Hydromodification Mitigation Plan

Aliso Canyon Subdivision
County of San Diego, California
Project: PDS2011-TM-5589

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Section 1. Integrated Management Practices

This report addresses hydromodification mitigation for the proposed development at Aliso Canyon Subdivision. Please refer to the project specific Drainage Study and Storm Water Management Plan (SWMP), found under separate cover, for additional project site information pertaining to 100-year peak flows and water quality treatment.

1.1. Bioretention

Bioretention basins have been strategically located on each of the proposed building pads on lots 1-7, as shown on the Tentative Map and Preliminary Grading Plan. Bioretention will also be used to treat runoff from the proposed Street 'A' bisecting the site, as well as the existing portion of Aliso Canyon Road east of the site. The only non-landscaped portion of the project site not draining to the proposed bioretention areas consists of existing improvements to remain. As such, all project site runoff is disconnected prior to discharge from the site.

The nine proposed bioretention basins will consist of a 12-inch rock section with perforated underdrain pipe, an 18-inch minimum biofiltration soil layer, and 4 inches of available surface ponding. The basins will be fitted with perforated sub-drains and impermeable side-wall liners will be extended into the sub-grade to prevent the potential for lateral migration of flow. Discharge piping from each bioretention area will be fitted with an orifice-controlled end cap. The specifications of each bioretention IMP that was modeled are in Table 3-3.

A 12-inch diameter riser will be set at 4" above the bioretention basin surface.

Bioretention Maintenance

Maintenance Program for Bioretention Area

Inspection Frequency/Indications:	Regular Inspections ❑ Before wet season begins (September); ❑ Every 60 days during wet season (September-April); ❑ After wet season (April). Performance Inspections ❑ After rainfall events greater than 0.5 inch
Maintenance Indications Connections	**Maintenance Activities Connections**
❑ Damage to inlet/outlet, side slopes, headwall, or other structures	❑ Repair inlet/outlet structures, side slopes, fences, or other structural elements as needed to maintain performance of the facility.
❑ Over-grown vegetation, emergent woody vegetation and/or weeds	❑ Trim vegetation to average height of 12 inches and remove trimmings. ❑ Remove emergent trees and other vegetation that are not part of bioretention basin plan and weeds ❑ Re-seed and re-plan barren areas prior to rainy season ❑ Install erosion blanket on barren spots if re-vegetation is not successful
❑ Sediment accumulation over 3 inches	❑ Remove sediment accumulation at or near plant height
❑ Trash, debris, and vegetative litter	❑ Remove trash, debris, and vegetative litter
❑ Rodents or other vectors	❑ Abate and control rodents as necessary to maintain performance of the facility ❑ Drain standing water
Waste Disposal	Sediment, other pollutants, and all other waste shall be properly disposed of in a licensed landfill or by another appropriate disposal method in accordance with local, state, and federal regulations.

Section 2. Hydromodification Study Methods

To determine the impact of hydromodification and to provide a design that fully mitigates potential hydromodification impacts, calculations were performed using the Hydrologic Simulation Program Fortran (HSPF) within the San Diego Hydrology Model (SDHM). HSPF has been the state-of-the-art program for long-term continuous simulation calculations since its inception over 30 years ago.

The model uses hourly rainfall data collected at the Poway rain gage. The loss rates applied to the precipitation data are provided in Appendix F of the Final Hydromodification Management Plan for the County of San Diego.

2.1. Typical Case

Four Points of Compliance have been modeled within SDHM, based on the project site discharging to the west and south under pre and post development conditions. The drainage areas have not changed significantly as a result of the project.

2.2. Modeling Approach

The bioretention areas have each been modeled within SDHM. The proposed building pads and private street will be graded such that all developed area will drain to a bioretention area before discharging offsite via existing natural flow paths. It was assumed that the amount of proposed impervious surface draining to a bioretention area from each of the seven building pads is 10,000 square feet (0.23 acres).

Section 3. Conclusions

The site is currently steep undeveloped land. To mitigate potential hydromodification impacts from development, nine bioretention areas and level grading have been proposed. They collectively serve a number of important purposes:

- The bioretention areas provide runoff storage and attenuation of peak flow discharge rates and flow duration to pre-project levels.
- The use of select import in IMPs will provide increased infiltration rate and flow retention, which will result in increased initial abstraction (the minimum precipitation required to cause runoff).
- The bioretention areas provide a means to disconnect impervious area runoff prior to discharge from the project site. In that regard, they serve as a Low Impact Development (LID) IMP.
- The soil filtration and biological uptake of the plant life within the bioretention areas will provide water quality treatment from the pollutants typically associated with residential rooftop runoff and roadways, respectively.

Table 3-1 presents the hydrologic soil type, land cover/use and slope for areas that drain to each point of compliance. Although the project area is only 30.7 acres, the pre- and post-project areas analyzed for this study are equal and total 45.1 acres. This includes offsite run-on from east, west, and south of the project area.

The HMP Map in Appendix B provides a summary of the area proposed to meet hydromodification and water quality requirements.

Table 3-2 shows that the mitigated post-development 2-, 5-, 10-, and 25-year peak runoff rates are less than or equal to the predevelopment runoff rates at each of the four POC's. Each point of compliance mitigates hydromodification at the project boundary.

Complete results of the SDHM analysis are included in Attachment A, and clearly show that mitigation of both peak flow and flow duration are accomplished for the statistical range of events between 10% of Q2 and Q10 (hydromodification zone). This result is in compliance with the latest standards of the County of San Diego SUSMP.

Table 3-1 Summary of Pre- and Post-Project SDHM Land Characteristics

Hydrologic Soil Type	Cover	Slope	POC #1 (acres)	POC #2 (acres)	POC #3 (acres)	POC #4 (acres)
Existing Condition						
D	Grass	Flat (0-5%)	2.49	0.66	0.54	2.94
D	Grass	Moderate (5-10%)	6.49	1.30	0.81	6.29
D	Grass	Steep (10-20%)	12.57	0.65	0.17	7.93
	Impervious	Flat (0-5%)	1.63	0	0	0.63
		TOTAL	**23.18**	**2.61**	**1.52**	**17.79**
Proposed Condition						
D	Grass	Flat (0-5%)	3.20	1.08	0.96	3.77
D	Grass	Moderate (5-10%)	5.82	0.78	0.26	5.21
D	Grass	Steep (10-20%)	11.79	0.52	0.07	7.14
	Impervious	Flat (0-5%)	2.37	0.23	0.23	1.67
		TOTAL	**23.18**	**2.61**	**1.52**	**17.79**

Table 3-2: Pre- and Mitigated Post-Development 2-, 5-, 10-, and 25-Year Peak Flows

P.O.C.	2-Year		5-Year		10-Year		25-Year	
	Pre-Project (cfs)	Mitigated Post-Project (cfs)	Pre-Project (cfs)	Mitigated Post-Project (cfs)	Pre-Project (cfs)	Mitigated Post-Project (cfs)	Pre-Project (cfs)	Mitigated Post-Project (cfs)
1	4.36	4.17	8.16	8.04	8.84	8.81	12.15	11.67
2	0.40	0.28	0.80	0.61	0.93	0.91	1.26	1.06
3	0.21	0.09	0.44	0.31	0.53	0.46	0.72	0.54
4	3.09	2.54	5.79	5.58	6.57	6.59	9.02	8.30

- Although the 10-year peak flow increases in the SDHM continuous simulation analysis for POC 4, the POC is still compliant with Hydromodification management requirements since it passes the flow-duration analysis at every flow level. See results in Appendix A.

Table 3-3: Bioretention IMP Specifications (Refer To SDHM input)

IMP ID	IMP Surface Area (sf)	Biofiltration Soil Depth (ft)	Orifice Diameter (in)
1-3	1,000	2	1
1-4	1,000	2	1
1-5	1,000	2	1
2	1,000	3	1
3	1,200	3	0.5
4-1	1,000	3	0.5
4-2	1,000	3	0.5
4-3	1,000	3	0.5
4-4	1,500	3	0.5

Section 4. References

Brown and Caldwell, 2011. Brown and Caldwell. (March 2011). Final Hydromodification Management Plan, prepared for the County of San Diego

Appendix A: IMP Design Calculations

POST-CONSTRUCTION BMP SUMMARY TABLE

POC	DMA	Bioretention IMP	Total Area (AC)	Proposed Impervious Area (SF)	WQ Surface Area		WQ Volume		Water Quality Compliance Met	Peak Flow		Detention Volume		CEQA Compliance Met	HYDROMODIFICATION COMPLIANCE MET
					Required (SF)	Provided (SF)	Required (ft^3)	Provided (ft^3)		Existing (cfs)	Proposed (cfs)	Required (ft^3)	Provided (ft^3)		
1	1-1	-	4.09	0	-	-	-	-	-	40.4	39.3	6,984	7,000	YES	YES
	1-2	-	3.59	0	-	-	-	-	-						
	1-3	IMP 1-3	2.21	10,000	499	1,000	1,007	1,900	YES						
	1-4	IMP 1-4	1.05	12,200	720	1,000	1,788	1,900	YES						
	1-5	IMP 1-5	6.37	10,000	506	1,000	1,037	1,900	YES						
	1-6	IMP 1-6	1.76	15,340	859	1,200	1,998	3,240	YES						
	1-7	-	4.11	0	-	-	-	-	-						
2	2	IMP 2	2.61	10,000	490	1,000	1,149	2,300	YES	4.5	3.5	1,254	2,757	YES	YES
3	3	IMP 3	1.52	10,000	518	1,200	1,101	2,760	YES	1.5	1.5	3,330	3,460	YES	YES
4	4-1	IMP 4-1	15.45	10,000	476	1,000	893	2,300	YES	31.5	27.3	1,440	8,920	YES	YES
		IMP 4-2		10,000	519	1,000	1,101	2,300	YES						
		IMP 4-3		10,000	499	1,000	1,007	2,300	YES						
	4-4	IMP 4-4	0.83	18,000	760	1,500	1,106	3,450	YES						
	4-5	IMP 4-5	1.51	17,420	894	1,250	1,851	3,375	YES						

SDHM

PROJECT REPORT

POC 1

General Model Information

Project Name:	137718-POC1
Site Name:	ALISO CANYON - POC 1
Site Address:	
City:	RANCHO SANTA FE
Report Date:	8/14/2014
Gage:	POWAY
Data Start:	10/01/1963
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.00
Version:	2014/08/12

POC Thresholds

Low Flow Threshold for POC1:	10 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year

Landuse Basin Data
Predeveloped Land Use

POC 1

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	2.49
D,Grass,MOD(5-10%)	6.49
D,Grass,STEEP(10-20	12.57
Pervious Total	21.55
Impervious Land Use	Acres
IMPERVIOUS-FLAT	1.63
Impervious Total	1.63
Basin Total	23.18

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

LOT 1

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	0.57
Pervious Total	0.57
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.23
Impervious Total	0.23
Basin Total	0.8

Element Flows To:

Surface	Interflow	Groundwater
Surface IMP 1-1	Surface IMP 1-1	

LOT 7

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	0.61
Pervious Total	0.61
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.23
Impervious Total	0.23
Basin Total	0.84

Element Flows To:

Surface	Interflow	Groundwater
Surface IMP 1-5	Surface IMP 1-5	

TO REMAIN

Bypass:	Yes
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	2.02
D,Grass,MOD(5-10%)	5.82
D,Grass,STEEP(10-20	11.79
Pervious Total	19.63
Impervious Land Use	Acres
IMPERVIOUS-FLAT	1.63
Impervious Total	1.63
Basin Total	21.26

Element Flows To:

Surface	Interflow	Groundwater

STREET A

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
Pervious Total	0
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.28
Impervious Total	0.28
Basin Total	0.28

Element Flows To:

Surface	Interflow	Groundwater
Surface IMP 1-4	Surface IMP 1-4	

Routing Elements
Predeveloped Routing

Mitigated Routing

IMP 1-1

Bottom Length:	30.00 ft.
Bottom Width:	33.00 ft.
Material thickness of first layer:	2
Material type for first layer:	Loamy fine sand
Material thickness of second layer:	0.5
Material type for second layer:	ASTM 8
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (ft):	0.33
Orifice Diameter (in):	1
Offset (in):	0
Flow Through Underdrain (ac-ft):	7.876
Total Outflow (ac-ft):	8.882
Percent Through Underdrain:	88.68
Discharge Structure	
Riser Height:	0.33 ft.
Riser Diameter:	12 in.
Notch Type:	Rectangular
Notch Width:	0.000 ft.
Notch Height:	0.000 ft.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0373	0.0000	0.0000	0.0000
0.0440	0.0372	0.0002	0.0000	0.0000
0.0879	0.0370	0.0004	0.0000	0.0000
0.1319	0.0368	0.0006	0.0000	0.0000
0.1758	0.0366	0.0008	0.0000	0.0000
0.2198	0.0364	0.0010	0.0000	0.0000
0.2637	0.0362	0.0012	0.0000	0.0000
0.3077	0.0361	0.0016	0.0001	0.0000
0.3516	0.0359	0.0020	0.0001	0.0000
0.3956	0.0357	0.0024	0.0002	0.0000
0.4396	0.0355	0.0028	0.0002	0.0000
0.4835	0.0353	0.0032	0.0003	0.0000
0.5275	0.0351	0.0036	0.0004	0.0000
0.5714	0.0350	0.0040	0.0005	0.0000
0.6154	0.0348	0.0044	0.0006	0.0000
0.6593	0.0346	0.0049	0.0007	0.0000
0.7033	0.0344	0.0053	0.0008	0.0000
0.7473	0.0342	0.0057	0.0009	0.0000
0.7912	0.0341	0.0061	0.0011	0.0000
0.8352	0.0339	0.0066	0.0013	0.0000
0.8791	0.0337	0.0070	0.0015	0.0000
0.9231	0.0335	0.0075	0.0017	0.0000
0.9670	0.0333	0.0079	0.0020	0.0000
1.0110	0.0331	0.0083	0.0023	0.0000
1.0549	0.0330	0.0088	0.0026	0.0000
1.0989	0.0328	0.0093	0.0029	0.0000

1.1429	0.0326	0.0097	0.0030	0.0000
1.1868	0.0324	0.0102	0.0032	0.0000
1.2308	0.0322	0.0106	0.0036	0.0000
1.2747	0.0320	0.0111	0.0040	0.0000
1.3187	0.0319	0.0116	0.0044	0.0000
1.3626	0.0317	0.0120	0.0047	0.0000
1.4066	0.0315	0.0125	0.0048	0.0000
1.4505	0.0313	0.0130	0.0056	0.0000
1.4945	0.0311	0.0135	0.0061	0.0000
1.5385	0.0309	0.0140	0.0062	0.0000
1.5824	0.0308	0.0144	0.0063	0.0000
1.6264	0.0306	0.0149	0.0073	0.0000
1.6703	0.0304	0.0154	0.0074	0.0000
1.7143	0.0302	0.0159	0.0074	0.0000
1.7582	0.0300	0.0164	0.0080	0.0000
1.8022	0.0298	0.0169	0.0082	0.0000
1.8462	0.0297	0.0174	0.0088	0.0000
1.8901	0.0295	0.0179	0.0091	0.0000
1.9341	0.0293	0.0184	0.0096	0.0000
1.9780	0.0291	0.0190	0.0099	0.0000
2.0220	0.0289	0.0195	0.0104	0.0000
2.0659	0.0287	0.0201	0.0106	0.0000
2.1099	0.0286	0.0207	0.0111	0.0000
2.1538	0.0284	0.0212	0.0114	0.0000
2.1978	0.0282	0.0218	0.0118	0.0000
2.2418	0.0280	0.0224	0.0120	0.0000
2.2857	0.0278	0.0230	0.0124	0.0000
2.3297	0.0277	0.0236	0.0127	0.0000
2.3736	0.0275	0.0242	0.0131	0.0000
2.4176	0.0273	0.0248	0.0133	0.0000
2.4615	0.0271	0.0253	0.0136	0.0000
2.5055	0.0269	0.0260	0.0138	0.0000
2.5495	0.0267	0.0266	0.0142	0.0000
2.5934	0.0266	0.0272	0.0141	0.0000
2.6374	0.0264	0.0278	0.0141	0.0000
2.6813	0.0262	0.0284	0.0140	0.0000
2.7253	0.0260	0.0290	0.0140	0.0000
2.7692	0.0258	0.0296	0.0140	0.0000
2.8132	0.0256	0.0303	0.0140	0.0000
2.8571	0.0255	0.0309	0.0144	0.0000
2.9011	0.0253	0.0315	0.0150	0.0000
2.9451	0.0251	0.0322	0.0158	0.0000
2.9890	0.0249	0.0328	0.0167	0.0000
3.0330	0.0247	0.0334	0.0176	0.0000
3.0769	0.0246	0.0341	0.0184	0.0000
3.1209	0.0244	0.0347	0.0197	0.0000
3.1648	0.0242	0.0354	0.0197	0.0000
3.2088	0.0240	0.0361	0.0197	0.0000
3.2527	0.0238	0.0367	0.0197	0.0000
3.2967	0.0236	0.0374	0.0197	0.0000
3.3407	0.0235	0.0380	0.0197	0.0000
3.3846	0.0233	0.0387	0.0197	0.0000
3.4286	0.0231	0.0394	0.0197	0.0000
3.4725	0.0229	0.0401	0.0197	0.0000
3.5000	0.0227	0.0405	0.0197	0.0000

