

# CHAPTER 3

## DEMOGRAPHICS AND SYSTEM FLOWS

### 3.1 GENERAL

This Chapter of the Plan details the land use, zoning, and population characteristics of the District’s service area. Population, employment and land use data is sourced from the Puget Sound Regional Council (PSRC), as well as the jurisdictions within which the District operates. The chapter’s aim is to provide realistic growth projections based on demographic trend forecasts and anticipated development within the District’s service area. These projections provide the basis for evaluating the exiting system’s capabilities to meet current and projected future demand.

### 3.2 ZONING AND LAND USE

Figure 3-1 provides a generalized summary of zoning and land use within the District’s boundaries. The District operates within the cities of SeaTac, Tukwila, Seattle, and Burien, and within unincorporated King County. As such, the zoning classifications have been generalized in Figure 3-1 in order to achieve consistency and provide a common basis for further analysis. Figure 3-1 is not intended to be used as a site-specific zoning map; such information should be obtained directly from the appropriate jurisdictional agencies.

As indicated in Figure 3-1, land use within the District is predominantly single family residential, with multi-family and commercial uses concentrated along major thoroughfares. Industrial uses are located primarily in the northeastern of the District, along East Marginal Way and adjacent to the Duwamish River, while mixed aviation and industrial uses are also present in the portion of District located in the northeast of SeaTac City limits and north of Sea-Tac International Airport.

Table 3-1 below provides the approximate percentages of total District land area occupied by each of the 6 zoning classifications shown in Figure 3-1. For comparison purposes, the table provides both 2020 land area percentages (as shown in Figure 3-1) and the 2010 land area distribution figures put forward in the District’s previous Plan (2015). The District’s service area saw an 8% increase in the percentage of land dedicated to single family residential between 2010 and 2020, while the proportion of multi-family residential was maintained. Conversely, the percentage of industrially dedicated land was reduced by 14%, with the addition of separate ‘Aviation’ and ‘Park’ land-use categories in the 2020 figures.

**TABLE 3-1: LAND AREA COMPARISON**

Zoning Classification	2000 Percentage of Land Area	2010 Percentage of Land Area	2020 Percentage of Land Area
Single Family	70%	53%	61%
Multi-Family	7%	9%	9%
Industrial	15%	29%	15%
Commercial	8%	9%	8%
Park	-	-	5%
Aviation	-	-	2%

