SUMMARY REPORT 2
REVIEW OF FLOOD INSURANCE STUDY
TOWN OF FORT MYERS BEACH, FLORIDA

Submitted to
Town of Fort Myers Beach, Florida
2523 Estero Boulevard
Fort Myers Beach, Florida

Submitted By
Tomasello Consulting Engineers, Inc.
5906 Center Street,
Jupiter, Florida 33458

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SUMMARY REPORT 2
FLOOD INSURANCE STUDY
TOWN OF FORT MYERS BEACH, FLORIDA

I. The Purpose of the Study

The purpose of this report is to present FIRM comparisons and evaluation of A & V zones for the Town of Fort Myers Beach (Town). Tomasello Consulting Engineers, Inc, (TCE) reviewed the Draft Preliminary Flood Insurance Rate Maps (Draft FIRMs) from FEMA and compared them with the effective maps. TCE evaluated the differences and how they were derived. Of particular attention to the town is the potential relocation of the A-zone/V-zone boundary in commercial areas of the Town. TCE identified technical, policy, or mapping alternatives that might allow the effects of this relocation to be minimized. Summary Report 1, January 2006, reviewed available information regarding the Revised Flood Insurance Study (RFIS) including Draft Flood Insurance Rate Maps (FIRMs)[1] and "Coastal Engineering Analysis" (CEA)[2]. The review identified the components of the RFIS stillwater flood elevations (surge plus tides and wave setup) and the inputs to the wave height analyses including transect details.

II. CHAMP/WHAFIS Input Comparison

TCE contacted Mr. Jeff Gangai and Dr. Nader Mahmoudpour, of Dewberry, Inc, in an effort to locate the effective FIS WHAFIS inputs and output files for Lee County, Florida, in particular, the Town. Dewberry suggested that TCE contact Mr. Venkat Venkatraj of Michael Baker, Jr, Inc, at the FEMA National Service Provider library. Ms. Kaminowitz of MapMod Team, a division of Michael Baker, Jr., posted the requested information on Baker's ftp site. The downloaded document was 96 pages of printed microfiche information for the 1984 Study, "Gulf of Mexico-125124 Restudy –WHAFIS" (Wave Height Analysis Flood Insurance Study, which is now part of the FEMA CHAMP model). However, the requested information did not include the effective FIS transects for the Town (transect 13-16). TCE then contacted Ms. Kaminowitz again, and was told she was unable to locate the Town's transect data and had provided TCE with everything that they had in the way of WHAFIS data for the effective study.

With no way to compare the effective study WHAFIS results to the Draft Preliminary Flood Insurance study results from FEMA, TCE pursued possible errors in the methodology and inputs of the latter. TCE analyzed the DVD[1] containing the information for the Draft FIS Study for Lee County and "Coastal Engineering Analysis Flood Insurance Study, Lee County, Florida EMA -97-CO-0137" (CEA) by Taylor Engineers, Inc. [2] (See Appendix A - FEMA CHAMP Model Inputs and Outputs)

TCE investigation of the FEMA's Draft Preliminary FIRMs was reported in the Summary Report 1, January 2006. FEMA's CHAMP (Coastal Hazard Analysis Modeling Program) model was used by FEMA study contractor for the Lee County study. Upon close examination of the d Draft FIS inputs into the CHAMP model, TCE founds some inconsistencies. First, the distances between transects are too great to adequately represent the differences along the diverse shoreline on Fort Myers Beach. The distance between Transect 13 and 14 was more than 11,000' along the shoreline. The distance between Transect 14 and 15 was more than 10.000' along the shoreline. The distance between Transect 15 and 16 was more than 8,000' along the shoreline.

FEMA study contractor used OF (overwater fetch) cards in the WHAFIS analysis through out a considerable percentage of the each transect (13-16) where IF (inland fetch) and other cards should have been used for the inland fetches. As defined by Appendix D of Guidance for Coastal Flooding Analyses and Mapping: [5]

> *"IF Line (Inland Fetch) This line enters the parameters necessary to compute wave regeneration through somewhat sheltered fetches and over shallow inland water bodies. The IF regeneration is computed using a sustained wind speed of 60 mph."*
>
> *"OF Line (Overwater Fetch) This line enters the parameters necessary to compute wave regeneration over large bodies of water (i.e., large lakes, bays) using a sustained wind speed of 80 mph. If an inland body of water is sheltered and has a depth of ten feet or less, the IF line calling for reduced wind speed should be used"*

TCE established 0.0' NGVD on each transect (13-16), using the R-Monument (Florida DEP) matched to the transect. Profiles for R-Monuments were obtained from Dr. Nader Mahmoudpour, of Dewberry. Once the 0.0' NGVD point of each transect was established, TCE measured distances off to establish location for each WHAFIS card input from the FEMA contractor and TCE created a point file in ArcGIS, ArcView 9.1. This GIS file was overlayed on the aerials provided on the DVD[1]. Through a visual inspection of the CHAMP WHAFIS card points on the aerials, TCE was able to match FEMA contractors CHAMP WHAFIS inputs. Because of the great distance between transects, FEMA contractor had to use their best judgment to represent entire distance between transects. TCE found some inconsistencies with the FEMA contractor's CHAMP WHAFIS card inputs which are described as follows:

A. Transect 13 Comparisons

TCE used the same inputs into the General parameters of the CHAMP model as the FEMA contractor (See Figure 1). Because of not having surveyed transects, TCE accepted FEMA's contractors' topographic inputs into the Transect portion of the CHAMP model. These Transect inputs were used for the Erosion portion of CHAMP, TCE accepted the FEMA contractors eroded transects. However, based on visual examination of the aerial photos[1], TCE made changes in WHAFIS cards. The FEMA contractor applied an OF card along Transect 13 from 164' to 274', which is behind the dune. TCE applied a building card to represent the same transect segment. In calculating the open area for buildings that are close to the Gulf coast shoreline, TCE took into account the break-away design requirements and/or assumed building destruction during 1% flood experienced. The building widths in these open coast areas were assumed to be only 20% of the building widths measured from the aerial photographs. The open area widths entered reflect this adjusted building width. Only the first row of buildings was assumed to be of break away design and/or destructive status. TCE use building cards from 274' to 510'. At the distance 510' to 660', TCE used an IF card to represent a canal that connects to the bay side. At the distance of 648', TCE changed the 10% still water to 9.42' NAVD to represent the SFWMD still water flood elevation on the Matanzas Pass side of the barrier island. The FEMA contractor used 11.32' NAVD, the SFWMD still water computed for the open coast[3, 4]. This use of open coast still water flood levels across the island is not consistent with the FEMA methodology.

The aerial photo with location of Transect 13 and FEMA's contractors' distances can be found on Figure 2. Comparisons of CHAMP WHAFIS cards for Transect 13 can be found on Figure 3. TCE CHAMP model runs (inputs and outputs) for Transect 13 can be found in Appendix B on CD.

B. Transect 14 Comparisons

For Transect 14, TCE inputs followed much of the same approach as used in Transect 13. The FEMA contractor applied a DU (dune) card along Transect 14 from 132' to 191'. The FEMA contractor applied an OF card along Transect 14 from 191' to 201'. TCE considered the dune was from 96' to 127'. TCE applied a building card to represent the transect segment from 127' to 201'. TCE used the 20% of building width method as described in Transect 13 for the first row of buildings in Transect 14. At the distance of 1210', TCE changed the 10% still water to 9.42' NAVD to represent the SFWMD still water flood elevation on the Matanzas Pass side of the barrier island. The FEMA contractor used 11.32' NAVD, SFWMD still water computed for the open coast.

