Agriculture Water Demand Model
Region-specific Description: Squamish River Valley
March 2018

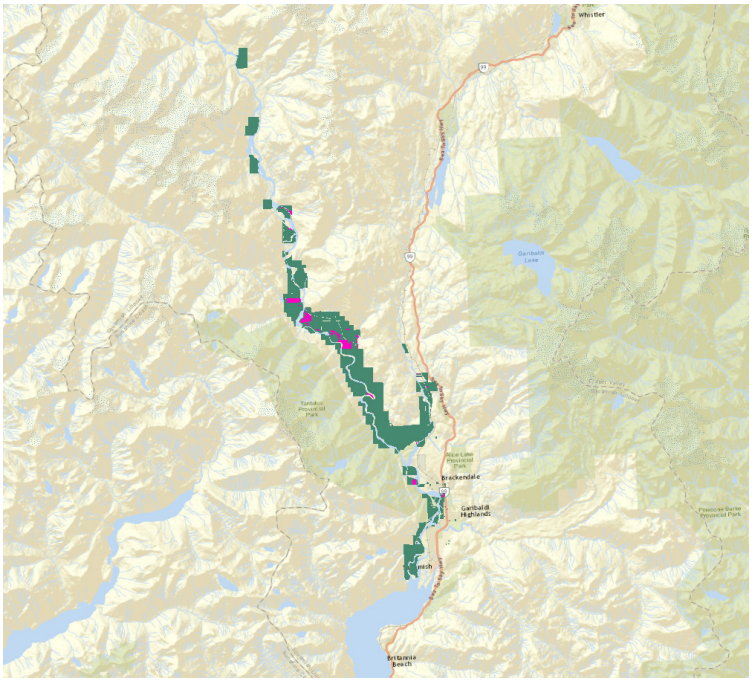
Purpose

The Agriculture Water Demand Model (AWDM) was initially developed for the Okanagan Valley and has since been extended to cover a significant portion of British Columbia. In general, the same types of input information are used for each modeling region, but there are differences between regions; these memos serve to highlight those characteristics that are different from the overall "standards".

This document describes the Squamish River Valley modeling region.

Land Use Inventory Coverage

The area covered by the Squamish Land Use Inventory is pictured below.



Currently or potentially irrigated areas in magenta

Soils Data

The Squamish River Valley sources use the new multi-horizon soils data developed in conjunction with the Ministry of Environment for the Squamish and Lillooet areas; all of the currently or potentially irrigated areas are covered by soils polygons, but about a quarter of that is currently without associated horizon data. This is being modeled as the default *Sandy Loam* soil texture.

irrigUsed	Soil Coverage	Area (ha)
Y	has soil data	10
Y	defaulted	3
P	has soil data	187
P	defaulted	54

Greenhouses

Inventoried greenhouses were randomly assigned types in the following proportions:

Tomato	28%
Pepper	39%
Cucumber	12%
Flower	21%

Flower operations were assigned *Microsprinkler* irrigation and all other greenhouses *Drip*.

Greenhouses were assigned a soil texture of *CultMed*.

Region-specific modeling settings

greenhouse leaching factor	0.4
early season evaporation factor	0.85
interior/coastal ET0 setting	coastal
arid/humid ET0 setting	sub-humid
flood irrigation end day	366 (no end specified)

Growing season overrides (when selected for modeling)

A maximum end day for the growing season has been specified as follows

cropId	maximum end day
AppleHD	275
AppleLD	275
AppleMD	275
Berry	275
Blueberry	275
Cereal	250
CherryHD	275
CherryMD	275
Cranberry	275
Floriculture	225
Forage	275
Fstock	275
GH Cucumber	335
GH Cucumber norecirc	335
GH Flower	304
GH Flower norecirc	304
GH Pepper	335
GH Pepper norecirc	335
GH Tomato	335
GH Tomato norecirc	335
Golf	275
Grape	250
Grass	275
Kiwi	275
Mushroom	365
NurseryPOT	275
Nuts	275

cropId	maximum end day
Pasture	275
Pea	245
Pear	275
Plum	275
Potato	240
Raspberry	275
Shrubs/Trees	275
Strawberry	240
Sweetcorn	240
TreeFruit	275
TurfFarm	275
TurfPark	275
Vegetable	240
VineBerry	275
Yard	275