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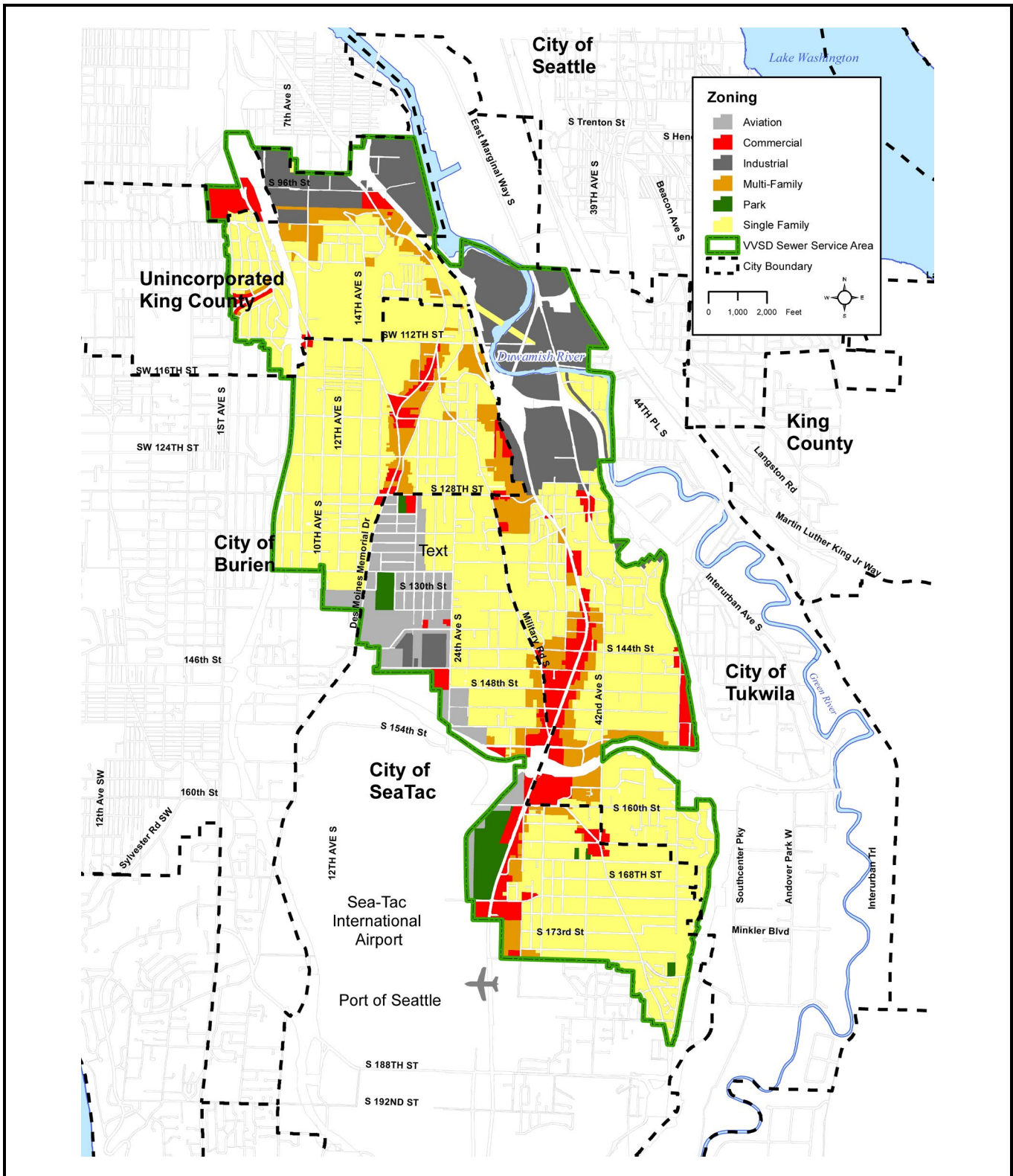


Figure 3-1

Zoning Map

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### 3.3 PROJECTED DEVELOPMENT

Anticipated development within the District's service area is limited to infill development and associated projects, with redevelopment anticipated in the future. The District's previous comprehensive plan (2015) proposed a strong likelihood of the continued trend towards reduction in single-family residential uses and increases in multi-family and commercial uses, as had occurred between 2000 and 2010 (Table 3-1). This trend remains present in an extended 20 year scope (2000 -2020) and, while trend fluctuations can be seen in the recent 10 year term, directional trend forecasts remain consistent with those of the previous Plan.

Continued expansion of activity around SeaTac International Airport is believed to have impacted current development and has contributed to the increased shift from single-family to multi-family and commercial land uses that are necessary to support additional airport activity.

### 3.4 POPULATION AND EMPLOYMENT

Population and employment projections for the District's service area were calculated in 5 year increments, from 2020 to 3030, and one 10 year increment, from 2030 to 2040. Spatial distribution of population and employment change is contextualized through division of the area into sub-basins. The figures used are based on interpolation of population and employment data provided by the Puget Sound Regional Council (PSRC's) Land Use Vision Version 2 (LUV.2) dataset, last updated in 2018. This dataset allocates values at the parcel level, rather than utilizing census tracts or forecast area zones (FAZ) as PSRC has in the past. This nature of its value allocation methodology makes the 2018 dataset preferable to population and employment input data, as it doesn't require a secondary sub-allocation of values based on the percentages of census tract within each basin. The result is more reliable and accurate model calculations and future projections.