The aerial photo with location of Transect 14 and FEMA's contractors' distances can be found on Figure 5. Comparisons of CHAMP WHAFIS cards for Transect 14 can be found on Figure 6. TCE CHAMP model runs (inputs and outputs) for Transect 14 can be found in Appendix B on CD

C. Transect 15 Comparisons

For Transect 15, TCE again followed much of the same approach as used in Transect 13. The FEMA contractor applied a DU (dune) card along Transect 15 from 346' to 347', and used OF cards to the 0.0' point at Gulf shore. The FEMA contractor applied an IF card from 347' to 348' and an OF card from 348' to 368' along Transect 15. TCE considered the dune to be from 293' to 326'. TCE applied an IF card (to represent flat lawn area) from 326' to 346' and a building card to represent the transect segment from 346' to 426'. TCE used the 20% of building width method as described in Transect 13 for the first row of buildings in Transect 15. At the distance of 1277', TCE changed the 10% still water to 9.32' NAVD to represent the SFWMD still water flood elevation on the Estero Bay side of the barrier island. The FEMA contractor used 11.22' NAVD, the SFWMD still water computed for the open coast.

The aerial photo with location of Transect 15 and FEMA's contractors' distances can be found on Figure 7. Comparisons of CHAMP WHAFIS cards for Transect 15 can be found on Figure 8. TCE CHAMP model runs (inputs and outputs) for Transect 15 can be found in Appendix B on CD

D. Transect 16 Comparisons

For Transect 16, TCE again followed much of the same approach as used in Transect 13. The FEMA contractor applied a DU (dune) card along Transect 16 from 726' to 815'. TCE applied a building card to represent the transect segment from 680' to 815' TCE used the 20% of building width method as described in Transect 13 for the first row of buildings in Transect 16. At the distance of 1575', TCE changed the 10% still water to 9.32' NAVD to represent the SFWMD still water flood elevation on the Estero Bay side of the barrier island. The FEMA contractor used 11.22' NAVD, the SFWMD still water computed for the open coast.

The aerial photo with location of Transect 16 and FEMA's contractors' distances can be found on Figures 8 and 9. Comparisons of CHAMP WHAFIS cards for Transect 16 can be found on Figure 10. TCE CHAMP model runs (inputs and outputs) for Transect 16 can be found in Appendix B on CD

III. A & V Zone Locations/Flood Elevations

A. Transect 13 Comparisons

With changes made in WHAFIS cards and still water inputs, the location of the V zone at Transect 13 was moved a distance of 345' westerly toward the Gulf of Mexico. FEMA contractor's CHAMP Part 5 – Location of V zones was 671' from the 0.0' point [1], while TCE's CHAMP Part 5 – Location of V zones was 326' from the 0.0' point (See Appendix B). Comparisons of CHAMP Part 6 – Numbered A Zones and V zones and Part 5- Location of V zones for Transect 13 can be found on Figure 11. Chart of comparisons of Parts 5 and Part 6 for Transect 13 can be found on Figure 12. For Transect 13, the differences in the inland extent of the v-zones and flood elevations computed by TCE verses FEMA contractor are displayed on Figure 12.

B. Transect 14 Comparisons

With changes made in WHAFIS cards and still water inputs, the location of the V zone at Transect 14 was moved a distance of 31' westerly toward the Gulf of Mexico. FEMA contractor's CHAMP Part 5 – Location of V zones was 551' from the 0.0' point [1], while TCE's CHAMP Part 5 – Location of V zones was 520' from the 0.0' point (See Appendix B). Comparisons of CHAMP Part 6 – Numbered A Zones and V zones and Part 5- Location of V zones for Transect 14 can be found on Figure 13. Chart of comparisons of Parts 5 and Part 6 for Transect 14 can be found on Figure 14. For Transect 14, the differences in the inland extent of the v-zones and flood elevations computed by TCE verses FEMA contractor are displayed on Figure 14.

C. Transect 15 Comparisons

With changes made in WHAFIS cards and still water inputs, the location of the V zone at Transect 15 was moved a distance of 149' westerly toward the Gulf of Mexico. FEMA contractor's CHAMP Part 5 – Location of V zones was 734' from the 0.0' point [1], while TCE's CHAMP Part 5 – Location of V zones was 585' from the 0.0' point (See Appendix B). Comparisons of CHAMP Part 6 – Numbered A Zones and V zones and Part 5- Location of V zones for Transect 15 can be found on Figure 15. Chart of comparisons of Parts 5 and Part 6 for Transect 15 can be found on Figure 16. For Transect 15, the differences in the inland extent of the v-zones and flood elevations computed by TCE verses FEMA contractor are displayed on Figure 16.

D. Transect 16 Comparisons

With changes made in WHAFIS cards and still water inputs, the location of the V zone at Transect 16 was moved a distance of 332' westerly toward the Gulf of Mexico. FEMA contractor's CHAMP Part 5 – Location of V zones was 1438' from the 0.0' point [1], while TCE's CHAMP Part 5 – Location of V zones was 1106' from the 0.0' point (See Appendix B). Comparisons of CHAMP Part 6 – Numbered A Zones and V zones and Part 5- Location of V

zones for Transect 16 can be found on Figure 17. Chart of comparisons of Parts 5 and Part 6 for Transect 16 can be found on Figure 18. For Transect 16, the differences in the inland extent of the v-zones and flood elevations computed by TCE verses FEMA contractor are displayed on Figure 18.

IV. Conclusions and Recommendations

TCE identified inconsistencies in the FEMA contractors' inputs to the CHAMP WHAFIS analyses. In the TCE revised transects corrections to the input still water flood elevations to reflect the SFWMD computed still water levels on the Estero Bay side of the barrier island were applied consistent with FEMA methodology. TCE revised CHAMP WHAFIS card inputs were also applied along the transects consistent with FEMA methodologies. The resulting wave effected flood elevations and V-zone location were plotted on Figures 12, 14, 16 and 18.

It is recommended that those revised CHAMP WHAFIS analyses results be submitted to FEMA for consideration in developing the final preliminary FIRMS. IT is also recommended that additional transects be analyzed along the Town of Fort Myers Beach shoreline to better represent topographic and land use conditions.

V. References

[1] DVD containing Coastal Flood Hazard Data for Draft FIS received from Gib Jones of Dewberry

2 "Coastal Engineering Analysis Flood Insurance Study, Lee County , Florida EMA -97-CO-0137" prepared for Federal Emergency Management Agency prepared by Taylor Engineering, Inc., received by Dewberry and Davis Feb 28, 2002.