Irrigation season overrides (when selected for modeling)

Minimum start and maximum end days for irrigation have been specified as follows

cropId	minimum start day	maximum end day
AppleHD	Tsum1000_day	275
AppleLD	Tsum1000_day	275
AppleMD	Tsum1000_day	275
Berry	Tsum1000_day	275
Blueberry	Tsum1000_day	275
Cereal	Tsum1000_day	250
CherryHD	Tsum1000_day	275
CherryMD	Tsum1000_day	275
Cranberry	Tsum1000_day	275
Floriculture	Tsum1000_day	225
Forage	Tsum1000_day	275
Fstock	Tsum1000_day	275
GH Cucumber		335
GH Cucumber norecirc		335
GH Flower		304
GH Flower norecirc		304
GH Pepper		335
GH Pepper norecirc		335
GH Tomato		335
GH Tomato norecirc		335
Golf	Tsum600_day	275
Grape	Tsum1000_day	250
Grass	Tsum1000_day	275
Kiwi	Tsum1000_day	275

cropId	minimum start day	maximum end day
Mushroom		365
NurseryPOT	Tsum600_day	275
Nuts	Tsum1000_day	275
Pasture	Tsum1000_day	275
Pea	Tsum1000_day	245
Pear	Tsum1000_day	275
Plum	Tsum1000_day	275
Potato	Tsum1000_day	240
Raspberry	Tsum1000_day	275
Shrubs/Trees	Tsum1000_day	275
Strawberry	Tsum1000_day	240
Sweetcorn	Tsum1000_day	240
TreeFruit	Tsum1000_day	275
TurfFarm	Tsum600_day	275
TurfPark	Tsum600_day	275
Vegetable	Tsum1000_day	240
VineBerry	Tsum1000_day	275
Yard	Tsum600_day	275

Agriculture Water Demand Model
Annual Summary 1 (Irrigation and Animal Use)

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Modeling Parameters

model version 2017.12.06

Modeling area: Squamish		**Run Date:** 3/10/2018 12:01:26 PM
Case Study: March 2018 - buildout		
Description:		
Source: D:\iwd_model\squamish\IWDM Original Source.mdb		
Climate Scenario: actuals4	**Year(s):** 1997,2003	
Growing Season Overrides Table: not used	**Irrigation Season Overrides:** used	**Irrigation Management Practice:** avg
Selection Criteria: ((outdoorUseType IN ('Agriculture','Recreation','Domestic') AND irrigUsed IN ('Y','P','N') AND irrigId <> 'Blank') OR hasDailyAgricultureUse = 'Y')		
Landuse Changes: SET irrigUsed = 'Y' WHERE irrigUsed IN ('P','N')		

Overall Annual Irrigation and Animal Water Demand

	Water Source									Crop Irrigation Totals			Animal Use Total	Grand Total
	Surface Water			Reclaimed Water			Groundwater							
Year	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Water Demand (m3)	Water Demand (m3)
1997	240.8	**532,603**	221	0.0	**0**	0	12.1	**32,107**	265	252.9	**564,710**	223	**12,792**	**577,503**
2003	240.8	**970,736**	403	0.0	**0**	0	12.1	**57,825**	477	252.9	**1,028,562**	407	**12,792**	**1,041,354**

Animals

Year: 1997	Water Demand (m3)
Animal Type	
Beef	931
Goats	759
Horses	9,143
Poultry - broiler	109
Poultry - laying	57
Sheep	1,095
Swine	698
	12,792

Year: 2003	Water Demand (m3)
Animal Type	
Beef	931
Goats	759
Horses	9,143
Poultry - broiler	109
Poultry - laying	57
Sheep	1,095
Swine	698
	12,792

Crops

Frost Protection, Harvesting and Other Use

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Use	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
GH Pepper	0.0	0	0	0.0	0	0	0.0	276	984	0.0	**276**	984
GH Tomato	0.0	0	0	0.0	0	0	0.1	773	1,276	0.1	**773**	1,276
	0.0	**0**	0	0.0	**0**	0	0.1	**1,049**	1,184	0.1	**1,049**	1,184

