HARMONY GROVE VILLAGE SOUTH

APPENDIX M-3

PRELIMINARY HYDROMODIFICATION MANAGEMENT STUDY

for the

DRAFT FINAL ENVIRONMENTAL IMPACT REPORT

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Prepared for:
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PRELIMINARY HYDROMODIFICATION MANAGEMENT STUDY
Harmony Grove Village South
County of San Diego, CA

April 11, 2017

PDS2015-TM-5600, PDS2015-SP-15-002,
PDS2015-GPA-15-002

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1. INTRODUCTION

This Preliminary Hydromodification Management Study has been prepared in support of a Tentative Map submittal for the Harmony Grove Village South project, which is located south of Harmony Grove Road and East of Country Club Drive in the unincorporated area within the County of San Diego, California near Escondido. This report is a companion report to the following project technical studies:

- CEQA Preliminary Drainage Study, prepared by Project Design Consultants
- Storm Water Quality Management Plan (SWQMP), prepared by Project Design Consultants
- Project Downstream Channel SCCWRP Analysis, prepared by Chang Consultants, entitled "Hydromodification Screening for the Harmony Grove Village South Project."

The purpose of this report is to document the project's compliance with the County's Final Hydromodification Management Plan (HMP). The stated purpose of the final hydromodification requirements is "...to manage increases in runoff discharge rates and durations from all Priority Development Projects, where such increased rates and durations are likely to cause increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force" (County Final HMP, page ES-1). Flow duration control is the most common form of hydromodification management. Unless a project meets an exemption or is granted prior lawful approval, the County Hydromodification Management Plan (HMP) requires that all priority projects comply with the HMP. Since the project does not qualify for an exemption, the project is required to address the applicability of Final HMP requirements.

2. PROJECT DESCRIPTION

The project is located in the unincorporated area of the County of San Diego (County). It is approximately 111 acres in size and located west of Interstate 15 and south of State Route 78

(SR 78). Specifically, the project is south of the intersection of Country Club Drive and Harmony Grove Road. See Vicinity Map, Figure 1, for the project location. The project is bounded by Escondido Creek to the north, Country Club Drive to the west, and the Del Dios Highland Preserve to the South. The Harmony Grove Village South project is located to the south of the Harmony Grove Village development, currently under construction to the north of Escondido Creek by others.

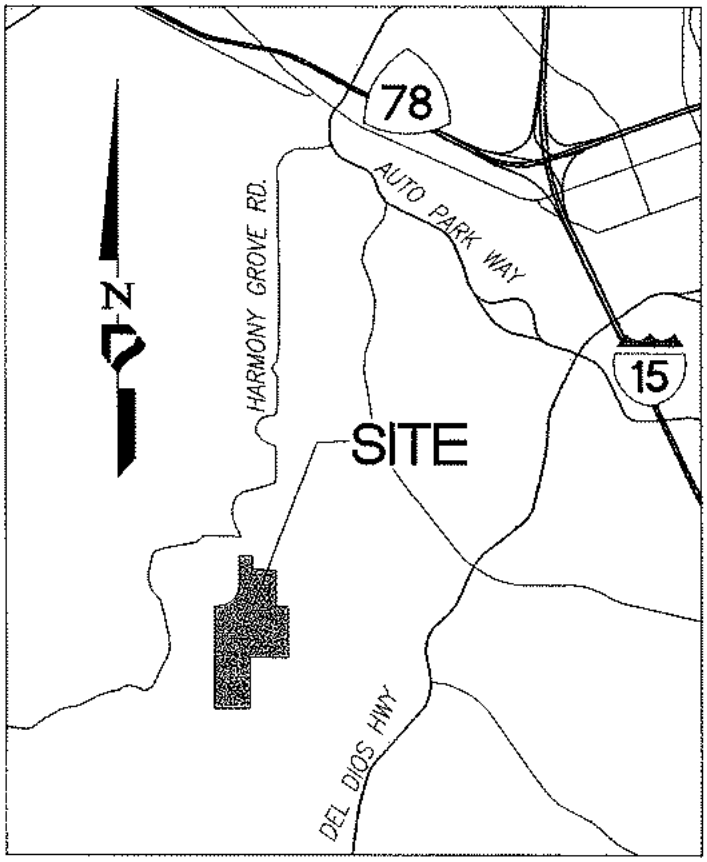

Figure 1: Project Vicinity Map

In general, the project when developed, will consist of up to 453 dwelling units and a commercial/civic area; consisting of a homeowner's association clubhouse building that serves as a public gathering place/destination for the residents. The project will include open space, and

public right of way for streets, access easements, and necessary utility easements.

The project lies in the southern portion of a large circular shaped valley surrounded by prominent peaks and steep hillsides. Escondido Creek bisects the valley, and Harmony Grove Village South lies south of the creek. Several unpaved roads traverse the property along with one paved road that bisects the property from east to west in the central portion of the site. The paved road and another unpaved road provide access to existing residences located east of the property.

Under existing conditions, the project development area consists of undeveloped land and is located within a larger tributary drainage basin that includes upstream properties in the upper hillsides of the valley. There are two main drainage areas for the project, the North drainage basin and the South drainage basin. The majority of the onsite project area is within the North drainage basin. The North drainage basin drains to the north and drains toward Escondido Creek and includes upstream runon as well as onsite storm flows. The South drainage basin is located in the southwestern corner of the site, and originates from the south (on and offsite) and drains to the west to a defined drainage along the western project boundary. This defined drainage traverses the existing residential properties west of Cordrey Drive and ultimately flows into Escondido Creek downstream and west of the Country Club Drive crossing.

Under existing conditions, the north central and southwestern portions of the site are relatively flat, covered in Non-Native Grasslands. Steep slopes occur in the northeastern corner, the southeastern region, the southern tip of the site, and a couple of isolated areas in the central western portion of the site. Diegan Coastal Sage Scrub, Coastal Sage Chaparral Scrub, Mafic Southern Mixed Chaparral, and Granitic Southern Mixed Chaparral, cover the steeper areas of the site. The southern-most portion of the site (preserved as open space) has significant biological habitat including a small area of Coast Live Oak and jurisdictional drainages that flow down from the peaks and exit the site along the western boundary.

In the proposed condition, existing drainage patterns will be maintained and the drainage areas to the North and South discharge locations will be preserved. Two detention/hydromodification underground vaults are proposed upstream of the storm drain discharge locations to mitigate the

increased flows and durations from the proposed project development.

3. HYDROMODIFICATION MANAGEMENT APPROACH

The project will comply with final hydromodification requirements through flow control management for the portions of the project that require hydromodification mitigation. There are two main discharge locations for the storm drain system for the project. Therefore, for this project, there will be two points of compliance (POCs) for the hydromodification analysis. POC#1 will represent the North drainage area and POC#2 will represent the South drainage area. For the north discharge point, a new storm drain will be constructed from the North hydromodification basin and will discharge into Escondido creek to the north. There is also a small portion of Country Club Drive (downstream of the proposed bridge over Escondido Creek) that cannot drain to the North hydromodification basin and will be drained to Escondido Creek in a separate pipe. This small drainage area (Basin#3) was modeled as a bypass drainage basin for the North basin, so it goes to the same POC. For the south discharge point, a new storm drain will be constructed from the South hydromodification basin that will discharge the runoff from the basin to the defined drainage course along the western project boundary. Other minor discharge locations surrounding the site are included in the drainage report analysis, but do not require hydromodification analysis because their respective drainage areas do not include any significant proposed impervious areas, and therefore, no hydromodification mitigation is required for those outfalls.

The proposed subdivision is located in the flatter areas of the site so that the steeper hillsides upstream of the development are preserved. A portion of the storm drain system for the project was designed so that a portion of the hillside areas bypass the proposed hydromodification basin, because they will remain undeveloped and therefore do not need to be commingled for treatment purposes or flow attenuation. However, in other areas of the site, this was not feasible, and hence the flows are commingled.

The following is a summary of the major drainage discharge locations within the project. POC 1 includes the majority of the site drainage and drains to the North hydromodification basin. The drainage area includes a portion of runon from adjacent hillsides.

3.1 Basin Modeling Assumptions

This study identifies two hydromodification management detention basins needed to mitigate the increased rates and durations of stormwater runoff to two POCs. This Preliminary Hydromodification Management Study identifies a conservative estimate for the basin sizes and the report will be revised and updated as the design of the project continues to evolve through final design. The proposed hydromodification management basins have been modeled conservatively with no infiltration into native soils. The geotechnical engineer has recommended that the site's BMPs be designed to not rely on infiltration for treatment, as the site is constrained by subsurface rock layers and impermeable soils.

3.2 Flow Duration Control

The proposed project will comply with the HMP flow control duration criteria through the construction of two onsite hydromodification management underground vaults. The Final HMP requires that post-project runoff flows and durations comply with the following flow duration criteria:

- For flow rates between the pre-project low flow threshold and the pre-project 10-year event, the post-project discharge rates and durations may not deviate above the pre-project rates and durations by more than 10% over more than 10% of the length of the flow duration curve.

The low-flow threshold used in the analysis for Harmony Grove Village South is the 0.5Q2 low-flow threshold for both POCs. A project geomorphic channel assessment analysis was completed for this project, and the report is provided in a separate cover. The San Diego Hydrology Model (SDHM2015, dated October 14, 2015) was used for the continuous simulation modeling to determine the minimum required hydromodification management volumes for each proposed hydromodification management basin.

3.3 Dual Purpose for Water Quality Treatment

It is anticipated that the hydromodification management basins will fulfill water quality requirements by accommodating the lower portion of the underground vaults as harvest and reuse storage areas for the water quality volume (design capture volume). The lower portion of the vaults will hold the water quality volume and this portion of the underground vault will drain into the onsite reclaimed water system (purple pipe system) to address the new stormwater requirements. The upper portions of the underground storage vault will be used to accommodate the hydromodification and 100-year detention storage requirements. Therefore, the basin will be dual purpose to achieve the flow-duration requirements set forth in the County HMP, and will also address the stormwater quality treatment criteria via water reuse set forth in the MS4 Permit as a regional post-construction treatment BMP for the developed area per the 2013 municipal stormwater permit. The stormwater BMP plan and BMP approach may require further refinement as the project design and entitlement progresses. For more information on the treatment control aspect of the proposed combined hydromodification/stormwater reuse basins, refer to the project's Storm Water Quality Management Plan (SWQMP). In addition, the basins are proposed to be underground in order to utilize the areas above the vaults as private park areas for dual use.

4. METHODOLOGY FOR HYDROMODIFICATION ANALYSIS

The hydromodification analysis includes continuous simulation of hourly rainfall, evaporation, infiltration, depression storage, and runoff for the entire continuous rainfall record using SDHM. Note that since the time step of the data is hourly, the calculated rainfall flow rates are extremely low and are not comparable to any sort of synthetic hydrology model such as the Rational Method. The rainfall gauge data selected for this project is the Escondido gauge, which represents the project appropriately based on isopluvial and precipitation zone characteristics and has hourly data for the period of record of 1964 to 2008. The Escondido rain gauge is the closest rain gage to the site, is close to the same elevation, and, after reviewing the Escondido rain gauge data set, Project Design Consultants determined it to be the most appropriate data set to use for the project. Refer to Appendix 3 for the Rain Gage Location Exhibit. SDHM uses the Hydrologic Simulation Program Fortran (HSPF) software as its computational engine to run

rainfall-runoff algorithms. Input values into the model include the soil type, slope, land cover, drainage management areas, and rainfall data. Based on the output from the continuous simulation over the entire rainfall record, the program computes a flow duration curve for each point of compliance (POC) and compares the pre-project and post-project flow duration curves to the criteria established in the HMP. The low-flow and upper-flow thresholds are determined internally by the SDHM program using partial duration statistics. Partial duration statistics are required to estimate the statistics appropriately, since statistics based on peak annual series are inappropriate for estimating values for frequent return intervals such as the 2-year return period. Table 1 below summarizes the input data for the continuous simulation model.