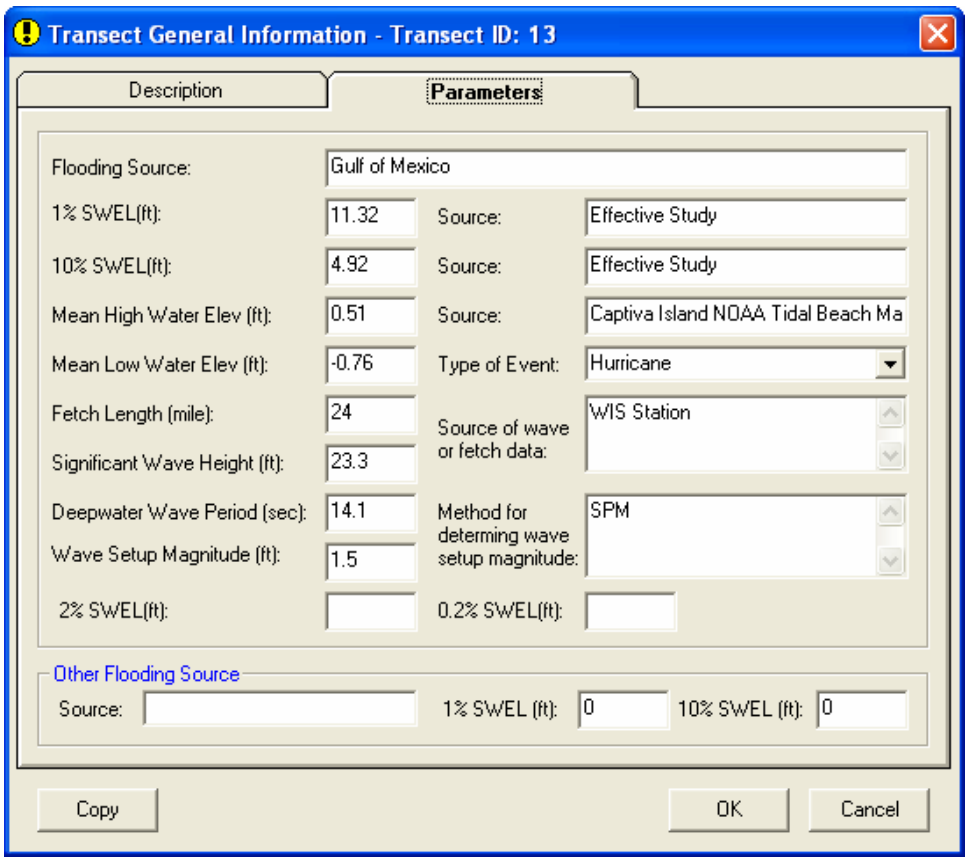
3 Flood Insurance Study Lee County, Florida , Federal Emergency Management Agency, July 20, 1998.

4 SFWMD, "Determination of 100-year Flood Elevations for Coastal Lee County, Florida" , 1983.

5 FEMA "Guidelines and Specifications for Flood Hazard Mapping Partners, Map Modernization for Federal Emergency Management Agency, Appendix D, Guidance for Coastal Flooding Analysis and Mapping." February 2002.

Figures

FEMA Contractor CHAMP



TCE CHAMP

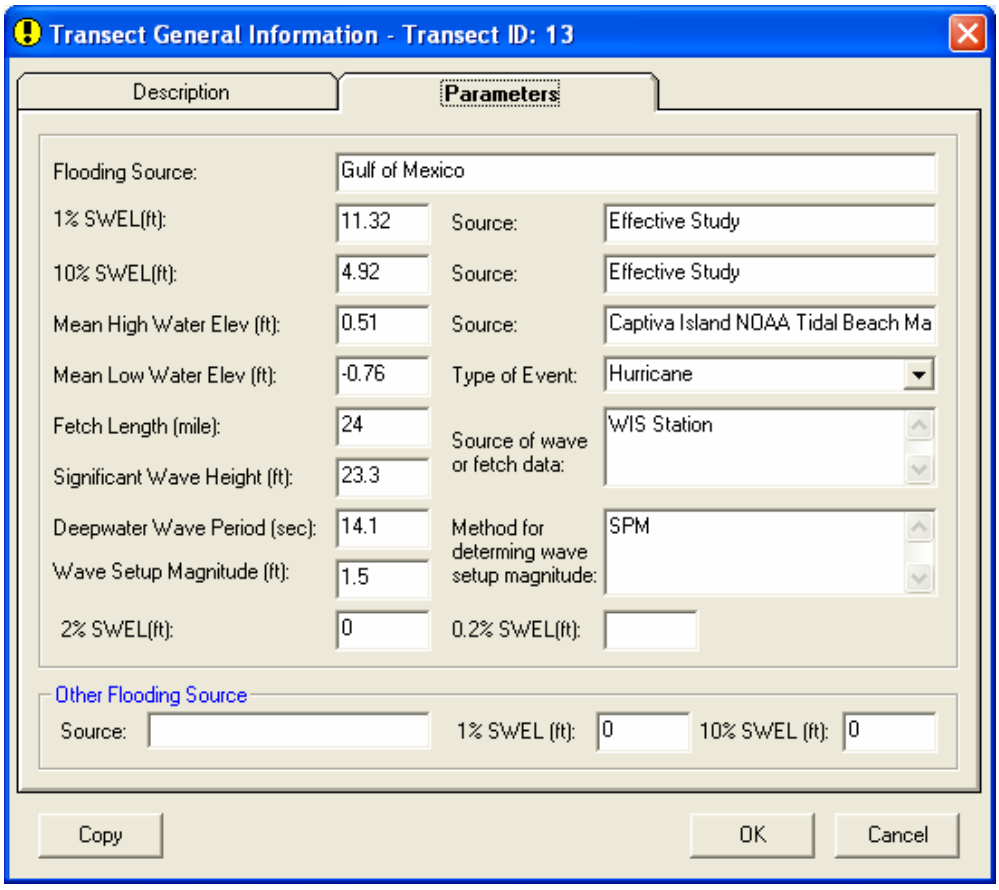


Figure 1

Transect 13

Figure 2

Transect 13					
TCE			Draft FEMA		
CARDS	DISTANCE feet	ELEVATION navd	CARDS	DISTANCE feet	ELEVATION navd
IE	0	0	IE	0	0
OF	11	0.7	OF	11	0.7
OF	18	1.3	OF	18	1.3
OF	29	1.3	OF	29	1.3
OF	62	2	OF	62	2
OF	100	2.7	OF	100	2.7
DU	164	4.89	DU	164	4.89
			OF	211	4.2
BU	274	4.1	OF	274	4.1
BU	350	4.05	BU	323	3.6
			DU	421	4.05
BU	510	2.05	BU	579	4.01
			BU	599	2.05
IF	600	0	OF	600	-1
IF	648	0	IF	648	-0.92
IF	660	0	IF	660	-1
VE	663	2.02	BU	663	2.02
BU	730	4			
IF	800	4			
BU	850	4			
BU	1190	4			
IF	1230	2	BU	1240	2
IF	1250	0	OF	1250	-1
ET	0	0	OF	2848	-1
			OF	2858	2.02
			BU	3335	4.01
			BU	3400	4
			BU	4230	4
			BU	4680	4
			BU	4760	2
			BU	4767	3.97
			BU	5010	4
			OF	5038	1.88
			OF	5061	-1
			ET	0	0