Agriculture Water Demand Model - Annual Summary 1

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Use	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
GH Pepper	0.0	0	0	0.0	0	0	0.0	299	1,067	0.0	**299**	1,067
GH Tomato	0.0	0	0	0.0	0	0	0.1	821	1,355	0.1	**821**	1,355
	0.0	**0**	0	0.0	**0**	0	0.1	**1,120**	1,264	0.1	**1,120**	1,264

by Crop Group

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Apple	0.3	796	260	0.0	0	0	0.0	143	293	0.4	**939**	265
Berry	0.2	398	214	0.0	0	0	0.0	0	0	0.2	**398**	214
Pasture/Grass	114.9	326,760	284	0.0	0	0	6.6	18,867	285	121.5	**345,627**	285
Vegetable	125.4	204,650	163	0.0	0	0	5.4	12,048	224	130.8	**216,698**	166
	240.8	**532,603**	221	0.0	**0**	0	12.0	**31,058**	258	252.8	**563,661**	223

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Apple	0.3	1,580	517	0.0	0	0	0.0	276	564	0.4	**1,856**	523
Berry	0.2	765	411	0.0	0	0	0.0	0	0	0.2	**765**	411
Pasture/Grass	114.9	644,610	561	0.0	0	0	6.6	36,527	553	121.5	**681,137**	561
Vegetable	125.4	323,781	258	0.0	0	0	5.4	19,903	370	130.8	**343,684**	263
	240.8	**970,736**	403	0.0	**0**	0	12.0	**56,705**	471	252.8	**1,027,442**	406

by Irrigation System

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Irrigation System	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Drip	125.4	204,650	163	0.0	0	0	2.5	5,119	208	127.9	**209,769**	164
Overtreedrip	0.0	0	0	0.0	0	0	0.7	1,486	209	0.7	**1,486**	209
Sprinkler	99.4	279,321	281	0.0	0	0	9.0	25,502	285	108.3	**304,823**	281
Travgun	16.0	48,632	304	0.0	0	0	0.0	0	0	16.0	**48,632**	304
	240.8	**532,603**	221	0.0	**0**	0	12.1	**32,107**	265	252.9	**564,710**	223

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Irrigation System	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Drip	125.4	323,781	258	0.0	0	0	2.5	7,438	303	127.9	**331,219**	259
Overtreedrip	0.0	0	0	0.0	0	0	0.7	2,597	366	0.7	**2,597**	366
Sprinkler	99.4	550,026	553	0.0	0	0	9.0	47,790	533	108.3	**597,816**	552
Travgun	16.0	96,929	607	0.0	0	0	0.0	0	0	16.0	**96,929**	607
	240.8	**970,736**	403	0.0	**0**	0	12.1	**57,825**	477	252.9	**1,028,562**	407

by Soil Texture

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Soil Texture	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Cultured Medium	0.0	0	0	0.0	0	0	0.1	1,049	1,184	0.1	**1,049**	1,184
Sandy Loam	129.4	320,043	247	0.0	0	0	8.2	20,970	255	137.7	**341,013**	248
Sandy Loam (defaulted)	111.3	212,560	191	0.0	0	0	3.8	10,088	264	115.2	**222,648**	193
	240.8	**532,603**	221	0.0	**0**	0	12.1	**32,107**	265	252.9	**564,710**	223

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Soil Texture	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Cultured Medium	0.0	0	0	0.0	0	0	0.1	1,120	1,264	0.1	**1,120**	1,264
Sandy Loam	129.4	584,847	452	0.0	0	0	8.2	38,792	472	137.7	**623,640**	453
Sandy Loam (defaulted)	111.3	385,889	347	0.0	0	0	3.8	17,913	470	115.2	**403,802**	351
	240.8	**970,736**	403	0.0	**0**	0	12.1	**57,825**	477	252.9	**1,028,562**	407