Table 1. Continuous Simulation Model Input Parameters

Total Drainage Area	81.22 acres POC #1 to North Basin and 1.59 acres bypass basin for POC #1, 14.13 acres POC #2
Pre-project land cover	Soil Types A, C, and D. Slope ranges from Flat to Steep, Grass Cover, with some impervious areas (for example, the existing width of Country Club Drive and houses and driveways in areas upstream of project). For specifics of the pre-project land cover, refer to tabular summary in Appendix 1 and Pre-project land cover exhibit in Appendix 5.
Post-project land cover	Soil Types A, C, and D. Slope ranges from Flat to Steep, Grass Cover and impervious areas. Refer to tabular summary in Appendix 1 and Post-project land cover exhibit in Appendix 5.
Rainfall Gage	Escondido
Low Flow Threshold	0.5Q2 low-flow threshold
Upper Flow Threshold	Q10 based on SDHM partial duration statistics

4.1 Soil Type Analysis

Based on the NRCS soil data maps in Appendix 3, the soils within the entire onsite project area are characterized as Hydrologic Soil Type A, C, and D. Type A soils exist downstream of the North basin in the alluvial valley area of Escondido Creek. The majority of the site's soils are Soil Type C. Type C soils have slow infiltration rates. Although infiltration rates within the same hydrologic soil group can vary greatly depending on several factors, Type C soils can have infiltration rates of the order of 0.1 inches per hour (Reference: Table G.1-4 of County BMP

Design Manual). The project geotechnical engineer has recommended that this project not pursue infiltration as a stormwater treatment method.

4.2 Land Cover and Slope Analysis

The input values for the SDHM model were developed by breaking the drainage area to the POC into discrete drainage management areas (DMAs). The drainage areas of the model were separated into discrete areas with uniform cover properties for modeling purposes within SDHM. All pervious areas were modeled with grass cover. All pervious areas were categorized into slope categories of flat (0-5%), moderate (5-10%), or steep (greater than 10%). For the pre-project condition, a GIS slope analysis was performed on the pre-project topography using the aerial topography to separate the drainage areas into the various slope categories. For the post-project condition, the land cover analysis was based on approximations of the post-project topography. The level of imperviousness was estimated based on the approximate imperviousness value consistent with the impervious values used in the Drainage Study. The impervious areas were modeled with street areas and conservative envelope areas for the pads. For example, the exact building limits are not known at this time, so a conservative envelope for each clustered building complex was assumed for modeling purposes. Future refinements of the site plan during future design phases may warrant refinements to the input data used in the SDHM model.

The modeling elements used for this project and available in SDHM include the following options:

- Standard drainage basin: Used to model either impervious or pervious areas that drain directly to a hydromodification management facility or POC.
- Bypass drainage basin: Used to model either impervious or pervious areas that bypass a hydromodification management facility and drain directly to the POC.
- Vault: Used to model an underground basin with vertical sides representing the proposed basin with a composite outlet control structure.
- Flow-splitter: Used to model flows splitting into two different streams (or outlets) based on a threshold flow rate. For this particular project, a flow splitter was used as a modeling trick to separate the lower and upper portions of the basin and their respective

outfalls. The lower portion of the basin (the water quality design capture volume) discharges to the harvest and reuse system in combination with the onsite purple pipe system. The upper portion of the basin discharges to the creek. The discharge to the creek is the outlet for comparison with the flow duration criteria.

Refer to the pre-project and post-project HMP Exhibits in Appendix 5 for the area and location of the DMAs. The DMAs that bypass the hydromodification management basins (those areas draining directly to the stream without detention) were modeled as bypass basins.

4.3 Basin Stage-Volume-Discharge Modeling

For the purpose of defining the volume required for hydromodification management, the basins were modeled in SDHM assuming no infiltration and were modeled as underground vaults with a composite outlet structure.

Due to the limitations of SDHM, there is not a simple modeling technique for modeling discharges from a single basin to two separate discharge POCs. Because the lower portion of the vault (the water quality design capture volume) discharges to the harvest and reuse system and the upper portion of the vault discharges to the creek, there are in reality two different POCs for each basin. In order to model this with SDHM, a modeling work-around was employed in order to model this unique situation. Each pre-project scenario was modeled with duplicate basins draining to two different POCs so that each of the two POCs could be compared against an equal pre-project scenario. Each post-project scenario was modeled with two vaults separated by an idealized flow splitter. The lower portion of the vault was modeled with a low-flow orifice that drains the lower portion of the vault within 36 hours. This flow represents the flow that drains to the harvest and reuse system via a pump system, which eventually will get into Rincon's recycled water distribution system. The discharge then flows to the flow-splitter. All flows less than the orifice flow at the corresponding height of the design capture volume drains to POC #1. The flows above the flow threshold flow to the second vault, which represents in reality the upper portion of the same vault. The height of the second vault is measured from the top of the design capture volume. The flows from the second vault are routed to the creek outfall (POC #2 in the SDHM model). For a graphical representation of this modeling technique, refer to Figure 2 below.

Figure 2: Post-project Modeling Technique to Model Separate Discharges from One Basin

For a graphical representation of the split flows from each of the two basins into the harvest and reuse outlet and the stream discharge outlet, refer to the following figures. Figures 3 and 4 indicate that many of the smaller storms are captured by the water harvesting system.

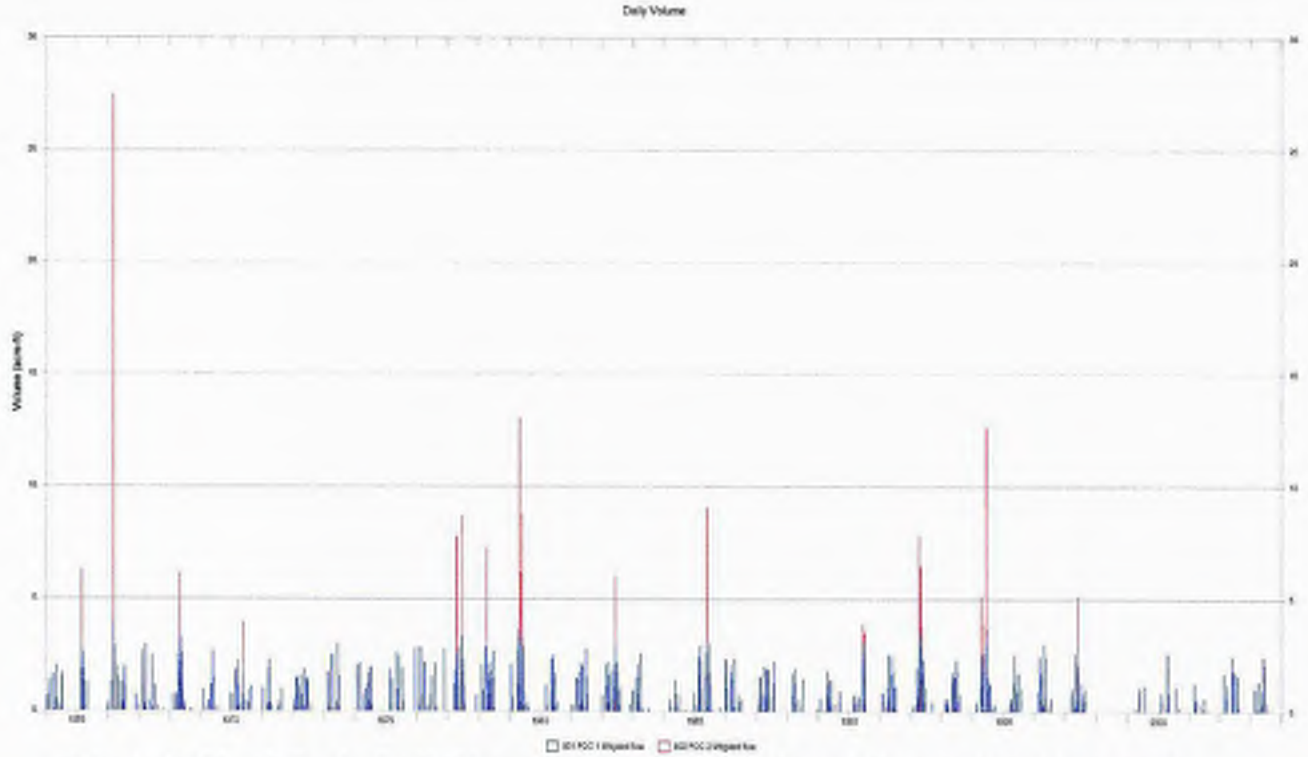

Figure 3: North Basin Daily Volumes (Blue-Harvest/Reuse System, Red-Discharge)

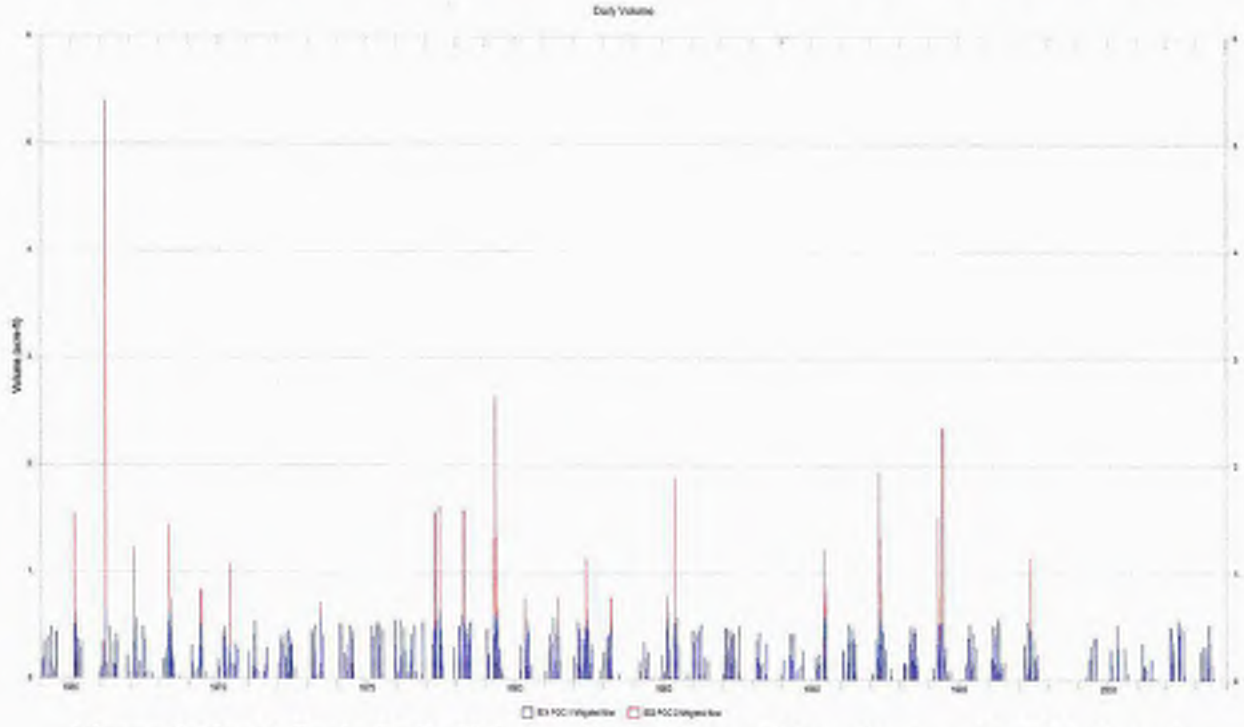

Figure 4: South Basin Daily Volumes (Blue-Harvest/Reuse System, Red-Discharge)

The modeling results indicate that the design complies with both water quality requirements (via stormwater reuse as a part of the lower portion of the basins) and hydromodification requirements (via flow control as a part of the higher portion of the basin above the water quality volume). The Harmony Grove Village South project is in a unique position to pursue this reuse opportunity since it is found within the Rincon Water District. The Rincon Water District possesses an existing recycled water system and has a very large winter user at a power generation plant. This condition is unlike the typical County condition where the majority of the rain occurs in the winter when there is minimal-to-no recycled water use. Since guidelines for this reuse program presently do not exist, the project is unable to achieve the documentation and agreements necessary to ensure this use at the tentative tract map stage. However, it is important that the project preserves the right to confirm this use at the final map stage.