Figure 3

Transect 14

Figure 4

Transect 14					
TCE			Draft FEMA		
CARDS	DISTANCE feet	ELEVATION navd	CARDS	DISTANCE feet	ELEVATION navd
IE	0	0	IE	0	0
OF	4	0.5	OF	4	0.5
OF	13	1.4	OF	13	1.4
OF	29	1.2	OF	29	1.2
OF	44	2	OF	44	2
OF	51	1.8	OF	51	1.8
OF	73	2.8	OF	73	2.8
OF	96	4.4	OF	96	4.4
DU	127	4.8	OF	127	4.8
			OF	132	4.86
			DU	191	6.03
BU	201	5.5	OF	201	5.5
			OF	251	5.3
			OF	316	4.5
			OF	339	4
			BU	350	4
IF	365	4			
BU	425	4			
BU	563	4			
BU	860	4	BU	860	4
BU	1210	4	BU	1210	4
BU	1800	4	BU	1800	4
IF	1890	2	OF	1890	2
ET	0	0	OF	1900	-1
			ET	0	0

Figure 5

Transect 15

Figure 6

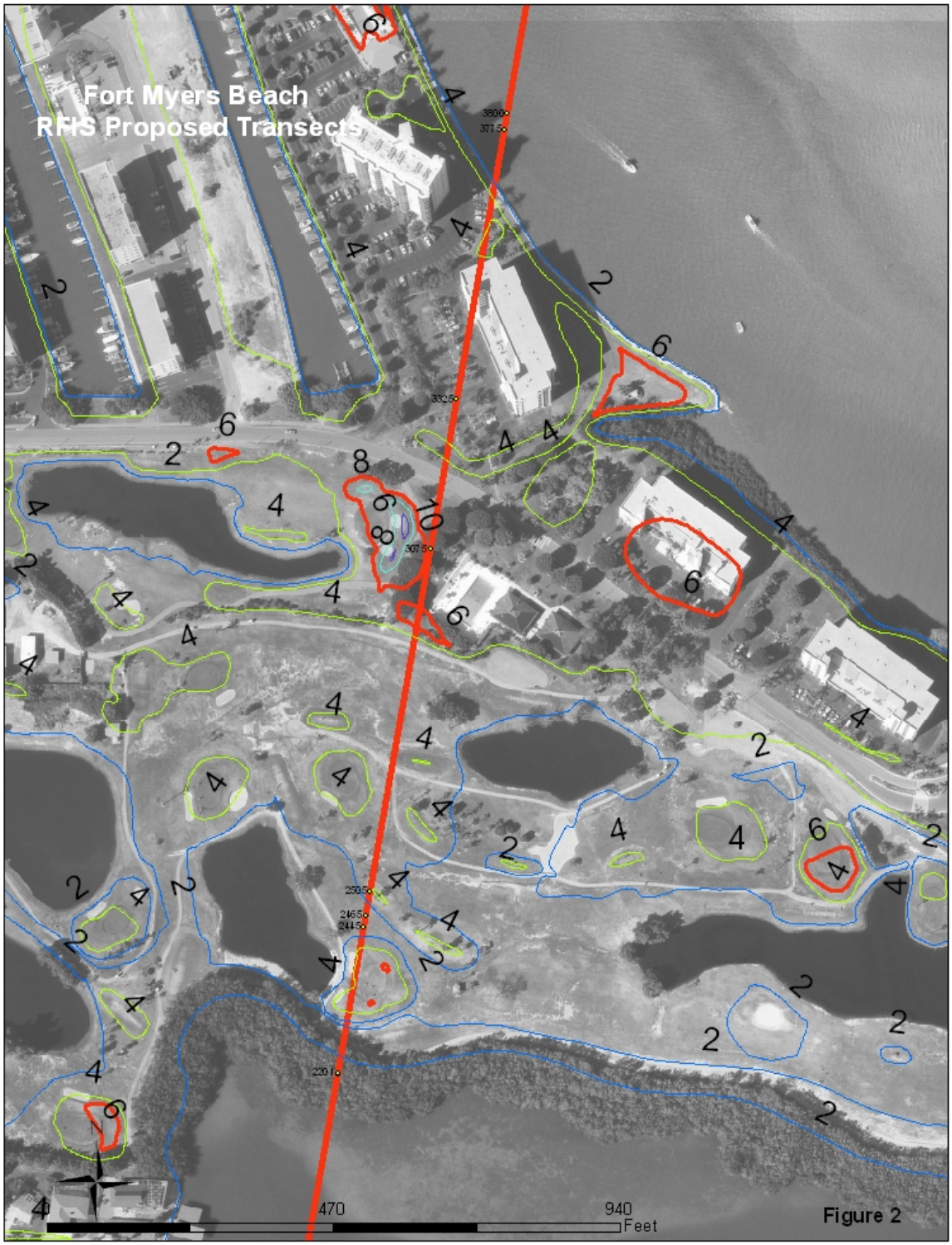
Transect 15					
TCE			Draft FEMA		
CARDS	DISTANCE feet	ELEVATION navd	CARDS	DISTANCE feet	ELEVATION navd
IE	0	0	IE	0	0
OF	11	1.2	OF	11	1.2
OF	14	1.5	OF	14	1.5
OF	50	1.8	OF	50	1.8
OF	75	0.8	OF	75	0.8
OF	108	2.9	OF	108	2.9
OF	137	3.9	OF	137	3.9
OF	151	2.1	OF	151	2.1
OF	197	2.1	OF	197	2.1
OF	218	2.7	OF	218	2.7
OF	226	2.1	OF	226	2.1
OF	260	2.4	OF	260	2.4
OF	293	2.8	OF	293	2.8
DU	326	4.6	OF	326	4.6
IF	346	4.3	OF	346	4.3
			DU	347	5.4
			IF	348	5.2
			OF	368	5
BU	426	5			
VE	475	5			
IF	525	5			
BU	676	5			
IF	722	5			
BU	821	5	BU	821	5
BU	872	4			
IF	959	4			
BU	1041	4	BU	1041	4
			BU	1200	4
IF	1277	4			
BU	1400	2	BU	1400	2
BU	1710	2	BU	1710	2
BU	2120	2	BU	2120	2
IF	2153	-0.93	OF	2153	-0.93
ET	0	0	ET	0	0

Figure 7

Transect 16 A

Figure 8

Transect 16B



Transect 16

Figure 9

TCE			Draft FEMA		
CARDS	DISTANCE feet	ELEVATION navd	CARDS	DISTANCE feet	ELEVATION navd
IE	0	0	IE	0	0
OF	16	0	OF	17	0.81
OF	37	0	OF	32	1.08
OF	45	0	OF	45	1.97
OF	75	0			
			OF	116	1.43
			OF	127	-0.07
			OF	141	-2.7
			OF	162	-1.5
			OF	170	-2.09
OF	197	0			
			OF	200	-1.7
OF	253	0			
OF	296	0			
			OF	323	-0.1
OF	364	0			
			OF	378	0.2
OF	404	0			
			OF	420	-1
OF	451	0			
OF	497	0	OF	490	-0.92
OF	537	0	OF	529	-0.96
OF	555	0	OF	573	-1.68
OF	566	0			
OF	585	0			
OF	600	1.6			
OF	601	2.3			
			OF	619	-1
			OF	621	-1.54
			OF	664	-2.11
DU	680	4	OF	680	-2.8
			OF	691	-1.4
			OF	710	-0.1
			OF	725	1.6
			OF	726	2.3
BU	815	4	DU	815	4
			IF	855	4
IF	1025	4	DU	1025	6
BU	1125	4	BU	1125	4
VE	1175	4			
BU	1255	4			
IF	1335	4			
BU	1405	4			
IF	1479	4			
IF	1540	4			
BU	1557	4			
			BU	1565	4
IF	1575	4			
			OF	1600	2
			OF	1602	-1
IF	2200	0	OF	2200	-1
			OF	2201	2
VE	2300	4			
IF	2320	2			
IF	2340	4			
IF	2380	4			
			OF	2445	2
			OF	2465	4
			OF	2505	4
IF	2950	6			
			OF	3075	6
IF	3200	4			
IF	3325	2	OF	3325	4
BU	3650	2	BU	3775	2
IF	3800	2	OF	3800	-1
ET	0	0	ET	0	0