Landscape Swale Hydraulic Table

Stage(ft)Area(ac)Volume(ac-ft)Discharge(cfs)To Amended(cfs)Infilt(cfs)

3.5000	0.0373	0.0405	0.0000	0.0201	0.0000
3.5440	0.0375	0.0421	0.0000	0.0201	0.0000
3.5879	0.0376	0.0438	0.0000	0.0205	0.0000
3.6319	0.0378	0.0454	0.0000	0.0210	0.0000
3.6758	0.0380	0.0471	0.0000	0.0214	0.0000
3.7198	0.0382	0.0488	0.0000	0.0218	0.0000
3.7637	0.0384	0.0505	0.0000	0.0223	0.0000
3.8077	0.0386	0.0521	0.0000	0.0227	0.0000
3.8516	0.0387	0.0538	0.0310	0.0231	0.0000
3.8956	0.0389	0.0556	0.1636	0.0236	0.0000
3.9396	0.0391	0.0573	0.3532	0.0240	0.0000
3.9835	0.0393	0.0590	0.5858	0.0244	0.0000
4.0000	0.0394	0.0596	0.8546	0.0246	0.0000

Surface IMP 1-1

Element Flows To:

Outlet 1	Outlet 2
	IMP 1-1

IMP 1-5

Bottom Length:	30.00 ft.
Bottom Width:	33.00 ft.
Material thickness of first layer:	2
Material type for first layer:	Fine sandy loam
Material thickness of second layer:	0.5
Material type for second layer:	ASTM 8
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (ft):	0.33
Orifice Diameter (in):	1
Offset (in):	0
Flow Through Underdrain (ac-ft):	7.24
Total Outflow (ac-ft):	9.042
Percent Through Underdrain:	80.07
Discharge Structure	
Riser Height:	0.33 ft.
Riser Diameter:	12 in.
Notch Type:	Rectangular
Notch Width:	0.000 ft.
Notch Height:	0.000 ft.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0373	0.0000	0.0000	0.0000
0.0440	0.0372	0.0002	0.0000	0.0000
0.0879	0.0370	0.0005	0.0000	0.0000
0.1319	0.0368	0.0007	0.0000	0.0000
0.1758	0.0366	0.0009	0.0000	0.0000
0.2198	0.0364	0.0011	0.0000	0.0000
0.2637	0.0362	0.0014	0.0000	0.0000
0.3077	0.0361	0.0018	0.0000	0.0000
0.3516	0.0359	0.0023	0.0001	0.0000
0.3956	0.0357	0.0028	0.0001	0.0000
0.4396	0.0355	0.0033	0.0001	0.0000
0.4835	0.0353	0.0038	0.0001	0.0000
0.5275	0.0351	0.0043	0.0002	0.0000
0.5714	0.0350	0.0047	0.0002	0.0000
0.6154	0.0348	0.0052	0.0003	0.0000
0.6593	0.0346	0.0057	0.0004	0.0000
0.7033	0.0344	0.0062	0.0004	0.0000
0.7473	0.0342	0.0068	0.0005	0.0000
0.7912	0.0341	0.0073	0.0006	0.0000
0.8352	0.0339	0.0078	0.0007	0.0000
0.8791	0.0337	0.0083	0.0008	0.0000
0.9231	0.0335	0.0088	0.0009	0.0000
0.9670	0.0333	0.0093	0.0010	0.0000
1.0110	0.0331	0.0099	0.0011	0.0000
1.0549	0.0330	0.0104	0.0013	0.0000
1.0989	0.0328	0.0109	0.0014	0.0000
1.1429	0.0326	0.0115	0.0016	0.0000
1.1868	0.0324	0.0120	0.0018	0.0000

1.2308	0.0322	0.0126	0.0020	0.0000
1.2747	0.0320	0.0131	0.0022	0.0000
1.3187	0.0319	0.0137	0.0025	0.0000
1.3626	0.0317	0.0142	0.0027	0.0000
1.4066	0.0315	0.0148	0.0030	0.0000
1.4505	0.0313	0.0154	0.0030	0.0000
1.4945	0.0311	0.0159	0.0032	0.0000
1.5385	0.0309	0.0165	0.0035	0.0000
1.5824	0.0308	0.0171	0.0038	0.0000
1.6264	0.0306	0.0176	0.0041	0.0000
1.6703	0.0304	0.0182	0.0045	0.0000
1.7143	0.0302	0.0188	0.0048	0.0000
1.7582	0.0300	0.0194	0.0048	0.0000
1.8022	0.0298	0.0200	0.0049	0.0000
1.8462	0.0297	0.0206	0.0057	0.0000
1.8901	0.0295	0.0212	0.0061	0.0000
1.9341	0.0293	0.0218	0.0062	0.0000
1.9780	0.0291	0.0224	0.0063	0.0000
2.0220	0.0289	0.0230	0.0072	0.0000
2.0659	0.0287	0.0235	0.0073	0.0000
2.1099	0.0286	0.0241	0.0074	0.0000
2.1538	0.0284	0.0247	0.0074	0.0000
2.1978	0.0282	0.0253	0.0084	0.0000
2.2418	0.0280	0.0258	0.0084	0.0000
2.2857	0.0278	0.0264	0.0084	0.0000
2.3297	0.0277	0.0270	0.0089	0.0000
2.3736	0.0275	0.0276	0.0087	0.0000
2.4176	0.0273	0.0282	0.0086	0.0000
2.4615	0.0271	0.0288	0.0085	0.0000
2.5055	0.0269	0.0294	0.0085	0.0000
2.5495	0.0267	0.0300	0.0085	0.0000
2.5934	0.0266	0.0306	0.0085	0.0000
2.6374	0.0264	0.0312	0.0085	0.0000
2.6813	0.0262	0.0318	0.0090	0.0000
2.7253	0.0260	0.0325	0.0099	0.0000
2.7692	0.0258	0.0331	0.0099	0.0000
2.8132	0.0256	0.0337	0.0099	0.0000
2.8571	0.0255	0.0343	0.0099	0.0000
2.9011	0.0253	0.0350	0.0099	0.0000
2.9451	0.0251	0.0356	0.0099	0.0000
2.9890	0.0249	0.0363	0.0099	0.0000
3.0330	0.0247	0.0369	0.0099	0.0000
3.0769	0.0246	0.0375	0.0099	0.0000
3.1209	0.0244	0.0382	0.0099	0.0000
3.1648	0.0242	0.0388	0.0099	0.0000
3.2088	0.0240	0.0395	0.0099	0.0000
3.2527	0.0238	0.0402	0.0099	0.0000
3.2967	0.0236	0.0408	0.0099	0.0000
3.3407	0.0235	0.0415	0.0099	0.0000
3.3846	0.0233	0.0422	0.0099	0.0000
3.4286	0.0231	0.0428	0.0099	0.0000
3.4725	0.0229	0.0435	0.0099	0.0000
3.5000	0.0227	0.0439	0.0099	0.0000

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
3.5000	0.0373	0.0439	0.0000	0.0101	0.0000
3.5440	0.0375	0.0456	0.0000	0.0101	0.0000

3.5879	0.0376	0.0472	0.0000	0.0104	0.0000
3.6319	0.0378	0.0489	0.0000	0.0106	0.0000
3.6758	0.0380	0.0506	0.0000	0.0108	0.0000
3.7198	0.0382	0.0522	0.0000	0.0110	0.0000
3.7637	0.0384	0.0539	0.0000	0.0112	0.0000
3.8077	0.0386	0.0556	0.0000	0.0115	0.0000
3.8516	0.0387	0.0573	0.0310	0.0117	0.0000
3.8956	0.0389	0.0590	0.1636	0.0119	0.0000
3.9396	0.0391	0.0607	0.3532	0.0121	0.0000
3.9835	0.0393	0.0624	0.5858	0.0123	0.0000
4.0000	0.0394	0.0631	0.8546	0.0124	0.0000

Surface IMP 1-5

Element Flows To:

Outlet 1	Outlet 2
	IMP 1-5

IMP 1-4

Bottom Length:	30.00 ft.
Bottom Width:	33.00 ft.
Material thickness of first layer:	2
Material type for first layer:	Loamy fine sand
Material thickness of second layer:	0.5
Material type for second layer:	ASTM 8
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (ft):	0.33
Orifice Diameter (in):	1
Offset (in):	0
Flow Through Underdrain (ac-ft):	8.054
Total Outflow (ac-ft):	8.697
Percent Through Underdrain:	92.61
Discharge Structure	
Riser Height:	0.33 ft.
Riser Diameter:	12 in.
Notch Type:	Rectangular
Notch Width:	0.000 ft.
Notch Height:	0.000 ft.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0373	0.0000	0.0000	0.0000
0.0440	0.0372	0.0002	0.0000	0.0000
0.0879	0.0370	0.0004	0.0000	0.0000
0.1319	0.0368	0.0006	0.0000	0.0000
0.1758	0.0366	0.0008	0.0000	0.0000
0.2198	0.0364	0.0010	0.0000	0.0000
0.2637	0.0362	0.0012	0.0000	0.0000
0.3077	0.0361	0.0016	0.0001	0.0000
0.3516	0.0359	0.0020	0.0001	0.0000
0.3956	0.0357	0.0024	0.0002	0.0000
0.4396	0.0355	0.0028	0.0002	0.0000
0.4835	0.0353	0.0032	0.0003	0.0000
0.5275	0.0351	0.0036	0.0004	0.0000
0.5714	0.0350	0.0040	0.0005	0.0000
0.6154	0.0348	0.0044	0.0006	0.0000
0.6593	0.0346	0.0049	0.0007	0.0000
0.7033	0.0344	0.0053	0.0008	0.0000
0.7473	0.0342	0.0057	0.0009	0.0000
0.7912	0.0341	0.0061	0.0011	0.0000
0.8352	0.0339	0.0066	0.0013	0.0000
0.8791	0.0337	0.0070	0.0015	0.0000
0.9231	0.0335	0.0075	0.0017	0.0000
0.9670	0.0333	0.0079	0.0020	0.0000
1.0110	0.0331	0.0083	0.0023	0.0000
1.0549	0.0330	0.0088	0.0026	0.0000
1.0989	0.0328	0.0093	0.0029	0.0000
1.1429	0.0326	0.0097	0.0030	0.0000
1.1868	0.0324	0.0102	0.0032	0.0000

1.2308	0.0322	0.0106	0.0036	0.0000
1.2747	0.0320	0.0111	0.0040	0.0000
1.3187	0.0319	0.0116	0.0044	0.0000
1.3626	0.0317	0.0120	0.0047	0.0000
1.4066	0.0315	0.0125	0.0048	0.0000
1.4505	0.0313	0.0130	0.0056	0.0000
1.4945	0.0311	0.0135	0.0061	0.0000
1.5385	0.0309	0.0140	0.0062	0.0000
1.5824	0.0308	0.0144	0.0063	0.0000
1.6264	0.0306	0.0149	0.0073	0.0000
1.6703	0.0304	0.0154	0.0074	0.0000
1.7143	0.0302	0.0159	0.0074	0.0000
1.7582	0.0300	0.0164	0.0080	0.0000
1.8022	0.0298	0.0169	0.0082	0.0000
1.8462	0.0297	0.0174	0.0088	0.0000
1.8901	0.0295	0.0179	0.0091	0.0000
1.9341	0.0293	0.0184	0.0096	0.0000
1.9780	0.0291	0.0190	0.0099	0.0000
2.0220	0.0289	0.0195	0.0104	0.0000
2.0659	0.0287	0.0201	0.0106	0.0000
2.1099	0.0286	0.0207	0.0111	0.0000
2.1538	0.0284	0.0212	0.0114	0.0000
2.1978	0.0282	0.0218	0.0118	0.0000
2.2418	0.0280	0.0224	0.0120	0.0000
2.2857	0.0278	0.0230	0.0124	0.0000
2.3297	0.0277	0.0236	0.0127	0.0000
2.3736	0.0275	0.0242	0.0131	0.0000
2.4176	0.0273	0.0248	0.0133	0.0000
2.4615	0.0271	0.0253	0.0136	0.0000
2.5055	0.0269	0.0260	0.0138	0.0000
2.5495	0.0267	0.0266	0.0142	0.0000
2.5934	0.0266	0.0272	0.0141	0.0000
2.6374	0.0264	0.0278	0.0141	0.0000
2.6813	0.0262	0.0284	0.0140	0.0000
2.7253	0.0260	0.0290	0.0140	0.0000
2.7692	0.0258	0.0296	0.0140	0.0000
2.8132	0.0256	0.0303	0.0140	0.0000
2.8571	0.0255	0.0309	0.0144	0.0000
2.9011	0.0253	0.0315	0.0150	0.0000
2.9451	0.0251	0.0322	0.0158	0.0000
2.9890	0.0249	0.0328	0.0167	0.0000
3.0330	0.0247	0.0334	0.0176	0.0000
3.0769	0.0246	0.0341	0.0184	0.0000
3.1209	0.0244	0.0347	0.0197	0.0000
3.1648	0.0242	0.0354	0.0197	0.0000
3.2088	0.0240	0.0361	0.0197	0.0000
3.2527	0.0238	0.0367	0.0197	0.0000
3.2967	0.0236	0.0374	0.0197	0.0000
3.3407	0.0235	0.0380	0.0197	0.0000
3.3846	0.0233	0.0387	0.0197	0.0000
3.4286	0.0231	0.0394	0.0197	0.0000
3.4725	0.0229	0.0401	0.0197	0.0000
3.5000	0.0227	0.0405	0.0197	0.0000

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
3.5000	0.0373	0.0405	0.0000	0.0201	0.0000
3.5440	0.0375	0.0421	0.0000	0.0201	0.0000

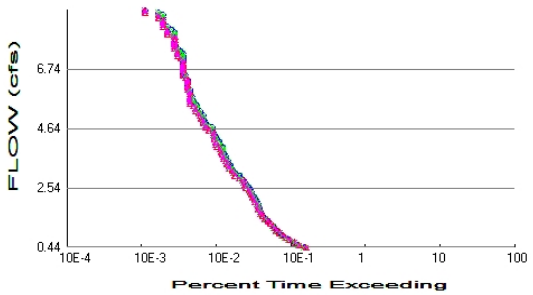
3.5879	0.0376	0.0438	0.0000	0.0205	0.0000
3.6319	0.0378	0.0454	0.0000	0.0210	0.0000
3.6758	0.0380	0.0471	0.0000	0.0214	0.0000
3.7198	0.0382	0.0488	0.0000	0.0218	0.0000
3.7637	0.0384	0.0505	0.0000	0.0223	0.0000
3.8077	0.0386	0.0521	0.0000	0.0227	0.0000
3.8516	0.0387	0.0538	0.0310	0.0231	0.0000
3.8956	0.0389	0.0556	0.1636	0.0236	0.0000
3.9396	0.0391	0.0573	0.3532	0.0240	0.0000
3.9835	0.0393	0.0590	0.5858	0.0244	0.0000
4.0000	0.0394	0.0596	0.8546	0.0246	0.0000