In the unlikely event the project is unable to gain approval for stormwater use in the recycled system, the project will construct a stormwater BMP system in accordance with the BMP Design Manual as an alternative to the reuse system. The final BMP system (including hydromodification control) will be designed during final engineering, but for the entitlement, the drainage design for the project is designed to accommodate a stormwater reuse system (with integrated hydromodification control).

5. HYDROMODIFICATION ANALYSIS RESULTS

The SDHM models for the basins (North.whm and South.whm), represent the proposed site plan for the hydromodification analysis included for this study. Based on the selected basin outlet configurations and basin elevation-volume relationship, the HMP flow-duration requirements are satisfied with the proposed design. The stage-volume relationship for each basin was modeled as an underground vault that represents the basin volume as shown on the preliminary grading plan. During final engineering, further refinements to the design will be required to support the final construction drawings.

Table 2. Summary of Proposed Hydromodification Management BMPs

Hydromodification Control	Location & Description	Modeled Size
North Hydromodification Vault (with 100-year detention and water quality harvest and reuse components) (POC #1)	Large vault located east of Country Club Drive and South of the Wastewater Treatment Storage Area	28,073 SF x 9.5' deep, 6.1 AF
South Hydromodification Vault (with 100-year detention and water quality harvest and reuse components) (POC #2)	Small vault located west of the intersection of Private Drive C and Private Drive D	10,340 SF x 7.5' deep, 1.8 AF

5.1 Drawdown Calculations

Per Section 6.4.6 of the County HMP, the maximum drawdown time to comply with Department of Environmental Health (DEH) guidelines is 96 hours. This standard has been set to minimize mosquito habitat and reduce the public health risk for West Nile Virus. This project complies with the DEH guidelines and, therefore, a separate vector control maintenance plan is not required.

6. CONCLUSION

This Preliminary Hydromodification Management report documents how the proposed project design complies with the new requirements presented in the County's Final HMP. The report and analysis presented herein supports the preliminary design of the storm drain improvements and hydromodification management facilities for the Tentative Map for the Harmony Grove Village South project (PDS2015-TM-5600). The results are located in the SDHM output files in Appendix 2 and indicate that the proposed hydromodification management vaults mitigate for

increased flows and durations per the criteria set forth in the County HMP. In addition, the facilities satisfy the DEH drawdown guidelines for vector control.

APPENDIX 1

Input Summary Tables

APPENDIX 1

Input Summary Tables

Pre-Project Hydromodification Report

2015-11-11

Basin	Soil Rating	Slope_Cover	SF	Acres	Percent
1					
	A				
		Flat	2,144	0.05	0.06%
		Moderate	351	0.01	0.01%
		Steep	47	0	0%
	C				
		Flat	174,470	4.01	4.93%
		Impervious Pad	3,506	0.08	0.1%
		Impervious Street	7,633	0.18	0.22%
		Moderate	494,091	11.34	13.97%
		Steep	2,527,655	58.03	71.45%
	D				
		Flat	2,902	0.07	0.08%
		Moderate	2,742	0.06	0.08%
		Steep	322,084	7.39	9.1%
			3,537,627	**81.21**	**100%**
2					
	C				
		Flat	11,415	0.26	1.86%
		Moderate	35,130	0.81	5.71%
		Steep	447,415	10.27	72.71%
	D				
		Flat	1,091	0.03	0.18%
		Moderate	1,484	0.03	0.24%
		Steep	118,772	2.73	19.3%
			615,306	**14.13**	**100%**
3					
	A				
		Flat	9,028	~~0.21~~ 0.34	~~14.51%~~
		Moderate	5,618	0.13	9.03%
		Steep	6,100	0.14	9.8%
	C				
		Flat	16,010	~~0.37~~ ok 0.37	25.73%
		Moderate	12,445	0.29	20%

Basin	Soil Rating	Slope_Cover	SF	Acres	Percent
		Steep	8,020	0.18	12.89%
	D				
		Flat	594	~~0.01~~ 0.04	~~0.95%~~
		Moderate	1,794	0.04	2.88%
		Steep	2,620	0.06	4.21%
			62,229	~~**1.43**~~ 1.59	**100%**
			4,215,162	96.77	

Post-Project Hydromodification Report

2015-11-11

Basin	Soil Rating	Slope_Cover	SF	Acres	Percent
1					
	A				
		Impervious Street	2,103	0.05	0.06%
		Landscape Flat	398	0.01	0.01%
		Landscape Steep	42	0	0%
	C				
		Impervious Pad	693,844	15.93	19.61%
		Impervious Street	512,452	11.76	14.48%
		Landscape Flat	393,387	9.03	11.12%
		Landscape Steep	568,989	13.06	16.08%
		Natural Flat	19,201	0.44	0.54%
		Natural Moderate	28,360	0.65	0.8%
		Natural Steep	991,354	22.76	28.02%
	D				
		Landscape Steep	379	0.01	0.01%
		Natural Flat	2,902	0.07	0.08%
		Natural Moderate	2,742	0.06	0.08%
		Natural Steep	321,705	7.39	9.09%
			3,537,857	**81.22**	**100%**
2					
	C				
		Impervious Pad	237,342	5.45	38.57%
		Impervious Street	79,361	1.82	12.9%
		Landscape Flat	117,699	2.7	19.13%
		Landscape Steep	59,566	1.37	9.68%
	D				
		Impervious Pad	49,550	1.14	8.05%
		Impervious Street	25,503	0.59	4.14%
		Landscape Flat	18,465	0.42	3%
		Landscape Steep	27,830	0.64	4.52%
			615,316	**14.13**	**100%**
3					
	A				
		Impervious Street	20,567	~~0.47~~ 0.39	33.05%

Basin	Soil Rating	Slope_Cover	SF	Acres	Percent
		Landscape ~~Steep~~ Flat	179	0.22	~~0.29%~~
	C				
		Impervious Street	35,461	~~0.81~~ 0.69	~~56.98%~~
		Landscape ~~Steep~~ Flat	1,014	~~0.02~~ 0.15	1.63%
	D				
		Impervious Street	5,008	~~0.11~~ 0.14	8.05%
			62,229	~~**1.43**~~ 1.59	**100%**
			4,215,402	96.77	

APPENDIX 2

Results Summary Table & SDHM Output

85th Percenile depth (in)= 0.52

Basin Water Quality Volume-based Sizing for Detention and Hydromod and Pollutant Control

Basin Sizing Approach

																C=	0.9	0.1
Extended Detention Basin	Drainage Area (ac)	Street Impervious Area (AC)	Pad Impervious Area (AC)	A Soils, Landscape Flat (AC)	C Soils, Landscape Flat (AC)	D Soils, Landscape Flat (AC)	A Soils, Landscape Steep (AC)	C Soils, Landscape Steep (AC)	D Soils, Landscape Steep (AC)	C Soils, Natural Landscape Flat (AC)	D Soils, Natural Landscape Flat (AC)	C Soils, Natural Landscape Mod (AC)	D Soils, Natural Landscape Mod (AC)	C Soils, Natural Landscape Steep (AC)	D Soils, Natural Landscape Steep (AC)	Total Impervious Area (AC)	A Soils, Landscaped Total (ac)
North, POC #1	81.22	11.81	15.93	0.01	9.03			13.06	0.01	0.44	0.07	0.65	0.06	22.76	7.39	27.74	0.01
South, POC #2	14.13	2.41	6.59		2.70	0.42		1.37	0.64							9.00	0.00
Country Club, POC #2 bypass	1.59	1.22	0	0.22	0.15											1.22	0.22

Notes:

1) C_{WQ}=Composite runoff factor per Section B.1 and B.2 of BMP Design Manual

2) WQ Vol=WQ 85th Percentile depth* C_{WQ}* Area

3) Drawdown calculation with integration of orifice equation

0.23	0.3	0.1	0.23	0.3													
C Soils, Landscaped Total (ac)	D Soils, Landscaped Total (ac)	A Soils, Natural Total (ac)	C Soils, Natural Total (ac)	D Soils, Natural Total (ac)	C_{WQ}[1]	WQ Volume (AF)[2]	Area of basin (SF)	Area of basin (AF)	Modeled L (square)	WQ depth	Avg Qorif for 36hr drawdown of DCV (cfs)	Lower Orifice D (in)	Q initial Orifice (cfs)	Q initial Orifice (gpm)	WQ Volume Drawdown (hours)[3]	Low flow threshold (LFT) criteria	LFT (cfs)
22.09	0.01	0.00	23.85	7.52	0.47	1.64	28073.19	0.644	167.55	2.54	0.55	6.2	1.29	577.23	22.1	0.5Q2	8.1
4.07	1.06	0.00	0.00	0.00	0.66	0.41	10339.9	0.24	101.69	1.69	0.14	3	0.25	110.84	28.6	0.5Q2	1.43
0.15	0.00	0.00	0.00	0.00	0.73	0.05											