Figure 10

Transect 13 CHAMP - Part 6 Numbered A zones and V zones								
TCE				**Draft FEMA**				
0	19.68			0	19.68	671		
4.42	19.5	V22	EL=20	5.42	19.5	671	V22	EL=20
11	19.23	V22	EL=19	11	19.31	671	V22	EL=19
18	18.86	V22	EL=19	18	18.99	671	V22	EL=19
29	18.77	V22	EL=19	29	18.99	671	V22	EL=19
42.93	18.5	V22	EL=19	62	18.6	671	V22	EL=19
62	18.13	V22	EL=18	72.06	18.5	671	V22	EL=19
97.59	17.5	V22	EL=18	100	18.21	671	V22	EL=18
100	17.46	V21	EL=17	138.35	17.5	671	V22	EL=18
136.49	16.5	V21	EL=17	164	17.02	671	V22	EL=17
164	15.78	V21	EL=16	211	17.13	671	V22	EL=17
198.96	15.5	V20	EL=16	274	17.13	671	V22	EL=17
274	14.9	V20	EL=15	321.28	16.5	671	V22	EL=17
286.32	14.5	V19	EL=15	323	16.48	671	V22	EL=16
316.93	13.5	V19	EL=14	421	16.45	671	V22	EL=16
325.79	13.28	V19	EL=13	579	15.85	671	V22	EL=16
347.55	12.5	A11	EL=13	594	15.5	671	V22	EL=16
350	12.42	A11	EL=12	599	15.38	671	V22	EL=15
462.13	11.5	A11	EL=12	600	15.08	671	V22	EL=15
510	11.11	A11	EL=11	648	15.1	671	V22	EL=15
570	10.94	A11	EL=11	660	15.1	671	V22	EL=15
600	10.65	A11	EL=11	663	14.74	671	V22	EL=15
645.68	10.5	A11	EL=11	671.92	14.64	671	V22	EL=15
648	10.49	A11	EL=10	803.56	14.5	671	A18	EL=15
652.55	10.5	A11	EL=10	1240	13.77	671	A18	EL=14
665.06	10.5	A11	EL=11	1250	13.65	671	A18	EL=14
1250	10.03	A11	EL=10					

Transect 13 CHAMP Part 5 - Location of V zones			
	TCE		FEMA
8.5	0	9	0
8.5	325.9	9	671

Figure 11

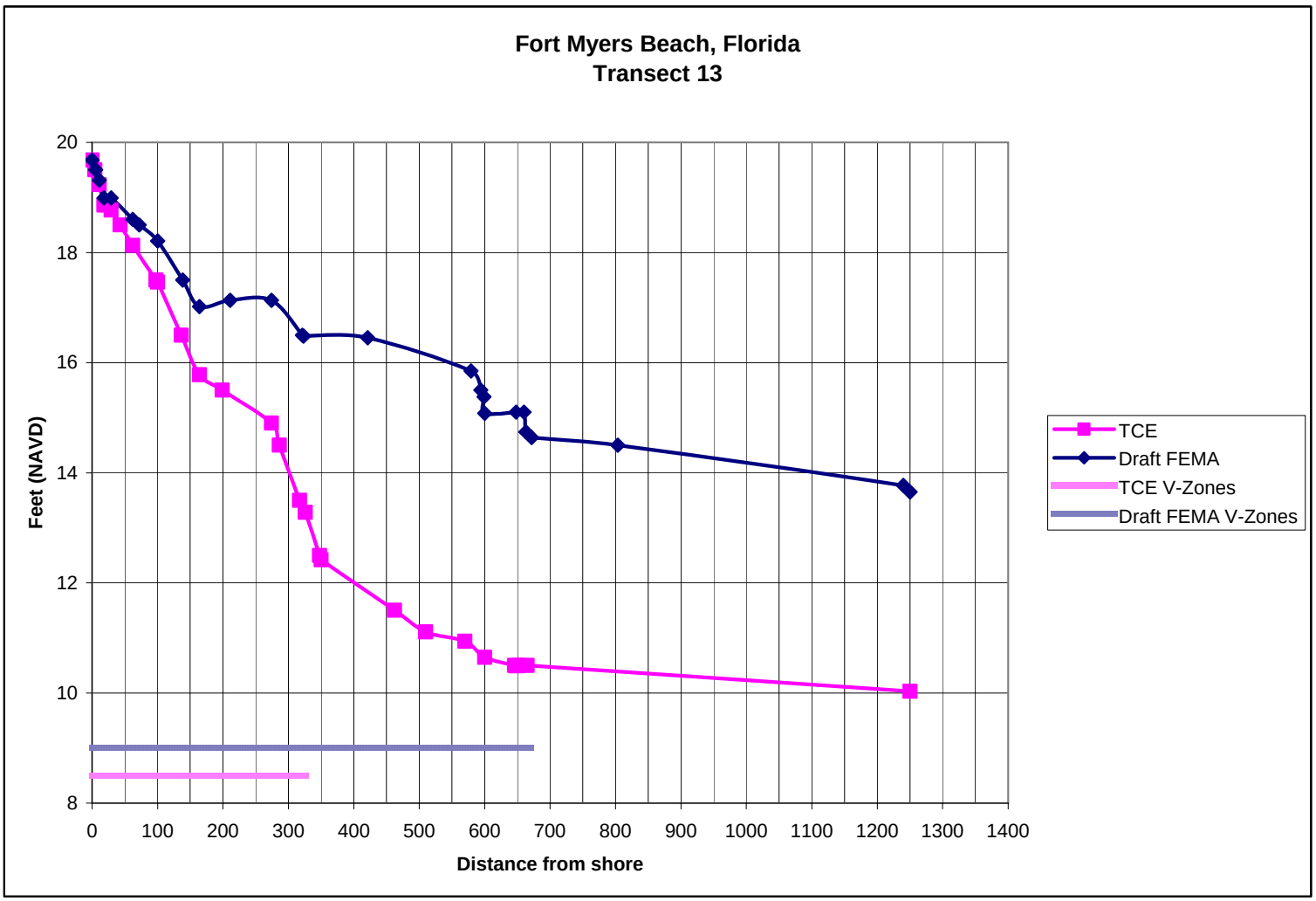

Fort Myers Beach, Florida
Transect 13
Feet (NAVD)
20
18
16
14
12
10
8
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
Distance from shore
TCE
Draft FEMA
TCE V-Zones
Draft FEMA V-Zones

