















May 10, 2017

### Bayfront Canal / Atherton Channel Watershed and Flow Contributions

Located north of Highway 101 near the San Francisco Bay (Bay), the Bayfront Canal (Canal) drains a 9.5 square mile area which includes sections of the cities of Menlo Park and Redwood City, the towns of Atherton and Woodside and unincorporated areas of San Mateo County. Approximately 8,000 feet long, the Canal begins in Redwood City by Douglas Court and runs west to east along the southern edge of salt ponds owned and operated by Cargill, Inc. The Atherton Channel, which is located along the jurisdictional boundary between the Town of Atherton and the City, joins the Canal a few hundred feet west of Marsh Road and also receives flow from the City, Redwood City, the towns of Atherton and Woodside and unincorporated areas of San Mateo County. The combined flow from the Atherton Channel and Canal empty into Flood Slough through a tide gate control structure that is operated and maintained by the City of Redwood City. The intended use of the tide gates is to prevent Bay water from Flood Slough from flowing back into the Canal. The tide gates close automatically when tide levels in the Bay are high, preventing storm flow from emptying into Flood Slough.

The Canal has been the subject of many studies throughout the years. The most recent study, "Bayfront Canal Hydrology and Hydraulic Evaluation" conducted by BKF Engineers on October 18, 2013, describes a drainage area consisting of seven subwatersheds. Each subwatershed contributes flow to the Canal based on the hydrologic characteristics, such as the amount of impervious and pervious land area. Subwatersheds that exhibit a characteristic with higher pervious land area contribute less drainage flow due to higher infiltration rates and lower stormwater runoff. As shown in Table 1, the Atherton Channel subwatershed represents 70% of the land area draining into the Canal. While it is a large subwatershed, it contributes 39% of the total 25 year peak flow due to the higher amount of pervious land area.

**Table 1 – Bayfront Canal Subwatershed Areas and Drainage Flow**

Subwatershed	Area		25 Year Peak Flow	
	(sq. miles)	% of Total	(cfs)	% of Total
Atherton Channel	6.59	70%	1,244	39%
2 <sup>nd</sup> Ave.	0.65	7%	523	17%
Broadway	0.32	3%	293	9%
Douglas	0.26	3%	266	8%
5 <sup>th</sup> Ave.	0.44	5%	367	12%
East Bayshore	0.32	3%	236	7%
Selby	0.90	9%	228	7%
Total	9.48	100%	3,157	100%

Source: BKF, 2013

The hydrologic analysis was based on subwatersheds that lie across jurisdictional boundaries. To determine the flow contribution on a jurisdictional basis, the subwatersheds were first subdivided based on the boundaries of the cities of Menlo Park and Redwood City, the towns of Atherton and Woodside and unincorporated areas of San Mateo County (Attachment 1). The flow contribution was then determined using the area per jurisdiction within the subwatersheds in proportion to the total 25 year peak flow per the subwatershed (Attachment 2). Using this approach, the jurisdictional flow contributions to the Canal were determined as follows:

**Table 2 – Flow Contributions per Jurisdiction**

	<b>Area % of Total</b>	<b>25 Year Peak Flow % of Total</b>
Town of Atherton	44%	38%
City of Redwood City	13%	26%
San Mateo County	20%	22%
City of Menlo Park	17%	10.5%
Town of Woodside	6%	3.5%
Total	100%	100%

Attachments:

- 1) Figure – Bayfront Canal and Atherton Channel Subwatersheds and Jurisdictional Boundaries
- 2) Table - Bayfront Canal and Atherton Channel Flow Contribution per Area / Jurisdiction





**ATTACHMENT 2 - ESTIMATES OF FLOW CONTRIBUTION PER JURISDICTION**

<b>Atherton Channel + Bayfront Canal</b>												
<b>Drainage Area</b>	<b>Area (acres)</b>						<b>25 Year Peak Flow (cfs)</b>					
	<b>Redwood City</b>	<b>Menlo Park</b>	<b>San Mateo County</b>	<b>Atherton</b>	<b>Woodside</b>	<b>BKF Total</b>	<b>Redwood City</b>	<b>Menlo Park</b>	<b>San Mateo County</b>	<b>Atherton</b>	<b>Woodside</b>	<b>Total</b>
<b>Atherton Channel</b>	48	979	762	2,123	391	4,217	14	283	220	614	113	1,244
<b>Bayfront Canal (Canal)</b>												
2nd Ave	109		316	1		415	134		388	1		523
Broadway	196		3			205	289		4			293
Douglas	122		43			166	197		69			266
5th Ave	211		70			284	276		91			367
East Bayshore	126	50	18			205	153	61	22			236
Selby	14		2	558		573	6		1	222		228
Subtotal (Canal)	778	50	452	559		1,849	809	52	470	581		1,913
<b>Total</b>	<b>826</b>	<b>1,029</b>	<b>1,214</b>	<b>2,682</b>	<b>391</b>	<b>6,066</b>	<b>823</b>	<b>335</b>	<b>690</b>	<b>1,195</b>	<b>113</b>	<b>3,157</b>
	13.0%	17.0%	20.0%	44.0%	6.0%	% Area	26%	10.5%	22%	38%	3.5%	% Flow Contribution

<b>Atherton Channel</b>						
<b>Drainage Basins</b>	<b>Area (acres)</b>					
	<b>Redwood City</b>	<b>Menlo Park</b>	<b>San Mateo County</b>	<b>Atherton</b>	<b>Woodside</b>	<b>BKF Total</b>
A		60	157	41	379	639
B			1	83	8	93
C		3		72	4	82
D		249		27		271
E				103		101
F		260	273	88		604
G			1	80		81
H				141		143
I		8		207		216
J				67		64
K		63		233		287
L		160		199		360
M		2	2	564		563
N	48	98	2			168
North Fair Oaks			326	218		545
<b>Total</b>	<b>48</b>	<b>979</b>	<b>762</b>	<b>2,123</b>	<b>391</b>	<b>4,217</b>

Note: Subwatershed areas and flows from "Bayfront Canal Hydrology and Hydraulic Evaluation" conducted by BKF Engineers on October 18, 2013