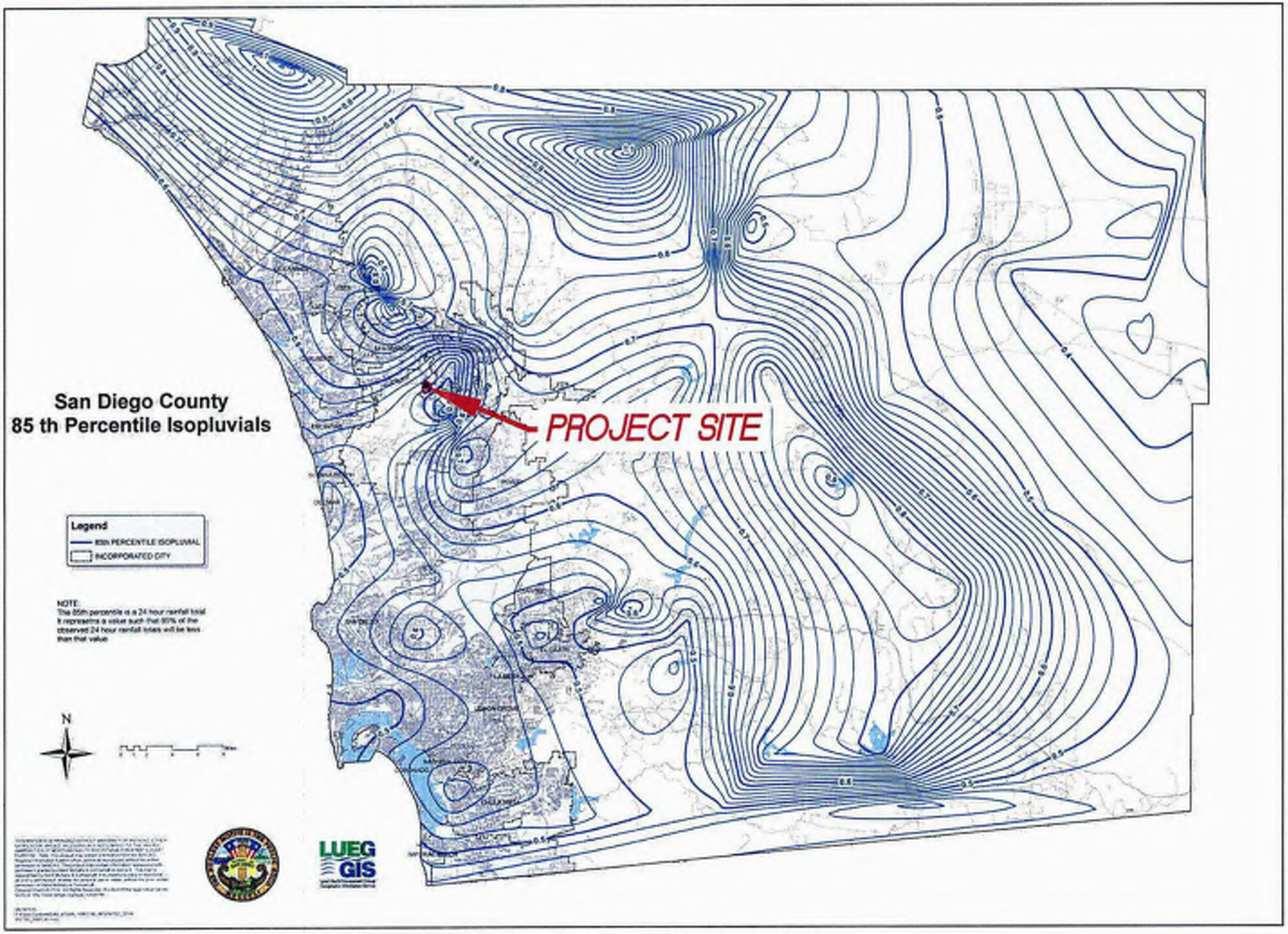

Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

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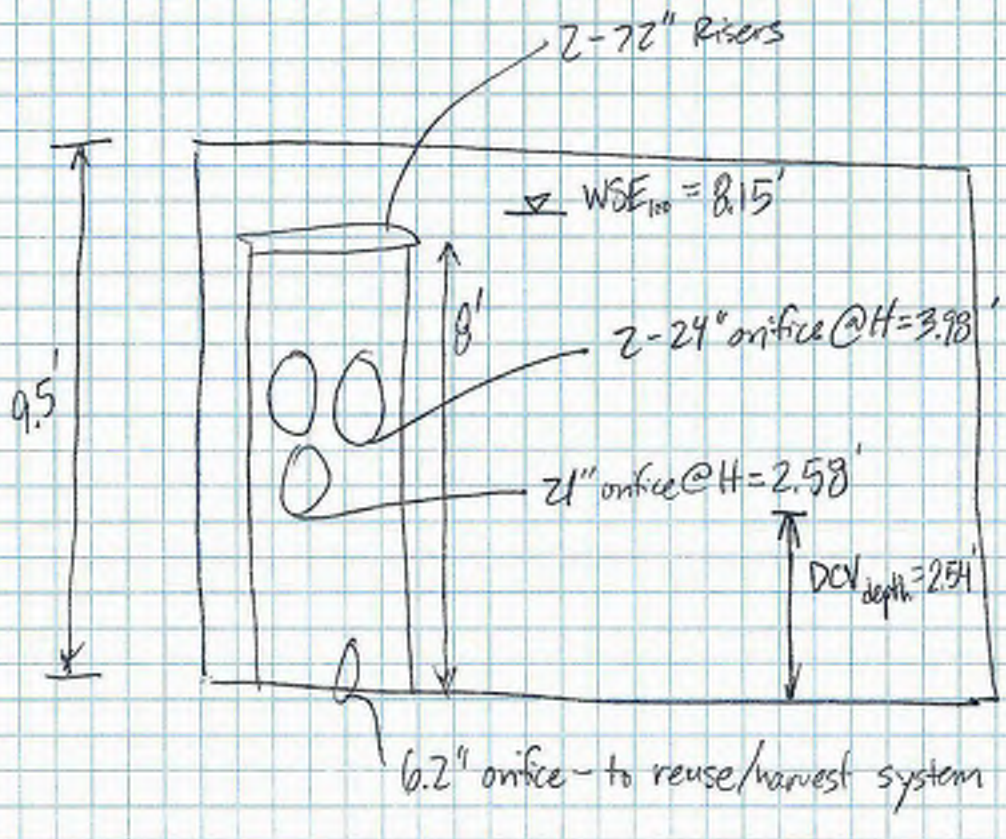
PROJECT HGVS
SUBJECT Detention Vault Cross Section
PAGE : 1 OF 1 JOB NO.: 4095.01
DRAWN BY : CP DATE : 1/16/16
CHECKED BY : _____ DATE : _____



NORTH BASIN

NTS

SDHM

PROJECT REPORT

General Model Information

Project Name:	POC1&3
Site Name:	HGVS
Site Address:	Country Club Dr
City:	County of SD
Report Date:	12/28/2016
Gage:	ESCONDID
Data Start:	10/01/1964
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.00
Version:	2015/09/23

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year
Low Flow Threshold for POC2:	50 Percent of the 2 Year
High Flow Threshold for POC2:	10 Year

Landuse Basin Data
Predeveloped Land Use

Basin 1 to POC 2

Bypass: No

GroundWater: No

Pervious Land Use	acre
A,Grass,FLAT(0-5%)	0.05
A,Grass,MOD(5-10%)	0.01
C,Grass,FLAT(0-5%)	4.02
C,Grass,MOD(5-10%)	11.34
C,Grass,STEEP(10-20	58.03
D,Grass,FLAT(0-5%)	0.07
D,Grass,MOD(5-10%)	0.05
D,Grass,STEEP(10-20	7.39
Pervious Total	80.96

Impervious Land Use	acre
IMPERVIOUS-FLAT	0.26
Impervious Total	0.26

Basin Total 81.22

Element Flows To:

Surface	Interflow	Groundwater

Basin 1 to POC 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A,Grass,FLAT(0-5%)	0.05
A,Grass,MOD(5-10%)	0.01
C,Grass,FLAT(0-5%)	4.02
C,Grass,MOD(5-10%)	11.34
C,Grass,STEEP(10-20	58.03
D,Grass,FLAT(0-5%)	0.07
D,Grass,MOD(5-10%)	0.05
D,Grass,STEEP(10-20	7.39
Pervious Total	80.96

Impervious Land Use	acre
IMPERVIOUS-FLAT	0.26
Impervious Total	0.26
Basin Total	81.22

Element Flows To:

Surface	Interflow	Groundwater

Basin 3 to POC1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A,Grass,MOD(5-10%)	0.13
A,Grass,STEEP(10-20	0.14
C,Grass,FLAT(0-5%)	0.37
C,Grass,MOD(5-10%)	0.29
C,Grass,STEEP(10-20	0.18
D,Grass,MOD(5-10%)	0.04
D,Grass,STEEP(10-20	0.06
A,Grass,FLAT(0-5%)	0.34
D,Grass,FLAT(0-5%)	0.04
Pervious Total	1.59

Impervious Land Use	acre
Impervious Total	0
Basin Total	1.59

Element Flows To:

Surface	Interflow	Groundwater

Basin 3 to POC2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A,Grass,MOD(5-10%)	0.13
A,Grass,STEEP(10-20	0.14
C,Grass,FLAT(0-5%)	0.37
C,Grass,MOD(5-10%)	0.29
C,Grass,STEEP(10-20	0.18
D,Grass,MOD(5-10%)	0.04
D,Grass,STEEP(10-20	0.06
A,Grass,FLAT(0-5%)	0.34
D,Grass,FLAT(0-5%)	0.04
Pervious Total	1.59

Impervious Land Use	acre
Impervious Total	0
Basin Total	1.59

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A,Grass,FLAT(0-5%)	0.01
C,Grass,FLAT(0-5%)	9.47
C,Grass,MOD(5-10%)	0.65
C,Grass,STEEP(10-20	35.82
D,Grass,FLAT(0-5%)	0.07
D,Grass,MOD(5-10%)	0.06
D,Grass,STEEP(10-20	7.4
Pervious Total	53.48

Impervious Land Use	acre
IMPERVIOUS-FLAT	27.74
Impervious Total	27.74
Basin Total	81.22

Element Flows To:

Surface	Interflow	Groundwater
Vault 1-WQV	Vault 1-WQV	

Basin 3

Bypass:	Yes
GroundWater:	No

Pervious Land Use	acre
A,Grass,FLAT(0-5%)	0.22
C,Grass,FLAT(0-5%)	0.15
Pervious Total	0.37

Impervious Land Use	acre
IMPERVIOUS-FLAT	1.22
Impervious Total	1.22
Basin Total	1.59

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Routing

Vault 1-WQV

Width: 167.55 ft.
Length: 167.55 ft.
Depth: 9.5 ft.
Discharge Structure
Riser Height: 2.58 ft.
Riser Diameter: 72 in.
Orifice 1 Diameter: 6.2 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2
Flow Splitter 1

Vault Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.644	0.000	0.000	0.000
0.1056	0.644	0.068	0.338	0.000
0.2111	0.644	0.136	0.479	0.000
0.3167	0.644	0.204	0.587	0.000
0.4222	0.644	0.272	0.677	0.000
0.5278	0.644	0.340	0.757	0.000
0.6333	0.644	0.408	0.830	0.000
0.7389	0.644	0.476	0.896	0.000
0.8444	0.644	0.544	0.958	0.000
0.9500	0.644	0.612	1.016	0.000
1.0556	0.644	0.680	1.071	0.000
1.1611	0.644	0.748	1.124	0.000
1.2667	0.644	0.816	1.174	0.000
1.3722	0.644	0.884	1.222	0.000
1.4778	0.644	0.952	1.268	0.000
1.5833	0.644	1.020	1.312	0.000
1.6889	0.644	1.088	1.355	0.000
1.7944	0.644	1.156	1.397	0.000
1.9000	0.644	1.224	1.437	0.000
2.0056	0.644	1.292	1.477	0.000
2.1111	0.644	1.360	1.515	0.000
2.2167	0.644	1.428	1.553	0.000
2.3222	0.644	1.496	1.589	0.000
2.4278	0.644	1.564	1.625	0.000
2.5333	0.644	1.632	1.660	0.000
2.6389	0.644	1.700	2.604	0.000
2.7444	0.644	1.768	5.972	0.000
2.8500	0.644	1.836	10.68	0.000
2.9556	0.644	1.904	16.41	0.000
3.0611	0.644	1.972	22.99	0.000
3.1667	0.644	2.040	30.30	0.000
3.2722	0.644	2.108	38.22	0.000
3.3778	0.644	2.176	46.67	0.000
3.4833	0.644	2.244	55.56	0.000
3.5889	0.644	2.312	64.79	0.000
3.6944	0.644	2.380	74.26	0.000
3.8000	0.644	2.449	83.90	0.000
3.9056	0.644	2.517	93.59	0.000
4.0111	0.644	2.585	103.2	0.000
4.1167	0.644	2.653	112.7	0.000