Figure 12

Transect 14 CHAMP - Part 6 Numbered A zones and V Zones								
TCE				Draft FEMA			
0	19.68			0	19.68		
2.63	19.5	V22	EL=20	2.74	19.5	V22	EL=20
4	19.4	V22	EL=19	4	19.42	V22	EL=19
13	18.89	V22	EL=19	13	18.93	V22	EL=19
29	18.87	V22	EL=19	29	18.95	V22	EL=19
41.93	18.5	V22	EL=19	44	18.58	V22	EL=19
44	18.44	V22	EL=18	51	18.6	V22	EL=19
51	18.45	V22	EL=18	55.56	18.5	V22	EL=19
73	17.89	V22	EL=18	73	18.12	V22	EL=18
82.54	17.5	V22	EL=18	89.22	17.5	V22	EL=18
96	16.94	V22	EL=17	96	17.24	V22	EL=17
127	16.6	V22	EL=17	127	16.99	V22	EL=17
137.46	16.5	V22	EL=17	132	16.95	V22	EL=17
201	15.91	V21	EL=16	170.42	16.5	V22	EL=17
365	15.62	V21	EL=16	191	16.26	V22	EL=16
372.16	15.5	V21	EL=16	201	16.34	V22	EL=16
425	14.59	V20	EL=15	251	16.34	V22	EL=16
432.77	14.5	V20	EL=15	316	16.41	V22	EL=16
517.24	13.5	V20	EL=14	339	16.46	V22	EL=16
520.93	13.53	V20	EL=13	350	15.52	V22	EL=16
563	12.96	A11	EL=13	353.71	15.5	V22	EL=16
635.68	12.5	A11	EL=13	548.68	14.5	V22	EL=15
794.3	11.5	A11	EL=12	551.67	14.44	V22	EL=14
860	11.09	A11	EL=11	743.64	13.5	A15	EL=14
998.96	10.5	A11	EL=11	860	12.9	A15	EL=13
1210	9.61	A11	EL=10	1024.22	12.5	A15	EL=13
1600.96	9.5	A11	EL=10	1210	12.04	A15	EL=12
1808.9	9.5	A11	EL=9	1764.06	11.5	A15	EL=12
1890	10.01	A11	EL=10	1800	11.46	A15	EL=11
				1804.79	11.5	A15	EL=11
				1890	12.13	A15	EL=12
				1900	12.06	A15	EL=12

Transect 14 CHAMP Part 5 Location of V zones			
TCE		FEMA	
8.5	0	9	0
8.5	520	9	551

Figure 13

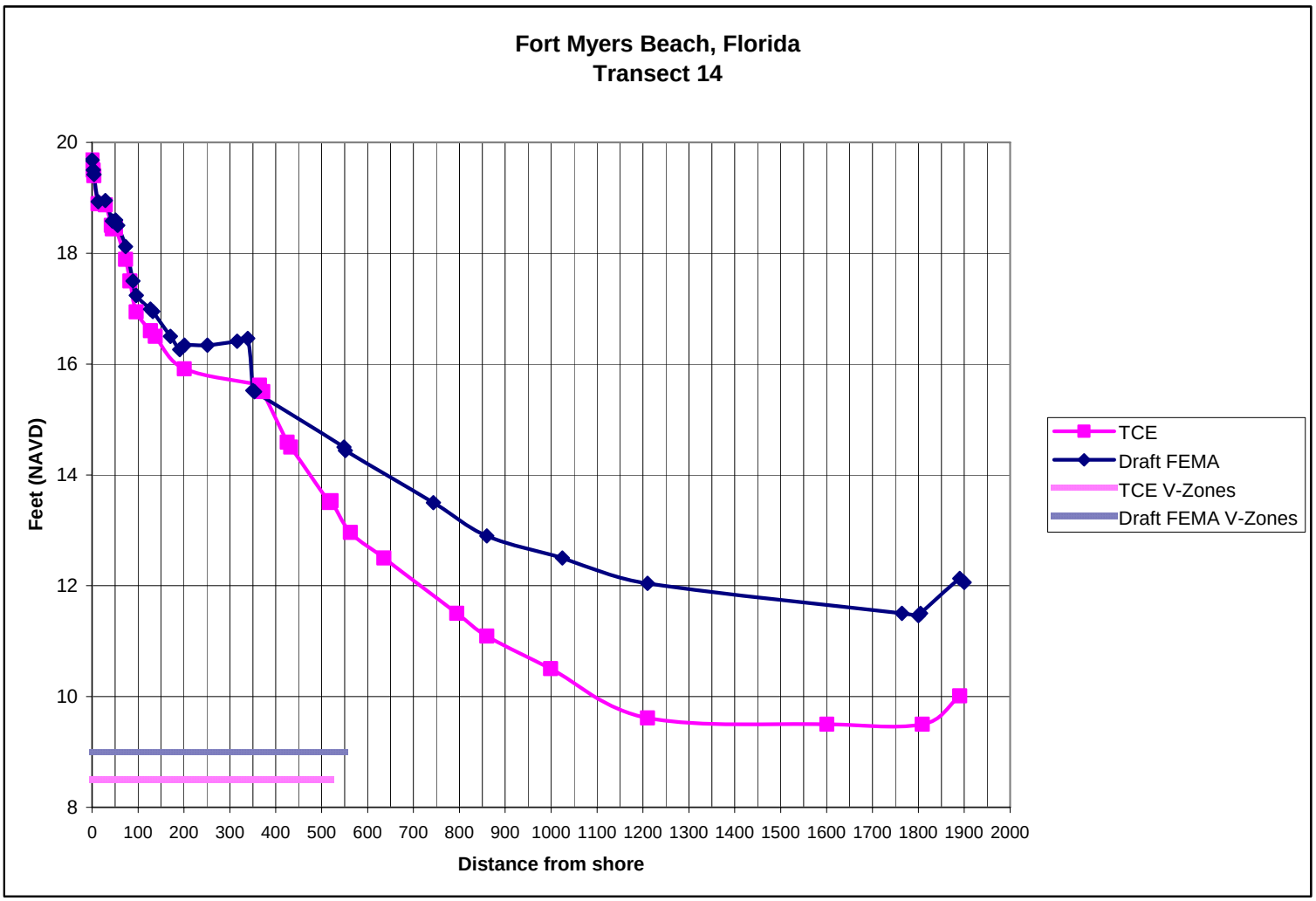

Fort Myers Beach, Florida
Transect 14
Feet (NAVD)
20
18
16
14
12
10
8
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000
Distance from shore
TCE
Draft FEMA
TCE V-Zones
Draft FEMA V-Zones