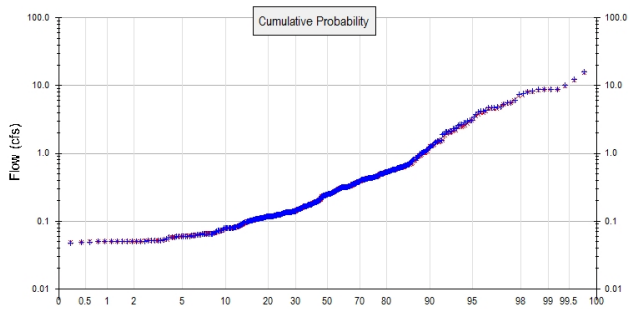
Surface IMP 1-4

Element Flows To:

Outlet 1	Outlet 2
	IMP 1-4

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 21.55
Total Impervious Area: 1.63

Mitigated Landuse Totals for POC #1
Total Pervious Area: 20.81
Total Impervious Area: 2.37

Flow Frequency Method: Cunnane

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	4.362099
5 year	8.162551
10 year	8.837298
25 year	12.150309

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	4.171257
5 year	8.041908
10 year	8.806092
25 year	11.672446

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.4362	551	573	103	Pass
0.5211	458	471	102	Pass
0.6059	398	407	102	Pass
0.6908	338	348	102	Pass
0.7756	303	309	101	Pass
0.8605	275	283	102	Pass
0.9454	252	257	101	Pass
1.0302	236	233	98	Pass
1.1151	217	220	101	Pass
1.1999	209	208	99	Pass
1.2848	191	191	100	Pass
1.3697	180	179	99	Pass
1.4545	168	161	95	Pass
1.5394	152	150	98	Pass
1.6242	146	143	97	Pass
1.7091	142	141	99	Pass
1.7940	139	134	96	Pass
1.8788	133	131	98	Pass
1.9637	130	128	98	Pass
2.0485	128	120	93	Pass
2.1334	122	117	95	Pass
2.2183	116	110	94	Pass
2.3031	109	106	97	Pass
2.3880	106	103	97	Pass
2.4728	103	99	96	Pass
2.5577	99	91	91	Pass
2.6426	92	88	95	Pass
2.7274	86	85	98	Pass
2.8123	83	82	98	Pass
2.8971	79	73	92	Pass
2.9820	74	65	87	Pass
3.0669	65	62	95	Pass
3.1517	60	59	98	Pass
3.2366	57	54	94	Pass
3.3214	56	53	94	Pass
3.4063	54	50	92	Pass
3.4912	52	49	94	Pass
3.5760	49	46	93	Pass
3.6609	48	45	93	Pass
3.7457	47	43	91	Pass
3.8306	45	42	93	Pass
3.9154	44	41	93	Pass
4.0003	44	37	84	Pass
4.0852	41	36	87	Pass
4.1700	40	36	90	Pass
4.2549	37	34	91	Pass
4.3397	36	34	94	Pass
4.4246	34	33	97	Pass
4.5095	33	33	100	Pass
4.5943	32	29	90	Pass
4.6792	32	26	81	Pass
4.7640	28	26	92	Pass
4.8489	26	24	92	Pass

4.9338	25	24	96	Pass
5.0186	24	23	95	Pass
5.1035	24	22	91	Pass
5.1883	22	21	95	Pass
5.2732	22	19	86	Pass
5.3581	20	19	95	Pass
5.4429	20	18	90	Pass
5.5278	19	16	84	Pass
5.6126	18	16	88	Pass
5.6975	17	16	94	Pass
5.7824	17	16	94	Pass
5.8672	16	16	100	Pass
5.9521	16	16	100	Pass
6.0369	16	15	93	Pass
6.1218	15	15	100	Pass
6.2067	15	15	100	Pass
6.2915	15	15	100	Pass
6.3764	15	15	100	Pass
6.4612	14	14	100	Pass
6.5461	14	13	92	Pass
6.6310	13	13	100	Pass
6.7158	13	13	100	Pass
6.8007	13	13	100	Pass
6.8855	13	13	100	Pass
6.9704	13	13	100	Pass
7.0552	13	13	100	Pass
7.1401	13	12	92	Pass
7.2250	13	11	84	Pass
7.3098	13	11	84	Pass
7.3947	12	11	91	Pass
7.4795	11	10	90	Pass
7.5644	10	10	100	Pass
7.6493	10	10	100	Pass
7.7341	10	10	100	Pass
7.8190	10	10	100	Pass
7.9038	10	10	100	Pass
7.9887	10	8	80	Pass
8.0736	10	8	80	Pass
8.1584	9	8	88	Pass
8.2433	8	7	87	Pass
8.3281	7	7	100	Pass
8.4130	7	7	100	Pass
8.4979	7	7	100	Pass
8.5827	7	6	85	Pass
8.6676	7	6	85	Pass
8.7524	6	4	66	Pass
8.8373	4	4	100	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

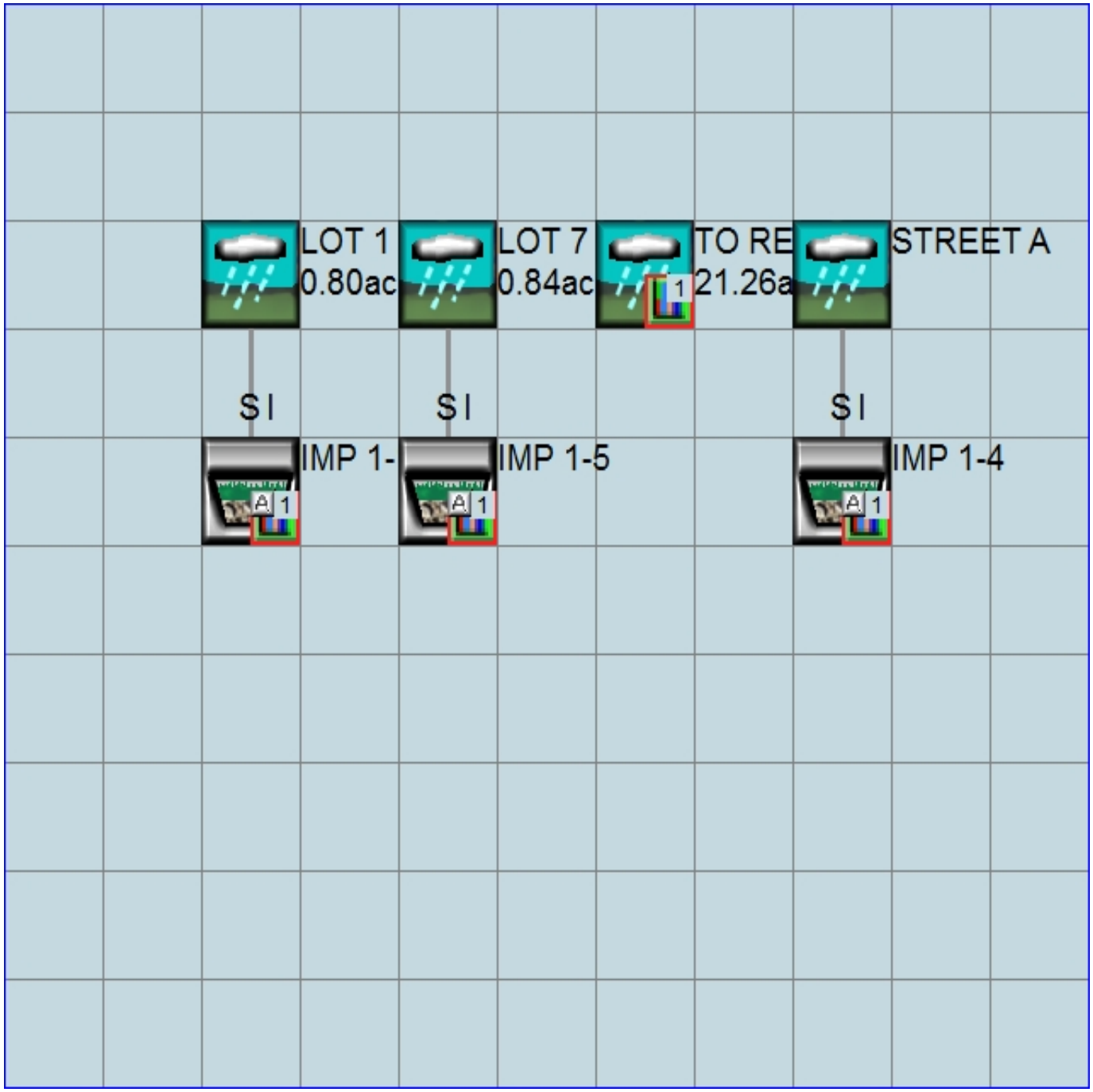
IMPLND Changes

No IMPLND changes have been made.

Appendix

Predeveloped Schematic

Mitigated Schematic



SDHM2011

PROJECT REPORT

POC 2

General Model Information

Project Name:	137718-POC2
Site Name:	ALISO CANYON - POC 2
Site Address:	
City:	RANCHO SANTA FE
Report Date:	8/14/2014
Gage:	POWAY
Data Start:	10/01/1963
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.00
Version:	2014/08/12

POC Thresholds

Low Flow Threshold for POC2:	10 Percent of the 2 Year
High Flow Threshold for POC2:	10 Year

Landuse Basin Data
Predeveloped Land Use

POC 2

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	0.66
D,Grass,MOD(5-10%)	1.3
D,Grass,STEEP(10-20	0.65
Pervious Total	2.61
Impervious Land Use	Acres
Impervious Total	0
Basin Total	2.61

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

LOT 2

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	0.74
Pervious Total	0.74
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.23
Impervious Total	0.23
Basin Total	0.97

Element Flows To:

Surface	Interflow	Groundwater
Surface IMP 2	Surface IMP 2	

TO REMAIN

Bypass:	Yes
GroundWater:	No
Pervious Land Use	Acres
D,Grass,MOD(5-10%)	0.78
D,Grass,STEEP(10-20	0.52
D,Grass,FLAT(0-5%)	0.34
Pervious Total	1.64
Impervious Land Use	Acres
Impervious Total	0
Basin Total	1.64

Element Flows To:

Surface	Interflow	Groundwater

Routing Elements
Predeveloped Routing

Mitigated Routing

IMP 2

Bottom Length:	30.00 ft.
Bottom Width:	33.00 ft.
Material thickness of first layer:	3
Material type for first layer:	Loamy fine sand
Material thickness of second layer:	0.5
Material type for second layer:	ASTM 8
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (ft):	0.33
Orifice Diameter (in):	1
Offset (in):	0
Flow Through Underdrain (ac-ft):	8.031
Total Outflow (ac-ft):	9.225
Percent Through Underdrain:	87.06
Discharge Structure	
Riser Height:	0.33 ft.
Riser Diameter:	12 in.
Notch Type:	Rectangular
Notch Width:	0.000 ft.
Notch Height:	0.000 ft.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0414	0.0000	0.0000	0.0000
0.0549	0.0412	0.0002	0.0000	0.0000
0.1099	0.0410	0.0005	0.0000	0.0000
0.1648	0.0408	0.0007	0.0000	0.0000
0.2198	0.0406	0.0010	0.0000	0.0000
0.2747	0.0403	0.0012	0.0000	0.0000
0.3297	0.0401	0.0017	0.0000	0.0000
0.3846	0.0399	0.0022	0.0000	0.0000
0.4396	0.0396	0.0027	0.0001	0.0000
0.4945	0.0394	0.0032	0.0001	0.0000
0.5495	0.0392	0.0038	0.0001	0.0000
0.6044	0.0389	0.0043	0.0002	0.0000
0.6593	0.0387	0.0048	0.0002	0.0000
0.7143	0.0385	0.0053	0.0003	0.0000
0.7692	0.0383	0.0059	0.0004	0.0000
0.8242	0.0380	0.0064	0.0005	0.0000
0.8791	0.0378	0.0070	0.0006	0.0000
0.9341	0.0376	0.0075	0.0007	0.0000
0.9890	0.0373	0.0081	0.0008	0.0000
1.0440	0.0371	0.0086	0.0009	0.0000
1.0989	0.0369	0.0092	0.0011	0.0000
1.1538	0.0367	0.0098	0.0012	0.0000
1.2088	0.0364	0.0103	0.0013	0.0000
1.2637	0.0362	0.0109	0.0014	0.0000
1.3187	0.0360	0.0115	0.0016	0.0000
1.3736	0.0357	0.0121	0.0018	0.0000

1.4286	0.0355	0.0127	0.0020	0.0000
1.4835	0.0353	0.0133	0.0023	0.0000
1.5385	0.0351	0.0139	0.0025	0.0000
1.5934	0.0348	0.0145	0.0028	0.0000
1.6484	0.0346	0.0151	0.0031	0.0000
1.7033	0.0344	0.0157	0.0034	0.0000
1.7582	0.0341	0.0164	0.0037	0.0000
1.8132	0.0339	0.0170	0.0041	0.0000
1.8681	0.0337	0.0176	0.0044	0.0000
1.9231	0.0335	0.0183	0.0048	0.0000
1.9780	0.0332	0.0189	0.0049	0.0000
2.0330	0.0330	0.0195	0.0052	0.0000
2.0879	0.0328	0.0202	0.0056	0.0000
2.1429	0.0325	0.0209	0.0060	0.0000
2.1978	0.0323	0.0215	0.0062	0.0000
2.2527	0.0321	0.0222	0.0063	0.0000
2.3077	0.0319	0.0229	0.0072	0.0000
2.3626	0.0316	0.0235	0.0077	0.0000
2.4176	0.0314	0.0242	0.0077	0.0000
2.4725	0.0312	0.0249	0.0077	0.0000
2.5275	0.0309	0.0256	0.0083	0.0000
2.5824	0.0307	0.0263	0.0086	0.0000
2.6374	0.0305	0.0270	0.0099	0.0000
2.6923	0.0303	0.0277	0.0099	0.0000
2.7473	0.0300	0.0284	0.0100	0.0000
2.8022	0.0298	0.0291	0.0104	0.0000
2.8571	0.0296	0.0298	0.0107	0.0000
2.9121	0.0293	0.0305	0.0112	0.0000
2.9670	0.0291	0.0313	0.0115	0.0000
3.0220	0.0289	0.0321	0.0120	0.0000
3.0769	0.0287	0.0329	0.0123	0.0000
3.1319	0.0284	0.0337	0.0128	0.0000
3.1868	0.0282	0.0345	0.0131	0.0000
3.2418	0.0280	0.0353	0.0135	0.0000
3.2967	0.0277	0.0362	0.0138	0.0000
3.3516	0.0275	0.0370	0.0142	0.0000
3.4066	0.0273	0.0378	0.0145	0.0000
3.4615	0.0271	0.0387	0.0149	0.0000
3.5165	0.0268	0.0395	0.0151	0.0000
3.5714	0.0266	0.0404	0.0155	0.0000
3.6264	0.0264	0.0412	0.0157	0.0000
3.6813	0.0261	0.0421	0.0161	0.0000
3.7363	0.0259	0.0430	0.0163	0.0000
3.7912	0.0257	0.0438	0.0163	0.0000
3.8462	0.0255	0.0447	0.0164	0.0000
3.9011	0.0252	0.0456	0.0164	0.0000
3.9560	0.0250	0.0465	0.0166	0.0000
4.0110	0.0248	0.0474	0.0173	0.0000
4.0659	0.0246	0.0483	0.0182	0.0000
4.1209	0.0243	0.0492	0.0197	0.0000
4.1758	0.0241	0.0501	0.0197	0.0000
4.2308	0.0239	0.0510	0.0197	0.0000
4.2857	0.0236	0.0519	0.0197	0.0000
4.3407	0.0234	0.0529	0.0197	0.0000
4.3956	0.0232	0.0538	0.0197	0.0000
4.4505	0.0230	0.0547	0.0197	0.0000
4.5000	0.0227	0.0556	0.0197	0.0000

