

Total Maximum Daily Load (TMDL) for Bacteria Impairments

Project Area 2
Basins D&E

August 21, 2003

 **PARSONS**

**HICKS &
COMPANY**
ENVIRONMENTAL
ARCHEOLOGICAL
AND PLANNING
CONSULTANTS

James Miertschin & Associates

Study Segments

- Segment 1903 – Medina River
- Segment 1910 – Salado Creek and its tributary Segment 1910A, Walzem Creek
- Segment 1911 – Upper San Antonio River
- Segment 1901 – Lower San Antonio River

Purpose of Today's Meeting

- Review *E. coli* Data (historical and current) for the Five Segments
- Recruit Permanent Stakeholders for the Upper San Antonio River, Lower San Antonio River, Salado Creek and Medina River TMDLs

Segment 1903 – Medina River

Medina Diversion Dam in
Medina County to Confluence
with San Antonio River in
Bexar County

Additional Monitoring for E. coli Medina River

- Agricultural Watershed
 - 25 mile reach
- 4 monitoring stations
- 10 sampling surveys

Medina River *E. coli* Data,

(1996-2001)

Not enough data to show impairment

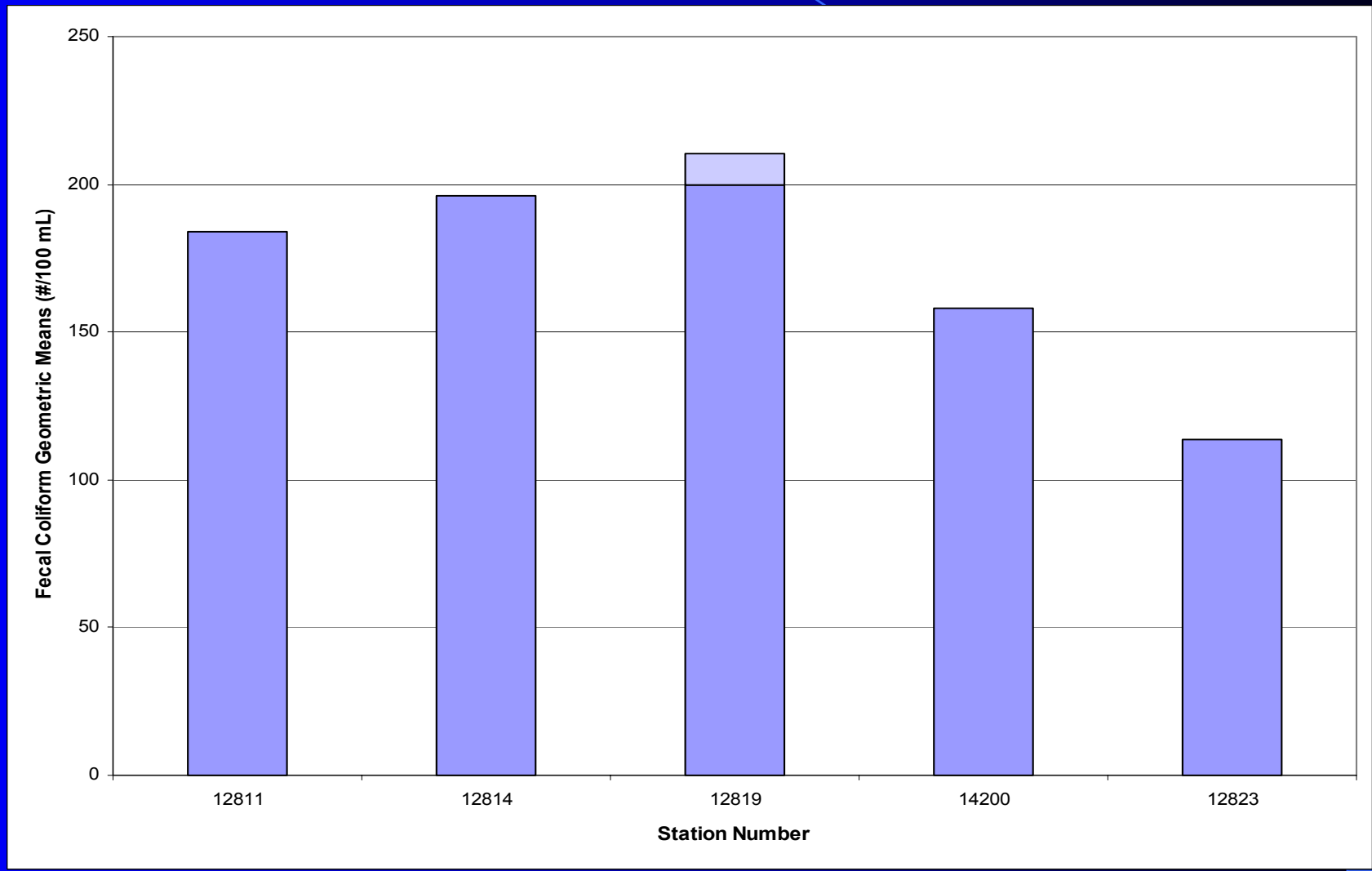
STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
14200	CR 484	20	0	105	fully supporting	Montgomery Rd to US90, 17 mi
12814	Applewhite	2	0	219	not assessed	--
12823	Riomedina	2	0	63	not assessed	--

Medina River Fecal Coliform Data (1996-2001)

