Master Plan project adopted in 1993 was designed, constructed and completed in July 1997. An update to the existing Stormwater Master Plan has been drafted by a consultant and is currently under review for adoption of the final draft by the Village Council. The update includes Hydraulic and Hydrologic modeling and the preparation of the mapping in the GIS platform. The following objectives are included as part of the update: 1) The development of topographical survey information with respect to the districts within Key Biscayne that contain the most flood prone properties; 2) The design of changes in the existing topography, including a system of swales among other earthworks, at selected locations within the drainage basins, to improve the behavior of stormwater, particularly in areas where surface drainage problems tend to exist; and 3) The development of an implementation program including the identification of potential funding sources, and a timeline for the incremental execution of this project. Estimated cost: \$150,000

Project 3: Flap Gates at Outfalls

This project is one of the alternatives resulting from the Stormwater Master Plan Update 2010. It proposes flap gates to be installed at each of the Village's outfalls. A total of 16 Flap gates work by closing when the water elevation downstream is higher than the elevation upstream. The minimum downstream increase in depth above the upstream depth required to trigger closing the gate varies depending on the type of gate or valve used. The installation of these gates on the Village's outfalls could reduce the impact of high tide conditions for those periodic events that coincide with an inland storm event. The gates could help prevent the inflow of seawater in the conveyance system, thereby allowing stormwater runoff on the island to enter the stormwater system instead of ponding on private property and public right of ways. All ponding will not be eliminated, however, the depth and duration of ponding can be reduced. Estimated cost: \$626,700.00





Stormwater Master Plan Update

- **Purpose of SWMP Update:**
 - To meet regulatory requirements
 - Update Master Plan adopted in 1993 which was implemented & constructed
 - To determine how existing system is functioning
 - Define repetitive loss areas
 - Resolve deficiencies in the stormwater system where flooding/ponding occurs in the defined repetitive loss areas
 - Provide cost effective alternatives associated with proposed and recommended improvements
 - NOTE: Not all ponding was not resolved