Landscape Swale Hydraulic Table

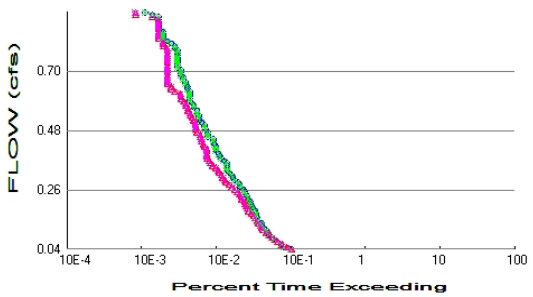
Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
4.5000	0.0414	0.0556	0.0000	0.0200	0.0000
4.5549	0.0417	0.0579	0.0000	0.0200	0.0000
4.6099	0.0419	0.0602	0.0000	0.0204	0.0000
4.6648	0.0421	0.0625	0.0000	0.0207	0.0000
4.7198	0.0424	0.0648	0.0000	0.0211	0.0000
4.7747	0.0426	0.0671	0.0000	0.0215	0.0000
4.8297	0.0428	0.0695	0.0000	0.0218	0.0000
4.8846	0.0431	0.0718	0.1243	0.0222	0.0000
4.9396	0.0433	0.0742	0.3532	0.0226	0.0000
4.9945	0.0435	0.0766	0.6498	0.0229	0.0000
5.0000	0.0435	0.0768	1.0012	0.0229	0.0000

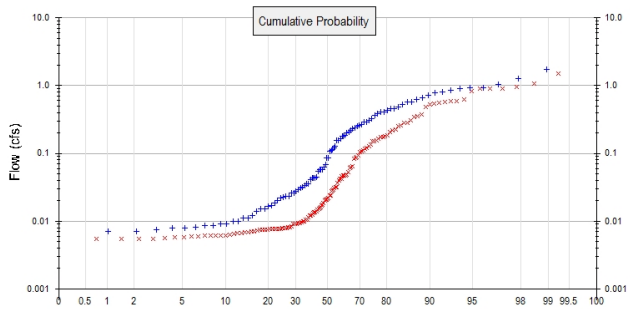
Surface IMP 2

Element Flows To:

Outlet 1	Outlet 2
	IMP 2

Analysis Results
POC 2





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 2.61
Total Impervious Area: 0

Mitigated Landuse Totals for POC #2
Total Pervious Area: 2.38
Total Impervious Area: 0.23

Flow Frequency Method: Cunnane

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	**Flow(cfs)**
2 year	0.402968
5 year	0.796281
10 year	0.925779
25 year	1.260842

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	**Flow(cfs)**
2 year	0.279763
5 year	0.607221
10 year	0.907932
25 year	1.055005

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0403	358	373	104	Pass
0.0492	290	321	110	Pass
0.0582	267	273	102	Pass
0.0671	237	238	100	Pass
0.0761	215	218	101	Pass
0.0850	198	203	102	Pass
0.0940	183	186	101	Pass
0.1029	176	169	96	Pass
0.1119	166	149	89	Pass
0.1208	157	144	91	Pass
0.1297	148	141	95	Pass
0.1387	145	130	89	Pass
0.1476	131	126	96	Pass
0.1566	129	119	92	Pass
0.1655	122	114	93	Pass
0.1745	122	106	86	Pass
0.1834	120	98	81	Pass
0.1923	113	94	83	Pass
0.2013	108	91	84	Pass
0.2102	105	88	83	Pass
0.2192	102	87	85	Pass
0.2281	97	79	81	Pass
0.2371	92	78	84	Pass
0.2460	90	74	82	Pass
0.2550	87	69	79	Pass
0.2639	83	63	75	Pass
0.2728	76	58	76	Pass
0.2818	74	53	71	Pass
0.2907	70	48	68	Pass
0.2997	64	47	73	Pass
0.3086	60	44	73	Pass
0.3176	57	42	73	Pass
0.3265	54	39	72	Pass
0.3355	51	38	74	Pass
0.3444	51	36	70	Pass
0.3533	51	32	62	Pass
0.3623	50	30	60	Pass
0.3712	46	29	63	Pass
0.3802	42	27	64	Pass
0.3891	41	27	65	Pass
0.3981	39	27	69	Pass
0.4070	36	27	75	Pass
0.4160	36	27	75	Pass
0.4249	36	25	69	Pass
0.4338	34	24	70	Pass
0.4428	33	23	69	Pass
0.4517	33	23	69	Pass
0.4607	28	22	78	Pass
0.4696	28	22	78	Pass
0.4786	28	20	71	Pass
0.4875	26	19	73	Pass
0.4965	25	19	76	Pass
0.5054	25	19	76	Pass

0.5143	23	19	82	Pass
0.5233	22	18	81	Pass
0.5322	21	17	80	Pass
0.5412	21	16	76	Pass
0.5501	20	16	80	Pass
0.5591	20	15	75	Pass
0.5680	18	15	83	Pass
0.5770	18	14	77	Pass
0.5859	17	14	82	Pass
0.5948	16	13	81	Pass
0.6038	16	12	75	Pass
0.6127	16	12	75	Pass
0.6217	16	12	75	Pass
0.6306	16	10	62	Pass
0.6396	15	9	60	Pass
0.6485	15	9	60	Pass
0.6575	14	8	57	Pass
0.6664	14	8	57	Pass
0.6753	13	8	61	Pass
0.6843	13	8	61	Pass
0.6932	12	8	66	Pass
0.7022	12	8	66	Pass
0.7111	12	8	66	Pass
0.7201	11	8	72	Pass
0.7290	11	8	72	Pass
0.7379	11	8	72	Pass
0.7469	11	8	72	Pass
0.7558	11	8	72	Pass
0.7648	11	8	72	Pass
0.7737	11	8	72	Pass
0.7827	11	8	72	Pass
0.7916	10	8	80	Pass
0.8006	10	7	70	Pass
0.8095	9	7	77	Pass
0.8184	8	7	87	Pass
0.8274	7	6	85	Pass
0.8363	7	6	85	Pass
0.8453	7	6	85	Pass
0.8542	7	6	85	Pass
0.8632	6	6	100	Pass
0.8721	6	6	100	Pass
0.8811	6	6	100	Pass
0.8900	6	6	100	Pass
0.8989	6	6	100	Pass
0.9079	6	5	83	Pass
0.9168	5	3	60	Pass
0.9258	4	3	75	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

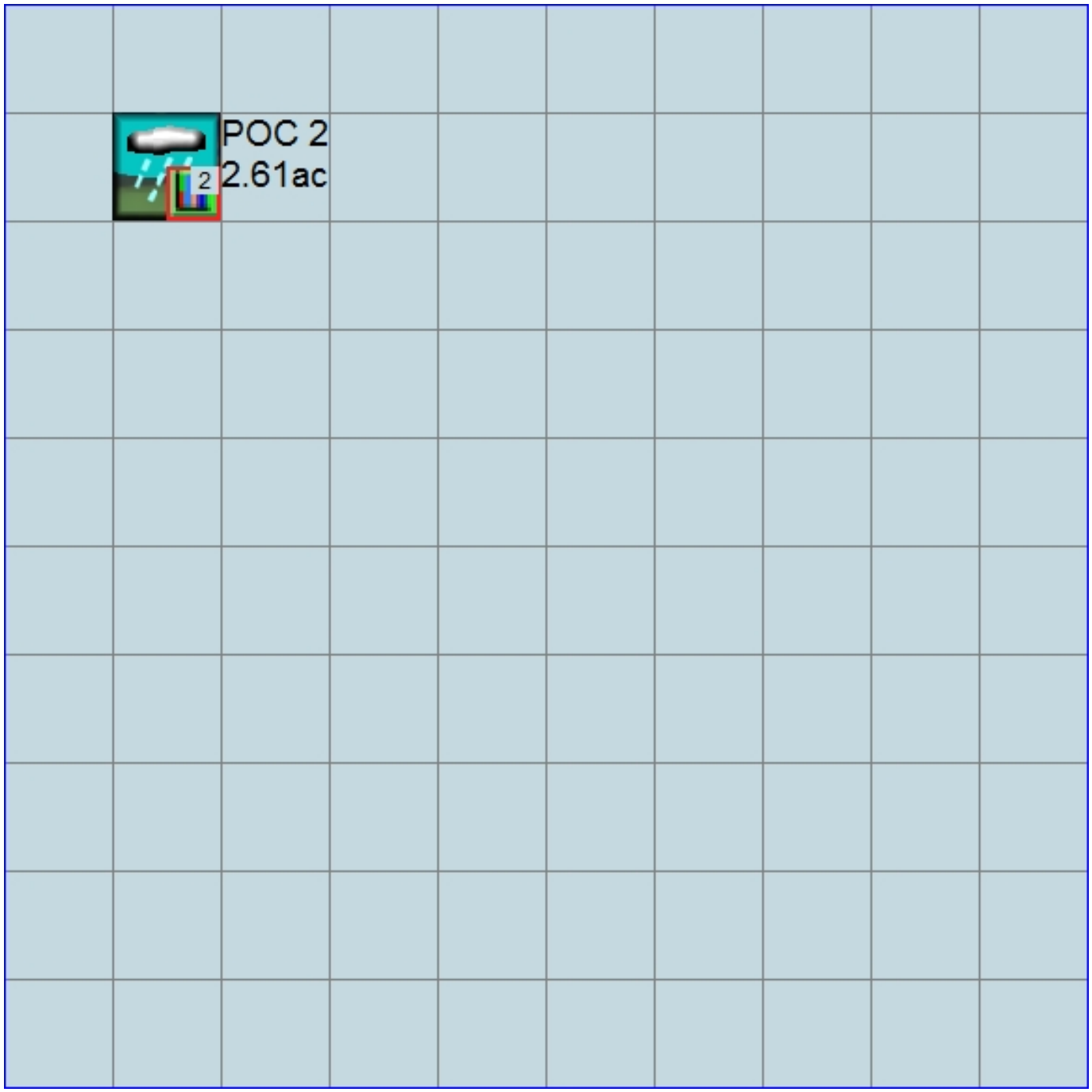
No PERLND changes have been made.

IMPLND Changes

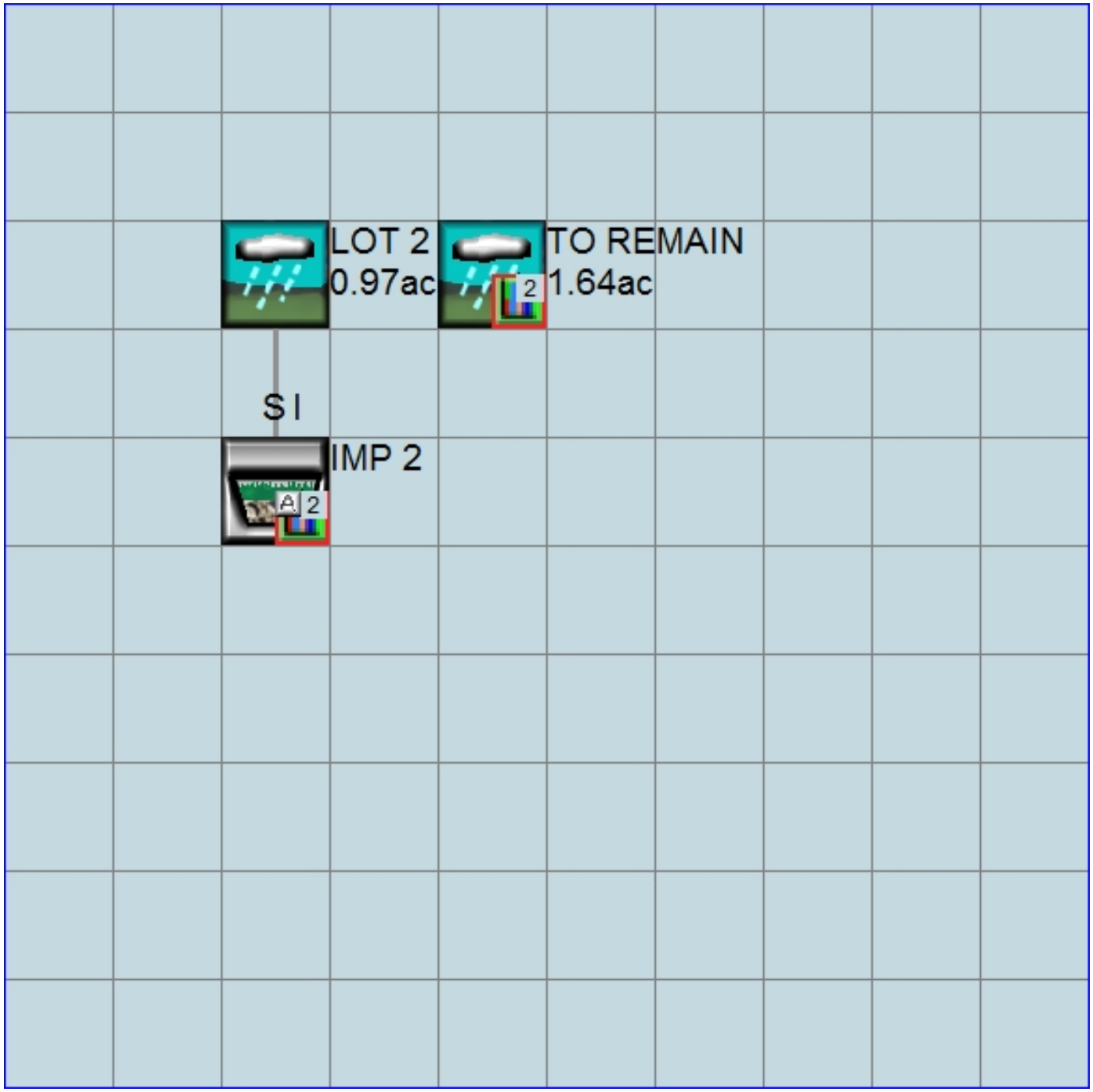
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



SDHM2011

PROJECT REPORT

POC 3

General Model Information

Project Name:	137718-POC3
Site Name:	ALISO CANYON - POC 3
Site Address:	
City:	RANCHO SANTA FE
Report Date:	8/14/2014
Gage:	POWAY
Data Start:	10/01/1963
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.00
Version:	2014/08/12

POC Thresholds

Low Flow Threshold for POC3:	10 Percent of the 2 Year
High Flow Threshold for POC3:	10 Year

Landuse Basin Data
Predeveloped Land Use

POC 3

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	0.54
D,Grass,MOD(5-10%)	0.81
D,Grass,STEEP(10-20	0.17
Pervious Total	1.52
Impervious Land Use	Acres
Impervious Total	0
Basin Total	1.52

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

LOT 3

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	0.68
Pervious Total	0.68
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.23
Impervious Total	0.23
Basin Total	0.91

Element Flows To:

Surface	Interflow	Groundwater
Surface IMP 3	Surface IMP 3	

TO REMAIN

Bypass:	Yes
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	0.28
D,Grass,MOD(5-10%)	0.26
D,Grass,STEEP(10-20	0.07
Pervious Total	0.61
Impervious Land Use	Acres
Impervious Total	0
Basin Total	0.61

Element Flows To:

Surface	Interflow	Groundwater

Routing Elements
Predeveloped Routing

Mitigated Routing

IMP 3

Bottom Length:	30.00 ft.
Bottom Width:	40.00 ft.
Material thickness of first layer:	3
Material type for first layer:	Loamy fine sand
Material thickness of second layer:	0.5
Material type for second layer:	ASTM 8
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (ft):	0.33
Orifice Diameter (in):	0.5
Offset (in):	0
Flow Through Underdrain (ac-ft):	7.796
Total Outflow (ac-ft):	9.041
Percent Through Underdrain:	86.23
Discharge Structure	
Riser Height:	0.33 ft.
Riser Diameter:	12 in.
Notch Type:	Rectangular
Notch Width:	0.000 ft.
Notch Height:	0.000 ft.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0463	0.0000	0.0000	0.0000
0.0549	0.0461	0.0003	0.0000	0.0000
0.1099	0.0458	0.0006	0.0000	0.0000
0.1648	0.0456	0.0009	0.0000	0.0000
0.2198	0.0454	0.0012	0.0000	0.0000
0.2747	0.0452	0.0015	0.0000	0.0000
0.3297	0.0449	0.0021	0.0000	0.0000
0.3846	0.0447	0.0027	0.0001	0.0000
0.4396	0.0445	0.0033	0.0001	0.0000
0.4945	0.0442	0.0039	0.0001	0.0000
0.5495	0.0440	0.0045	0.0002	0.0000
0.6044	0.0438	0.0051	0.0002	0.0000
0.6593	0.0436	0.0058	0.0003	0.0000
0.7143	0.0433	0.0064	0.0004	0.0000
0.7692	0.0431	0.0070	0.0005	0.0000
0.8242	0.0429	0.0077	0.0006	0.0000
0.8791	0.0426	0.0083	0.0007	0.0000
0.9341	0.0424	0.0090	0.0008	0.0000
0.9890	0.0422	0.0096	0.0010	0.0000
1.0440	0.0419	0.0103	0.0011	0.0000
1.0989	0.0417	0.0110	0.0013	0.0000
1.1538	0.0415	0.0116	0.0014	0.0000
1.2088	0.0413	0.0123	0.0015	0.0000
1.2637	0.0410	0.0130	0.0015	0.0000
1.3187	0.0408	0.0137	0.0016	0.0000
1.3736	0.0406	0.0144	0.0017	0.0000