4.2222	0.644	2.721	122.0	0.000
4.3278	0.644	2.789	131.0	0.000
4.4333	0.644	2.857	139.5	0.000
4.5389	0.644	2.925	147.6	0.000
4.6444	0.644	2.993	155.2	0.000
4.7500	0.644	3.061	162.1	0.000
4.8556	0.644	3.129	168.5	0.000
4.9611	0.644	3.197	174.2	0.000
5.0667	0.644	3.265	179.2	0.000
5.1722	0.644	3.333	183.7	0.000
5.2778	0.644	3.401	187.6	0.000
5.3833	0.644	3.469	191.0	0.000
5.4889	0.644	3.537	194.2	0.000
5.5944	0.644	3.605	199.3	0.000
5.7000	0.644	3.673	202.7	0.000
5.8056	0.644	3.741	206.1	0.000
5.9111	0.644	3.809	209.4	0.000
6.0167	0.644	3.877	212.7	0.000
6.1222	0.644	3.945	215.9	0.000
6.2278	0.644	4.013	219.1	0.000
6.3333	0.644	4.081	222.3	0.000
6.4389	0.644	4.149	225.3	0.000
6.5444	0.644	4.217	228.4	0.000
6.6500	0.644	4.285	231.4	0.000
6.7556	0.644	4.353	234.4	0.000
6.8611	0.644	4.421	237.3	0.000
6.9667	0.644	4.489	240.2	0.000
7.0722	0.644	4.557	243.1	0.000
7.1778	0.644	4.625	245.9	0.000
7.2833	0.644	4.693	248.7	0.000
7.3889	0.644	4.761	251.4	0.000
7.4944	0.644	4.829	254.2	0.000
7.6000	0.644	4.898	256.9	0.000
7.7056	0.644	4.966	259.6	0.000
7.8111	0.644	5.034	262.2	0.000
7.9167	0.644	5.102	264.8	0.000
8.0222	0.644	5.170	267.4	0.000
8.1278	0.644	5.238	270.0	0.000
8.2333	0.644	5.306	272.5	0.000
8.3389	0.644	5.374	275.1	0.000
8.4444	0.644	5.442	277.6	0.000
8.5500	0.644	5.510	280.0	0.000
8.6556	0.644	5.578	282.5	0.000
8.7611	0.644	5.646	284.9	0.000
8.8667	0.644	5.714	287.4	0.000
8.9722	0.644	5.782	289.8	0.000
9.0778	0.644	5.850	292.1	0.000
9.1833	0.644	5.918	294.5	0.000
9.2889	0.644	5.986	296.8	0.000
9.3944	0.644	6.054	299.1	0.000
9.5000	0.644	6.122	301.4	0.000
9.6056	0.644	6.190	303.7	0.000
9.7111	0.000	0.000	306.0	0.000

Flow Splitter 1

Bottom Length: 10.00 ft.
Bottom Length: 10.00 ft.
Depth: 10 ft.
Side slope 1: 0 To 1
Side slope 2: 0 To 1
Side slope 3: 0 To 1
Side slope 4: 0 To 1

Threshold Splitter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Primary(cfs)	Secondary(cfs)
0.000	0.002	0.000	1.670	0.000
0.111	0.002	0.000	1.670	0.000
0.222	0.002	0.000	1.670	0.000
0.333	0.002	0.000	1.670	0.000
0.444	0.002	0.001	1.670	0.000
0.555	0.002	0.001	1.670	0.000
0.666	0.002	0.001	1.670	0.000
0.777	0.002	0.001	1.670	0.000
0.888	0.002	0.002	1.670	0.000
1.000	0.002	0.002	1.670	0.000
1.111	0.002	0.002	1.670	0.000
1.222	0.002	0.002	1.670	0.000
1.333	0.002	0.003	1.670	0.000
1.444	0.002	0.003	1.670	0.000
1.555	0.002	0.003	1.670	0.000
1.666	0.002	0.003	1.670	0.000
1.777	0.002	0.004	1.670	0.000
1.888	0.002	0.004	1.670	0.000
2.000	0.002	0.004	1.670	0.000
2.111	0.002	0.004	1.670	0.000
2.222	0.002	0.005	1.670	0.000
2.333	0.002	0.005	1.670	0.000
2.444	0.002	0.005	1.670	0.000
2.555	0.002	0.005	1.670	0.000
2.666	0.002	0.006	1.670	0.000
2.777	0.002	0.006	1.670	0.000
2.888	0.002	0.006	1.670	1000
3.000	0.002	0.006	1.670	1000
3.111	0.002	0.007	1.670	1000
3.222	0.002	0.007	1.670	1000
3.333	0.002	0.007	1.670	1000
3.444	0.002	0.007	1.670	1000
3.555	0.002	0.008	1.670	1000
3.666	0.002	0.008	1.670	1000
3.777	0.002	0.008	1.670	1000
3.888	0.002	0.008	1.670	1000
4.000	0.002	0.009	1.670	1000
4.111	0.002	0.009	1.670	1000
4.222	0.002	0.009	1.670	1000
4.333	0.002	0.009	1.670	1000
4.444	0.002	0.010	1.670	1000
4.555	0.002	0.010	1.670	1000
4.666	0.002	0.010	1.670	1000
4.777	0.002	0.011	1.670	1000
4.888	0.002	0.011	1.670	1000
5.000	0.002	0.011	1.670	1000
5.111	0.002	0.011	1.670	1000

5.222	0.002	0.012	1.670	1000
5.333	0.002	0.012	1.670	1000
5.444	0.002	0.012	1.670	1000
5.555	0.002	0.012	1.670	1000
5.666	0.002	0.013	1.670	1000
5.777	0.002	0.013	1.670	1000
5.888	0.002	0.013	1.670	1000
6.000	0.002	0.013	1.670	1000
8.111	0.002	0.014	1.670	1000
6.222	0.002	0.014	1.670	1000
6.333	0.002	0.014	1.670	1000
6.444	0.002	0.014	1.670	1000
6.555	0.002	0.015	1.670	1000
6.666	0.002	0.015	1.670	1000
6.777	0.002	0.015	1.670	1000
6.888	0.002	0.015	1.670	1000
7.000	0.002	0.018	1.670	1000
7.111	0.002	0.016	1.670	1000
7.222	0.002	0.016	1.670	1000
7.333	0.002	0.016	1.670	1000
7.444	0.002	0.017	1.670	1000
7.555	0.002	0.017	1.670	1000
7.666	0.002	0.017	1.670	1000
7.777	0.002	0.017	1.670	1000
7.888	0.002	0.018	1.670	1000
8.000	0.002	0.018	1.670	1000
8.111	0.002	0.018	1.670	1000
8.222	0.002	0.018	1.670	1000
8.333	0.002	0.019	1.670	1000
8.444	0.002	0.019	1.670	1000
8.555	0.002	0.019	1.670	1000
8.666	0.002	0.019	1.670	1000
8.777	0.002	0.020	1.870	1000
8.888	0.002	0.020	1.870	1000
9.000	0.002	0.020	1.670	1000
9.111	0.002	0.020	1.670	1000
9.222	0.002	0.021	1.670	1000
9.333	0.002	0.021	1.670	1000
9.444	0.002	0.021	1.670	1000
9.555	0.002	0.021	1.670	1000
9.666	0.002	0.022	1.670	1000
9.777	0.002	0.022	1.670	1000
9.888	0.002	0.022	1.670	1000
10.00	0.002	0.023	1.670	1000
10.11	0.002	0.023	1.670	1000

Discharge Structure
Riser Height: 0 ft.
Riser Diameter: 0 in.
Element Flows To:
Outlet 1 Outlet 2
Vault 2

Vault 2

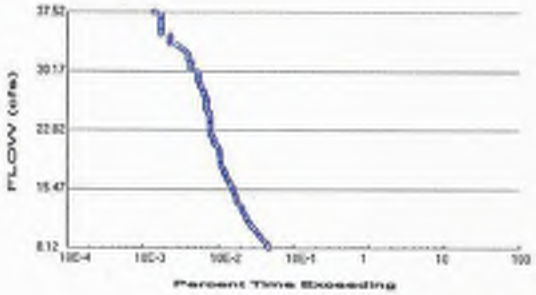
Width:	167.55 ft.	
Length:	167.55 ft.	
Depth:	6.92 ft.	
Discharge Structure		
Riser Height:	5.42 ft.	
Riser Diameter:	144 in.	
Orifice 1 Diameter:	21 in.	Elevation:0 ft.
Orifice 2 Diameter:	24 in.	Elevation:1.4 ft.
Orifice 3 Diameter:	24 in.	Elevation:1.4 ft.
Element Flows To:		
Outlet 1	Outlet 2	

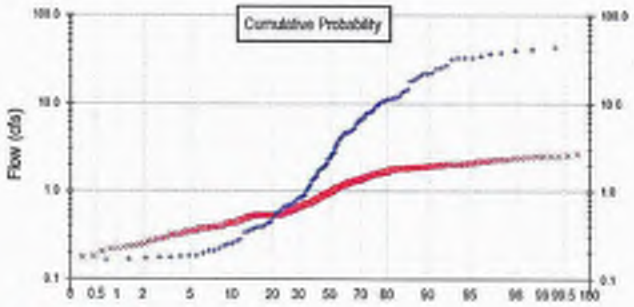
Vault Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.644	0.000	0.000	0.000
0.0769	0.644	0.049	3.318	0.000
0.1538	0.644	0.099	4.692	0.000
0.2307	0.644	0.148	5.747	0.000
0.3076	0.644	0.198	6.636	0.000
0.3844	0.644	0.247	7.420	0.000
0.4613	0.644	0.297	8.128	0.000
0.5382	0.644	0.346	8.779	0.000
0.6151	0.644	0.396	9.385	0.000
0.6920	0.644	0.446	9.955	0.000
0.7689	0.644	0.495	10.49	0.000
0.8458	0.644	0.545	11.00	0.000
0.9227	0.644	0.594	11.49	0.000
0.9996	0.644	0.644	11.96	0.000
1.0764	0.644	0.693	12.41	0.000
1.1533	0.644	0.743	12.85	0.000
1.2302	0.644	0.792	13.27	0.000
1.3071	0.644	0.842	13.68	0.000
1.3840	0.644	0.891	14.07	0.000
1.4609	0.644	0.941	22.17	0.000
1.5378	0.644	0.991	26.44	0.000
1.6147	0.644	1.040	29.69	0.000
1.6916	0.644	1.090	32.44	0.000
1.7684	0.644	1.139	34.89	0.000
1.8453	0.644	1.189	37.11	0.000
1.9222	0.644	1.238	39.18	0.000
1.9991	0.644	1.288	41.11	0.000
2.0760	0.644	1.337	42.94	0.000
2.1529	0.644	1.387	44.68	0.000
2.2298	0.644	1.437	46.34	0.000
2.3067	0.644	1.486	47.94	0.000
2.3836	0.644	1.536	49.48	0.000
2.4604	0.644	1.585	50.96	0.000
2.5373	0.644	1.635	52.40	0.000
2.6142	0.644	1.684	53.79	0.000
2.6911	0.644	1.734	55.15	0.000
2.7680	0.644	1.783	56.47	0.000
2.8449	0.644	1.833	57.76	0.000
2.9218	0.644	1.883	59.02	0.000
2.9987	0.644	1.932	60.25	0.000