Agriculture Water Demand Model - Annual Summary 1

by Subbasin

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Subbasin (node)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
	6.7	15,377	231	0.0	0	0	0.0	0	0	6.7	**15,377**	231
ASHLU CREEK	47.5	133,958	282	0.0	0	0	0.0	0	0	47.5	**133,958**	282
CHEAKAMUS RIVER	3.1	7,743	248	0.0	0	0	1.5	4,076	270	4.6	**11,819**	255
PILLCHUCK CREEK	8.6	18,109	211	0.0	0	0	4.4	9,349	211	13.0	**27,457**	211
SQUAMISH RIVER	174.9	357,416	204	0.0	0	0	6.2	18,683	302	181.1	**376,099**	208
	240.8	**532,603**	221	0.0	**0**	0	12.1	**32,107**	265	252.9	**564,710**	223

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Subbasin (node)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
	6.7	28,063	421	0.0	0	0	0.0	0	0	6.7	**28,063**	421
ASHLU CREEK	47.5	264,550	557	0.0	0	0	0.0	0	0	47.5	**264,550**	557
CHEAKAMUS RIVER	3.1	14,920	478	0.0	0	0	1.5	7,546	499	4.6	**22,466**	485
PILLCHUCK CREEK	8.6	33,429	390	0.0	0	0	4.4	15,481	350	13.0	**48,911**	376
SQUAMISH RIVER	174.9	629,774	360	0.0	0	0	6.2	34,798	562	181.1	**664,572**	367
	240.8	**970,736**	403	0.0	**0**	0	12.1	**57,825**	477	252.9	**1,028,562**	407

by Water Purveyor

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Water Purveyor	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Private	240.8	532,603	221	0.0	0	0	12.1	32,107	265	252.9	**564,710**	223
	240.8	**532,603**	221	0.0	**0**	0	12.1	**32,107**	265	252.9	**564,710**	223
	240.8	**532,603**	221	0.0	**0**	0	12.1	**32,107**	265	252.9	**564,710**	223

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Water Purveyor	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Private	240.8	970,736	403	0.0	0	0	12.1	57,825	477	252.9	**1,028,562**	407
	240.8	**970,736**	403	0.0	**0**	0	12.1	**57,825**	477	252.9	**1,028,562**	407
	240.8	**970,736**	403	0.0	**0**	0	12.1	**57,825**	477	252.9	**1,028,562**	407

by Aquifer

Year: 1997		Water Source									Total		
		Surface Water			Reclaimed Water			Groundwater					
Aquifer Label and Type		Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
		236.5	522,206	221	0.0	0	0	4.5	9,886	218	241.0	**532,092**	221
22 km north along the	Alluvial	2.3	5,207	225	0.0	0	0	1.5	4,031	270	3.8	**9,239**	242
Cheekye Fan	Alluvial	0.8	2,458	325	0.0	0	0	0.0	0	0	0.8	**2,458**	325
Mamquam Valley	Alluvial	0.0	0	0	0.0	0	0	0.1	773	1,276	0.1	**773**	1,276
Squamish River Squa	Alluvial	1.2	2,732	219	0.0	0	0	6.0	17,417	289	7.3	**20,149**	277
		240.8	**532,603**	221	0.0	**0**	0	12.1	**32,107**	265	252.9	**564,710**	223

Year: 2003		Water Source									Total		
		Surface Water			Reclaimed Water			Groundwater					
Aquifer Label and Type		Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
		236.5	951,124	402	0.0	0	0	4.5	16,214	357	241.0	**967,338**	401
22 km north along the	Alluvial	2.3	9,980	430	0.0	0	0	1.5	7,467	500	3.8	**17,448**	458
Cheekye Fan	Alluvial	0.8	4,794	634	0.0	0	0	0.0	0	0	0.8	**4,794**	634
Mamquam Valley	Alluvial	0.0	0	0	0.0	0	0	0.1	821	1,355	0.1	**821**	1,355
Squamish River Squa	Alluvial	1.2	4,838	389	0.0	0	0	6.0	33,323	553	7.3	**38,161**	525
		240.8	**970,736**	403	0.0	**0**	0	12.1	**57,825**	477	252.9	**1,028,562**	407

by Local Government code

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Local Government	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)