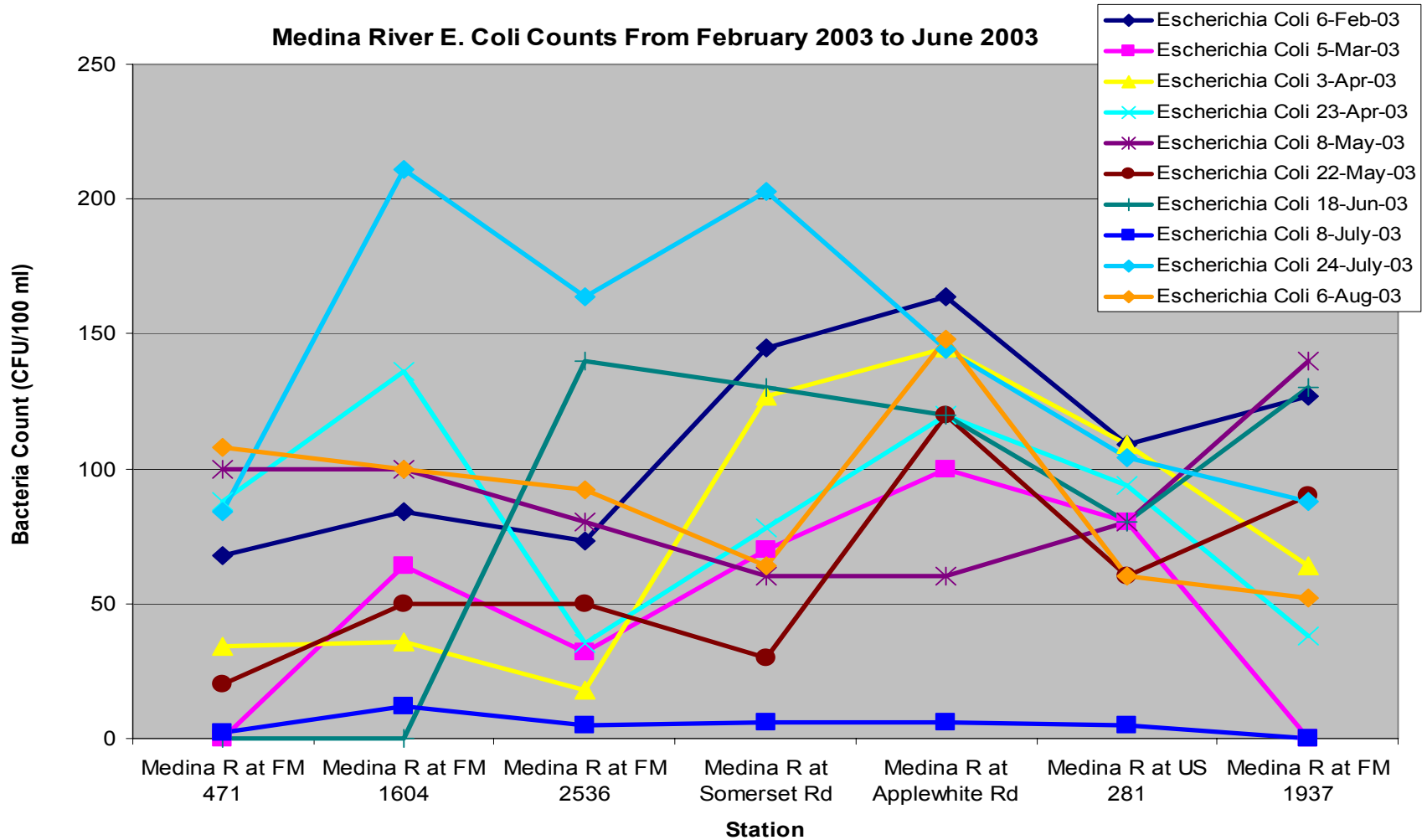
1 station out of 5 “not supporting”, mid-reach

STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
12811	FM 1937	15	1	184	fully supporting	confluence to US281, 6.3 mi
12814	Applewhite	14	1	196	fully supporting	US281 to I35, 19 mi
12823	Riomedina	13	1	114	fully supporting	US90 to end, 25 mi
14200	CR 484	25	1	158	fully supporting	Montgomery Rd to US90, 17 mi
12819	FM 1604	11	1	210	not supporting	I35 to Montgomery Rd, 12 mi

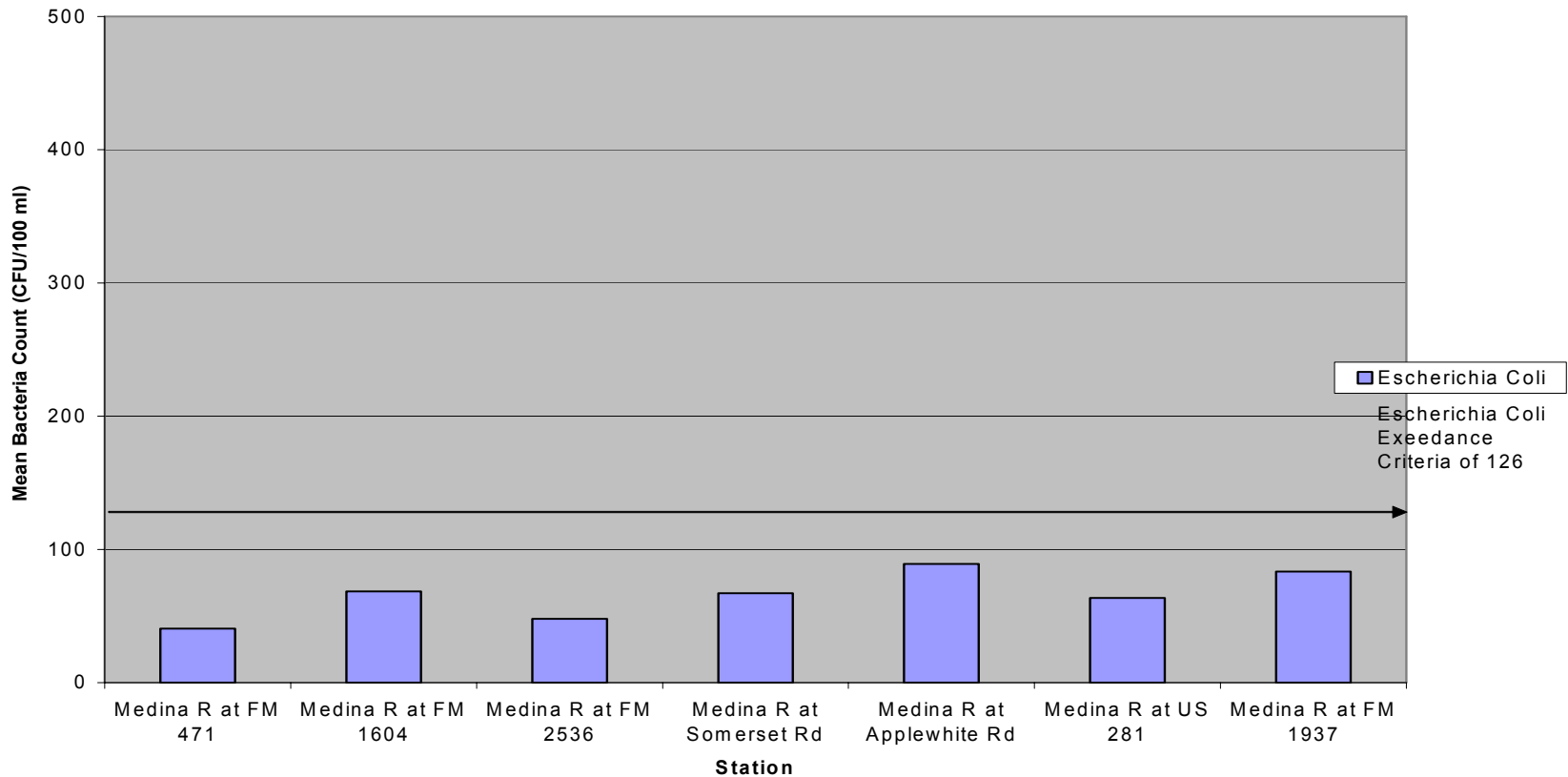
Medina River Spatial Trend of Geometric Means Fecal Coliform (1996-2001)