3.0756	0.644	1.982	61.45	0.000
3.1524	0.644	2.031	62.63	0.000
3.2293	0.644	2.081	63.78	0.000
3.3062	0.644	2.130	64.92	0.000
3.3831	0.644	2.180	66.03	0.000
3.4600	0.644	2.229	67.12	0.000
3.5369	0.644	2.279	68.20	0.000
3.6138	0.644	2.329	69.26	0.000
3.6907	0.644	2.378	70.30	0.000
3.7676	0.644	2.428	71.33	0.000
3.8444	0.644	2.477	72.34	0.000
3.9213	0.644	2.527	73.33	0.000
3.9982	0.644	2.576	74.32	0.000
4.0751	0.644	2.626	75.28	0.000
4.1520	0.644	2.675	76.24	0.000
4.2289	0.644	2.725	77.19	0.000
4.3058	0.644	2.774	78.12	0.000
4.3827	0.644	2.824	79.04	0.000
4.4596	0.644	2.874	79.95	0.000
4.5364	0.644	2.923	80.85	0.000
4.6133	0.644	2.973	81.74	0.000
4.6902	0.644	3.022	82.62	0.000
4.7671	0.644	3.072	83.49	0.000
4.8440	0.644	3.121	84.35	0.000
4.9209	0.644	3.171	85.20	0.000
4.9978	0.644	3.220	86.05	0.000
5.0747	0.644	3.270	86.88	0.000
5.1516	0.644	3.320	87.71	0.000
5.2284	0.644	3.369	88.53	0.000
5.3053	0.644	3.419	89.34	0.000
5.3822	0.644	3.468	90.14	0.000
5.4591	0.644	3.518	91.93	0.000
5.5360	0.644	3.567	96.76	0.000
5.6129	0.644	3.617	103.3	0.000
5.6898	0.644	3.666	111.1	0.000
5.7667	0.644	3.716	120.0	0.000
5.8436	0.644	3.766	129.9	0.000
5.9204	0.644	3.815	140.6	0.000
5.9973	0.644	3.865	152.1	0.000
6.0742	0.644	3.914	164.3	0.000
6.1511	0.644	3.964	177.2	0.000
6.2280	0.644	4.013	190.8	0.000
6.3049	0.644	4.063	204.9	0.000
6.3818	0.644	4.112	219.6	0.000
6.4587	0.644	4.162	234.9	0.000
6.5356	0.644	4.212	250.7	0.000
6.6124	0.644	4.261	266.9	0.000
6.6893	0.644	4.311	283.6	0.000
6.7662	0.644	4.360	300.7	0.000
6.8431	0.644	4.410	318.3	0.000
6.9200	0.644	4.459	336.2	0.000
6.9969	0.644	3.909	354.5	0.000

Analysis Results
POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 82.55
Total Impervious Area: 0.26

Mitigated Landuse Totals for POC #1
Total Pervious Area: 53.85
Total Impervious Area: 28.96

Flow Frequency Method: Cunnane

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	16.234707
5 year	33.02673
10 year	37.524591
25 year	41.644044

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	2.216245
5 year	2.444482
10 year	2.512781
25 year	2.55381

Duration Flows

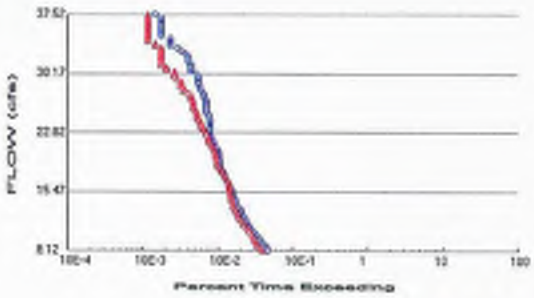
The Facility PASSED

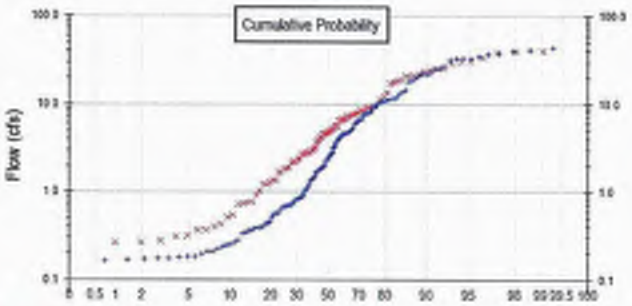
Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
8.1174	162	0	0	Pass
8.4144	158	0	0	Pass
8.7114	153	0	0	Pass
9.0085	143	0	0	Pass
9.3055	132	0	0	Pass
9.6026	123	0	0	Pass
9.8996	117	0	0	Pass
10.1967	112	0	0	Pass
10.4937	104	0	0	Pass
10.7907	96	0	0	Pass
11.0878	92	0	0	Pass
11.3848	88	0	0	Pass
11.6819	84	0	0	Pass
11.9789	82	0	0	Pass
12.2760	78	0	0	Pass
12.5730	75	0	0	Pass
12.8700	72	0	0	Pass
13.1671	71	0	0	Pass
13.4641	68	0	0	Pass
13.7612	61	0	0	Pass
14.0582	61	0	0	Pass
14.3553	60	0	0	Pass
14.6523	58	0	0	Pass
14.9493	56	0	0	Pass
15.2464	55	0	0	Pass
15.5434	55	0	0	Pass
15.8405	51	0	0	Pass
16.1375	50	0	0	Pass
16.4346	48	0	0	Pass
16.7316	45	0	0	Pass
17.0286	45	0	0	Pass
17.3257	42	0	0	Pass
17.6227	42	0	0	Pass
17.9198	41	0	0	Pass
18.2168	39	0	0	Pass
18.5139	37	0	0	Pass
18.8109	37	0	0	Pass
19.1079	37	0	0	Pass
19.4050	37	0	0	Pass
19.7020	36	0	0	Pass
19.9991	36	0	0	Pass
20.2961	36	0	0	Pass
20.5932	35	0	0	Pass
20.8902	33	0	0	Pass
21.1872	30	0	0	Pass
21.4843	30	0	0	Pass
21.7813	30	0	0	Pass
22.0784	28	0	0	Pass
22.3754	28	0	0	Pass
22.6725	27	0	0	Pass
22.9695	27	0	0	Pass
23.2665	27	0	0	Pass
23.5636	27	0	0	Pass

23.8606	27	0	0	Pass
24.1577	27	0	0	Pass
24.4547	27	0	0	Pass
24.7518	26	0	0	Pass
25.0488	26	0	0	Pass
25.3458	24	0	0	Pass
25.6429	24	0	0	Pass
25.9399	24	0	0	Pass
26.2370	24	0	0	Pass
26.5340	24	0	0	Pass
26.8311	24	0	0	Pass
27.1281	23	0	0	Pass
27.4251	22	0	0	Pass
27.7222	22	0	0	Pass
28.0192	21	0	0	Pass
28.3163	20	0	0	Pass
28.6133	20	0	0	Pass
28.9103	19	0	0	Pass
29.2074	19	0	0	Pass
29.5044	19	0	0	Pass
29.8015	19	0	0	Pass
30.0985	18	0	0	Pass
30.3956	15	0	0	Pass
30.6926	15	0	0	Pass
30.9896	15	0	0	Pass
31.2867	15	0	0	Pass
31.5837	14	0	0	Pass
31.8808	14	0	0	Pass
32.1778	14	0	0	Pass
32.4749	13	0	0	Pass
32.7719	12	0	0	Pass
33.0689	11	0	0	Pass
33.3660	10	0	0	Pass
33.6630	8	0	0	Pass
33.9601	8	0	0	Pass
34.2571	8	0	0	Pass
34.5542	8	0	0	Pass
34.8512	6	0	0	Pass
35.1482	6	0	0	Pass
35.4453	6	0	0	Pass
35.7423	6	0	0	Pass
36.0394	6	0	0	Pass
36.3364	6	0	0	Pass
36.6335	6	0	0	Pass
36.9305	6	0	0	Pass
37.2275	6	0	0	Pass
37.5246	5	0	0	Pass

Water Quality

POC 2





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 82.55
Total Impervious Area: 0.26

Mitigated Landuse Totals for POC #2
Total Pervious Area: 53.48
Total Impervious Area: 27.74

Flow Frequency Method: Cunnane

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	**Flow(cfs)**
2 year	16.234707
5 year	33.02673
10 year	37.524591
25 year	41.644044

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	**Flow(cfs)**
2 year	12.792046
5 year	25.710442
10 year	32.750862
25 year	39.364768

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
8.1174	162	138	85	Pass
8.4144	158	128	81	Pass
8.7114	153	118	77	Pass
9.0085	143	116	81	Pass
9.3055	132	111	84	Pass
9.6026	123	107	86	Pass
9.8996	117	104	88	Pass
10.1967	112	100	89	Pass
10.4937	104	92	88	Pass
10.7907	96	89	92	Pass
11.0878	92	85	92	Pass
11.3848	88	77	87	Pass
11.6819	84	74	88	Pass
11.9789	82	71	86	Pass
12.2760	78	65	83	Pass
12.5730	75	65	86	Pass
12.8700	72	63	87	Pass
13.1671	71	60	84	Pass
13.4641	68	58	85	Pass
13.7612	61	56	91	Pass
14.0582	61	56	91	Pass
14.3553	60	53	88	Pass
14.6523	58	53	91	Pass
14.9493	56	52	92	Pass
15.2464	55	51	92	Pass
15.5434	55	50	90	Pass
15.8405	51	50	98	Pass
16.1375	50	49	98	Pass
16.4346	48	48	100	Pass
16.7316	45	48	106	Pass
17.0286	45	46	102	Pass
17.3257	42	43	102	Pass
17.6227	42	42	100	Pass
17.9198	41	39	95	Pass
18.2168	39	38	97	Pass
18.5139	37	37	100	Pass
18.8109	37	34	91	Pass
19.1079	37	34	91	Pass
19.4050	37	33	89	Pass
19.7020	36	33	91	Pass
19.9991	36	32	88	Pass
20.2961	36	32	88	Pass
20.5932	35	31	88	Pass
20.8902	33	31	93	Pass
21.1872	30	29	96	Pass
21.4843	30	27	90	Pass
21.7813	30	26	86	Pass
22.0784	28	26	92	Pass
22.3754	28	26	92	Pass
22.6725	27	24	88	Pass
22.9695	27	24	88	Pass
23.2665	27	22	81	Pass
23.5636	27	21	77	Pass

23.8606	27	20	74	Pass
24.1577	27	20	74	Pass
24.4547	27	19	70	Pass
24.7518	26	18	69	Pass
25.0488	26	18	69	Pass
25.3458	24	18	75	Pass
25.6429	24	17	70	Pass
25.9399	24	16	66	Pass
26.2370	24	16	66	Pass
26.5340	24	16	66	Pass
26.8311	24	16	66	Pass
27.1281	23	15	65	Pass
27.4251	22	15	68	Pass
27.7222	22	14	63	Pass
28.0192	21	12	57	Pass
28.3163	20	12	60	Pass
28.6133	20	11	55	Pass
28.9103	19	11	57	Pass
29.2074	19	11	57	Pass
29.5044	19	10	52	Pass
29.8015	19	9	47	Pass
30.0985	18	9	50	Pass
30.3956	15	9	60	Pass
30.6926	15	7	46	Pass
30.9896	15	7	46	Pass
31.2867	15	6	40	Pass
31.5837	14	6	42	Pass
31.8808	14	6	42	Pass
32.1778	14	6	42	Pass
32.4749	13	6	46	Pass
32.7719	12	6	50	Pass
33.0689	11	6	54	Pass
33.3660	10	6	60	Pass
33.6630	8	5	62	Pass
33.9601	8	5	62	Pass
34.2571	8	4	50	Pass
34.5542	8	4	50	Pass
34.8512	6	4	66	Pass
35.1482	6	4	66	Pass
35.4453	6	4	66	Pass
35.7423	6	4	66	Pass
36.0394	6	4	66	Pass
36.3364	6	4	66	Pass
36.6335	6	4	66	Pass
36.9305	6	4	66	Pass
37.2275	6	4	66	Pass
37.5246	5	4	80	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