1.4286	0.0403	0.0151	0.0018	0.0000
1.4835	0.0401	0.0158	0.0020	0.0000
1.5385	0.0399	0.0165	0.0021	0.0000
1.5934	0.0397	0.0172	0.0023	0.0000
1.6484	0.0394	0.0179	0.0024	0.0000
1.7033	0.0392	0.0186	0.0026	0.0000
1.7582	0.0390	0.0193	0.0026	0.0000
1.8132	0.0387	0.0201	0.0028	0.0000
1.8681	0.0385	0.0208	0.0029	0.0000
1.9231	0.0383	0.0215	0.0030	0.0000
1.9780	0.0381	0.0223	0.0031	0.0000
2.0330	0.0378	0.0230	0.0032	0.0000
2.0879	0.0376	0.0238	0.0033	0.0000
2.1429	0.0374	0.0245	0.0034	0.0000
2.1978	0.0371	0.0253	0.0034	0.0000
2.2527	0.0369	0.0261	0.0036	0.0000
2.3077	0.0367	0.0268	0.0036	0.0000
2.3626	0.0365	0.0276	0.0037	0.0000
2.4176	0.0362	0.0284	0.0038	0.0000
2.4725	0.0360	0.0292	0.0039	0.0000
2.5275	0.0358	0.0300	0.0039	0.0000
2.5824	0.0355	0.0307	0.0040	0.0000
2.6374	0.0353	0.0315	0.0041	0.0000
2.6923	0.0351	0.0324	0.0042	0.0000
2.7473	0.0349	0.0332	0.0042	0.0000
2.8022	0.0346	0.0340	0.0043	0.0000
2.8571	0.0344	0.0348	0.0044	0.0000
2.9121	0.0342	0.0356	0.0045	0.0000
2.9670	0.0339	0.0364	0.0045	0.0000
3.0220	0.0337	0.0374	0.0046	0.0000
3.0769	0.0335	0.0383	0.0046	0.0000
3.1319	0.0333	0.0392	0.0047	0.0000
3.1868	0.0330	0.0401	0.0048	0.0000
3.2418	0.0328	0.0411	0.0049	0.0000
3.2967	0.0326	0.0420	0.0049	0.0000
3.3516	0.0323	0.0429	0.0050	0.0000
3.4066	0.0321	0.0439	0.0050	0.0000
3.4615	0.0319	0.0448	0.0051	0.0000
3.5165	0.0317	0.0458	0.0051	0.0000
3.5714	0.0314	0.0467	0.0052	0.0000
3.6264	0.0312	0.0477	0.0052	0.0000
3.6813	0.0310	0.0487	0.0053	0.0000
3.7363	0.0307	0.0497	0.0054	0.0000
3.7912	0.0305	0.0507	0.0054	0.0000
3.8462	0.0303	0.0517	0.0055	0.0000
3.9011	0.0301	0.0526	0.0055	0.0000
3.9560	0.0298	0.0536	0.0056	0.0000
4.0110	0.0296	0.0547	0.0057	0.0000
4.0659	0.0294	0.0557	0.0057	0.0000
4.1209	0.0291	0.0567	0.0057	0.0000
4.1758	0.0289	0.0577	0.0057	0.0000
4.2308	0.0287	0.0587	0.0057	0.0000
4.2857	0.0285	0.0598	0.0057	0.0000
4.3407	0.0282	0.0608	0.0058	0.0000
4.3956	0.0280	0.0618	0.0059	0.0000
4.4505	0.0278	0.0629	0.0061	0.0000
4.5000	0.0275	0.0638	0.0139	0.0000

Landscape Swale Hydraulic Table

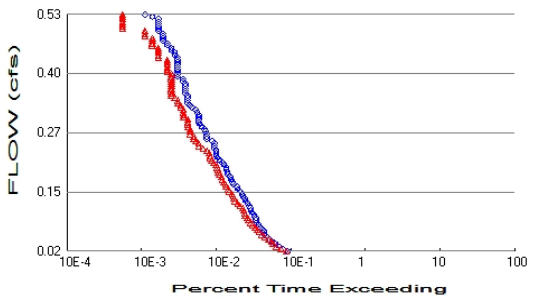
Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
4.5000	0.0463	0.0638	0.0000	0.0243	0.0000
4.5549	0.0465	0.0664	0.0000	0.0243	0.0000
4.6099	0.0467	0.0689	0.0000	0.0247	0.0000
4.6648	0.0470	0.0715	0.0000	0.0252	0.0000
4.7198	0.0472	0.0741	0.0000	0.0256	0.0000
4.7747	0.0474	0.0767	0.0000	0.0260	0.0000
4.8297	0.0477	0.0793	0.0000	0.0265	0.0000
4.8846	0.0479	0.0819	0.1243	0.0269	0.0000
4.9396	0.0481	0.0846	0.3532	0.0273	0.0000
4.9945	0.0483	0.0872	0.6498	0.0278	0.0000
5.0000	0.0484	0.0875	1.0012	0.0278	0.0000

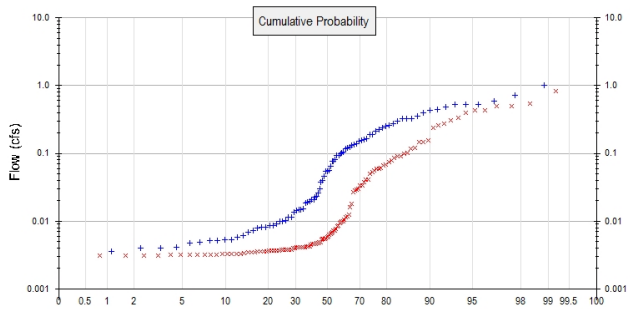
Surface IMP 3

Element Flows To:

Outlet 1	Outlet 2
	IMP 3

Analysis Results
POC 3





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #3
Total Pervious Area: 1.52
Total Impervious Area: 0

Mitigated Landuse Totals for POC #3
Total Pervious Area: 1.29
Total Impervious Area: 0.23

Flow Frequency Method: Cunnane

Flow Frequency Return Periods for Predeveloped. POC #3

Return Period	**Flow(cfs)**
2 year	0.213287
5 year	0.438654
10 year	0.526841
25 year	0.715273

Flow Frequency Return Periods for Mitigated. POC #3

Return Period	**Flow(cfs)**
2 year	0.090357
5 year	0.3142
10 year	0.458189
25 year	0.538026

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0213	328	312	95	Pass
0.0264	280	267	95	Pass
0.0315	251	233	92	Pass
0.0366	225	209	92	Pass
0.0418	203	197	97	Pass
0.0469	186	180	96	Pass
0.0520	173	161	93	Pass
0.0571	160	147	91	Pass
0.0622	158	135	85	Pass
0.0673	150	127	84	Pass
0.0724	142	119	83	Pass
0.0775	133	111	83	Pass
0.0826	124	104	83	Pass
0.0877	123	98	79	Pass
0.0928	123	94	76	Pass
0.0979	116	88	75	Pass
0.1030	110	86	78	Pass
0.1081	105	84	80	Pass
0.1132	102	81	79	Pass
0.1183	100	75	75	Pass
0.1235	94	70	74	Pass
0.1286	90	65	72	Pass
0.1337	87	62	71	Pass
0.1388	82	61	74	Pass
0.1439	80	59	73	Pass
0.1490	76	54	71	Pass
0.1541	71	52	73	Pass
0.1592	68	49	72	Pass
0.1643	62	48	77	Pass
0.1694	59	45	76	Pass
0.1745	57	43	75	Pass
0.1796	55	42	76	Pass
0.1847	52	40	76	Pass
0.1898	51	38	74	Pass
0.1949	49	38	77	Pass
0.2000	49	37	75	Pass
0.2052	46	36	78	Pass
0.2103	43	33	76	Pass
0.2154	40	31	77	Pass
0.2205	38	30	78	Pass
0.2256	36	30	83	Pass
0.2307	36	29	80	Pass
0.2358	36	27	75	Pass
0.2409	34	24	70	Pass
0.2460	34	21	61	Pass
0.2511	34	21	61	Pass
0.2562	32	19	59	Pass
0.2613	27	18	66	Pass
0.2664	27	18	66	Pass
0.2715	27	16	59	Pass
0.2766	26	16	61	Pass
0.2817	25	16	64	Pass
0.2869	23	15	65	Pass

0.2920	22	15	68	Pass
0.2971	21	15	71	Pass
0.3022	21	15	71	Pass
0.3073	21	13	61	Pass
0.3124	21	13	61	Pass
0.3175	20	13	65	Pass
0.3226	19	13	68	Pass
0.3277	17	12	70	Pass
0.3328	16	12	75	Pass
0.3379	15	11	73	Pass
0.3430	15	11	73	Pass
0.3481	15	10	66	Pass
0.3532	15	9	60	Pass
0.3583	14	9	64	Pass
0.3634	14	9	64	Pass
0.3685	14	9	64	Pass
0.3737	14	9	64	Pass
0.3788	14	9	64	Pass
0.3839	13	9	69	Pass
0.3890	13	9	69	Pass
0.3941	11	9	81	Pass
0.3992	11	9	81	Pass
0.4043	11	8	72	Pass
0.4094	11	8	72	Pass
0.4145	11	8	72	Pass
0.4196	11	8	72	Pass
0.4247	11	8	72	Pass
0.4298	11	8	72	Pass
0.4349	11	6	54	Pass
0.4400	10	6	60	Pass
0.4451	10	6	60	Pass
0.4502	9	6	66	Pass
0.4554	9	6	66	Pass
0.4605	8	5	62	Pass
0.4656	8	5	62	Pass
0.4707	7	5	71	Pass
0.4758	7	5	71	Pass
0.4809	7	4	57	Pass
0.4860	7	4	57	Pass
0.4911	6	4	66	Pass
0.4962	6	2	33	Pass
0.5013	6	2	33	Pass
0.5064	6	2	33	Pass
0.5115	6	2	33	Pass
0.5166	6	2	33	Pass
0.5217	5	2	40	Pass
0.5268	4	2	50	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

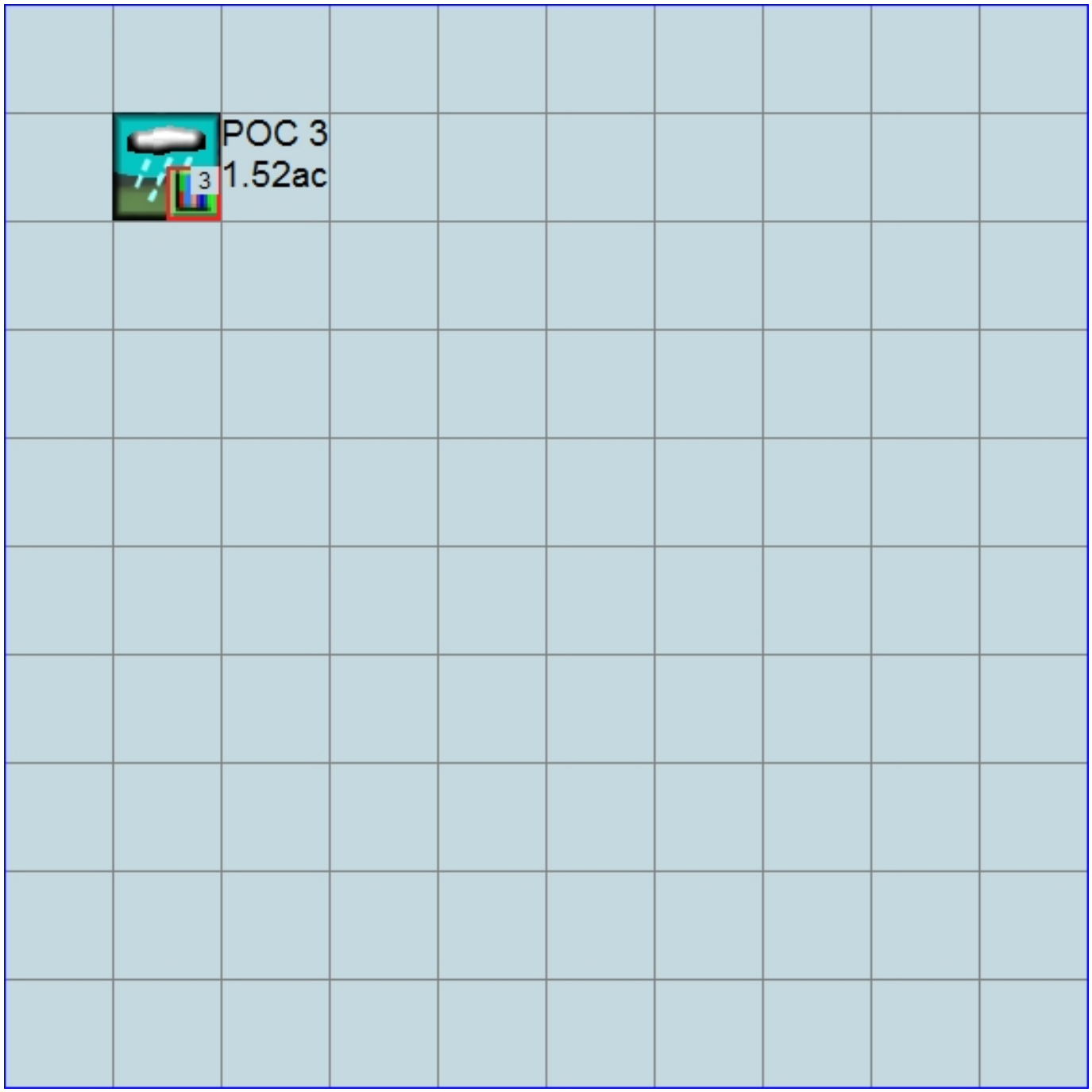
No PERLND changes have been made.