Medina River *E. coli* Counts February 2003 to August 2003



Medina River 2003 Sampling Events Geometric Mean Bacteria Counts Per Station, February 2003 to August 2003



Segment 1910 – Salado Creek and
Segment 1910A – Walzem Creek

Additional Monitoring for E. coli Salado Creek

- Urbanized Watershed
 - 24 mile reach
- 9 monitoring stations
- 6 sampling surveys
- 1 baseflow, 1 runoff event

Salado Creek *E. coli* Data (1996-2001)

9 stations “not supporting”, lower 24 miles

STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
12877	NE Loop 410	7	2	94	no concern	1 mi
15643	SH 368	58	13	225	not supporting	<1 mi
12876	SH 368	5	5	2962	primary concern	<1 mi
12875	Eisenhauer	59	11	131	not supporting	1 mi
12874	Rittiman	4	0	129	primary concern	<1 mi
15642	Holbrook	56	16	212	not supporting	1 mi
12872	Pershing	65	10	113	fully supporting	1 mi
12871	IH 35	57	9	108	fully supporting	<1 mi

Salado Creek *E. coli* Data, continued

STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
15644	Pletz Pk	59	12	143	not supporting	<1 mi
12870	Gembler	25	4	125	fully supporting	1 mi
15645	Commerce	59	11	169	not supporting	1 mi
15646	MLK Pk	99	31	220	not supporting	1.5 mi
12868	Rigsby	63	21	203	not supporting	2 mi
15647	E Southcross	58	9	159	not supporting	1.5 mi
12864	Loop 13	69	14	184	not supporting	2.5 mi
12862	Goliad	120	17	114	fully supporting	1.5 mi

Salado Creek Fecal Coliform Data (1996-2001)

12 stations “not supporting”

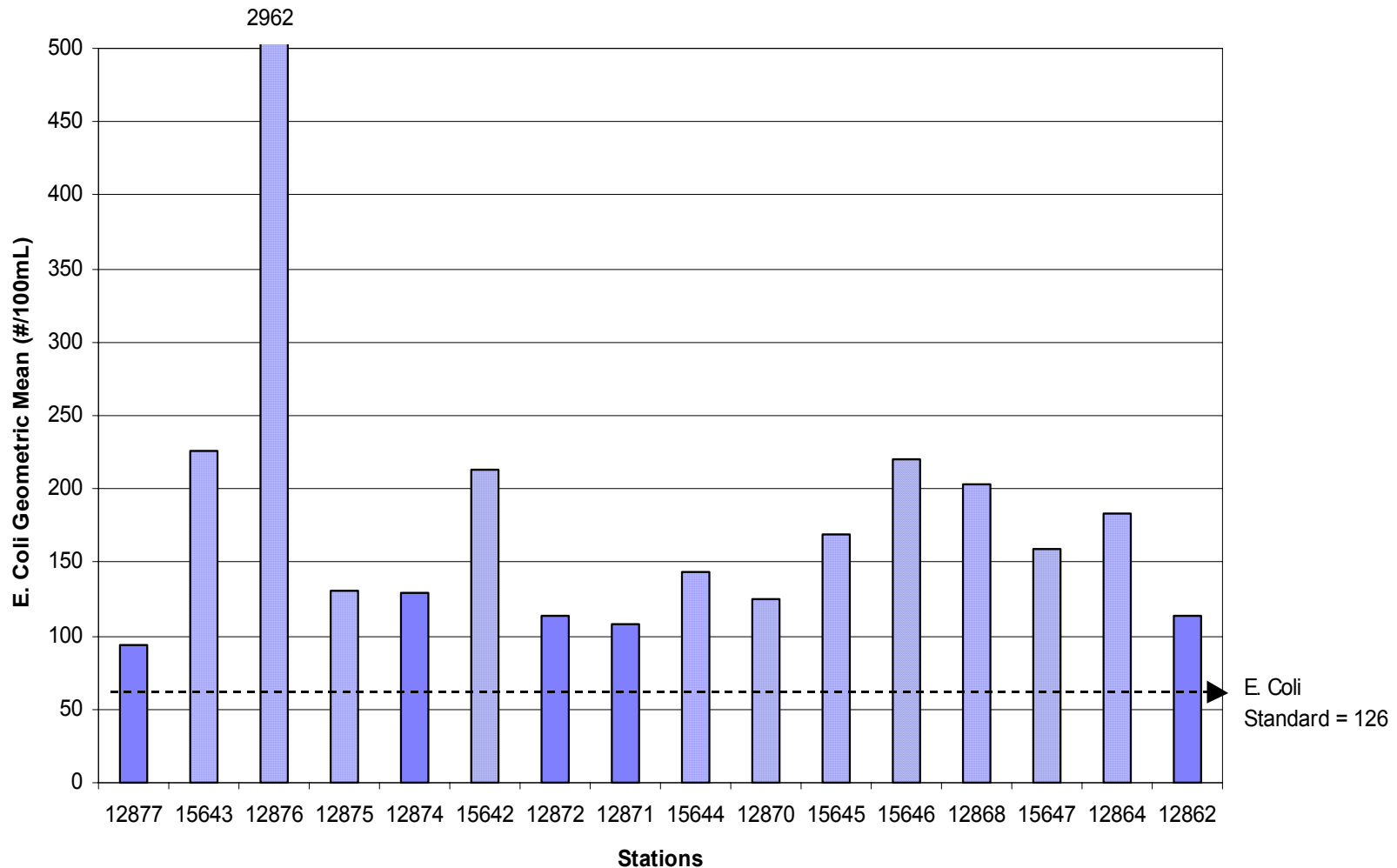
STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
12878	Los Patios	1	0	320	not assessed	<1 mi
12877	NE Loop 410	17	13	2124	not supporting	1 mi
15643	SH 368	60	29	439	not supporting	<1 mi
12876	SH 368	5	5	8226	primary concern	<1 mi
12875	Eisenhauer	61	24	260	not supporting	1 mi
12874	Rittiman	4	1	263	primary concern	<1 mi
15642	Holbrook	58	30	543	not supporting	1 mi
12872	Pershing	71	15	176	fully supporting	1 mi
12871	IH 35	59	14	208	not supporting	<1 mi