All population and employment projections are consistent with King County's recent (2020) Comprehensive Plan Update, which has completed its public review process and contains estimated housing targets and employment targets for each city and unincorporated urban areas within King County through the year 2031. Population and employment within the District is expected to increase over the immediate and long-range planning periods. The most significant increases are expected in the multi-family and commercial (including industrial) customer classifications. This shift is expected to take the form of mixed-use infill development and single-family redevelopment, particularly around the two Sound Transit operated light rail (Link) stations. One Link station is located at the intersection of International Boulevard (Pacific Highway South) and Southcenter Boulevard in Tukwila, and the other is located just at Sea-Tac International Airport, just west of the City of SeaTac's city center. As expansion of the Link rail system continues northward, the mobility offered to residents living in proximity to these two stations is expected to increase, as will the accessibility of commercial activities located nearby.

#### 3.4.1 Unsewered Areas

Portions of Valley View Sewer District are currently unsewered for a variety of reasons. Some areas are not fully built out, while others are developed and can be provided service once the necessary infrastructure is in place. These factors are considered when projecting population and employment growth within Valley Views' service area. This is a very important consideration when planning for the ability of the system to meet future growth needs of the community.

### 3.5 FLOW PROJECTIONS

Using the population and employment forecasts presented in Table 3-2, flow projections have been developed for the District’s service area by primary drainage and sub-basins. Projected base flows are indicated in Table 3-3.

The District’s service area, as defined in Chapter 2 of this document, includes areas which could potentially be served by either the District or by another sewerage provider, such as those areas in the eastern portion of the District which could possibly be served by the City of Tukwila. Although the projected flows are not substantial, it is important to note that service by the District is dependent on the timing of development and Tukwila’s degree of interest in extending service to these currently unsewered properties.

Average daily flows have been determined using the following criteria:

Residential flows:	75 gallons/capita/day
Industrial flows:	75 gallons/employee/day
Commercial flows:	35 gallons/employee/day

Peak flows have been determined by applying a peaking factor of 2.5 to average daily flows and do not include infiltration and inflow (I & I). These flows are presented in Table 3-4.

In addition to the projected flows calculated based on population, employment, and zoning, Valley View also has three industrial waste users within its service area. These users are:

<u>Name</u>	<u>Permit Number</u>
Kaiser Permanente Washington	11667-02
King County Metro Transit South Base	4238-04
King County Metro Transit South Base Interim Base	306864
King County Metro Transit South Base Facilities Maintenance	266-06
Port of Seattle, Sea-Tac International Airport, BW	7963-01
Port of Seattle, Sea-Tac International Airport, IWS-IWTP	7810-05
City of Seattle Joint Training Facility	10849-04
South Park Industrial Properties LLC	4086-04

The District was an active and voluntary participant in King County’s Regional Infiltration and Inflow (I&I) Control pilot Program to test new methods of controlling I & I. This program included flow monitoring by the District through drainage basins during the winter seasons of 2000 – 2002. Based on the flow and rainfall data collected for the ten largest rainfall events in the fall and winter of 2001 and 2002, the average calculated 30-minute peak, total I & I for the District was 3,789 gallons per acre per day (gpac).

The I&I control method implemented by Valley View was manhole rehabilitation, which consisted of rehabilitating manholes through chemical grouting or epoxy injection and adjusting frames and covers, however, no measurable I & I reduction was observed due to these measures.

The District also conducted their own I & I study in 1999 which indicates that currently I & I ranges from approximately 1,100 gpac in some basins to nearly 13,200 gpac in sub-basin Val007. Table 3-5 presents the I & I used in the modeling process, and also shows the added potential flow I & I adds to the peak flows from Table 3-4. The variance between the I & I values obtained from Valley View’s study and the King County I & I Study may be due to the difference in drainage basins. The drainage basins referenced in this plan are modified King County drainage basins. The drainage basins used in the 1999 Valley View study vary from the King County basins as well as the monitoring locations. Future facility planning is based on achieving an overall I & I rate of

1,100 gpad and Valley View has adopted an aggressive program for I & I reduction and prevention.

Despite the fact that the most recent Inflow and Infiltration (I&I) study dates back to 1999, the District's commitment to monitoring its sewer Lift Stations remains unwavering. Annually, the dedicated staff diligently assesses these stations and meticulously records a comprehensive range of rainfall events, spanning daily and monthly periods, to discern any discernible spikes linked to precipitation. This meticulous data collection regimen is further reinforced by the District's proactive site visits, which are conducted 2 to 3 times per week, solidifying their dedication to maintaining a vigilant oversight.