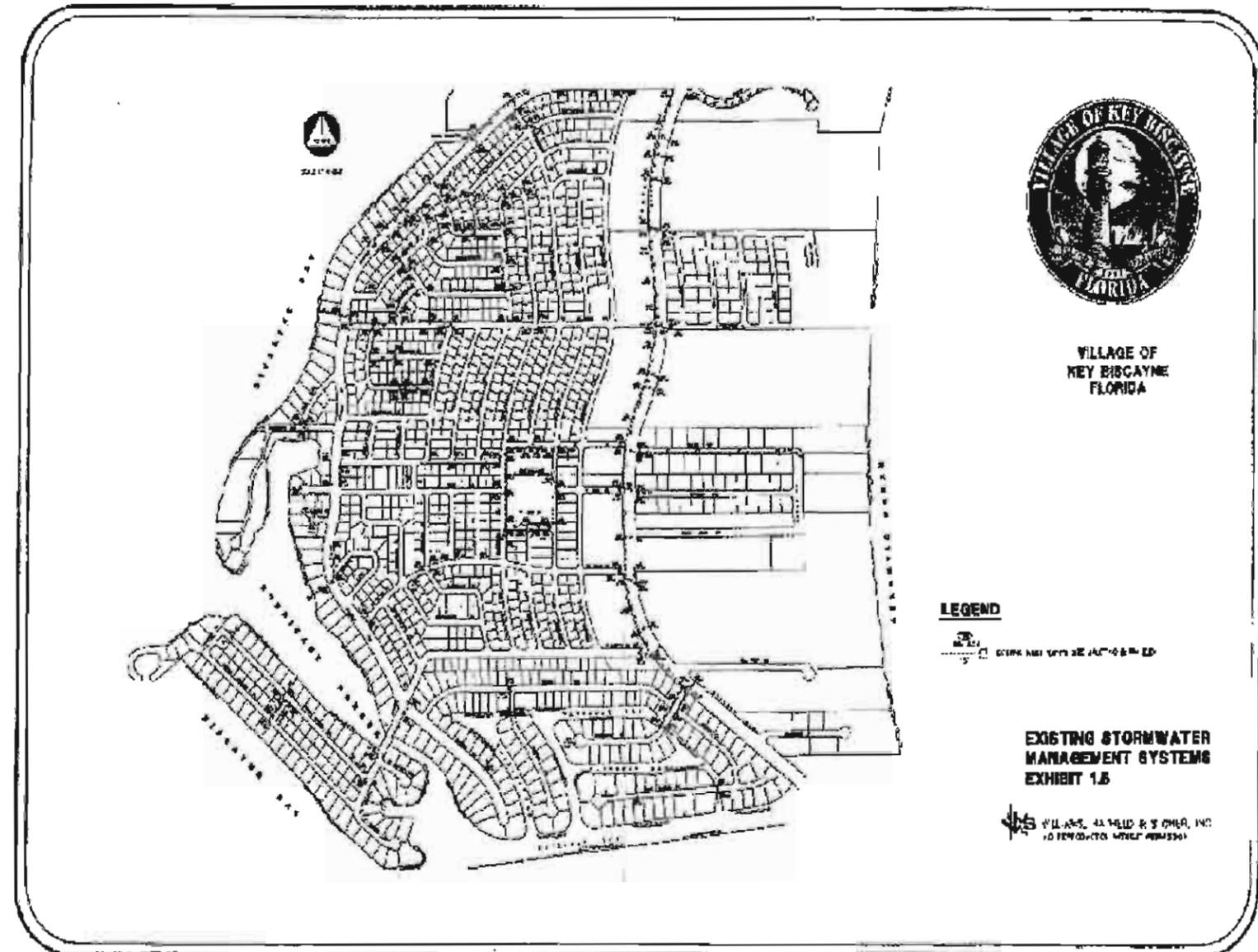
SWMP Update Outline

- **Section 1 – Introduction**
- **Section 2 – Existing Conditions and Stormwater Management Systems**
- **Section 3 – Hydrologic/Hydraulic Modeling**
- **Section 4 – Alternatives Identification and Evaluation**
- **Section 5 – Financial Snapshot & Recommended Plan**



1993 SMP Existing System

- Existing Physical Conditions
- Regulations
- Existing drainage system
- Existing flooding areas
- Existing water quality





Section 2 - Updated SMP

Existing System



VILLAGE OF KEY BISCAIYNE
 STORMWATER MASTER PLAN UPDATE
 EXISTING DRAINAGE STRUCTURE INVENTORY

ID	Design ID	Structure Type	Rim Elevation	Invert Elevation	Invert Depth	Elev Source	Historical Basin	Updated Basin	Address Number	Street	X	Y
J-829	4	Manhole	2.54	-4.56	7.1	Design Elevation	Outside	SUB-12340	300	CARIBBEAN RD	932008.3	495926.6
J-828	5	Catch Basin	2.14	-4.56	6.7	Design Elevation	Outside	SUB-12340	300	CARIBBEAN RD	931995.7	495925.5
J-830	6	Catch Basin	2.14	-4.56	6.7	Design Elevation	Outside	SUB-12340	300	CARIBBEAN RD	932022.3	495929.5
J-831	7	Manhole	2.49	-4.56	7.05	Design Elevation	Outside	SUB-12344	325	CARIBBEAN RD	932087.9	495724.9
J-832	8	Catch Basin	2.04	-4.56	6.6	Design Elevation	Outside	SUB-12344	330	CARIBBEAN RD	932027.9	495724.3
J-833	9	Catch Basin	2.14	-4.56	6.7	Design Elevation	Outside	SUB-12344	335	CARIBBEAN RD	932054.2	495720.3
J-836	10	Manhole	2.54	-5.06	7.6	Design Elevation	Outside	SUB-12346	378	CARIBBEAN RD	932054.9	495509.8
J-835	11	Catch Basin	2.24	-4.56	6.8	Design Elevation	Outside	SUB-12346	378	CARIBBEAN RD	932044.4	495509.8
J-834	12	Catch Basin	2.34	-4.56	6.9	Design Elevation	Outside	SUB-12346	385	CARIBBEAN RD	932070.3	495510.3
