APPENDIX H

Transport Storage Structures and CSD Structures

Appendix H provides a summary list and additional details on the transport storage structures (T/S structures).

North Shore Outfalls Consolidation

The Northern Bayside Facilities begin with the Jackson and Marina T/S systems that receive flow from the Golden Gate National Recreation Area and the northeastern sector of the City. The T/S structures plus associated sewer storage capacity is 24 MG. In dry weather, flows are conveyed to the North Shore Pump Station, which pumps 13.9 mgd (2003 – 2007 dry-weather average) to the Channel transport system. In wet weather, the North Shore Pump Station is capable of pumping 150 mgd of combined flows to the North Point Wet-Weather Facility.

Channel Outfalls Consolidation

The Channel T/S structure, completed in 1982, collects and transports sewage and runoff from the South of Market and northern Mission districts. The total storage volume in the Channel Outfalls Consolidaton, including the T/S structure plus associated sewer storage capacity, is 38 MG. In dry weather, the Channel System handles sewage pumped from the North Shore Pump Station and gravity flow from the Channel drainage area sewers. The Channel Pump Station pumps all flows through a 66-inch forcemain directly to the Southeast Water Pollution

Table H-1. Active Combined Sewer Discharge Structures

Outfall Number	Discharge Name	CSD Size (Diameter or W x H)	Elevation		Discharge Location	CSD Design Criteria (per year)	Control Program
			Crown[1]	Weir[2]			
Westside							
1	Lake Merced	10'x11'3"		+6.5'	Ocean Beach	8	LMT[3]
2	Vicente Street	5' diameter (2)[4]		+6.0'	Ocean Beach	8	WST[5]
3	Lincoln Way	6'x 6' (3)[4]		+6.0'	Ocean Beach	8	WST
4	Mile Rock	9'x11'		+39.14'	Mile Rock	8	RTS[6]
5	Sea Cliff #1 PS	18" diameter		+55.04'	China Beach	8	
6	Sea Cliff	6' diameter		+54.78'	Baker Beach	8	
7	Sea Cliff #2 PS	12" diameter		+34.50'	Baker Beach	8	

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Table H-1. Active Combined Sewer Discharge Structures

Outfall Number	Discharge Name	CSD Size (Diameter or W x H)	Elevation		Discharge Location	CSD Design Criteria (per year)	Control Program
			Crown[1]	Weir[2]			
Bayside							
9	Baker Street	9'	-20.0'	-1.8'	Marina	4	NSOC[7]
10	Pierce Street	7'	-6.63'	-4.0'	Marina	4	NSOC
11	Laguna Street	6'	-1.0'	-2.9'	Marina	4	NSOC
13	Beach Street	7'x 6'	-5.0'	-3.51'	Pier 39	4	NSOC
15	Sansome Street	5'6"x 6'6" (2)[4]	NA	-4.0'	Pier 31	4	NSOC
17	Jackson Street	8'x 9'6"	-3.5'	-3.9'	Pier 3	4	NSOC
18	Howard Street	7'6"	-4.92'	-3.5'	Pier 14	10	COC[8]
19	Brannan Street	7'6"x 6'	-5.97'	-3.75'	Pier 32	10	COC
22	Third Street	2'6"x 3'9"	-7.25'	-3.5'	Mission Creek	10	COC
23	Fourth Street	6'6"	-4.0'	-3.5'	Mission Creek	10	COC
24	Fifth Street	9' x 7'	-5.0'	-3.5'	Mission Creek	10	COC
25	Sixth Street/N	10'x 7'; 6'	-5.5'	-3.5'	Mission Creek	10	COC
26	Division Street	9'6"x 8'3" (4)[4]	+0.75'	-3.5'	Mission Creek	10	COC
27	Sixth Street/S	3'6"x 5'3"	-2.25'	-3.11'	Mission Creek	10	COC
28	Fourth Street/S	2'6"x 3'9"	-7.25'	-3.5'	Mission Creek	10	COC
29	Mariposa Street[9]	6'	-4.4'	-3.5'	Central Basin	10	—
30	Twentieth Street[9]	3'6"'	-9.0'	-3.0'	Central Basin	10	—
30A	22nd Street[9]	2'	NA	-2.7'	Central Basin	10	—
31	3rd Street/N	3'6"x 5'3"	-6.25'	-3.0'	Islais Creek	10	ICTS[10]
31A	Islais Creek/N	600' weir		-3.0'	Islais Creek	10	ICTS
32	Marin Street	10'x 8'	-4.0'	-3.0'	Islais Creek	10	ICTS
33	Selby Steet	10'x 7'6" (3)[4]	-2.5'	-3.0'	Islais Creek	10	ICTS
35	3rd Street/S	4'6"	-7.7'	-3.0'	Islais Creek	10	ICTS
37	Evans Avenue[11]	6'	+0.27'	+1.3'	India Basin	1	—
38	Hudson Steet[11]	2'	+1.0'	+7.0'	India Basin	1	—
40	Griffith/S[12]	5'6"	-4.45'	-2.5'	South Basin	1	—
41	Yosemite Avenue[12]	146' weir	NA	-2.7'	South Basin	1	—
42	Fitch Street[12]	6'9"	-4.35'	-2.70'	South Basin	1	—
43	Sunnydale Avenue[13]	158' weir	NA	-2.60'	Candlestick Cove	1	—