The District asserts that the continuous inspection of sewer Lift Stations and the meticulous documentation of rain volume collectively validate their rationale for not conducting additional I&I studies since 1999. This comprehensive data-driven approach serves as a testament to the District's commitment to efficiency and evidence-based decision-making.

By harnessing the valuable insights gathered through this systematic evaluation of rainfall events and the resulting impact on sewer infrastructure, the District substantiates its perspective that these regular assessments adequately address any potential I&I concerns. This approach not only highlights the District's prudent resource management but also reflects its dedication to adopting a pragmatic strategy that efficiently safeguards its sewer system and optimally serves the community it supports.

### **3.6 PRETREATMENT DEVICES**

The District does not require pretreatment devices as part of their standard details and specifications. The District does encourage homeowners and businesses to avoid pouring F.O.G. down the drain or into the garbage disposal. The District has included a section on their website with steps to prevent F.O.G. backup.

**TABLE 3-2: POPULATION AND EMPLOYMENT BY DRAINAGE BASIN**

Primary Drainage Basin	Sub-basin	Acres	2020		2025		2030		2040	
			Population	Employment	Population	Employment	Population	Employment	Population	Employment
Beverly Park	Val004	233.07	1,727	129	1,731	145	1,727	148	1,744	139
Duwamish	Val005A	323.10	117	2,655	115	2,984	113	3,292	86	4,248
Duwamish	Val005B	107.64	302	826	344	880	361	913	436	945
Glen Acres	Val003	109.79	1,180	289	1,185	283	1,181	277	1,178	243
Glen Acres	Val023	181.47	1,299	138	1,306	140	1,358	149	1,402	139
Glen Acres	ValXXX	174.72	1,201	76	1,253	88	1,313	98	1,377	128
Glen Acres	ValYYY	69.67	508	11	523	14	539	18	542	16
Macadam	Val013	237.89	1,213	1,194	1,345	1,181	1,406	1,183	1,596	1,327
McMicken	Val017	217.21	1,661	61	1,966	73	2,294	84	2,626	116
McMicken	Val019	109.18	663	92	773	103	993	119	1,159	160
McMicken	Val020	152.03	1,013	58	1,112	71	1,108	96	1,262	119
McMicken	Val021	122.94	1,069	31	1,248	32	1,440	42	1,672	75
Midway	Val016	193.43	3,961	485	4,152	590	5,421	745	5,818	1,222
Rainier Vista	Val007	330.26	2,421	162	2,418	151	2,526	144	2,600	135
Rainier Vista	Val008	83.92	712	55	767	71	798	82	852	97
Rainier Vista	Val010	178.79	1,668	103	1,854	118	1,945	121	2,153	136
Rainier Vista	Val011	170.88	1,651	476	1,656	483	1,651	479	1,693	503
Rainier Vista	Val012	225.98	1,497	64	1,698	84	1,986	97	2,361	149
Riverton	Val009	165.99	1,175	743	1,168	800	1,224	836	1,258	1,203
Riverton	Val014	206.83	1,763	182	1,948	178	2,212	196	2,595	241
Riverton	Val015	88.13	2,215	720	2,273	756	2,251	750	2,374	743
Riverton	Val068	369.82	2,658	2,870	3,305	2,933	3,421	2,969	2,854	3,221
South Park	Duwamish West	130.80	16	1,392	18	1,398	18	1,449	18	1,624
South Park	Val006	215.95	718	2,037	739	2,035	796	2,048	820	2,307
SW Suburban	SWSSD South	571.07	2,193	524	2,200	626	2,202	730	2,244	1,008
SW Suburban	SWSSD West	82.85	598	17	623	14	629	13	656	16