Figure 14

Transect 15 CHAMP - Part 6 Numbered A zones and V zones							
TCE				Draft FEMA			
0	19.53			0	19.53		
0.5	19.5	V22	EL=20	0.53	19.5	V22	EL=20
11	18.86	V22	EL=19	11	18.89	V22	EL=19
14	18.68	V22	EL=19	14	18.73	V22	EL=19
35.82	18.5	V22	EL=19	50	18.53	V22	EL=19
50	18.38	V22	EL=18	75	18.64	V22	EL=19
75	18.44	V22	EL=18	81.19	18.5	V22	EL=19
108	17.56	V22	EL=18	108	17.89	V22	EL=18
110.71	17.5	V22	EL=18	127.97	17.5	V22	EL=18
137	16.91	V22	EL=17	137	17.33	V22	EL=17
151	17.14	V21	EL=17	146.71	17.5	V22	EL=17
197	17.01	V21	EL=17	151	17.58	V22	EL=18
218	16.85	V21	EL=17	197	17.55	V22	EL=18
226	16.92	V21	EL=17	205.76	17.5	V22	EL=18
260	16.78	V21	EL=17	218	17.44	V22	EL=17
293	16.61	V21	EL=17	223.58	17.5	V22	EL=17
297.25	16.5	V21	EL=17	226	17.53	V22	EL=18
326	15.77	V21	EL=16	239.4	17.5	V22	EL=18
346	15.76	V21	EL=16	260	17.46	V22	EL=17
380.04	15.5	V20	EL=16	293	17.37	V22	EL=17
426	15.15	V20	EL=15	326	16.75	V22	EL=17
462.44	14.5	V20	EL=15	346	16.78	V22	EL=17
475	14.28	V20	EL=14	346.59	16.5	V22	EL=17
525	14.14	V20	EL=14	347	16.3	V22	EL=16
568.48	13.5	V19	EL=14	348	16.34	V22	EL=16
584.54	13.22	V19	EL=13	368	16.36	V22	EL=16
636.38	12.5	A11	EL=13	521.9	15.5	V21	EL=16
676	11.92	A11	EL=12	700.51	14.5	V21	EL=15
722	11.91	A11	EL=12	734.77	14.41	V21	EL=14
767.19	11.5	A11	EL=12	821	13.83	A15	EL=14
821	11.01	A11	EL=11	974.05	13.5	A15	EL=14
872	10.64	A11	EL=11	1041	13.36	A15	EL=13
959	10.85	A11	EL=11	1195.95	12.5	A15	EL=13
1041	10.5	A11	EL=11	1200	12.48	A15	EL=12
1277	10.56	A11	EL=11	1400	12.12	A15	EL=12
1290.9	10.5	A11	EL=11	1710	11.74	A15	EL=12
1685.16	9.5	A11	EL=10	1997.62	11.5	A15	EL=12
2120	9.37	A11	EL=	2120	11.4	A15	EL=11
				2131.33	11.5	A15	EL=11
				2153	11.69	A15	EL=12

Transect 15 CHAMP Part 5- Location of V Zones			
TCE		FEMA	
8.5	0	9	0
8.5	585	9	734

Figure 15

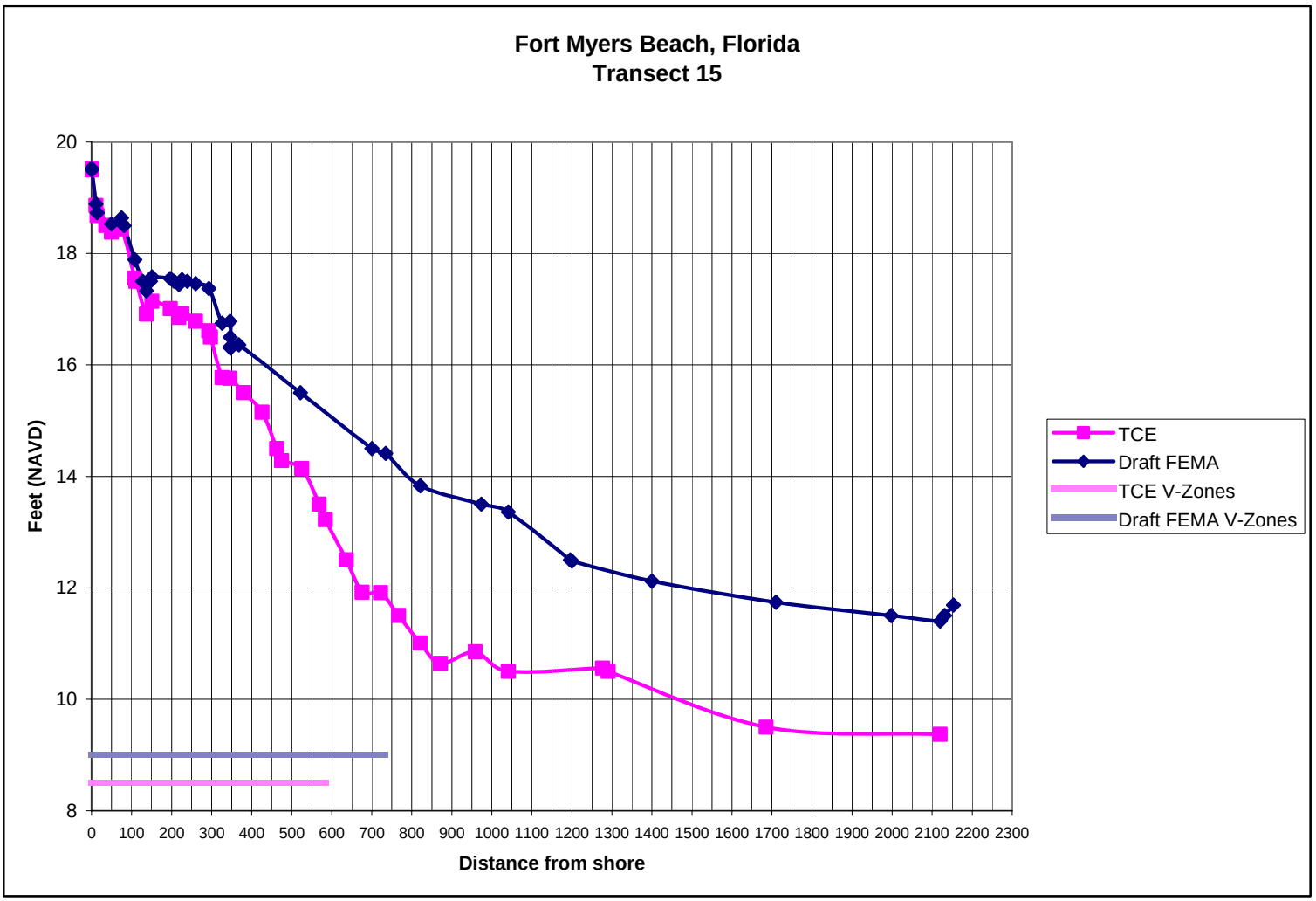

Fort Myers Beach, Florida
Transect 15
Feet (NAVD)
20
18
16
14
12
10
8
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
Distance from shore
TCE
Draft FEMA
TCE V-Zones
Draft FEMA V-Zones