J-809	17	Manhole	2.59	-5.06	7.65	Design Elevation	Outside	SUB-12364	16	TURTLE WALK	932344.5	495281.4
J-810	18	Manhole	2.34	-4.56	6.9	Design Elevation	Outside	SUB-12352	350	GULF RD	932347.7	495312.3
J-812	19	Catch Basin	2.04	-4.56	6.6	Design Elevation	Outside	SUB-12352	390	GULF RD	932339.4	495312.3
J-811	20	Catch Basin	2.04	-4.56	6.6	Design Elevation	Outside	SUB-12352	390	GULF RD	932364.4	495312.3
J-813	21	Manhole	2.44	-5.06	7.5	Design Elevation	Outside	SUB-12352	364	GULF RD	932351.6	495514.7
J-814	22	Catch Basin	3	-4.56	7.56	Assumed Elevation	Outside	SUB-12352	364	GULF RD	932343.4	495514.9
J-815	23	Catch Basin	1.94	-4.56	6.5	Design Elevation	Outside	SUB-12352	365	GULF RD	932369.1	495515
J-816	24	Manhole	2.34	-4.56	6.9	Design Elevation	Outside	SUB-12352	346	GULF RD	932342.8	495676.1
J-817	25	Catch Basin	2.04	-4.56	6.6	Design Elevation	Outside	SUB-12352	346	GULF RD	932336.3	495671.8
J-818	26	Catch Basin	2.04	-4.56	6.6	Design Elevation	Outside	SUB-12352	345	GULF RD	932358.5	495686.2
J-819	27	Manhole	2.54	-4.56	7.1	Design Elevation	Outside	SUB-12348	315	GULF RD	932307.3	495920.2
J-821	28	Catch Basin	2.24	0	0	Design Elevation	Outside	SUB-12348	315	GULF RD	932799	495918.6
J-820	29	Catch Basin	2.04	-4.56	6.6	Design Elevation	Outside	SUB-12348	300	GULF RD	932325.4	495923.2
J-822	30	Manhole	2.44	-4.56	7	Design Elevation	Outside	SUB-12348	235	CRANDON BLVD	932289.5	496039.1
J-823	31	Catch Basin	1.84	-4.56	6.4	Design Elevation	Outside	SUB-12340	300	GULF RD	932192.9	496035.9
J-824	32	Catch Basin	1.84	-4.56	6.4	Design Elevation	Outside	SUB-12348	300	GULF RD	932413.7	496036.3
J-851	33	Manhole	2.69	-3.56	6.25	Design Elevation	Outside	SUB-12356	6	TURTLE WALK	932644.5	495281.4
J-854	34	Catch Basin	3.1	-3.56	6.66	Assumed Elevation	Outside	SUB-12356	8	TURTLE WALK	932573.2	495268.6