Salado Creek Fecal Coliform Data, continued

STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
15644	Pletz Pk	60	22	269	not supporting	<1 mi
12870	Gembler	26	7	248	not supporting	<1 mi
15645	Commerce	61	30	415	not supporting	1.5 mi
15646	MLK Pk	104	52	449	not supporting	2 mi
12868	Rigsby	67	30	462	not supporting	<1 mi
15733	Comanche Pk	2	0	215	not assessed	1 mi
15647	E Southcross	60	19	311	not supporting	1.5 mi
12864	Loop 13	73	27	347	not supporting	2.5 mi
12862	Goliad	127	26	180	fully supporting	1.5 mi
12861	Southton	1	0	40	not assessed	--

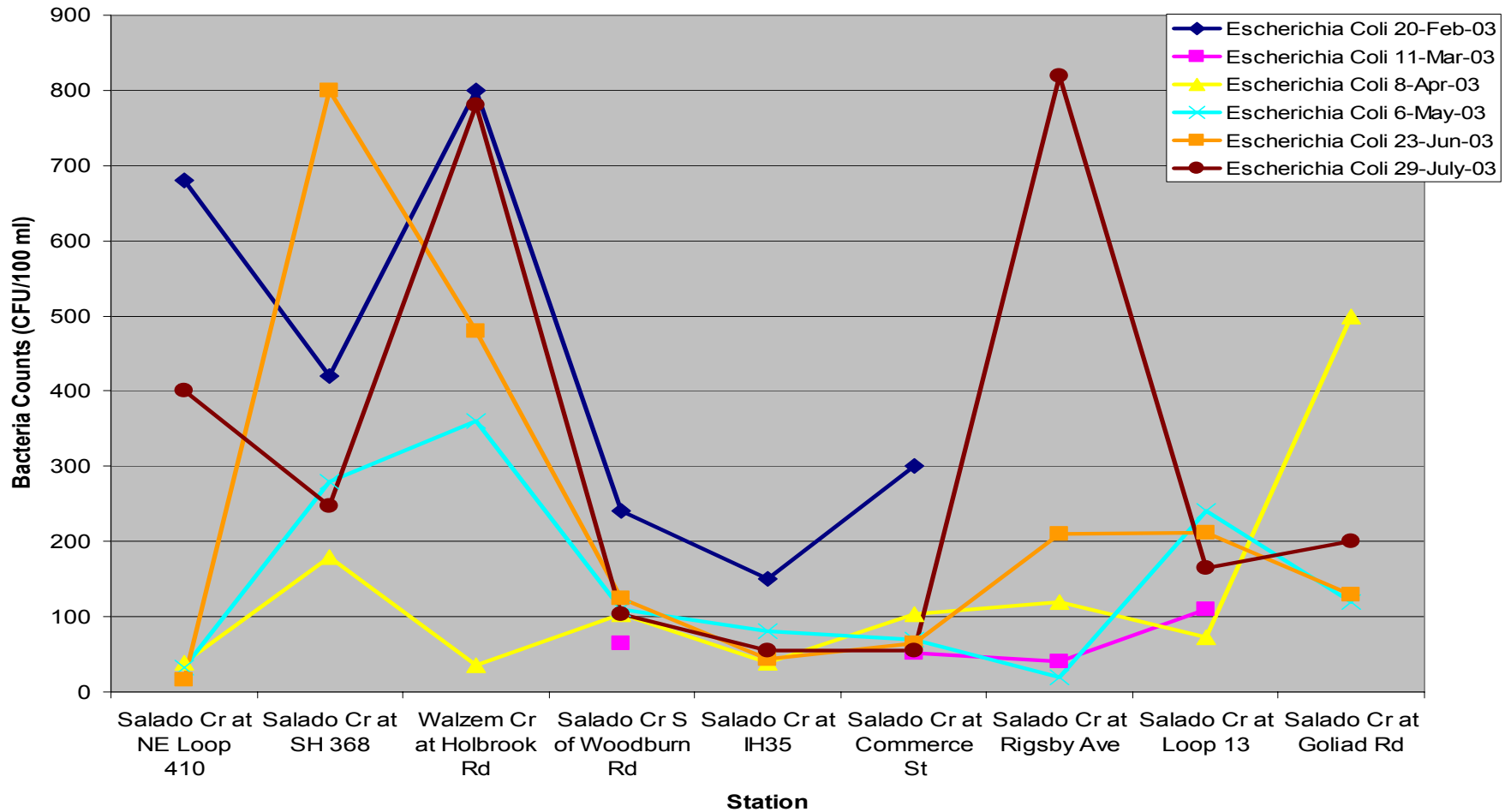
Salado Creek Spatial Trend of *E. coli* Geometric Means (1996-2001)