IMPLND Changes

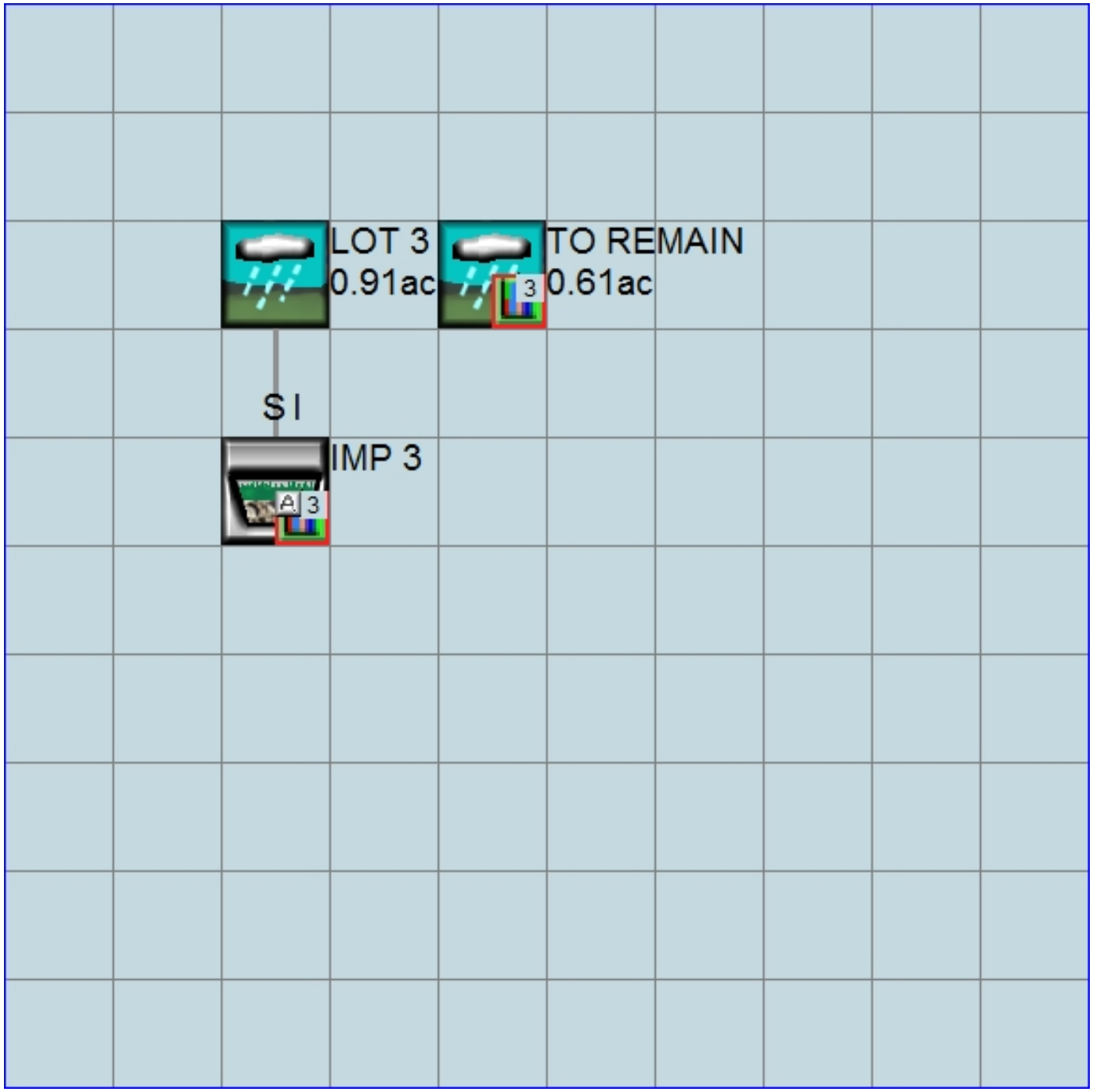
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



SDHM2011

PROJECT REPORT

POC 4

General Model Information

Project Name:	137718-POC4
Site Name:	ALISO CANYON - POC 4
Site Address:	
City:	RANCHO SANTA FE
Report Date:	8/15/2014
Gage:	POWAY
Data Start:	10/01/1963
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.00
Version:	2014/08/12

POC Thresholds

Low Flow Threshold for POC4:	10 Percent of the 2 Year
High Flow Threshold for POC4:	10 Year

Landuse Basin Data
Predeveloped Land Use

POC 4

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	2.94
D,Grass,MOD(5-10%)	6.29
D,Grass,STEEP(10-20	7.93
Pervious Total	17.16
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.63
Impervious Total	0.63
Basin Total	17.79

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

LOT 4

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	0.44
Pervious Total	0.44
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.23
Impervious Total	0.23
Basin Total	0.67

Element Flows To:

Surface	Interflow	Groundwater
Surface IMP 4-1	Surface IMP 4-1	

TO REMAIN

Bypass:	Yes
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	2.08
D,Grass,MOD(5-10%)	5.21
D,Grass,STEEP(10-20	7.14
Pervious Total	14.43
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.57
Impervious Total	0.57
Basin Total	15

Element Flows To:

Surface	Interflow	Groundwater

LOT 5

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	0.68
Pervious Total	0.68
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.23
Impervious Total	0.23
Basin Total	0.91

Element Flows To:

Surface	Interflow	Groundwater
Surface IMP 4-2	Surface IMP 4-2	

LOT 6

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
D,Grass,FLAT(0-5%)	0.57
Pervious Total	0.57
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.23
Impervious Total	0.23
Basin Total	0.8

Element Flows To:

Surface	Interflow	Groundwater
Surface IMP 4-3	Surface IMP 4-3	

STREET A

Bypass:	No
GroundWater:	No
Pervious Land Use	Acres
Pervious Total	0
Impervious Land Use	Acres
IMPERVIOUS-FLAT	0.41
Impervious Total	0.41
Basin Total	0.41

Element Flows To:

Surface	Interflow	Groundwater
Surface IMP 4-4	Surface IMP 4-4	

Routing Elements
Predeveloped Routing

Mitigated Routing

IMP 4-1

Bottom Length:	30.00 ft.
Bottom Width:	33.00 ft.
Material thickness of first layer:	3
Material type for first layer:	Loamy fine sand
Material thickness of second layer:	0.5
Material type for second layer:	ASTM 8
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (ft):	0.33
Orifice Diameter (in):	0.5
Offset (in):	0
Flow Through Underdrain (ac-ft):	7.344
Total Outflow (ac-ft):	8.351
Percent Through Underdrain:	87.95
Discharge Structure	
Riser Height:	0.33 ft.
Riser Diameter:	12 in.
Notch Type:	Rectangular
Notch Width:	0.000 ft.
Notch Height:	0.000 ft.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0414	0.0000	0.0000	0.0000
0.0549	0.0412	0.0002	0.0000	0.0000
0.1099	0.0410	0.0005	0.0000	0.0000
0.1648	0.0408	0.0007	0.0000	0.0000
0.2198	0.0406	0.0010	0.0000	0.0000
0.2747	0.0403	0.0012	0.0000	0.0000
0.3297	0.0401	0.0017	0.0000	0.0000
0.3846	0.0399	0.0022	0.0000	0.0000
0.4396	0.0396	0.0027	0.0001	0.0000
0.4945	0.0394	0.0032	0.0001	0.0000
0.5495	0.0392	0.0038	0.0001	0.0000
0.6044	0.0389	0.0043	0.0002	0.0000
0.6593	0.0387	0.0048	0.0002	0.0000
0.7143	0.0385	0.0053	0.0003	0.0000
0.7692	0.0383	0.0059	0.0004	0.0000
0.8242	0.0380	0.0064	0.0005	0.0000
0.8791	0.0378	0.0070	0.0006	0.0000
0.9341	0.0376	0.0075	0.0007	0.0000
0.9890	0.0373	0.0081	0.0008	0.0000
1.0440	0.0371	0.0086	0.0009	0.0000
1.0989	0.0369	0.0092	0.0011	0.0000
1.1538	0.0367	0.0098	0.0012	0.0000
1.2088	0.0364	0.0103	0.0013	0.0000
1.2637	0.0362	0.0109	0.0014	0.0000
1.3187	0.0360	0.0115	0.0015	0.0000
1.3736	0.0357	0.0121	0.0015	0.0000

1.4286	0.0355	0.0127	0.0017	0.0000
1.4835	0.0353	0.0133	0.0018	0.0000
1.5385	0.0351	0.0139	0.0020	0.0000
1.5934	0.0348	0.0145	0.0021	0.0000
1.6484	0.0346	0.0151	0.0023	0.0000
1.7033	0.0344	0.0157	0.0024	0.0000
1.7582	0.0341	0.0164	0.0026	0.0000
1.8132	0.0339	0.0170	0.0026	0.0000
1.8681	0.0337	0.0176	0.0028	0.0000
1.9231	0.0335	0.0183	0.0029	0.0000
1.9780	0.0332	0.0189	0.0030	0.0000
2.0330	0.0330	0.0195	0.0031	0.0000
2.0879	0.0328	0.0202	0.0032	0.0000
2.1429	0.0325	0.0209	0.0033	0.0000
2.1978	0.0323	0.0215	0.0034	0.0000
2.2527	0.0321	0.0222	0.0034	0.0000
2.3077	0.0319	0.0229	0.0036	0.0000
2.3626	0.0316	0.0235	0.0036	0.0000
2.4176	0.0314	0.0242	0.0037	0.0000
2.4725	0.0312	0.0249	0.0038	0.0000
2.5275	0.0309	0.0256	0.0039	0.0000
2.5824	0.0307	0.0263	0.0039	0.0000
2.6374	0.0305	0.0270	0.0040	0.0000
2.6923	0.0303	0.0277	0.0041	0.0000
2.7473	0.0300	0.0284	0.0042	0.0000
2.8022	0.0298	0.0291	0.0042	0.0000
2.8571	0.0296	0.0298	0.0043	0.0000
2.9121	0.0293	0.0305	0.0044	0.0000
2.9670	0.0291	0.0313	0.0045	0.0000
3.0220	0.0289	0.0321	0.0045	0.0000
3.0769	0.0287	0.0329	0.0046	0.0000
3.1319	0.0284	0.0337	0.0046	0.0000
3.1868	0.0282	0.0345	0.0047	0.0000
3.2418	0.0280	0.0353	0.0048	0.0000
3.2967	0.0277	0.0362	0.0049	0.0000
3.3516	0.0275	0.0370	0.0049	0.0000
3.4066	0.0273	0.0378	0.0050	0.0000
3.4615	0.0271	0.0387	0.0050	0.0000
3.5165	0.0268	0.0395	0.0051	0.0000
3.5714	0.0266	0.0404	0.0051	0.0000
3.6264	0.0264	0.0412	0.0052	0.0000
3.6813	0.0261	0.0421	0.0052	0.0000
3.7363	0.0259	0.0430	0.0053	0.0000
3.7912	0.0257	0.0438	0.0054	0.0000
3.8462	0.0255	0.0447	0.0054	0.0000
3.9011	0.0252	0.0456	0.0055	0.0000
3.9560	0.0250	0.0465	0.0055	0.0000
4.0110	0.0248	0.0474	0.0055	0.0000
4.0659	0.0246	0.0483	0.0055	0.0000
4.1209	0.0243	0.0492	0.0055	0.0000
4.1758	0.0241	0.0501	0.0055	0.0000
4.2308	0.0239	0.0510	0.0055	0.0000
4.2857	0.0236	0.0519	0.0056	0.0000
4.3407	0.0234	0.0529	0.0057	0.0000
4.3956	0.0232	0.0538	0.0059	0.0000
4.4505	0.0230	0.0547	0.0061	0.0000
4.5000	0.0227	0.0556	0.0139	0.0000

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
4.5000	0.0414	0.0556	0.0000	0.0200	0.0000
4.5549	0.0417	0.0579	0.0000	0.0200	0.0000
4.6099	0.0419	0.0602	0.0000	0.0204	0.0000
4.6648	0.0421	0.0625	0.0000	0.0207	0.0000
4.7198	0.0424	0.0648	0.0000	0.0211	0.0000
4.7747	0.0426	0.0671	0.0000	0.0215	0.0000
4.8297	0.0428	0.0695	0.0000	0.0218	0.0000
4.8846	0.0431	0.0718	0.1243	0.0222	0.0000
4.9396	0.0433	0.0742	0.3532	0.0226	0.0000
4.9945	0.0435	0.0766	0.6498	0.0229	0.0000
5.0000	0.0435	0.0768	1.0012	0.0229	0.0000

Surface IMP 4-1

Element Flows To:

Outlet 1	Outlet 2
	IMP 4-1

IMP 4-2

Bottom Length:	30.00 ft.
Bottom Width:	33.00 ft.
Material thickness of first layer:	3
Material type for first layer:	Fine sandy loam
Material thickness of second layer:	0.5
Material type for second layer:	ASTM 8
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (ft):	0.33
Orifice Diameter (in):	0.5
Offset (in):	0
Flow Through Underdrain (ac-ft):	7.116
Total Outflow (ac-ft):	9.065
Percent Through Underdrain:	78.5
Discharge Structure	
Riser Height:	0.33 ft.
Riser Diameter:	12 in.
Notch Type:	Rectangular
Notch Width:	0.000 ft.
Notch Height:	0.000 ft.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0414	0.0000	0.0000	0.0000
0.0549	0.0412	0.0003	0.0000	0.0000
0.1099	0.0410	0.0006	0.0000	0.0000
0.1648	0.0408	0.0009	0.0000	0.0000
0.2198	0.0406	0.0011	0.0000	0.0000
0.2747	0.0403	0.0014	0.0000	0.0000
0.3297	0.0401	0.0020	0.0000	0.0000
0.3846	0.0399	0.0026	0.0000	0.0000
0.4396	0.0396	0.0032	0.0000	0.0000
0.4945	0.0394	0.0038	0.0000	0.0000
0.5495	0.0392	0.0044	0.0001	0.0000
0.6044	0.0389	0.0051	0.0001	0.0000
0.6593	0.0387	0.0057	0.0001	0.0000
0.7143	0.0385	0.0063	0.0001	0.0000
0.7692	0.0383	0.0069	0.0002	0.0000
0.8242	0.0380	0.0076	0.0002	0.0000
0.8791	0.0378	0.0082	0.0003	0.0000
0.9341	0.0376	0.0089	0.0003	0.0000
0.9890	0.0373	0.0095	0.0004	0.0000
1.0440	0.0371	0.0102	0.0005	0.0000
1.0989	0.0369	0.0109	0.0005	0.0000
1.1538	0.0367	0.0116	0.0006	0.0000
1.2088	0.0364	0.0122	0.0007	0.0000
1.2637	0.0362	0.0129	0.0008	0.0000
1.3187	0.0360	0.0136	0.0009	0.0000
1.3736	0.0357	0.0143	0.0010	0.0000
1.4286	0.0355	0.0150	0.0011	0.0000
1.4835	0.0353	0.0157	0.0012	0.0000

1.5385	0.0351	0.0164	0.0013	0.0000
1.5934	0.0348	0.0172	0.0014	0.0000
1.6484	0.0346	0.0179	0.0016	0.0000
1.7033	0.0344	0.0186	0.0016	0.0000
1.7582	0.0341	0.0193	0.0016	0.0000
1.8132	0.0339	0.0201	0.0018	0.0000
1.8681	0.0337	0.0208	0.0018	0.0000
1.9231	0.0335	0.0216	0.0022	0.0000
1.9780	0.0332	0.0223	0.0022	0.0000
2.0330	0.0330	0.0231	0.0022	0.0000
2.0879	0.0328	0.0239	0.0024	0.0000
2.1429	0.0325	0.0247	0.0024	0.0000
2.1978	0.0323	0.0254	0.0026	0.0000
2.2527	0.0321	0.0262	0.0027	0.0000
2.3077	0.0319	0.0270	0.0028	0.0000
2.3626	0.0316	0.0278	0.0029	0.0000
2.4176	0.0314	0.0286	0.0030	0.0000
2.4725	0.0312	0.0294	0.0031	0.0000
2.5275	0.0309	0.0302	0.0032	0.0000
2.5824	0.0307	0.0311	0.0033	0.0000
2.6374	0.0305	0.0319	0.0034	0.0000
2.6923	0.0303	0.0327	0.0034	0.0000
2.7473	0.0300	0.0336	0.0036	0.0000
2.8022	0.0298	0.0344	0.0036	0.0000
2.8571	0.0296	0.0353	0.0037	0.0000
2.9121	0.0293	0.0361	0.0038	0.0000
2.9670	0.0291	0.0370	0.0039	0.0000
3.0220	0.0289	0.0378	0.0039	0.0000
3.0769	0.0287	0.0386	0.0040	0.0000
3.1319	0.0284	0.0394	0.0041	0.0000
3.1868	0.0282	0.0402	0.0042	0.0000
3.2418	0.0280	0.0410	0.0042	0.0000
3.2967	0.0277	0.0418	0.0043	0.0000
3.3516	0.0275	0.0427	0.0044	0.0000
3.4066	0.0273	0.0435	0.0045	0.0000
3.4615	0.0271	0.0444	0.0045	0.0000
3.5165	0.0268	0.0452	0.0046	0.0000
3.5714	0.0266	0.0461	0.0046	0.0000
3.6264	0.0264	0.0469	0.0047	0.0000
3.6813	0.0261	0.0478	0.0048	0.0000
3.7363	0.0259	0.0487	0.0049	0.0000
3.7912	0.0257	0.0495	0.0048	0.0000
3.8462	0.0255	0.0504	0.0048	0.0000
3.9011	0.0252	0.0513	0.0048	0.0000
3.9560	0.0250	0.0522	0.0048	0.0000
4.0110	0.0248	0.0531	0.0048	0.0000
4.0659	0.0246	0.0540	0.0048	0.0000
4.1209	0.0243	0.0549	0.0049	0.0000
4.1758	0.0241	0.0558	0.0051	0.0000
4.2308	0.0239	0.0567	0.0053	0.0000
4.2857	0.0236	0.0576	0.0055	0.0000
4.3407	0.0234	0.0586	0.0057	0.0000
4.3956	0.0232	0.0595	0.0059	0.0000
4.4505	0.0230	0.0604	0.0061	0.0000
4.5000	0.0227	0.0613	0.0099	0.0000