Section 3 – Hydrologic/Hydraulic Modeling

■ Modeling Parameters

- 277 Manholes
- 603 catch basins
- 874 storm sewer pipes (12" to 48")
- 17 outfalls
- 28 drainage wells @ 2500 GPM
- 2 pump stations

■ Modeling Results

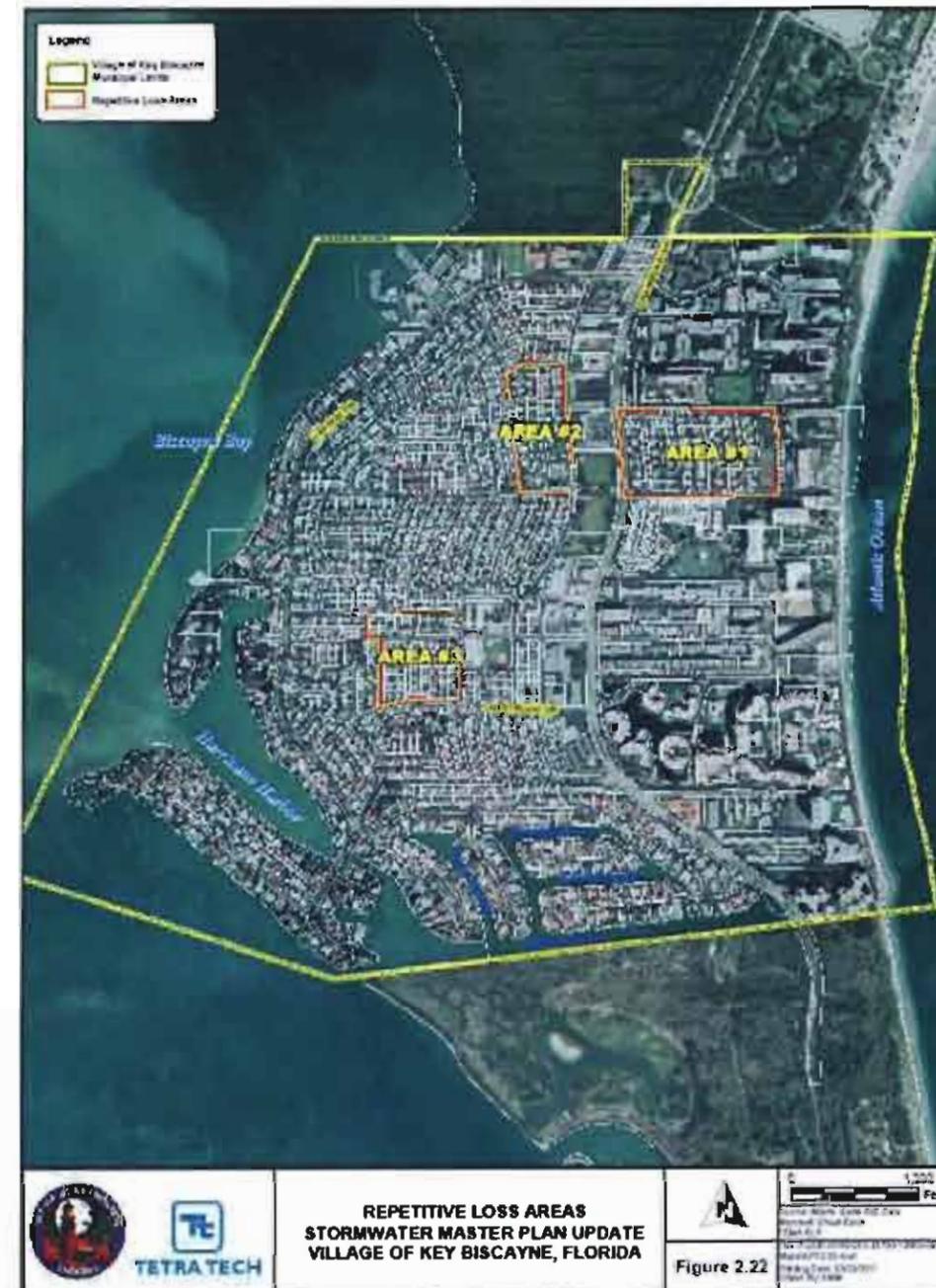
10-year Storm (9.5 Inches)
– Existing System Model
Preliminary Results