Agriculture Water Demand Model - Annual Summary 1

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Local Government	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
District Of Squamish	18.1	50,398	278	0.0	0	0	7.6	22,542	295	25.8	**72,940**	283
Squamish-Lillooet Regional District	222.6	482,205	217	0.0	0	0	4.5	9,565	213	227.1	**491,770**	217
	240.8	**532,603**	221	0.0	**0**	0	12.1	**32,107**	265	252.9	**564,710**	223

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Local Government	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
District Of Squamish	18.1	96,059	530	0.0	0	0	7.6	41,989	550	25.8	**138,048**	536
Squamish-Lillooet Regional District	222.6	874,677	393	0.0	0	0	4.5	15,836	352	227.1	**890,513**	392
	240.8	**970,736**	403	0.0	**0**	0	12.1	**57,825**	477	252.9	**1,028,562**	407

by Electoral Area

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Electoral Area	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
	18.1	50,398	278	0.0	0	0	7.6	22,542	295	25.8	**72,940**	283
SIrd Electoral Area D	222.6	482,205	217	0.0	0	0	4.5	9,565	213	227.1	**491,770**	217
	240.8	**532,603**	221	0.0	**0**	0	12.1	**32,107**	265	252.9	**564,710**	223

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Electoral Area	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
	18.1	96,059	530	0.0	0	0	7.6	41,989	550	25.8	**138,048**	536
SIrd Electoral Area D	222.6	874,677	393	0.0	0	0	4.5	15,836	352	227.1	**890,513**	392
	240.8	**970,736**	403	0.0	**0**	0	12.1	**57,825**	477	252.9	**1,028,562**	407

Agriculture Water Demand Model
Annual Summary 1 (Irrigation and Animal Use)

3/14/2018 11:37:50 AM

Modeling Parameters

model version 2017.12.06

Modeling area: Squamish		**Run Date:** 3/10/2018 12:02:25 PM
Case Study: March 2018 - no buildout		
Description:		
Source: D:\iwd_model\squamish\IWDM Original Source.mdb		
Climate Scenario: actuals4	**Year(s):** 1997,2003	
Growing Season Overrides Table: not used	**Irrigation Season Overrides:** used	**Irrigation Management Practice:** avg
Selection Criteria: ((outdoorUseType IN ('Agriculture','Recreation','Domestic') AND irrigUsed IN ('Y','N') AND irrigId <> 'Blank') OR hasDailyAgricultureUse = 'Y')		
Landuse Changes:		

Overall Annual Irrigation and Animal Water Demand

	Water Source									Crop Irrigation Totals			Animal Use Total	Grand Total
	Surface Water			Reclaimed Water			Groundwater							
Year	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Water Demand (m3)	Water Demand (m3)
1997	0.5	**1,194**	243	0.0	**0**	0	12.1	**32,107**	265	12.6	**33,301**	264	**12,792**	**46,093**
2003	0.5	**2,345**	477	0.0	**0**	0	12.1	**57,825**	477	12.6	**60,170**	477	**12,792**	**72,962**

Animals

Year: 1997	Water Demand (m3)
Animal Type	
Beef	931
Goats	759
Horses	9,143
Poultry - broiler	109
Poultry - laying	57
Sheep	1,095
Swine	698
	12,792

Year: 2003	Water Demand (m3)
Animal Type	
Beef	931
Goats	759
Horses	9,143
Poultry - broiler	109
Poultry - laying	57
Sheep	1,095
Swine	698
	12,792

Crops

Frost Protection, Harvesting and Other Use

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Use	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
GH Pepper	0.0	0	0	0.0	0	0	0.0	276	984	0.0	**276**	984
GH Tomato	0.0	0	0	0.0	0	0	0.1	773	1,276	0.1	**773**	1,276
	0.0	**0**	0	0.0	**0**	0	0.1	**1,049**	1,184	0.1	**1,049**	1,184