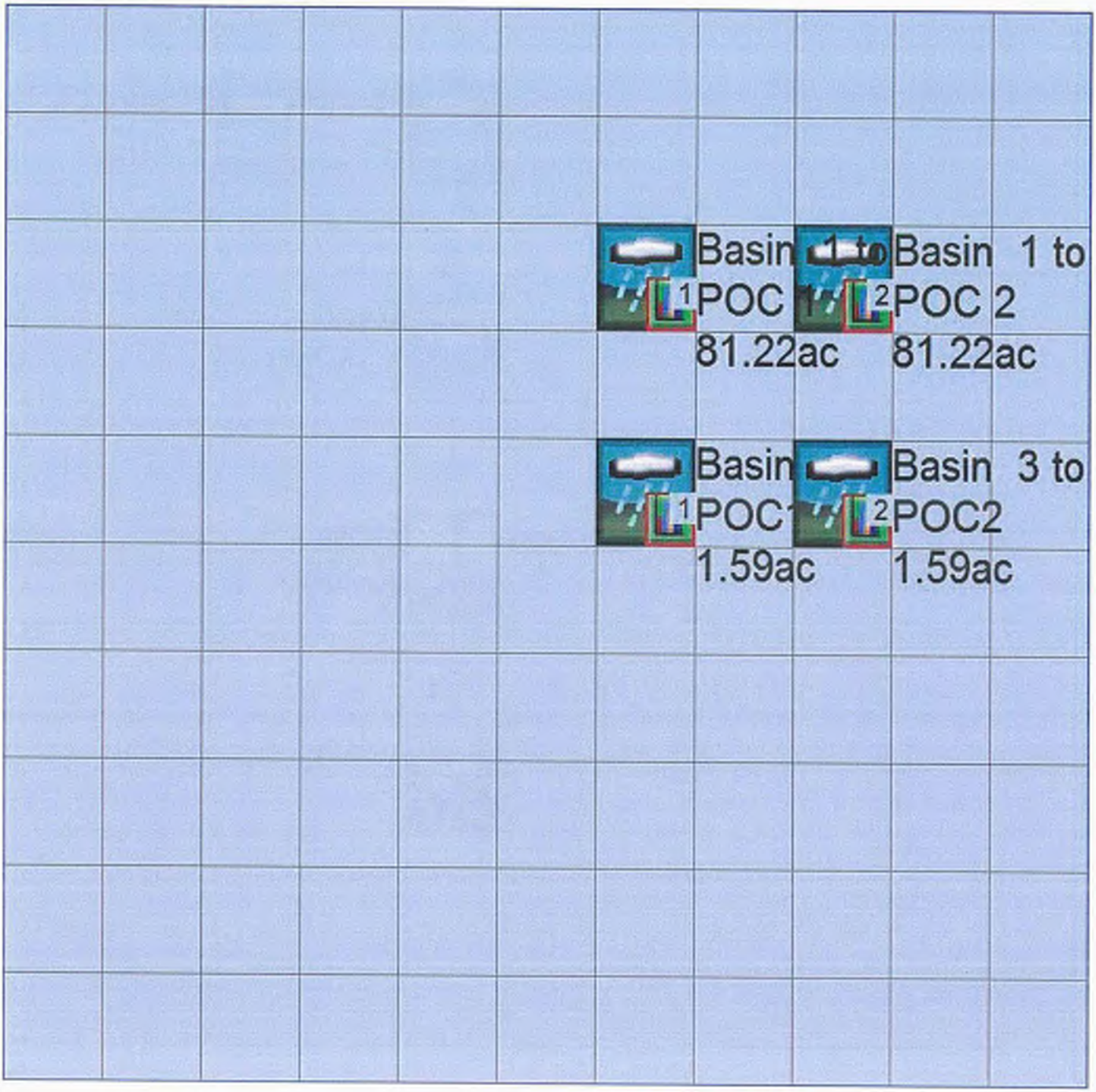
PERLND Changes

No PERLND changes have been made.

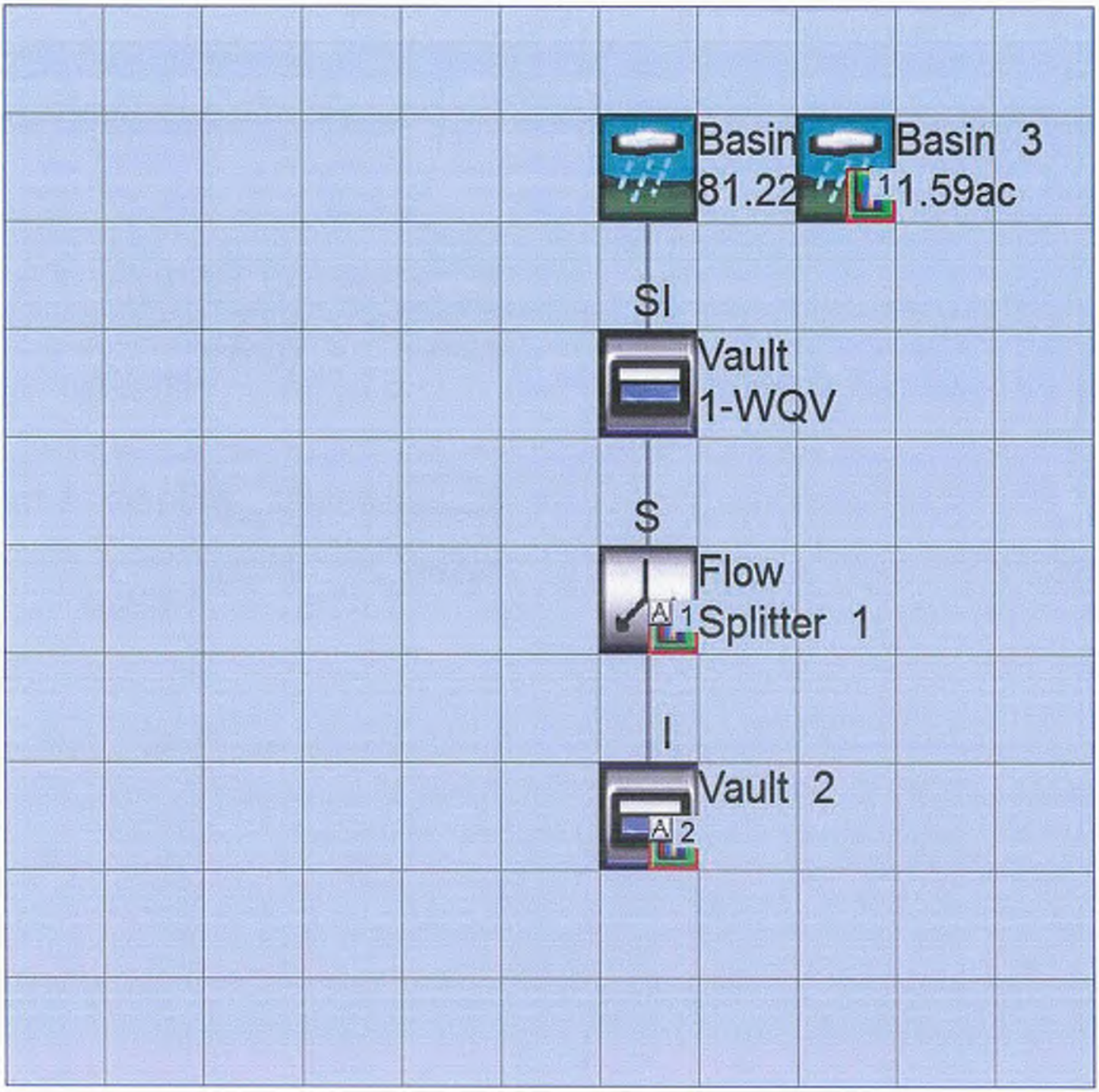
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1964 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   POC1&3.wdm
MESSU       25   PrePOC1&3.MES
            27   PrePOC1&3.L61
            28   PrePOC1&3.L62
            31   POCPOC1&32.dat
            30   POCPOC1&31.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:60
      PERLND        1
      PERLND        2
      PERLND       19
      PERLND       20
      PERLND       21
      PERLND       28
      PERLND       29
      PERLND       30
      IMPLND        1
      PERLND        3
      COPY        502
      COPY        501
      DISPLY        2
      DISPLY        1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    2        Basin  1 to POC 2          MAX                   1    2   31    9
    1        Basin  1 to POC 1          MAX                   1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1          1    1
  502          1    1
  501          1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out             ***
    1      A,Grass,FLAT(0-5%)      1    1    1    1   27    0
    2      A,Grass,MOD(5-10%)      1    1    1    1   27    0
```

```
 19       C,Grass,FLAT(0-5%)      1     1     1     1    27     0
 20       C,Grass,MOD(5-10%)      1     1     1     1    27     0
 21       C,Grass,STEEP(10-20     1     1     1     1    27     0
 28       D,Grass,FLAT(0-5%)      1     1     1     1    27     0
 29       D,Grass,MOD(5-10%)      1     1     1     1    27     0
 30       D,Grass,STEEP(10-20     1     1     1     1    27     0
  3       A,Grass,STEEP(10-20     1     1     1     1    27     0
END GEN-INFO
*** Section PWATER***

ACTIVITY
  <PLS > ************* Active Sections ******************************
  # -   # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
  1          0    0    1    0    0    0    0    0    0    0    0    0
  2          0    0    1    0    0    0    0    0    0    0    0    0
 19          0    0    1    0    0    0    0    0    0    0    0    0
 20          0    0    1    0    0    0    0    0    0    0    0    0
 21          0    0    1    0    0    0    0    0    0    0    0    0
 28          0    0    1    0    0    0    0    0    0    0    0    0
 29          0    0    1    0    0    0    0    0    0    0    0    0
 30          0    0    1    0    0    0    0    0    0    0    0    0
  3          0    0    1    0    0    0    0    0    0    0    0    0
END ACTIVITY

PRINT-INFO
  <PLS > ***************** Print-flags ***************************** PIVL  PYR
  # -   # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
  1          0    0    4    0    0    0    0    0    0    0    0    0    1     9
  2          0    0    4    0    0    0    0    0    0    0    0    0    1     9
 19          0    0    4    0    0    0    0    0    0    0    0    0    1     9
 20          0    0    4    0    0    0    0    0    0    0    0    0    1     9
 21          0    0    4    0    0    0    0    0    0    0    0    0    1     9
 28          0    0    4    0    0    0    0    0    0    0    0    0    1     9
 29          0    0    4    0    0    0    0    0    0    0    0    0    1     9
 30          0    0    4    0    0    0    0    0    0    0    0    0    1     9
  3          0    0    4    0    0    0    0    0    0    0    0    0    1     9
END PRINT-INFO

PWAT-PARM1
  <PLS >  PWATER variable monthly parameter value flags  ***
  # -   # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
  1          0    1    1    1    0    0    0    0    1    1    0
  2          0    1    1    1    0    0    0    0    1    1    0
 19          0    1    1    1    0    0    0    0    1    1    0
 20          0    1    1    1    0    0    0    0    1    1    0
 21          0    1    1    1    0    0    0    0    1    1    0
 28          0    1    1    1    0    0    0    0    1    1    0
 29          0    1    1    1    0    0    0    0    1    1    0
 30          0    1    1    1    0    0    0    0    1    1    0
  3          0    1    1    1    0    0    0    0    1    1    0
END PWAT-PARM1

PWAT-PARM2
  <PLS >       PWATER input info: Part 2          ***
  # -   # ***FOREST       LZSN     INFILT       LSUR      SLSUR      KVARY      AGWRC
  1               0        5.2       0.09        200       0.05          3       0.92
  2               0        4.8       0.07        200        0.1          3       0.92
 19               0        4.8       0.05        200       0.05          3       0.92
 20               0        4.5       0.04        200        0.1          3       0.92
 21               0        4.2       0.03        200       0.15          3       0.92
 28               0        4.8       0.04        200       0.05          3       0.92
 29               0        4.5       0.03        200        0.1          3       0.92
 30               0        4.2       0.02        200       0.15          3       0.92
  3               0        4.5      0.045        200       0.15          3       0.92
END PWAT-PARM2

PWAT-PARM3
  <PLS >       PWATER input info: Part 3          ***
  # -   # ***PETMAX     PETMIN     INFEXP     INFILD     DEEPFR     BASETP     AGWETP
  1              35         30          2          2        0.4       0.05       0.05
```