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Source: San Francisco Public Utilities Commission 2003.

Notes: N - north; S - south; W - width'; H - height; (') - feet; (") - inches.

1. *Elevation based on City Datum (zero feet at the Presidio tidal station) – crown of outfall at shoreline.*
2. *Elevation based on City Datum – weir height where overflow occurs from collection system.*
3. *Lake Merced Transport/Storage.*
4. *Number of structures*
5. *Westside Transport/Storage*
6. *Richmond Transport/Storage*
7. *NSOC – North Shore Outfalls Consolidation.*
8. *COC – Channel Outfalls Consolidation.*
9. *Mariposa Transport/ Storage*
10. *ICTS - Islais Creek Transport/Storage*
11. *Hunters Point Facilities*
12. *Yosemite Transport/Storage*
13. *Sunnydale Transport/Storage*

Control Plant (SEP). Dry-weather flows from the Channel and North Shore areas average 40.8 mgd (2003 – 2007 dry-weather average). In wet weather, with North Shore flows diverted to the NPF, the Channel Pump Station is capable of pumping 103 mgd of combined flows from the local drainage area to the SEP.

Mariposa Transport/Storage

The 0.6-MG Marisposa T/S structure, completed in 1992, collects and transports sewage and storm water runoff from the Potrero Hill and 20th Street areas. Dry- and wet-weather discharge from the Mariposa Pump Station and the 20th Street Pump Station is routed to a gravity sewer at 21st and Illinois streets—part of the Islais Creek Drainage Basin—which then flows to the SEP for treatment.

The 0.2-MG-volume 20th Street T/S and pump station facilities are included within the Mariposa facilities. Flow from the 20th Street pumping station also discharges to the gravity sewer in 21st and Illinois streets.

Hunters Point Facilities

These facilities, completed in 1989, limit combined sewer overflows from two locations—one on Evans Avenue and the other on Hudson Street. The Griffith Street North Outfall has been eliminated. Sewers convey wastewater flow from these locations to a control structure at Keith Street and Evans Avenue. A control structure then directs the flow to the Islais Creek Southside Outfall Consolidation structure and on to the SEP for treatment. There is no storage in the Hunters Point system.

Islais Creek Transport/Storage

Completed in 1997, the Islais Creek T/S volume is 45.1 MG, including associated sewer storage capacity. In dry weather, pumped flows from the Mariposa System and gravity flows from the Islais Creek Drainage Basin and southeast drainage area (Yosemite and Sunnydale Drainage Basins) are intercepted by the lift station and pumped directly to the SEP. In wet weather, excess flows are diverted to Islais Creek T/S facilities, which then convey the flows to the Bruce Flynn Pump Station. The Bruce Flynn Pump Station pumps flows to the SEP for treatment.

Yosemite Transport/Storage

Completed in 1989, the 11.5-MG-volume Yosemite T/S facilities (including associated sewer storage capacity) collect and transport sewage and storm water runoff from the Bayview/Hunters Point and Candlestick areas. Dry-weather flow from the upper Yosemite area gravitates to the Islais Creek Drainage Basin via the Hunters Point Tunnel. Dry-weather flow from the lower Yosemite areas combines with dry-weather flow from Sunnydale and is pumped to the Islais Creek Drainage Basin by the Griffith Pump Station. The Griffith Pump Station also pumps wet-weather flows from Yosemite and Sunnydale to the Islais Creek Drainage Basin. Flows from the Griffith Pump Station are discharged to the Islais Creek Drainage Basin and flows by gravity to the Southeast Lift Station; they are then lifted to SEP for treatment.