Primary Drainage Basin	Sub-basin	Acres	2020		2025		2030		2040	
			Population	Employment	Population	Employment	Population	Employment	Population	Employment
Three Tree	Tukwila	41.92	127	5	132	6	129	6	144	8
Three Tree	Val001	433.88	3,243	1,577	3,535	1,511	3,896	1,713	4,113	1,947
Three Tree	Val002	217.97	2,061	977	2,183	990	2,206	997	2,223	1,145
Three Tree	Val018	114.64	993	131	1,182	128	1,428	181	1,585	157
Three Tree	Val022	209.64	3,061	1,380	3,190	1,533	4,367	1,859	2,749	2,435
<b>TOTAL</b>		<b>6,071</b>	<b>44,684</b>	<b>19,460</b>	<b>47,942</b>	<b>20,399</b>	<b>52,939</b>	<b>21,834</b>	<b>54,190</b>	<b>25,952</b>

**TABLE 3-3: BASE FLOWS BY DRAINAGE BASIN (GPM)**

Primary Drainage Basin	Sub-basin	Acres	2020			2025			2030			2040		
			Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL
Beverly Park	Val004	233.07	85	3	89	90	4	94	90	4	94	91	3	94
Duwamish	Val005A	323.10	6	65	71	6	73	79	6	80	86	4	103	108
Duwamish	Val005B	107.64	16	20	36	18	21	39	19	22	41	23	23	46
Glen Acres	Val003	109.79	61	7	68	62	7	69	62	7	68	61	6	67
Glen Acres	Val023	181.47	64	3	68	68	3	71	71	4	74	73	3	76
Glen Acres	ValXXX	174.72	25	2	27	29	2	32	34	2	37	54	3	57
Glen Acres	ValYYY	69.67	19	0	19	20	0	21	22	0	23	28	0	29
Macadam	Val013	237.89	63	29	92	70	29	99	73	29	102	83	32	115
McMicken	Val017	217.21	87	1	88	102	2	104	119	2	122	137	3	140
McMicken	Val019	109.18	33	2	35	40	3	43	52	3	55	60	4	64
McMicken	Val020	152.03	53	1	54	58	2	60	58	2	60	66	3	69
McMicken	Val021	122.94	56	1	56	65	1	66	75	1	76	87	2	89
Midway	Val016	193.43	206	12	218	216	14	231	282	18	300	492	30	521
Rainier Vista	Val007	330.26	126	4	130	126	4	130	132	4	135	135	3	139
Rainier Vista	Val008	83.92	37	1	38	40	2	42	42	2	44	44	2	47
Rainier Vista	Val010	178.79	83	2	85	97	3	99	101	3	104	112	3	115
Rainier Vista	Val011	170.88	86	12	98	86	12	98	86	12	98	88	12	100
Rainier Vista	Val012	225.98	78	2	80	88	2	90	103	2	106	123	4	127

Primary Drainage Basin	Sub-basin	Acres	2020			2025			2030			2040		
			Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL
Riverton	Val009	165.99	58	17	75	61	19	80	64	20	84	66	29	95
Riverton	Val014	206.83	83	4	87	96	4	101	115	5	120	135	6	141
Riverton	Val015	88.13	115	18	133	118	18	137	117	18	135	124	18	142
Riverton	Val068	369.82	138	70	208	172	71	243	178	72	250	188	78	267
South Park	Duwamish West	130.80	1	34	35	1	34	35	1	35	36	1	39	40
South Park	Val006	215.95	37	50	87	38	49	88	41	50	91	43	56	99
SW Suburban	SWSSD South	571.07	80	13	93	86	15	101	92	18	109	117	25	141
SW Suburban	SWSSD West	82.85	2	0	2	3	0	3	5	0	5	21	0	21
Three Tree	Tukwila	41.92	0	0	0	0	0	0	1	0	1	5	0	5
Three Tree	Val001	433.88	118	38	157	138	37	175	162	42	204	214	47	262
Three Tree	Val002	217.97	86	24	110	97	24	121	103	24	128	116	28	144
Three Tree	Val018	114.64	52	3	55	62	3	65	74	4	79	83	4	86
Three Tree	Val022	209.64	159	34	193	166	37	203	274	45	320	240	59	299
<b>TOTAL</b>		<b>6,071</b>	<b>2,113</b>	<b>471</b>	<b>2,584</b>	<b>2,322</b>	<b>495</b>	<b>2,817</b>	<b>2,655</b>	<b>530</b>	<b>3,186</b>	<b>3,113</b>	<b>631</b>	<b>3,744</b>