Figure E. Coli Geometric Mean for Stations Along Salado Creek

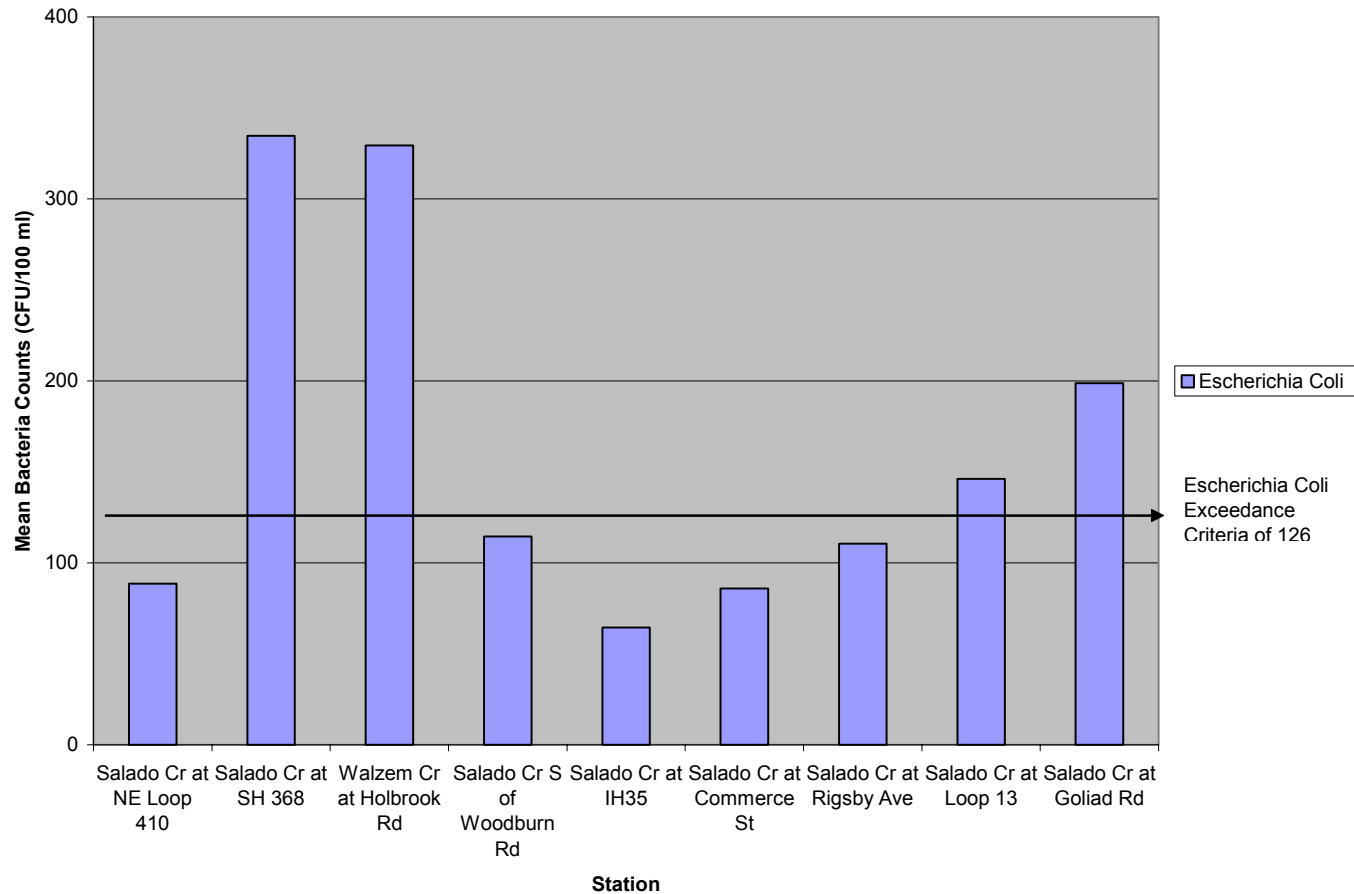


Salado Creek *E. coli* Counts February 2003 to July 2003

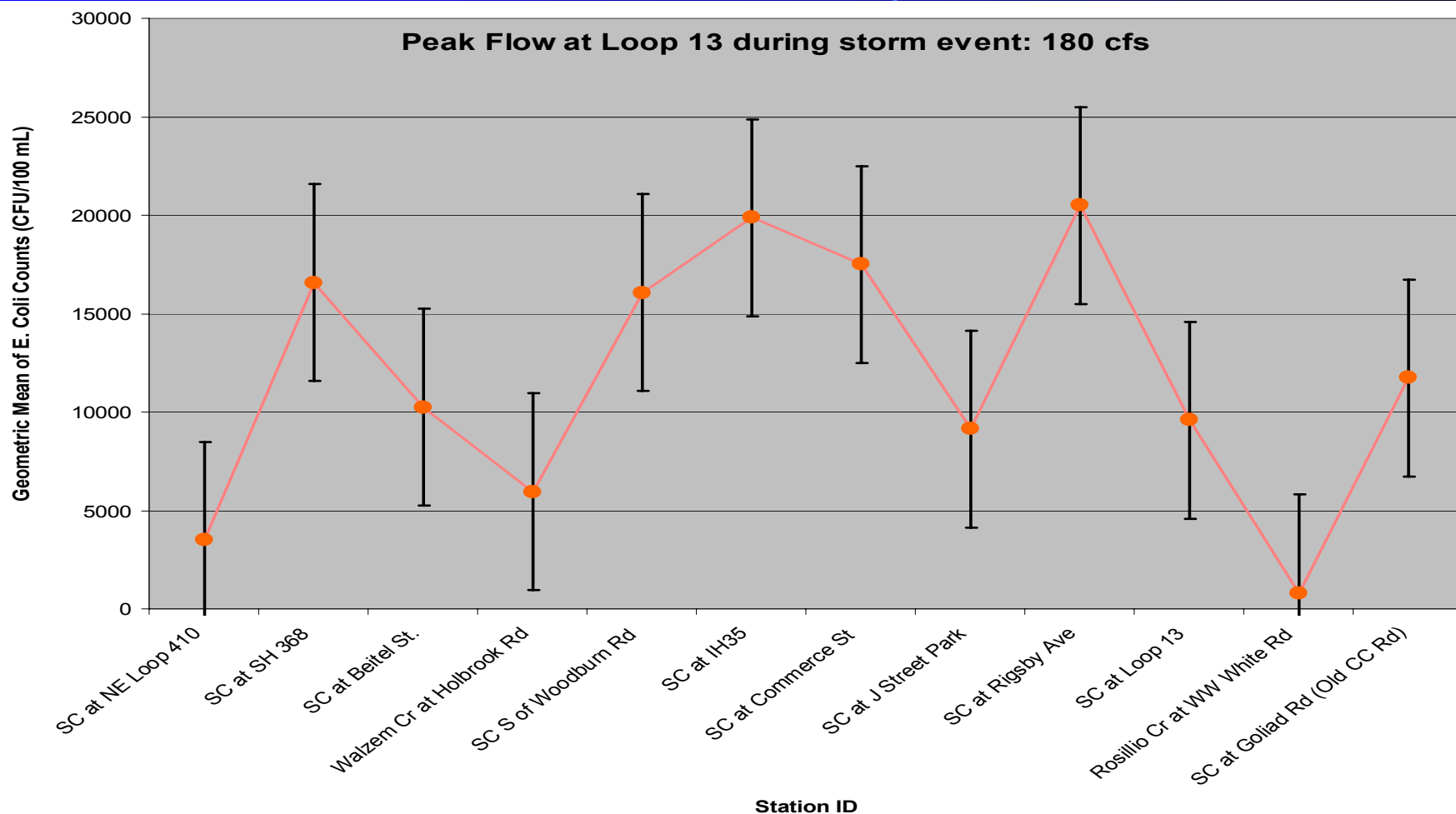
Salado Creek E. Coli Counts Form February 2003 to July 2003