Agriculture Water Demand Model - Annual Summary 1

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Use	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
GH Pepper	0.0	0	0	0.0	0	0	0.0	299	1,067	0.0	**299**	1,067
GH Tomato	0.0	0	0	0.0	0	0	0.1	821	1,355	0.1	**821**	1,355
	0.0	**0**	0	0.0	**0**	0	0.1	**1,120**	1,264	0.1	**1,120**	1,264

by Crop Group

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Apple	0.3	796	260	0.0	0	0	0.0	143	293	0.4	**939**	265
Berry	0.2	398	214	0.0	0	0	0.0	0	0	0.2	**398**	214
Pasture/Grass	0.0	0	0	0.0	0	0	6.6	18,867	285	6.6	**18,867**	285
Vegetable	0.0	0	0	0.0	0	0	5.4	12,048	224	5.4	**12,048**	224
	0.5	**1,194**	243	0.0	**0**	0	12.0	**31,058**	258	12.5	**32,252**	257

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Apple	0.3	1,580	517	0.0	0	0	0.0	276	564	0.4	**1,856**	523
Berry	0.2	765	411	0.0	0	0	0.0	0	0	0.2	**765**	411
Pasture/Grass	0.0	0	0	0.0	0	0	6.6	36,527	553	6.6	**36,527**	553
Vegetable	0.0	0	0	0.0	0	0	5.4	19,903	370	5.4	**19,903**	370
	0.5	**2,345**	477	0.0	**0**	0	12.0	**56,705**	471	12.5	**59,050**	471

by Irrigation System

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Irrigation System	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Drip	0.0	0	0	0.0	0	0	2.5	5,119	208	2.5	**5,119**	208
Overtreedrip	0.0	0	0	0.0	0	0	0.7	1,486	209	0.7	**1,486**	209
Sprinkler	0.5	1,194	243	0.0	0	0	9.0	25,502	285	9.5	**26,696**	282
	0.5	**1,194**	243	0.0	**0**	0	12.1	**32,107**	265	12.6	**33,301**	264

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Irrigation System	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Drip	0.0	0	0	0.0	0	0	2.5	7,438	303	2.5	**7,438**	303
Overtreedrip	0.0	0	0	0.0	0	0	0.7	2,597	366	0.7	**2,597**	366
Sprinkler	0.5	2,345	477	0.0	0	0	9.0	47,790	533	9.5	**50,134**	530
	0.5	**2,345**	477	0.0	**0**	0	12.1	**57,825**	477	12.6	**60,170**	477

by Soil Texture

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Soil Texture	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Cultured Medium	0.0	0	0	0.0	0	0	0.1	1,049	1,184	0.1	**1,049**	1,184
Sandy Loam	0.0	0	0	0.0	0	0	8.2	20,970	255	8.2	**20,970**	255
Sandy Loam (defaulted)	0.5	1,194	243	0.0	0	0	3.8	10,088	264	4.3	**11,282**	262
	0.5	**1,194**	243	0.0	**0**	0	12.1	**32,107**	265	12.6	**33,301**	264

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Soil Texture	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Cultured Medium	0.0	0	0	0.0	0	0	0.1	1,120	1,264	0.1	**1,120**	1,264
Sandy Loam	0.0	0	0	0.0	0	0	8.2	38,792	472	8.2	**38,792**	472
Sandy Loam (defaulted)	0.5	2,345	477	0.0	0	0	3.8	17,913	470	4.3	**20,258**	470
	0.5	**2,345**	477	0.0	**0**	0	12.1	**57,825**	477	12.6	**60,170**	477

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by Subbasin

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Subbasin (node)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
CHEAKAMUS RIVER	0.5	1,194	243	0.0	0	0	1.5	4,076	270	2.0	**5,270**	263
PILLCHUCK CREEK	0.0	0	0	0.0	0	0	4.4	9,349	211	4.4	**9,349**	211
SQUAMISH RIVER	0.0	0	0	0.0	0	0	6.2	18,683	302	6.2	**18,683**	302
	0.5	**1,194**	243	0.0	**0**	0	12.1	**32,107**	265	12.6	**33,301**	264