**TABLE 3-4: PEAK FLOWS WITHOUT INFILTRATION AND INFLOW (I&I) BY DRAINAGE BASIN (GPM)**

Primary Drainage Basin	Sub-basin	Acres	2020			2025			2030			2040		
			Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL
Beverly Park	Val004	233.07	214	8	221	225	9	234	225	9	234	227	8	236
Duwamish	Val005A	323.10	15	161	177	15	181	196	15	200	215	11	258	269
Duwamish	Val005B	107.64	39	50	90	45	53	98	47	55	102	57	57	114
Glen Acres	Val003	109.79	154	18	171	154	17	171	154	17	171	153	15	168
Glen Acres	Val023	181.47	161	8	169	170	9	179	177	9	186	183	8	191
Glen Acres	ValXXX	174.72	63	5	67	73	5	79	85	6	91	134	8	142
Glen Acres	ValYYY	69.67	46	0	47	51	1	52	56	1	57	71	1	72
Macadam	Val013	237.89	158	73	230	175	72	247	183	72	255	208	81	288
McMicken	Val017	217.21	216	4	220	256	4	260	299	5	304	342	7	349
McMicken	Val019	109.18	82	5	87	101	6	107	129	7	137	151	10	161

Primary Drainage Basin	Sub-basin	Acres	2020			2025			2030			2040		
			Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL	Residential	Comm./Ind.	TOTAL
McMicken	Val020	152.03	132	4	135	145	4	149	144	6	150	164	7	172
McMicken	Val021	122.94	139	2	141	163	2	164	188	3	190	218	5	222
Midway	Val016	193.43	516	29	545	541	36	576	706	45	751	1,229	74	1,303
Rainier Vista	Val007	330.26	315	10	325	315	9	324	329	9	338	339	8	347
Rainier Vista	Val008	83.92	93	3	96	100	4	104	104	5	109	111	6	117
Rainier Vista	Val010	178.79	206	6	212	241	7	249	253	7	261	280	8	289
Rainier Vista	Val011	170.88	215	29	244	216	29	245	215	29	244	220	31	251
Rainier Vista	Val012	225.98	195	4	199	221	5	226	259	6	264	307	9	316
Riverton	Val009	165.99	145	43	188	152	49	201	159	51	210	164	73	237
Riverton	Val014	206.83	207	11	218	241	11	252	288	12	300	338	15	353
Riverton	Val015	88.13	288	44	332	296	46	342	293	46	339	309	45	354
Riverton	Val068	369.82	346	174	520	430	178	171	445	180	183	471	196	667
South Park	Duwamish West	130.80	2	85	87	2	85	309	2	88	339	2	99	101
South Park	Val006	215.95	93	124	217	96	124	150	104	124	168	107	140	247
SW Suburban	SWSSD South	571.07	200	32	232	215	38	329	229	44	388	292	61	353
SW Suburban	SWSSD West	82.85	4	0	4	8	0	8	12	0	12	51	1	52
Three Tree	Tukwila	41.92	0	0	0	1	0	45	2	0	57	11	0	12
Three Tree	Val001	433.88	296	96	391	345	92	499	406	104	587	536	118	654
Three Tree	Val002	217.97	215	59	274	242	60	277	259	61	351	289	70	359
Three Tree	Val018	114.64	129	8	137	154	8	171	186	11	189	206	10	216
Three Tree	Val022	209.64	399	84	482	415	93	509	686	113	799	600	148	748
<b>TOTAL</b>		<b>5,283</b>	<b>1,178</b>	<b>6,461</b>	<b>5,804</b>	<b>1,238</b>	<b>6,923</b>	<b>6,639</b>	<b>1,326</b>	<b>7,980</b>	<b>7,783</b>	<b>1,576</b>	<b>9,359</b>	<b>5,283</b>