Salado Creek 2003 Sampling Events Geometric Mean Bacteria Counts Per Station, February 2003 to July 2003



Salado Creek Storm Water Runoff Survey - June 4, 2003



Segment 1911 – Upper San Antonio River

Hildebrand Avenue in San
Antonio to FM 791 near
Falls City in Karnes County

Additional Monitoring for E. coli

Upper San Antonio River

- Upper watershed urbanized, lower agricultural
 - 70 mile reach
- 13 monitoring stations
- 6 sampling surveys
- 1 baseflow, 1 runoff event

Upper San Antonio River *E. coli* Data (1996-2001)

1 station “not supporting”, 3 with “primary concern”, upper reach

STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
12912	Hildebrand	8	3	227	primary concern	2 mi
12904	Alamo St	5	1	266	primary concern	3 mi
14256	Mitchell St	26	9	263	not supporting	7 mi
12897	Loop 410	5	0	37	no concern	4.75 mi
12894	Blue Wing	5	2	199	primary concern	3.5 mi
16731	Medina confl	19	0	63	fully supporting	2 mi
12889	IH 37	6	0	45	no concern	4.75 mi
12883	Dietz Rd	5	0	123	no concern	10.5 mi
12879	FM 791	12	0	76	no concern	3 mi

Upper San Antonio River Fecal Coliform Data (1996-2001)

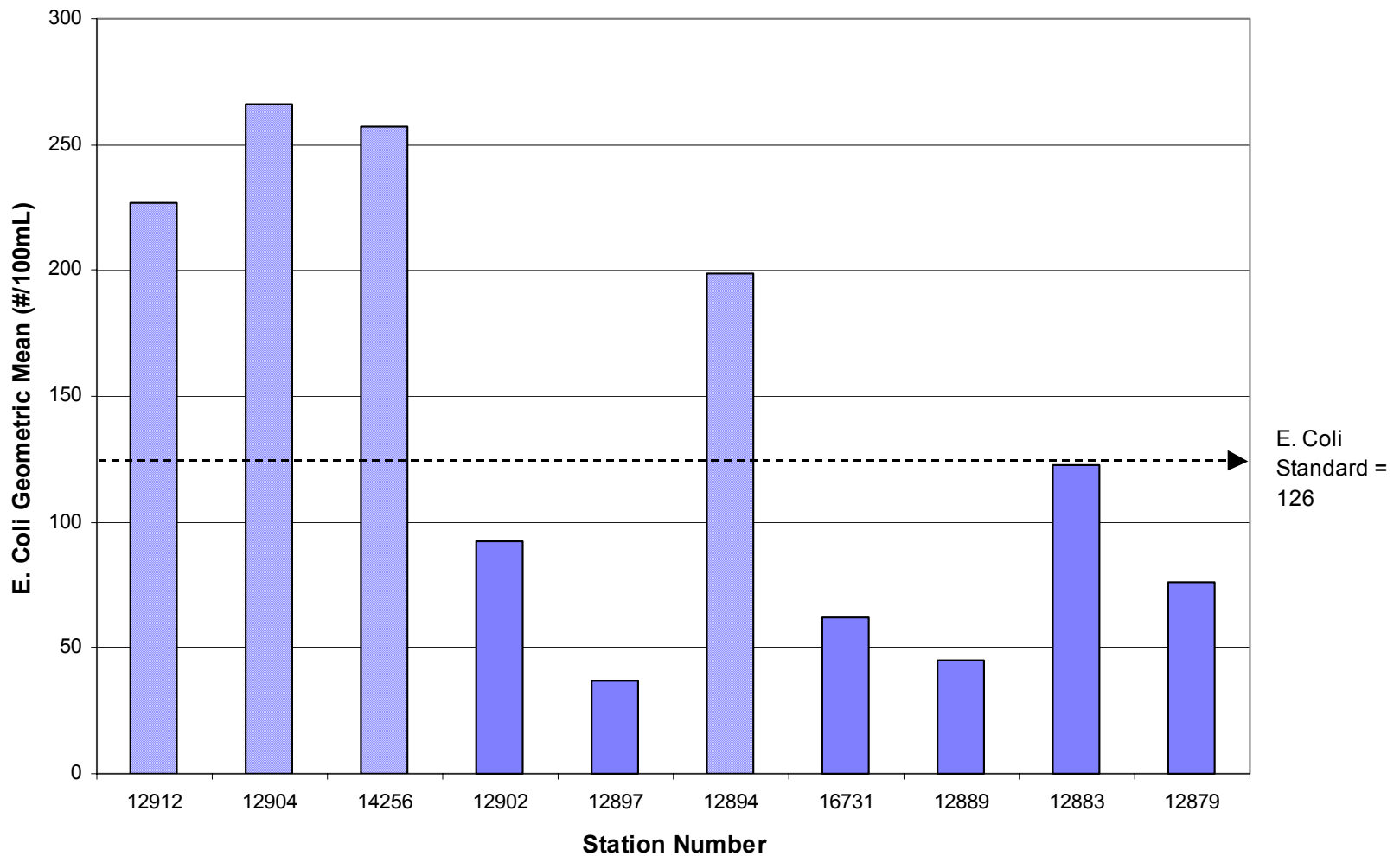
9 stations “not supporting”, upper reach primarily

STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
12912	Hildebrand	26	14	469	not supporting	2 mi
12904	Alamo St	33	19	865	not supporting	2.5 mi
14220	Lone Star	4	4	779	primary concern	1 mi
14256	Mitchell St	48	39	1720	not supporting	2.5 mi
15308	700 m d/s Loop 13	8	2	332	primary concern	2.5 mi
15310	1.2 km d/s Loop 13	5	0	93	no concern	1 mi
12902	Mission Dam	5	1	171	no concern	1 mi
12899	Padre Rd	16	7	67	not supporting	4 mi
12897	Loop 410	27	10	261	not supporting	2 mi
12894	Blue Wing	21	13	452	not supporting	3 mi