Sunnydale Transport/Storage

The Sunnydale T/S facilities, completed in 1991, collect and transport sewage and runoff from the Sunnydale drainage area. The total storage volume in the Sunnydale T/S structure, plus associated sewer storage capacity, is 6.2 MG. During normal dry-weather operation, flow bypasses the Sunnydale Facilities and flows to the Yosemite system by gravity. Flows from the Yosemite system are then directed to the Islais Creek Drainage Basin via the Griffith Pump Station. Dry-weather flows from the Sunnydale area average 2.5 mgd. During wet weather, combined flows are diverted from the gravity system to the T/S structure and then conveyed to the

Sunnydale Pump Station. Wet-weather flows are pumped to the Candlestick tunnel sewer and then flow to the Yosemite Facilities by gravity.

Richmond Transport/Storage

The Richmond T/S project was completed in 1994 to transport and store up to 12 MG. The Richmond Transport system consists of several elements:

- The Richmond Tunnel, a 14-feet – diameter, approximately 2 – mile long tunnel that extends from the Presidio to the northern end of the Great Highway
- A 2,100-feet – long, 10-feet – diameter pipe that connects to the upstream end of the Richmond Tunnel at the Presidio
- A 2,000-feet – long, 42-inch – diameter pipe along the Great Highway connecting the 14-feet—diameter portion of the tunnel to the Westside Transport system at Fulton Street
- The Mile Rock outfall, which provides hydraulic relief by allowing discharges near Land's End during exceptionally heavy storms

Topographically, the Richmond T/S is higher than the Westside T/S system; hence, all Richmond Tunnel flows reach the Westside T/S via gravity during dry weather. However, the elevation of the Mile Rock Overflow is such that the system can pressurize during wet-weather events. Domestic sewage and collected runoff from storms in the northwest section of the City are controlled and conveyed by the Richmond Tunnel. Interception of combined sewage begins at 17th Avenue and the Presidio, continues west to Lincoln Park, then south delivering flows to the Westside T/S at the Great Highway and Fulton Street. Richmond District drainage area flows converge with Sunset District and Lake Merced flows at the Westside T/S, and they are pumped by the Westside Pump Station to the Oceanside Water Pollution Control Plant for treatment.

Westside Transport/Storage

The Westside T/S was completed in 1986. With a useable storage volume of 49.3 MG, the Westside T/S system collects both sanitary and combined flows from the Sunset drainage area. Westside T/S is a 45-feet – deep and 25-feet – wide reinforced concrete box structure running north to south under the Great Highway, from Fulton Street to Sloat Boulevard (approximately 12,000 feet), where it enters the Westside Pump Station at the intersection of Sloat Boulevard and the Great Highway. Two short 25-feet – wide tunnels, one at Lincoln Way and one from Vicente to Sloat, parallel the Westside T/S and are hydraulically connected to it. It also receives flows from the Lake Merced area to the south via the Lake Merced Transport and from the Richmond area to the north via the Richmond Tunnel and the connecting 42-inch line.

During wet weather, all combined storm water and sanitary sewage flows leaving the Westside T/S receive the equivalent of primary–level treatment before being discharged from the Southwest Ocean Outfall or, during extreme storm conditions, from Mile Rock, Lincoln, Vicente, or Lake Merced outfalls. Nearly all Westside T/S influent arrives via gravity. Flows from areas too low to gravitate to the Westside T/S are pumped to it by Pine Lake Pump Station on the west end of Stern Grove and by the Zoo Wet-Weather Pump Station northeast of the intersection of Sloat and the Great Highway.

Lake Merced Transport

Capture and control of sewage and stormwater runoff from the extreme southwestern portion of the City required construction of the Lake Merced T/S. Major components consist of the discharge structure, outfall line, transport line (1.6 miles, 14–feet – diameter tunnel), and transition structure. Combined sewage flows from the southwest of the city are conveyed to the Ocean-

side Plant via the Lake Merced T/S, which discharges to the Westside T/S east box cunette. All Westside T/S dry-weather flows (as well as combined flows prior to decanting to the west chamber) mix at this point. Flows entering the Westside Pump Station east inlet are pumped to the Oceanside Plant. A transition structure at the north end of the Lake Merced T/S directs flows under the Great Highway to the east box. Flows enter the Lake Merced T/S system through a three-compartment sewer adjoining the transport structure on John Muir Drive. This structure directs both dry- and wet-weather flows to the Lake Merced T/S and excess storm flows to an outfall line. The capacity of the Lake Merced T/S, plus associated sewers, is 10 MG