**TABLE 3-5: PEAK FLOWS WITH I & I (GPM)**

Primary Drainage Basin	Sub-basin	Acres	2020		2025		2030		2040	
			I & I (gal/acre/day)	Total Flow w/ I & I	I & I (gal/acre/day)	Total Flow w/ I & I	I & I (gal/acre/day)	Total Flow w/ I & I	I & I (gal/acre/day)	Total Flow w/ I & I
Beverly Park	Val004	233.07	1,100	400	1,100	412	1,100	412	1,100	414
Duwamish	Val005A	323.10	1,100	423	1,100	443	1,100	462	1,100	516

Primary Drainage Basin	Sub-basin	Acres	2020		2025		2030		2040	
			I & I (gal/acre/day)	Total Flow w/ I & I	I & I (gal/acre/day)	Total Flow w/ I & I	I & I (gal/acre/day)	Total Flow w/ I & I	I & I (gal/acre/day)	Total Flow w/ I & I
Duwamish	Val005B	107.64	6,900	605	6,900	614	6,900	618	6,900	630
Glen Acres	Val003	109.79	1,100	255	1,100	255	1,100	254	1,100	252
Glen Acres	Val023	181.47	1,100	308	1,100	317	1,100	324	1,100	330
Glen Acres	ValXXX	174.72	13,200	1,669	13,200	1,680	13,200	1,693	13,200	1,744
Glen Acres	ValYYY	69.67	1,100	100	1,100	105	1,100	110	1,100	125
Macadam	Val013	237.89	7,000	1,387	7,000	1,403	7,000	1,411	7,000	1,445
McMicken	Val017	217.21	1,100	386	1,100	426	1,100	470	1,100	515
McMicken	Val019	109.18	1,100	171	1,100	190	1,100	220	1,100	244
McMicken	Val020	152.03	1,100	252	1,100	265	1,100	266	1,100	288
McMicken	Val021	122.94	1,100	235	1,100	258	1,100	284	1,100	316
Midway	Val016	193.43	1,100	693	1,100	724	1,100	899	1,100	1,451
Rainier Vista	Val007	330.26	1,100	577	1,100	576	1,100	590	1,100	599
Rainier Vista	Val008	83.92	8,600	597	8,600	605	8,600	610	8,600	618
Rainier Vista	Val010	178.79	8,600	1,280	8,600	1,316	8,600	1,328	8,600	1,356
Rainier Vista	Val011	170.88	2,900	588	2,900	589	2,900	588	2,900	595
Rainier Vista	Val012	225.98	8,600	1,548	8,600	1,576	8,600	1,614	8,600	1,666
Riverton	Val009	165.99	1,900	407	1,900	420	1,900	429	1,900	456
Riverton	Val014	206.83	1,100	376	1,100	410	1,100	458	1,100	511
Riverton	Val015	88.13	1,100	399	1,100	409	1,100	406	1,100	422
Riverton	Val068	369.82	2,500	1,163	2,500	813	2,500	825	2,500	1,309
South Park	Duwamish West	130.80	2,500	314	2,500	536	2,500	566	2,500	328
South Park	Val006	215.95	5,800	1,087	5,800	1,020	5,800	1,038	5,800	1,117
SW Suburban	SWSSD South	571.07	2,500	1,223	2,500	1,320	2,500	1,380	2,500	1,345
SW Suburban	SWSSD West	82.85	1,100	67	1,100	71	1,100	76	1,100	115
Three Tree	Tukwila	41.92	1,100	32	1,100	77	1,100	90	1,100	44
Three Tree	Val001	433.88	1,100	723	1,300	891	1,300	978	1,300	1,046
Three Tree	Val002	217.97	2,000	577	2,000	580	2,000	654	2,000	662
Three Tree	Val018	114.64	2,000	296	2,000	330	2,000	348	2,000	375
Three Tree	Val022	209.64	2,000	774	2,000	800	2,000	1,090	2,000	1,039
<b>TOTAL</b>		<b>6,071</b>		<b>18,912</b>		<b>19,435</b>		<b>20,492</b>		<b>21,870</b>