Landscape Swale Hydraulic Table

Stage(ft)Area(ac)Volume(ac-ft)Discharge(cfs)To Amended(cfs)Infilt(cfs)

4.5000	0.0414	0.0613	0.0000	0.0101	0.0000
4.5549	0.0417	0.0636	0.0000	0.0101	0.0000
4.6099	0.0419	0.0659	0.0000	0.0103	0.0000
4.6648	0.0421	0.0682	0.0000	0.0105	0.0000
4.7198	0.0424	0.0705	0.0000	0.0107	0.0000
4.7747	0.0426	0.0728	0.0000	0.0108	0.0000
4.8297	0.0428	0.0752	0.0000	0.0110	0.0000
4.8846	0.0431	0.0775	0.1243	0.0112	0.0000
4.9396	0.0433	0.0799	0.3532	0.0114	0.0000
4.9945	0.0435	0.0823	0.6498	0.0116	0.0000
5.0000	0.0435	0.0825	1.0012	0.0116	0.0000

Surface IMP 4-2

Element Flows To:

Outlet 1	Outlet 2
	IMP 4-2

IMP 4-3

Bottom Length:	30.00 ft.
Bottom Width:	33.00 ft.
Material thickness of first layer:	3
Material type for first layer:	Fine sandy loam
Material thickness of second layer:	0.5
Material type for second layer:	ASTM 8
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (ft):	0.33
Orifice Diameter (in):	0.5
Offset (in):	0
Flow Through Underdrain (ac-ft):	6.973
Total Outflow (ac-ft):	8.709
Percent Through Underdrain:	80.06
Discharge Structure	
Riser Height:	0.33 ft.
Riser Diameter:	12 in.
Notch Type:	Rectangular
Notch Width:	0.000 ft.
Notch Height:	0.000 ft.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0414	0.0000	0.0000	0.0000
0.0549	0.0412	0.0003	0.0000	0.0000
0.1099	0.0410	0.0006	0.0000	0.0000
0.1648	0.0408	0.0009	0.0000	0.0000
0.2198	0.0406	0.0011	0.0000	0.0000
0.2747	0.0403	0.0014	0.0000	0.0000
0.3297	0.0401	0.0020	0.0000	0.0000
0.3846	0.0399	0.0026	0.0000	0.0000
0.4396	0.0396	0.0032	0.0000	0.0000
0.4945	0.0394	0.0038	0.0000	0.0000
0.5495	0.0392	0.0044	0.0001	0.0000
0.6044	0.0389	0.0051	0.0001	0.0000
0.6593	0.0387	0.0057	0.0001	0.0000
0.7143	0.0385	0.0063	0.0001	0.0000
0.7692	0.0383	0.0069	0.0002	0.0000
0.8242	0.0380	0.0076	0.0002	0.0000
0.8791	0.0378	0.0082	0.0003	0.0000
0.9341	0.0376	0.0089	0.0003	0.0000
0.9890	0.0373	0.0095	0.0004	0.0000
1.0440	0.0371	0.0102	0.0005	0.0000
1.0989	0.0369	0.0109	0.0005	0.0000
1.1538	0.0367	0.0116	0.0006	0.0000
1.2088	0.0364	0.0122	0.0007	0.0000
1.2637	0.0362	0.0129	0.0008	0.0000
1.3187	0.0360	0.0136	0.0009	0.0000
1.3736	0.0357	0.0143	0.0010	0.0000
1.4286	0.0355	0.0150	0.0011	0.0000
1.4835	0.0353	0.0157	0.0012	0.0000

1.5385	0.0351	0.0164	0.0013	0.0000
1.5934	0.0348	0.0172	0.0014	0.0000
1.6484	0.0346	0.0179	0.0016	0.0000
1.7033	0.0344	0.0186	0.0016	0.0000
1.7582	0.0341	0.0193	0.0016	0.0000
1.8132	0.0339	0.0201	0.0018	0.0000
1.8681	0.0337	0.0208	0.0018	0.0000
1.9231	0.0335	0.0216	0.0022	0.0000
1.9780	0.0332	0.0223	0.0022	0.0000
2.0330	0.0330	0.0231	0.0022	0.0000
2.0879	0.0328	0.0239	0.0024	0.0000
2.1429	0.0325	0.0247	0.0024	0.0000
2.1978	0.0323	0.0254	0.0026	0.0000
2.2527	0.0321	0.0262	0.0027	0.0000
2.3077	0.0319	0.0270	0.0028	0.0000
2.3626	0.0316	0.0278	0.0029	0.0000
2.4176	0.0314	0.0286	0.0030	0.0000
2.4725	0.0312	0.0294	0.0031	0.0000
2.5275	0.0309	0.0302	0.0032	0.0000
2.5824	0.0307	0.0311	0.0033	0.0000
2.6374	0.0305	0.0319	0.0034	0.0000
2.6923	0.0303	0.0327	0.0034	0.0000
2.7473	0.0300	0.0336	0.0036	0.0000
2.8022	0.0298	0.0344	0.0036	0.0000
2.8571	0.0296	0.0353	0.0037	0.0000
2.9121	0.0293	0.0361	0.0038	0.0000
2.9670	0.0291	0.0370	0.0039	0.0000
3.0220	0.0289	0.0378	0.0039	0.0000
3.0769	0.0287	0.0386	0.0040	0.0000
3.1319	0.0284	0.0394	0.0041	0.0000
3.1868	0.0282	0.0402	0.0042	0.0000
3.2418	0.0280	0.0410	0.0042	0.0000
3.2967	0.0277	0.0418	0.0043	0.0000
3.3516	0.0275	0.0427	0.0044	0.0000
3.4066	0.0273	0.0435	0.0045	0.0000
3.4615	0.0271	0.0444	0.0045	0.0000
3.5165	0.0268	0.0452	0.0046	0.0000
3.5714	0.0266	0.0461	0.0046	0.0000
3.6264	0.0264	0.0469	0.0047	0.0000
3.6813	0.0261	0.0478	0.0048	0.0000
3.7363	0.0259	0.0487	0.0049	0.0000
3.7912	0.0257	0.0495	0.0048	0.0000
3.8462	0.0255	0.0504	0.0048	0.0000
3.9011	0.0252	0.0513	0.0048	0.0000
3.9560	0.0250	0.0522	0.0048	0.0000
4.0110	0.0248	0.0531	0.0048	0.0000
4.0659	0.0246	0.0540	0.0048	0.0000
4.1209	0.0243	0.0549	0.0049	0.0000
4.1758	0.0241	0.0558	0.0051	0.0000
4.2308	0.0239	0.0567	0.0053	0.0000
4.2857	0.0236	0.0576	0.0055	0.0000
4.3407	0.0234	0.0586	0.0057	0.0000
4.3956	0.0232	0.0595	0.0059	0.0000
4.4505	0.0230	0.0604	0.0061	0.0000
4.5000	0.0227	0.0613	0.0099	0.0000

Landscape Swale Hydraulic Table

Stage(ft)Area(ac)Volume(ac-ft)Discharge(cfs)To Amended(cfs)Infilt(cfs)

4.5000	0.0414	0.0613	0.0000	0.0101	0.0000
4.5549	0.0417	0.0636	0.0000	0.0101	0.0000
4.6099	0.0419	0.0659	0.0000	0.0103	0.0000
4.6648	0.0421	0.0682	0.0000	0.0105	0.0000
4.7198	0.0424	0.0705	0.0000	0.0107	0.0000
4.7747	0.0426	0.0728	0.0000	0.0108	0.0000
4.8297	0.0428	0.0752	0.0000	0.0110	0.0000
4.8846	0.0431	0.0775	0.1243	0.0112	0.0000
4.9396	0.0433	0.0799	0.3532	0.0114	0.0000
4.9945	0.0435	0.0823	0.6498	0.0116	0.0000
5.0000	0.0435	0.0825	1.0012	0.0116	0.0000

Surface IMP 4-3

Element Flows To:

Outlet 1	Outlet 2
	IMP 4-3

IMP 4-4

Bottom Length:	30.00 ft.
Bottom Width:	50.00 ft.
Material thickness of first layer:	3
Material type for first layer:	Loamy fine sand
Material thickness of second layer:	0.5
Material type for second layer:	ASTM 8
Material thickness of third layer:	1
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (ft):	0.33
Orifice Diameter (in):	0.5
Offset (in):	0
Flow Through Underdrain (ac-ft):	11.153
Total Outflow (ac-ft):	12.58
Percent Through Underdrain:	88.66
Discharge Structure	
Riser Height:	0.33 ft.
Riser Diameter:	12 in.
Notch Type:	Rectangular
Notch Width:	0.000 ft.
Notch Height:	0.000 ft.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(ft)	Area(ac)	Volume(ac-ft)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0532	0.0000	0.0000	0.0000
0.0549	0.0530	0.0004	0.0000	0.0000
0.1099	0.0528	0.0007	0.0000	0.0000
0.1648	0.0525	0.0011	0.0000	0.0000
0.2198	0.0523	0.0015	0.0000	0.0000
0.2747	0.0521	0.0018	0.0000	0.0000
0.3297	0.0518	0.0026	0.0000	0.0000
0.3846	0.0516	0.0033	0.0001	0.0000
0.4396	0.0514	0.0041	0.0001	0.0000
0.4945	0.0511	0.0048	0.0001	0.0000
0.5495	0.0509	0.0056	0.0002	0.0000
0.6044	0.0507	0.0064	0.0003	0.0000
0.6593	0.0505	0.0071	0.0004	0.0000
0.7143	0.0502	0.0079	0.0005	0.0000
0.7692	0.0500	0.0087	0.0006	0.0000
0.8242	0.0498	0.0095	0.0007	0.0000
0.8791	0.0495	0.0103	0.0009	0.0000
0.9341	0.0493	0.0111	0.0010	0.0000
0.9890	0.0491	0.0119	0.0012	0.0000
1.0440	0.0489	0.0127	0.0014	0.0000
1.0989	0.0486	0.0135	0.0015	0.0000
1.1538	0.0484	0.0143	0.0015	0.0000
1.2088	0.0482	0.0151	0.0019	0.0000
1.2637	0.0479	0.0159	0.0019	0.0000
1.3187	0.0477	0.0168	0.0019	0.0000
1.3736	0.0475	0.0176	0.0021	0.0000
1.4286	0.0472	0.0184	0.0022	0.0000
1.4835	0.0470	0.0193	0.0023	0.0000

1.5385	0.0468	0.0201	0.0024	0.0000
1.5934	0.0466	0.0210	0.0026	0.0000
1.6484	0.0463	0.0218	0.0026	0.0000
1.7033	0.0461	0.0227	0.0028	0.0000
1.7582	0.0459	0.0236	0.0029	0.0000
1.8132	0.0456	0.0244	0.0030	0.0000
1.8681	0.0454	0.0253	0.0031	0.0000
1.9231	0.0452	0.0262	0.0032	0.0000
1.9780	0.0450	0.0271	0.0033	0.0000
2.0330	0.0447	0.0280	0.0034	0.0000
2.0879	0.0445	0.0289	0.0034	0.0000
2.1429	0.0443	0.0298	0.0036	0.0000
2.1978	0.0440	0.0307	0.0036	0.0000
2.2527	0.0438	0.0316	0.0037	0.0000
2.3077	0.0436	0.0325	0.0038	0.0000
2.3626	0.0434	0.0334	0.0039	0.0000
2.4176	0.0431	0.0343	0.0039	0.0000
2.4725	0.0429	0.0353	0.0040	0.0000
2.5275	0.0427	0.0362	0.0041	0.0000
2.5824	0.0424	0.0371	0.0042	0.0000
2.6374	0.0422	0.0381	0.0042	0.0000
2.6923	0.0420	0.0390	0.0043	0.0000
2.7473	0.0417	0.0400	0.0044	0.0000
2.8022	0.0415	0.0409	0.0045	0.0000
2.8571	0.0413	0.0419	0.0045	0.0000
2.9121	0.0411	0.0429	0.0046	0.0000
2.9670	0.0408	0.0438	0.0046	0.0000
3.0220	0.0406	0.0449	0.0047	0.0000
3.0769	0.0404	0.0460	0.0048	0.0000
3.1319	0.0401	0.0471	0.0049	0.0000
3.1868	0.0399	0.0481	0.0049	0.0000
3.2418	0.0397	0.0492	0.0050	0.0000
3.2967	0.0395	0.0503	0.0050	0.0000
3.3516	0.0392	0.0514	0.0051	0.0000
3.4066	0.0390	0.0525	0.0051	0.0000
3.4615	0.0388	0.0536	0.0052	0.0000
3.5165	0.0385	0.0547	0.0052	0.0000
3.5714	0.0383	0.0559	0.0053	0.0000
3.6264	0.0381	0.0570	0.0054	0.0000
3.6813	0.0379	0.0581	0.0054	0.0000
3.7363	0.0376	0.0593	0.0055	0.0000
3.7912	0.0374	0.0604	0.0055	0.0000
3.8462	0.0372	0.0616	0.0056	0.0000
3.9011	0.0369	0.0627	0.0057	0.0000
3.9560	0.0367	0.0639	0.0057	0.0000
4.0110	0.0365	0.0650	0.0058	0.0000
4.0659	0.0363	0.0662	0.0057	0.0000
4.1209	0.0360	0.0674	0.0057	0.0000
4.1758	0.0358	0.0686	0.0057	0.0000
4.2308	0.0356	0.0697	0.0057	0.0000
4.2857	0.0353	0.0709	0.0057	0.0000
4.3407	0.0351	0.0721	0.0058	0.0000
4.3956	0.0349	0.0733	0.0060	0.0000
4.4505	0.0347	0.0745	0.0061	0.0000
4.5000	0.0344	0.0756	0.0139	0.0000

Landscape Swale Hydraulic Table

Stage(ft)Area(ac)Volume(ac-ft)Discharge(cfs)To Amended(cfs)Infilt(cfs)

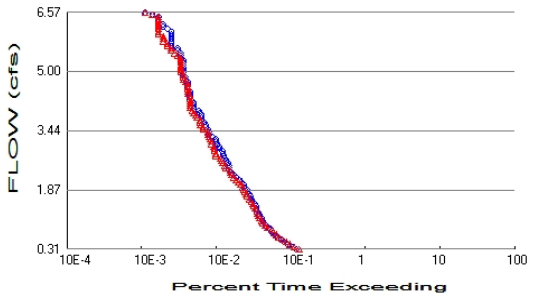
4.5000	0.0532	0.0756	0.0000	0.0303	0.0000
4.5549	0.0534	0.0785	0.0000	0.0303	0.0000
4.6099	0.0536	0.0815	0.0000	0.0309	0.0000
4.6648	0.0539	0.0844	0.0000	0.0314	0.0000
4.7198	0.0541	0.0874	0.0000	0.0320	0.0000
4.7747	0.0543	0.0904	0.0000	0.0325	0.0000
4.8297	0.0546	0.0934	0.0000	0.0331	0.0000
4.8846	0.0548	0.0964	0.1243	0.0336	0.0000
4.9396	0.0550	0.0994	0.3532	0.0342	0.0000
4.9945	0.0553	0.1024	0.6498	0.0347	0.0000
5.0000	0.0553	0.1027	1.0012	0.0348	0.0000

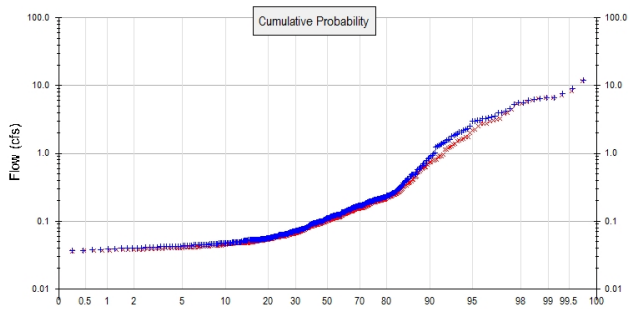
Surface IMP 4-4

Element Flows To:

Outlet 1	Outlet 2
	IMP 4-4

Analysis Results
POC 4





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #4
Total Pervious Area: 17.16
Total Impervious Area: 0.63

Mitigated Landuse Totals for POC #4
Total Pervious Area: 16.12
Total Impervious Area: 1.67