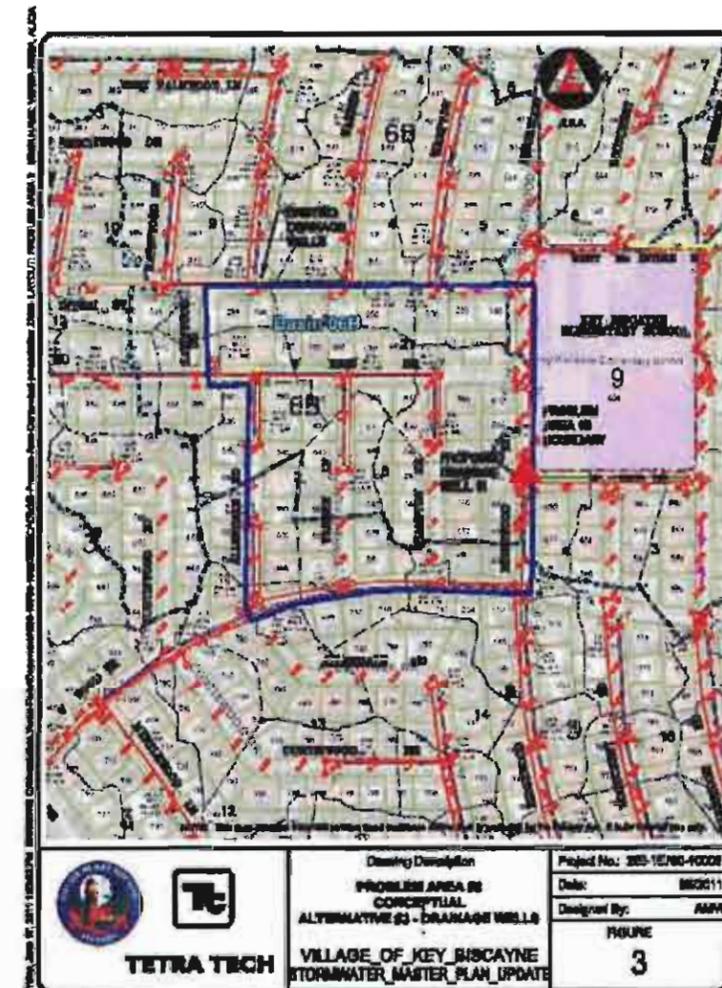
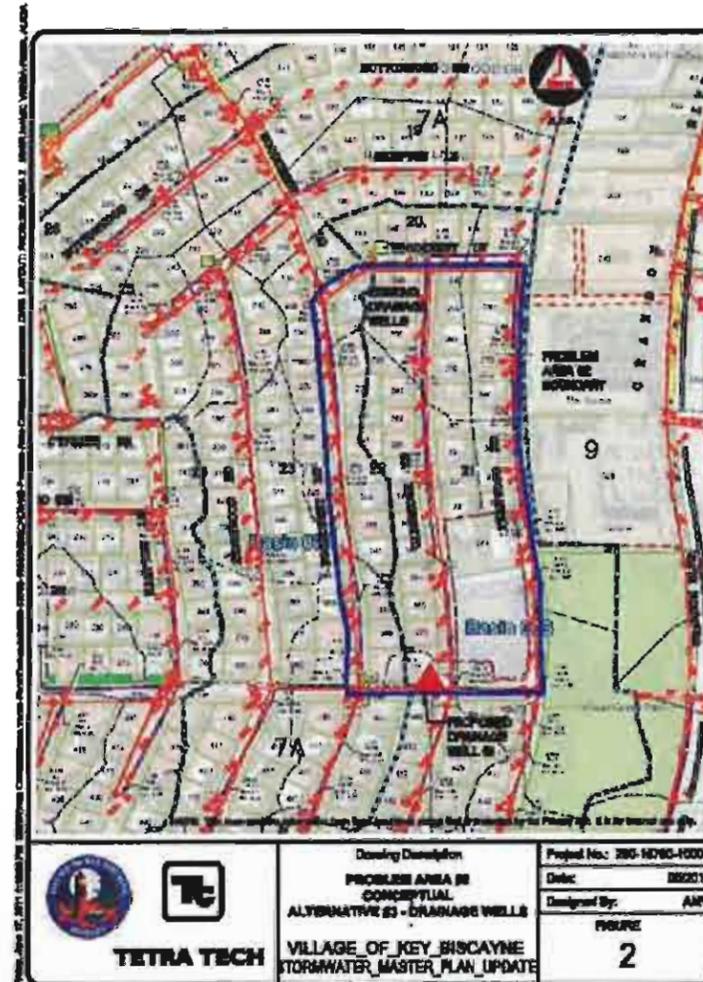
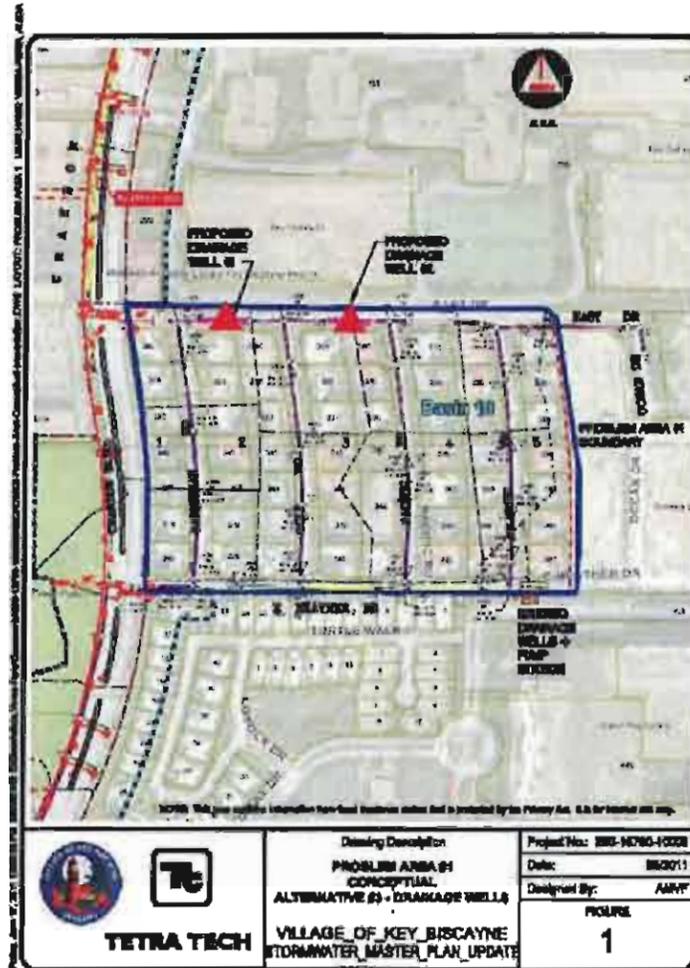
Section 5 – Financial Snapshot & Recommendations

- **Recommended alternative for each area**
- **Implementation of Schedule**
- **Financial Snapshot**
- **Conceptual designs**





Conceptuals Designs





Cost Summary

Summary of Recommended Alternatives

Problem Area No.	Number of Drainage Wells	Construction Cost	Design & Other Costs	Total Amount
1	2	\$ 433,195	\$ 129,959	\$ 563,154
2	1	\$ 238,665	\$ 71,600	\$ 310,265
3	1	\$ 238,665	\$ 71,600	\$ 310,265





SUMMARY

- **To adopt the stormwater master plan update to obtain credit for CRS Activity 450**
- **Any additional changes to the SWMP update per comments will amended and adopted accordingly.**
- **Thank you for the opportunity to present the stormwater master plan to maintain credits for CRS**