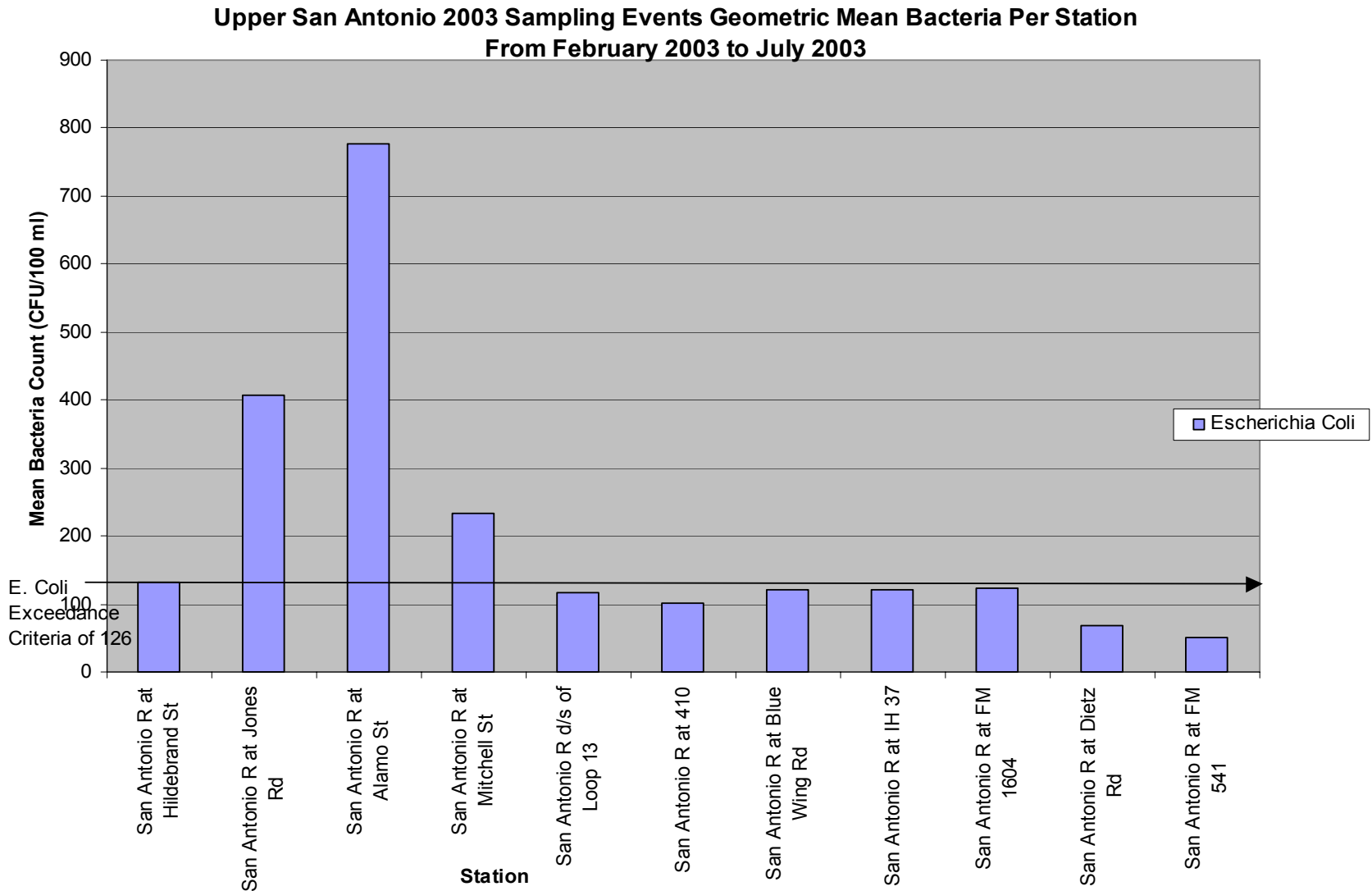
Upper San Antonio River Fecal Coliform Data, continued

STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
16731	Medina confl	19	2	131	fully supporting	2 mi
12890	Medina	6	4	446	primary concern	0.75 mi
12889	IH 37	20	3	146	not supporting	2.5 mi
12886	FM 1604	15	5	327	not supporting	6 mi
12885	Calaveras	15	3	180	fully supporting	6.5 mi
12884	Labatt Rd	21	2	128	fully supporting	1.5 mi
12883	Dietz Rd	20	3	181	fully supporting	2.5 mi
12882	FM 536	14	2	124	fully supporting	5.5 mi
12880	FM 541	15	4	259	not supporting	8 mi
12879	FM 791	30	5	147	fully supporting	4 mi

Upper San Antonio River Spatial Trend of Geometric Means, *E. coli* (1996-2001)



Upper San Antonio 2003 Sampling Events Geometric Mean Bacteria Per Station, February 2003 to July 2003



Segment 1901 – Lower San Antonio River

From FM 791 near Falls
City to Confluence
with Guadalupe River
in Refugio / Victoria
County

Lower San Antonio River *E. coli* Data (1996-2001)