Flow Frequency Method: Cunnane

Flow Frequency Return Periods for Predeveloped. POC #4

Return Period	**Flow(cfs)**
2 year	3.087448
5 year	5.792563
10 year	6.568986
25 year	9.022866

Flow Frequency Return Periods for Mitigated. POC #4

Return Period	**Flow(cfs)**
2 year	2.537151
5 year	5.576949
10 year	6.590029
25 year	8.301173

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.3087	428	463	108	Pass
0.3720	383	398	103	Pass
0.4352	326	348	106	Pass
0.4984	293	313	106	Pass
0.5617	267	279	104	Pass
0.6249	236	250	105	Pass
0.6882	222	230	103	Pass
0.7514	204	211	103	Pass
0.8146	192	201	104	Pass
0.8779	183	175	95	Pass
0.9411	168	163	97	Pass
1.0043	156	151	96	Pass
1.0676	149	146	97	Pass
1.1308	144	139	96	Pass
1.1940	139	132	94	Pass
1.2573	133	129	96	Pass
1.3205	128	126	98	Pass
1.3837	124	121	97	Pass
1.4470	122	114	93	Pass
1.5102	119	111	93	Pass
1.5734	110	106	96	Pass
1.6367	106	101	95	Pass
1.6999	104	92	88	Pass
1.7631	100	90	90	Pass
1.8264	95	86	90	Pass
1.8896	92	85	92	Pass
1.9528	85	82	96	Pass
2.0161	84	77	91	Pass
2.0793	79	72	91	Pass
2.1426	74	66	89	Pass
2.2058	67	62	92	Pass
2.2690	61	58	95	Pass
2.3323	57	56	98	Pass
2.3955	54	55	101	Pass
2.4587	54	49	90	Pass
2.5220	53	47	88	Pass
2.5852	52	44	84	Pass
2.6484	49	42	85	Pass
2.7117	47	41	87	Pass
2.7749	46	36	78	Pass
2.8381	44	36	81	Pass
2.9014	43	34	79	Pass
2.9646	40	34	85	Pass
3.0278	39	33	84	Pass
3.0911	37	31	83	Pass
3.1543	36	31	86	Pass
3.2175	35	30	85	Pass
3.2808	32	29	90	Pass
3.3440	29	28	96	Pass
3.4072	29	28	96	Pass
3.4705	28	24	85	Pass
3.5337	26	24	92	Pass
3.5970	26	22	84	Pass

3.6602	25	22	88	Pass
3.7234	23	22	95	Pass
3.7867	23	20	86	Pass
3.8499	23	19	82	Pass
3.9131	22	18	81	Pass
3.9764	21	17	80	Pass
4.0396	18	16	88	Pass
4.1028	18	16	88	Pass
4.1661	18	16	88	Pass
4.2293	17	16	94	Pass
4.2925	16	16	100	Pass
4.3558	16	16	100	Pass
4.4190	16	15	93	Pass
4.4822	16	15	93	Pass
4.5455	15	15	100	Pass
4.6087	15	15	100	Pass
4.6719	15	15	100	Pass
4.7352	15	14	93	Pass
4.7984	14	13	92	Pass
4.8616	14	13	92	Pass
4.9249	13	13	100	Pass
4.9881	13	12	92	Pass
5.0514	13	12	92	Pass
5.1146	13	12	92	Pass
5.1778	13	12	92	Pass
5.2411	13	12	92	Pass
5.3043	13	12	92	Pass
5.3675	12	12	100	Pass
5.4308	12	11	91	Pass
5.4940	12	10	83	Pass
5.5572	11	9	81	Pass
5.6205	11	9	81	Pass
5.6837	9	8	88	Pass
5.7469	9	8	88	Pass
5.8102	9	7	77	Pass
5.8734	9	7	77	Pass
5.9366	9	7	77	Pass
5.9999	9	6	66	Pass
6.0631	9	6	66	Pass
6.1263	8	6	75	Pass
6.1896	7	6	85	Pass
6.2528	7	6	85	Pass
6.3160	6	6	100	Pass
6.3793	6	6	100	Pass
6.4425	6	6	100	Pass
6.5058	5	5	100	Pass
6.5690	4	4	100	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

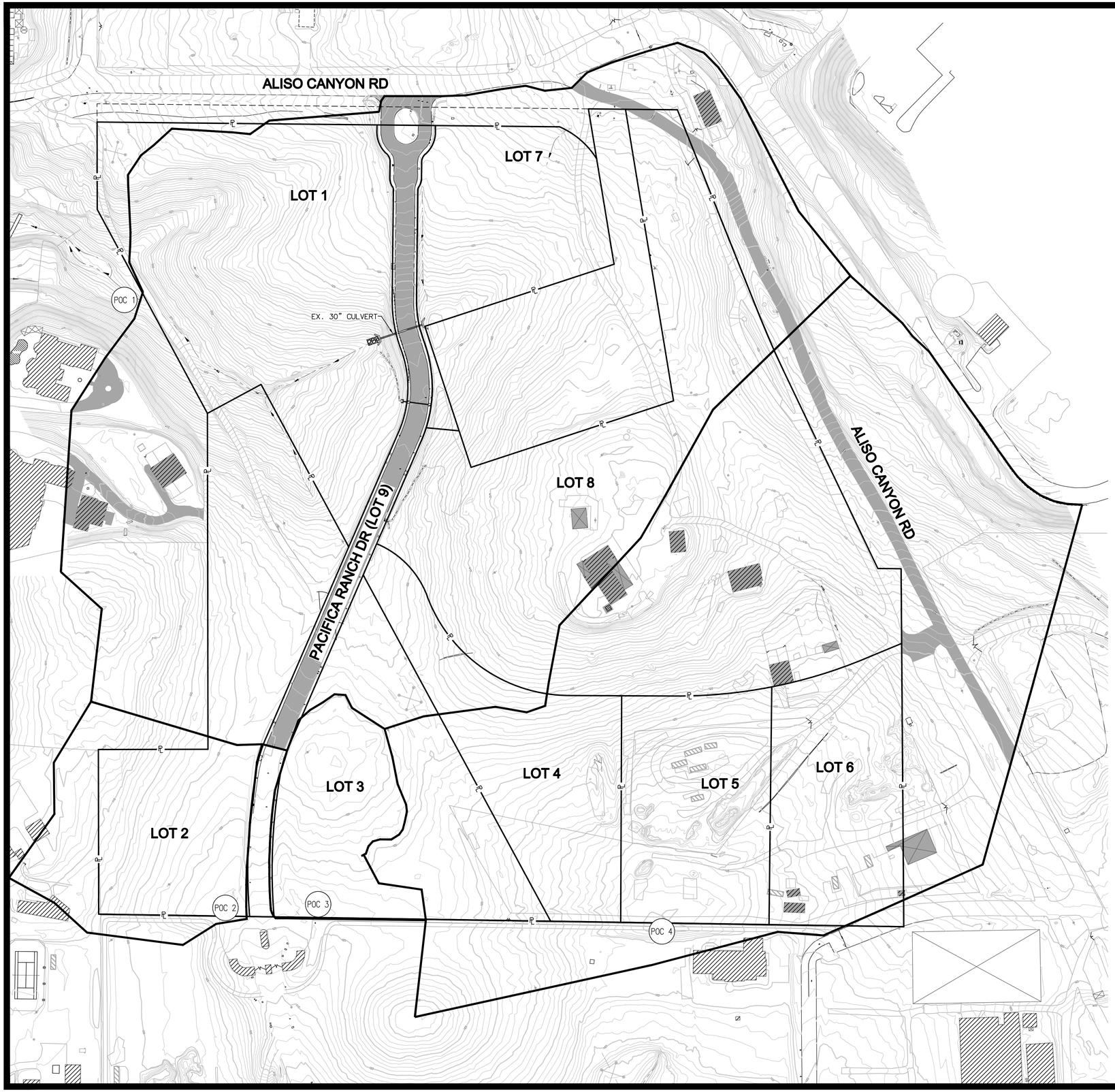
Appendix

Predeveloped Schematic

Mitigated Schematic

Appendix B: HMP Maps

(Pre and Post Development)



LEGEND

PROPERTY LINE

POINT OF COMPLIANCE (POC 1)

POC BOUNDARY

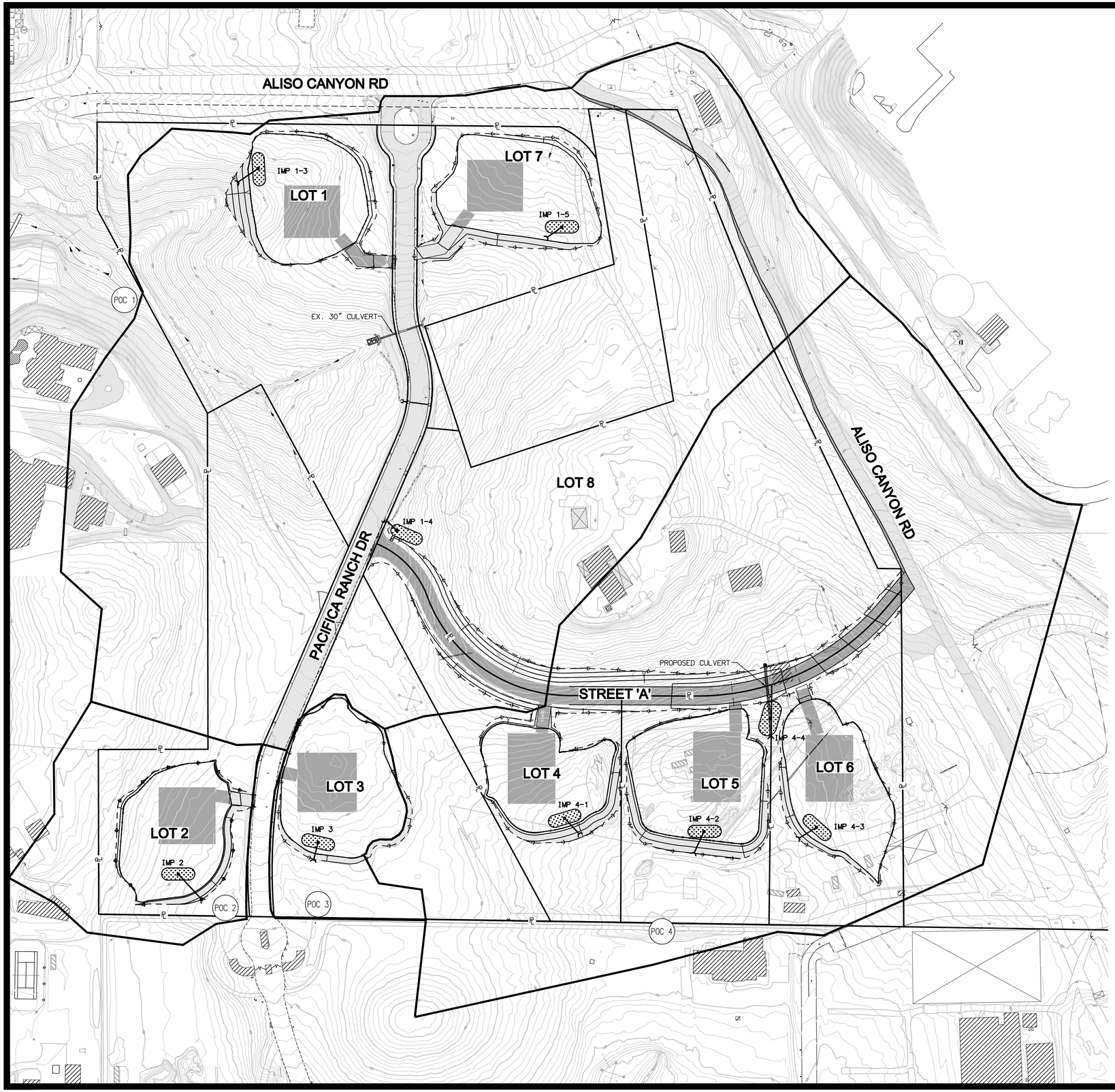
EXISTING IMPERVIOUS AREA (PAVED ROAD, BUILDING)

Hydrologic Soil Type	Cover	Slope	POC #1 (acres)	POC #2 (acres)	POC #3 (acres)	POC #4 (acres)
Existing Condition						
D	Grass	Flat (0-5%)	2.49	0.66	0.54	2.94
D	Grass	Moderate (5-10%)	6.49	1.30	0.81	6.29
D	Grass	Steep (10-20%)	12.57	0.65	0.17	7.93
	Impervious	Flat (0-5%)	1.63	0	0	0.63
		TOTAL	**23.18**	**2.61**	**1.52**	**17.79**

ALISO CANYON SUBDIVISION
HMP MAP
PRE-DEVELOPMENT

RBF CONSULTING
A Baker Company
5050 AVENIDA ENCINAS, SUITE 260
CARLSBAD, CALIFORNIA 92008-4395
760.476.9193 • FAX 760.476.9198 • www.RBF.com

H:\PROJECTS\137139_Aliso Canyon\Admin\Reports\HMP\CAD\137139-HMP EXHIBIT PRE.dwg 05/30/14 - 9:15am Dwenner



LEGEND

PROPERTY LINE

POINT OF COMPLIANCE (POC 1)

POC BOUNDARY

BIORETENTION AREA
INTEGRATED MANAGEMENT PRACTICE (IMP)

EXISTING IMPERVIOUS AREA

PROPOSED IMPERVIOUS AREA

LAND CHARACTERISTICS

Hydrologic Soil Type	Cover	Slope	POC #1 (acres)	POC #2 (acres)	POC #3 (acres)	POC #4 (acres)
Existing Condition						
D	Grass	Flat (0-5%)	2.49	0.66	0.54	2.94
D	Grass	Moderate (5-10%)	6.49	1.30	0.81	6.29
D	Grass	Steep (10-20%)	12.57	0.65	0.17	7.93
	Impervious	Flat (0-5%)	1.63	0	0	0.63
		TOTAL	**23.18**	**2.61**	**1.52**	**17.79**
Proposed Condition						
D	Grass	Flat (0-5%)	3.20	1.08	0.96	3.77
D	Grass	Moderate (5-10%)	5.82	0.78	0.26	5.21
D	Grass	Steep (10-20%)	11.79	0.52	0.07	7.14
	Impervious	Flat (0-5%)	2.37	0.23	0.23	1.67
		TOTAL	**23.18**	**2.61**	**1.52**	**17.79**

BIORETENTION IMP SUMMARY

IMP ID	IMP Surface Area (sf)	Biofiltration Soil Depth (ft)	Orifice Diameter (in)
1-3	1,000	2	1
1-4	1,000	2	1
1-5	1,000	2	1
2	1,000	3	1
3	1,200	3	0.5
4-1	1,000	3	0.5
4-2	1,000	3	0.5
4-3	1,000	3	0.5
4-4	1,500	3	0.5

SUMMARY OF PARTIAL-DURATION PEAK FLOW RATES

(REFER TO HYDROMODIFICATION CALCULATIONS)

POC	2-YEAR		5-YEAR		10-YEAR		25-YEAR	
	PRE-PROJECT	MITIGATED POST-PROJECT	PRE-PROJECT	MITIGATED POST-PROJECT	PRE-PROJECT	MITIGATED POST-PROJECT	PRE-PROJECT	MITIGATED POST-PROJECT
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
1	4.36	4.17	8.16	8.04	8.84	8.81	12.15	11.67
2	0.40	0.28	0.80	0.61	0.93	0.91	1.26	1.06
3	0.21	0.09	0.44	0.31	0.53	0.46	0.72	0.54
4	3.09	2.54	5.79	5.58	6.57	6.59	9.02	8.30

- ALTHOUGH THE 10-YEAR PEAK FLOW INCREASES IN THE SDHM CONTINUOUS SIMULATION ANALYSIS FOR POC 4, THE POC IS COMPLIANT WITH HYDROMODIFICATION MANAGEMENT REQUIREMENTS SINCE IT PASSES THE FLOW-DURATION ANALYSIS AT EVERY FLOW LEVEL. SEE RESULTS IN APPENDIX A OF THE HYDROMODIFICATION MITIGATION PLAN.

ALISO CANYON SUBDIVISION
HMP MAP
POST-DEVELOPMENT

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Appendix C: Digital SDHM Files