Figure 16

Transect 16 CHAMP - Part 16 Numbered A zones and V zones

TCE				Draft FEMA			
0	19.53			0	19.53		
9.26	19.5	V30	EL=20	1.2	19.5	V22	EL=20
16	19.48	V30	EL=19	17	19.09	V22	EL=19
37	19.41	V30	EL=19	32	18.94	V22	EL=19
45	19.38	V30	EL=19	44.07	18.5	V22	EL=19
75	19.28	V29	EL=19	45	18.47	V22	EL=18
197	18.88	V29	EL=19	101.6	18.5	V22	EL=18
253	18.7	V29	EL=19	116	18.51	V22	EL=19
296	18.56	V29	EL=19	127	18.68	V22	EL=19
312.98	18.5	V29	EL=19	141	18.98	V22	EL=19
364	18.33	V29	EL=18	162	18.83	V22	EL=19
404	18.2	V28	EL=18	170	18.9	V22	EL=19
451	18.04	V28	EL=18	200	18.84	V22	EL=19
497	17.89	V28	EL=18	323	18.63	V22	EL=19
537	17.76	V28	EL=18	378	18.57	V22	EL=19
555	17.7	V28	EL=18	420	18.68	V22	EL=19
566	17.67	V28	EL=18	490	18.65	V22	EL=19
585	17.6	V28	EL=18	529	18.64	V22	EL=19
586.73	17.5	V28	EL=18	573	18.71	V22	EL=19
600	16.71	V28	EL=17	619	18.62	V22	EL=19
600.56	16.5	V28	EL=17	621	18.67	V22	EL=19
601	16.33	V28	EL=16	664	18.73	V22	EL=19
657.5	15.5	V28	EL=16	680	18.82	V22	EL=19
680	15.17	V27	EL=15	691	18.64	V22	EL=19
815	14.61	V27	EL=15	710	18.5	V22	EL=19
858.82	14.5	V27	EL=15	710.22	18.5	V22	EL=19
1025	14.02	V26	EL=14	725	18.25	V22	EL=18
1051.55	13.5	V26	EL=14	726	17.88	V22	EL=18
1102.19	12.5	V26	EL=13	761.4	17.5	V22	EL=18
1105.59	12.5	V26	EL=12	815	16.92	V22	EL=17
1125	12.05	A21	EL=12	855	16.9	V22	EL=17
1175	11.93	A21	EL=12	965.08	16.5	V22	EL=17
1208.11	11.5	A21	EL=12	1025	16.28	V21	EL=16
1255	10.89	A21	EL=11	1125	15.76	V21	EL=16
1335	10.92	A21	EL=11	1178.32	15.5	V21	EL=16
1388.69	10.5	A21	EL=11	1386.15	14.5	V21	EL=15
1405	10.37	A21	EL=10	1437.61	14.29	V21	EL=14
1479	10.45	A21	EL=10	1565	13.64	A18	EL=14
1540	10.47	A21	EL=10	1600	13.54	A18	EL=14
1557	10.12	A21	EL=10	1600.54	13.5	A18	EL=14
1575	10.14	A21	EL=10	1602	13.38	A18	EL=13
1785.47	10.5	A21	EL=10	1667.16	13.5	A18	EL=13
2258.17	10.5	A21	EL=11	2043.62	14	A18	EL=14
2403.11	10.5	A21	EL=10	2200	14.17	V21	EL=14
3571.22	11.42	A21	EL=11	2201	14.48	V21	EL=14
3663.25	11.5	A24	EL=11	2219.9	14.5	V21	EL=14
3775	11.61	A21	EL=12	2445	14.68	V21	EL=15
				2465	14.83	V21	EL=15
				2505	14.83	V21	EL=15
				3067.67	14.5	V20	EL=15
				3075	14.49	V20	EL=14
				3088.79	14.5	V20	EL=14
				3325	14.71	V20	EL=15
				3485.25	14.5	V20	EL=15
				3775	14.11	V20	EL=14

Transect 16 CHAMP
Part 5 - location of V Zones

tce		FEMA	
8.5	0	9	0
8.5	1106	9	1438
8.5	3571.22	9	2044
8.5	4000	9	4000

Figure 17

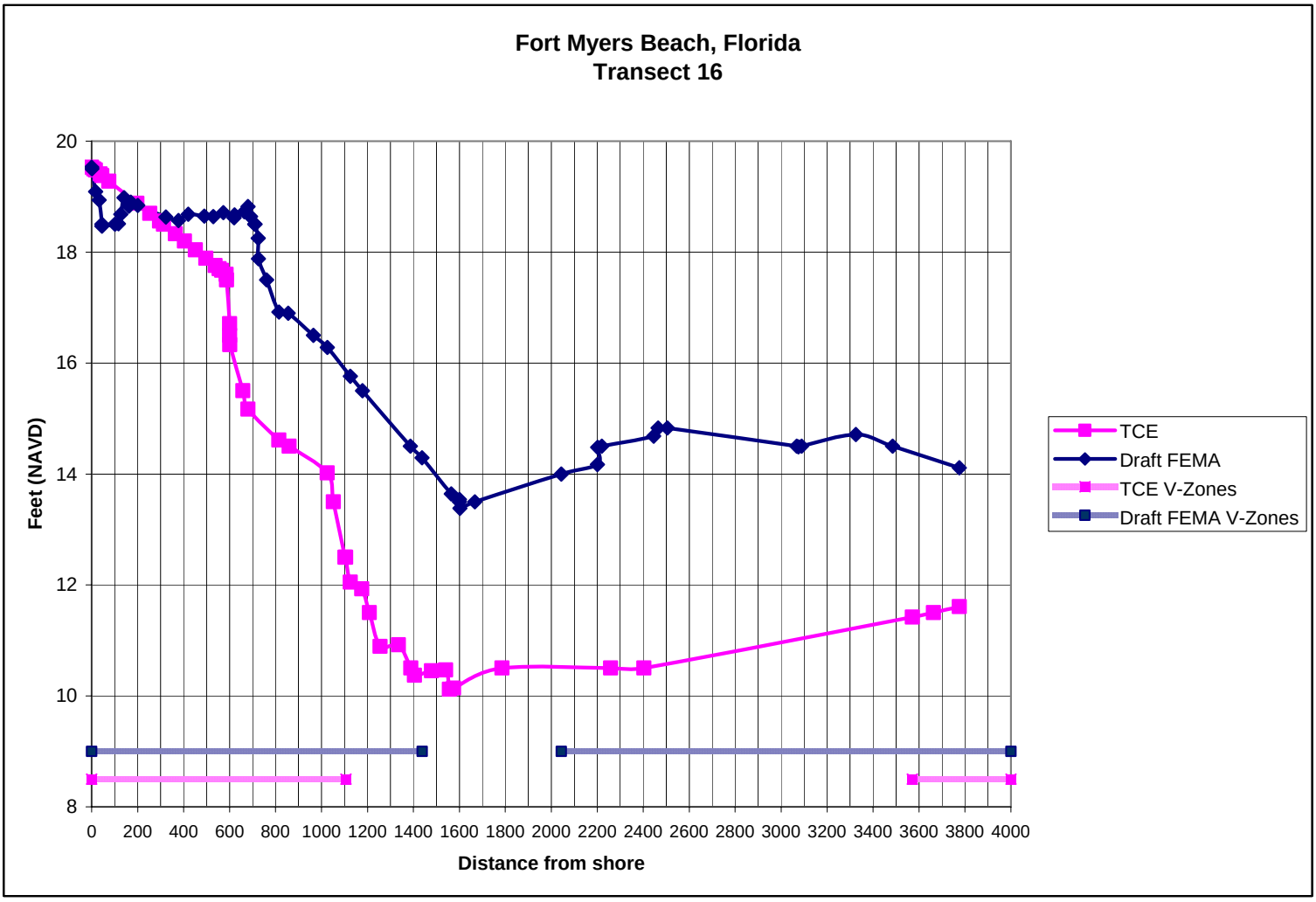

Fort Myers Beach, Florida
Transect 16
Feet (NAVD)
20
18
16
14
12
10
8
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
Distance from shore
TCE
Draft FEMA
TCE V-Zones
Draft FEMA V-Zones

Figure 18