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Subbasin (node)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
CHEAKAMUS RIVER	0.5	2,345	477	0.0	0	0	1.5	7,546	499	2.0	**9,891**	494
PILLCHUCK CREEK	0.0	0	0	0.0	0	0	4.4	15,481	350	4.4	**15,481**	350
SQUAMISH RIVER	0.0	0	0	0.0	0	0	6.2	34,798	562	6.2	**34,798**	562
	0.5	**2,345**	477	0.0	**0**	0	12.1	**57,825**	477	12.6	**60,170**	477

by Water Purveyor

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Water Purveyor	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Private	0.5	1,194	243	0.0	0	0	12.1	32,107	265	12.6	**33,301**	264
	0.5	**1,194**	243	0.0	**0**	0	12.1	**32,107**	265	12.6	**33,301**	264
	0.5	**1,194**	243	0.0	**0**	0	12.1	**32,107**	265	12.6	**33,301**	264

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Water Purveyor	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
Private	0.5	2,345	477	0.0	0	0	12.1	57,825	477	12.6	**60,170**	477
	0.5	**2,345**	477	0.0	**0**	0	12.1	**57,825**	477	12.6	**60,170**	477
	0.5	**2,345**	477	0.0	**0**	0	12.1	**57,825**	477	12.6	**60,170**	477

by Aquifer

Year: 1997		Water Source									Total		
		Surface Water			Reclaimed Water			Groundwater					
Aquifer Label and Type		Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
		0.0	0	0	0.0	0	0	4.5	9,886	218	4.5	**9,886**	218
22 km north along the	Alluvial	0.5	1,194	243	0.0	0	0	1.5	4,031	270	2.0	**5,225**	263
Mamquam Valley	Alluvial	0.0	0	0	0.0	0	0	0.1	773	1,276	0.1	**773**	1,276
Squamish River Squa	Alluvial	0.0	0	0	0.0	0	0	6.0	17,417	289	6.0	**17,417**	289
		0.5	**1,194**	243	0.0	**0**	0	12.1	**32,107**	265	12.6	**33,301**	264

Year: 2003		Water Source									Total		
		Surface Water			Reclaimed Water			Groundwater					
Aquifer Label and Type		Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
		0.0	0	0	0.0	0	0	4.5	16,214	357	4.5	**16,214**	357
22 km north along the	Alluvial	0.5	2,345	477	0.0	0	0	1.5	7,467	500	2.0	**9,812**	494
Mamquam Valley	Alluvial	0.0	0	0	0.0	0	0	0.1	821	1,355	0.1	**821**	1,355
Squamish River Squa	Alluvial	0.0	0	0	0.0	0	0	6.0	33,323	553	6.0	**33,323**	553
		0.5	**2,345**	477	0.0	**0**	0	12.1	**57,825**	477	12.6	**60,170**	477

by Local Government code

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Local Government	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
District Of Squamish	0.5	1,194	243	0.0	0	0	7.6	22,542	295	8.1	**23,735**	292
Squamish-Lillooet Regional District	0.0	0	0	0.0	0	0	4.5	9,565	213	4.5	**9,565**	213
	0.5	**1,194**	243	0.0	**0**	0	12.1	**32,107**	265	12.6	**33,301**	264

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Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Local Government	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
District Of Squamish	0.5	2,345	477	0.0	0	0	7.6	41,989	550	8.1	**44,334**	546
Squamish-Lillooet Regional District	0.0	0	0	0.0	0	0	4.5	15,836	352	4.5	**15,836**	352
	0.5	**2,345**	477	0.0	**0**	0	12.1	**57,825**	477	12.6	**60,170**	477

by Electoral Area

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Electoral Area	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
	0.5	1,194	243	0.0	0	0	7.6	22,542	295	8.1	**23,735**	292
Slrd Electoral Area D	0.0	0	0	0.0	0	0	4.5	9,565	213	4.5	**9,565**	213
	0.5	**1,194**	243	0.0	**0**	0	12.1	**32,107**	265	12.6	**33,301**	264

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Electoral Area	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m3)	Avg. Req. (mm)
	0.5	2,345	477	0.0	0	0	7.6	41,989	550	8.1	**44,334**	546
Slrd Electoral Area D	0.0	0	0	0.0	0	0	4.5	15,836	352	4.5	**15,836**	352
	0.5	**2,345**	477	0.0	**0**	0	12.1	**57,825**	477	12.6	**60,170**	477