3 stations “not supporting”, upper and lower reach

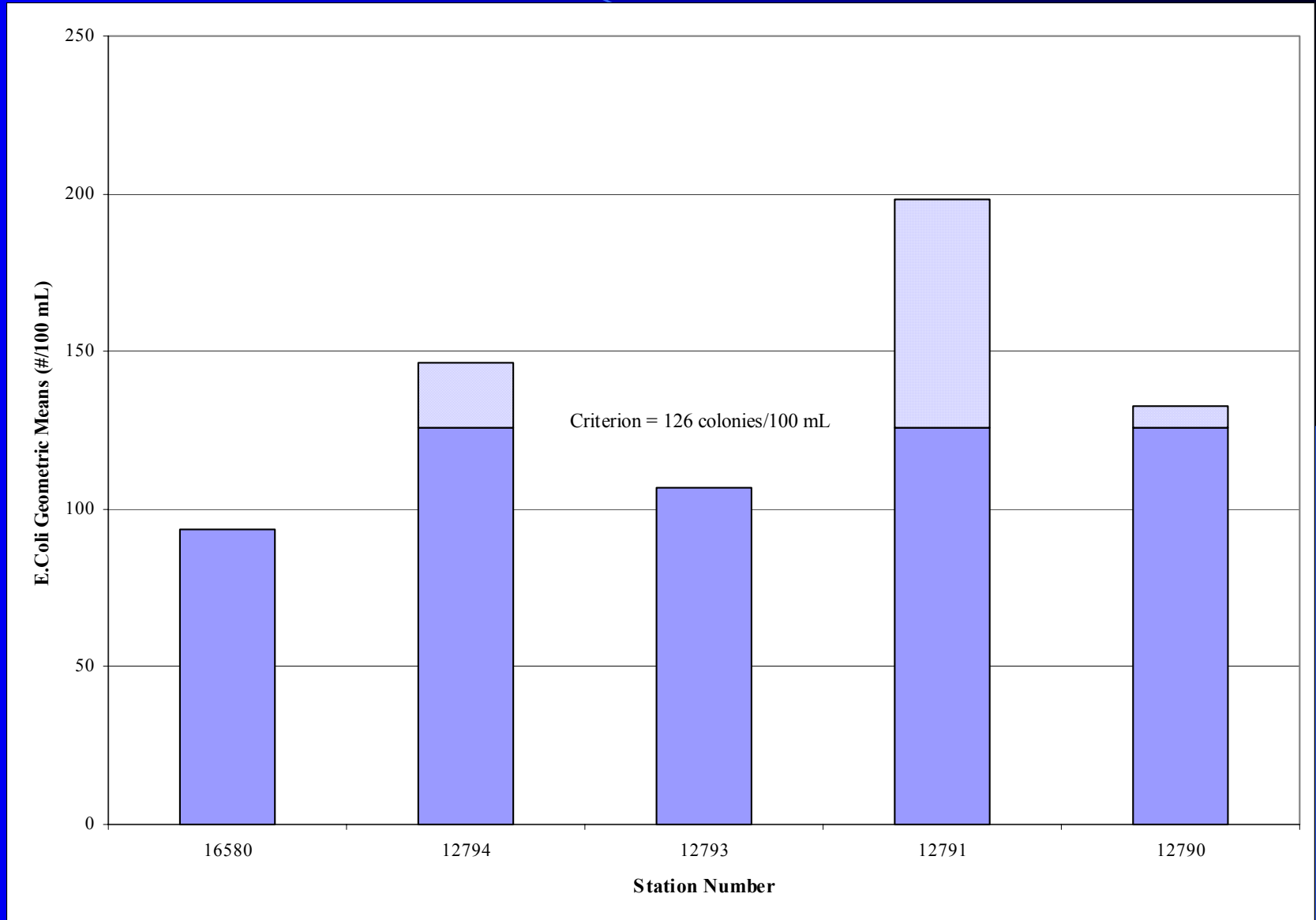
STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
16580	at Conquista	4	0	94	no concem	FM 791 to Cibolo Ck, 19 mi
12794	at SH 72	13	2	153	not supporting	Cibolo Ck to 2 mi N of Hondo Ck, 25 mi
12793	at SH 239	4	0	107	no concem	2 mi N of Hondo Ck to unnamed trib near Lott Cem., 25 mi
12791	at US 77-A and 183	17	3	198	not supporting	unnamed trib near Lott Cem. to Manahuilla Ck, 25 mi
12790	at FM 2506	22	5	133	not supporting	Manahuilla Ck to Goliad/Refugio Cty line, 25 mi

Lower San Antonio River Fecal Coliform Data (1996-2001)

3 stations “not supporting”, upper and lower reach

STATION	LOCATION	NO. OF SAMPLES	NO. OF EXCEED	GEO MEAN COL/100 ML	STATUS	COVERAGE
16580	at Conquista	4	0	129	no concem	FM 791 to Cibolo Ck, 19 mi
12794	at SH 72	14	4	224	not supporting	Cibolo Ck to 2 mi N of Hondo Ck, 25 mi
12793	at SH 239	4	0	144	no concem	2 mi N of Hondo Ck to unnamed trib near Lott Cem., 25 mi
12791	at US 77-A and 183	18	6	268	not supporting	unnamed trib near Lott Cem. to Manahuilla Ck, 25 mi
12790	at FM 2506	26	10	268	not supporting	Manahuilla Ck to Goliad/Refugio Cty line, 25 mi

Lower San Antonio River Spatial Trend of Geometric Means, *E. coli* (1996-2001)



Bacterial Source Tracking (BST)

Method: Ribotyping

- Genetic fingerprints of E. coli strains
- Genes that code for ribosome RNA
- Distinguish between different bacterial strains
- Agricultural Research and Extension Center (AREC) in El Paso

Bacterial Source Tracking (BST)

Library of Known Bacteria Types (knowns)

- Salado Creek/Upper San Antonio River: 500 samples
- Lower San Antonio River: 200 Samples
- Peach Creek: 300 samples

Water Samples for BST Testing (Unknowns)

- Salado Creek
 - St 12876 – Austin Hwy (SH368): 80 samples
 - St 15645 – Commerce St: 80 samples
 - St 12864 – Loop 13: 80 samples
 - St 12698 – Walzem Creek: 80 samples

BST Water Samples (unknowns)

- Upper San Antonio River
 - St 12912 – Hildebrand: 80 samples
 - St 14256 – Mitchell: 80 samples
 - St 12897 – Camino Coahuilteca – 80 samples
 - St 12883 – Dietz Rd, NW Floresville: 80 samples

BST Water Samples (Unknown)

- Lower San Antonio River
 - St 12794 – SH72: 80 samples
 - St 12790 – FM 2506: 80 samples
- Peach Creek
 - St 14937 – CR 353 – 80 samples

Time of Travel



Time of Travel



Bacteria Kinetics



Bacteria Kinetics



Next Phase

- Segment 1903 – Medina River: Agency Monitoring; Delisting?
- Segment 1910 – Salado Creek and its tributary Segment 1910A, Walzem Creek: Modeling
- Segment 1911 – Upper San Antonio River: Modeling
- Segment 1901 – Lower San Antonio River: Base Flow Sampling, Runoff Sampling

Stakeholder Involvement

- Improve the quality and quantity of contributions to TMDL projects
- Ensure that state government considers the local perspective in its decisions
- Lead to consensus-based solutions
- Encourage open dialogue on water quality issues

Who are Stakeholders?

- Significant contributors of pollutant loadings
- Persons affected by water quality problems
- Persons required to undertake control measures because of statutory or regulatory requirements
- Persons with regulatory responsibilities linked to water quality
- Persons who can help implement actions to fix water quality problems
- Members of the general public who live in the watershed or use the water resource

Questions / Comments ?