```
   2              35          30          2           2          0.4        0.05        0.05
  19              35          30          2           2          0.4        0.05        0.05
  20              35          30          2           2          0.4        0.05        0.05
  21              35          30          2           2          0.4        0.05        0.05
  28              35          30          2           2          0.4        0.05        0.05
  29              35          30          2           2          0.4        0.05        0.05
  30              35          30          2           2          0.4        0.05        0.05
   3              35          30          2           2          0.4        0.05        0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >      PWATER input info: Part 4                                          ***
    # -   #     CEPSC       UZSN       NSUR       INTFW        IRC       LZETP ***
    1            0.08        0.6        0.2         1.5        0.7         0.5
    2            0.08        0.6        0.2         1.5        0.7         0.5
   19            0.08        0.6        0.2         1.5        0.7         0.5
   20            0.08        0.6        0.2         1.5        0.7         0.5
   21            0.08        0.6        0.2         1.5        0.7         0.5
   28            0.08        0.6        0.2         1.5        0.7         0.5
   29            0.08        0.6        0.2         1.5        0.7         0.5
   30            0.08        0.6        0.2         1.5        0.7         0.5
    3            0.08        0.6        0.2         1.5        0.7         0.5
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3          ***
    # -   #  JAN   FEB   MAR   APR   MAY   JUN   JUL   AUG   SEP   OCT   NOV   DEC  ***
    1        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
    2        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
   19        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
   20        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
   21        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
   28        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
   29        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
   30        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
    3        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3          ***
    # -   #  JAN   FEB   MAR   APR   MAY   JUN   JUL   AUG   SEP   OCT   NOV   DEC  ***
    1        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
    2        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
   19        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
   20        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
   21        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
   28        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
   29        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
   30        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
    3        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -   # ***  CEPS      SURS       UZS       IFWS       LZS       AGWS       GWVS
    1             0         0      0.15          0         4       0.05          0
    2             0         0      0.15          0         4       0.05          0
   19             0         0      0.15          0         4       0.05          0
   20             0         0      0.15          0         4       0.05          0
   21             0         0      0.15          0         4       0.05          0
   28             0         0      0.15          0         4       0.05          0
   29             0         0      0.15          0         4       0.05          0
   30             0         0      0.15          0         4       0.05          0
    3             0         0      0.01          0       0.5        0.3       0.01
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name-------->   Unit-systems   Printer ***
    # -   #                     User  t-series Engl Metr ***
```

```
                                        in  out           ***
  1      IMPERVIOUS-FLAT          1     1    1   27     0
END GEN-INFO
*** Section IWATER***

ACTIVITY
  <PLS > ************* Active Sections ******************************
  # -   # ATMP SNOW IWAT  SLD  IWG IQAL    ***
  1         0    0    1    0    0    0
END ACTIVITY

PRINT-INFO
  <ILS > ******** Print-flags ******** PIVL  PYR
  # -   # ATMP SNOW IWAT  SLD  IWG IQAL     *********
  1         0    0    4    0    0    0     1     9
END PRINT-INFO

IWAT-PARM1
  <PLS >  IWATER variable monthly parameter value flags  ***
  # -   # CSNO RTOP  VRS  VNN RTLI      ***
  1         0    0    0    0    1
END IWAT-PARM1

IWAT-PARM2
  <PLS >       IWATER input info: Part 2          ***
  # -   # ***  LSUR      SLSUR      NSUR      RETSC
  1           100      0.035      0.05        0.1
END IWAT-PARM2

IWAT-PARM3
  <PLS >       IWATER input info: Part 3          ***
  # -   # ***PETMAX    PETMIN
  1              0          0
END IWAT-PARM3

IWAT-STATE1
  <PLS > *** Initial conditions at start of simulation
  # -   # ***  RETS       SURS
  1              0          0
END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->      <-Target->   MBLK    ***
<Name>   #                 <-factor->      <Name>   #   Tbl#    ***
Basin  1 to POC 2***
PERLND   1                      0.05      COPY   502      12
PERLND   1                      0.05      COPY   502      13
PERLND   2                      0.01      COPY   502      12
PERLND   2                      0.01      COPY   502      13
PERLND  19                      4.02      COPY   502      12
PERLND  19                      4.02      COPY   502      13
PERLND  20                     11.34      COPY   502      12
PERLND  20                     11.34      COPY   502      13
PERLND  21                     58.03      COPY   502      12
PERLND  21                     58.03      COPY   502      13
PERLND  28                      0.07      COPY   502      12
PERLND  28                      0.07      COPY   502      13
PERLND  29                      0.05      COPY   502      12
PERLND  29                      0.05      COPY   502      13
PERLND  30                      7.39      COPY   502      12
PERLND  30                      7.39      COPY   502      13
IMPLND   1                      0.26      COPY   502      15
Basin  1 to POC 1***
PERLND   1                      0.05      COPY   501      12
PERLND   1                      0.05      COPY   501      13
PERLND   2                      0.01      COPY   501      12
PERLND   2                      0.01      COPY   501      13
PERLND  19                      4.02      COPY   501      12
```

```
PERLND  19                          4.02      COPY    501      13
PERLND  20                         11.34      COPY    501      12
PERLND  20                         11.34      COPY    501      13
PERLND  21                         58.03      COPY    501      12
PERLND  21                         58.03      COPY    501      13
PERLND  28                          0.07      COPY    501      12
PERLND  28                          0.07      COPY    501      13
PERLND  29                          0.05      COPY    501      12
PERLND  29                          0.05      COPY    501      13
PERLND  30                          7.39      COPY    501      12
PERLND  30                          7.39      COPY    501      13
IMPLND   1                          0.26      COPY    501      15
Basin  3 to POC1***
PERLND   2                          0.13      COPY    501      12
PERLND   2                          0.13      COPY    501      13
PERLND   3                          0.14      COPY    501      12
PERLND   3                          0.14      COPY    501      13
PERLND  19                          0.37      COPY    501      12
PERLND  19                          0.37      COPY    501      13
PERLND  20                          0.29      COPY    501      12
PERLND  20                          0.29      COPY    501      13
PERLND  21                          0.18      COPY    501      12
PERLND  21                          0.18      COPY    501      13
PERLND  29                          0.04      COPY    501      12
PERLND  29                          0.04      COPY    501      13
PERLND  30                          0.06      COPY    501      12
PERLND  30                          0.06      COPY    501      13
PERLND   1                          0.34      COPY    501      12
PERLND   1                          0.34      COPY    501      13
PERLND  28                          0.04      COPY    501      12
PERLND  28                          0.04      COPY    501      13
Basin  3 to POC2***
PERLND   2                          0.13      COPY    502      12
PERLND   2                          0.13      COPY    502      13
PERLND   3                          0.14      COPY    502      12
PERLND   3                          0.14      COPY    502      13
PERLND  19                          0.37      COPY    502      12
PERLND  19                          0.37      COPY    502      13
PERLND  20                          0.29      COPY    502      12
PERLND  20                          0.29      COPY    502      13
PERLND  21                          0.18      COPY    502      12
PERLND  21                          0.18      COPY    502      13
PERLND  29                          0.04      COPY    502      12
PERLND  29                          0.04      COPY    502      13
PERLND  30                          0.06      COPY    502      12
PERLND  30                          0.06      COPY    502      13
PERLND   1                          0.34      COPY    502      12
PERLND   1                          0.34      COPY    502      13
PERLND  28                          0.04      COPY    502      12
PERLND  28                          0.04      COPY    502      13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   502 OUTPUT MEAN   1 1   12.1        DISPLY   2     INPUT  TIMSER 1
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<-------------------><---> User T-series  Engl Metr LKFG          ***
```

```
                                        in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -   # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -   # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -   #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit       possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *          ***
  END HYDR-PARM1

  HYDR-PARM2
    # -   #    FTABNO       LEN      DELTH     STCOR       KS       DB50       ***
  <------><--------><--------><--------><--------><--------><--------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -   # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft      for each possible exit        for each possible exit
  <------><--------->     <---><---><---><---><---> *** <---><---><---><---><---->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   502 OUTPUT MEAN   1 1     12.1      WDM    502 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>    <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    12

  MASS-LINK        13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    13

  MASS-LINK        15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    15
```

```
END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1964 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   POC1&3.wdm
MESSU       25   MitPOC1&3.MES
            27   MitPOC1&3.L61
            28   MitPOC1&3.L62
            30   POCPOC1&31.dat
            31   POCPOC1&32.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:60
      PERLND       1
      PERLND      19
      PERLND      20
      PERLND      21
      PERLND      28
      PERLND      29
      PERLND      30
      IMPLND       1
      RCHRES       1
      RCHRES       2
      RCHRES       3
      COPY         1
      COPY       501
      COPY       601
      COPY         2
      COPY       502
      COPY       602
      DISPLY       1
      DISPLY       2
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Flow Splitter  1             MAX                  1    2   30    9
    2        Vault  2                     MAX                  1    2   31    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1          1    1
  501          1    1
  601          1    1
    2          1    1
  502          1    1
  602          1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
```

```
END GENER
PERLND
  GEN-INFO
    <PLS ><--------Name-------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                        in   out           ***
     1       A,Grass,FLAT(0-5%)      1     1     1     1   27     0
    19       C,Grass,FLAT(0-5%)      1     1     1     1   27     0
    20       C,Grass,MOD(5-10%)      1     1     1     1   27     0
    21       C,Grass,STEEP(10-20     1     1     1     1   27     0
    28       D,Grass,FLAT(0-5%)      1     1     1     1   27     0
    29       D,Grass,MOD(5-10%)      1     1     1     1   27     0
    30       D,Grass,STEEP(10-20     1     1     1     1   27     0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************** Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
     1          0    0    1    0    0    0    0    0    0    0    0    0
    19          0    0    1    0    0    0    0    0    0    0    0    0
    20          0    0    1    0    0    0    0    0    0    0    0    0
    21          0    0    1    0    0    0    0    0    0    0    0    0
    28          0    0    1    0    0    0    0    0    0    0    0    0
    29          0    0    1    0    0    0    0    0    0    0    0    0
    30          0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ****************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
     1          0    0    4    0    0    0    0    0    0    0    0    0    1    9
    19          0    0    4    0    0    0    0    0    0    0    0    0    1    9
    20          0    0    4    0    0    0    0    0    0    0    0    0    1    9
    21          0    0    4    0    0    0    0    0    0    0    0    0    1    9
    28          0    0    4    0    0    0    0    0    0    0    0    0    1    9
    29          0    0    4    0    0    0    0    0    0    0    0    0    1    9
    30          0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
     1          0    1    1    1    0    0    0    0    1    1    0
    19          0    1    1    1    0    0    0    0    1    1    0
    20          0    1    1    1    0    0    0    0    1    1    0
    21          0    1    1    1    0    0    0    0    1    1    0
    28          0    1    1    1    0    0    0    0    1    1    0
    29          0    1    1    1    0    0    0    0    1    1    0
    30          0    1    1    1    0    0    0    0    1    1    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >       PWATER input info: Part 2          ***
    # -  # ***FOREST      LZSN     INFILT      LSUR      SLSUR      KVARY      AGWRC
     1               0      5.2       0.09       200       0.05          3       0.92
    19               0      4.8       0.05       200       0.05          3       0.92
    20               0      4.5       0.04       200        0.1          3       0.92
    21               0      4.2       0.03       200       0.15          3       0.92
    28               0      4.8       0.04       200       0.05          3       0.92
    29               0      4.5       0.03       200        0.1          3       0.92
    30               0      4.2       0.02       200       0.15          3       0.92
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >       PWATER input info: Part 3          ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
     1             35        30         2         2       0.4      0.05      0.05
    19             35        30         2         2       0.4      0.05      0.05
    20             35        30         2         2       0.4      0.05      0.05
```

```
  21              35          30           2           2         0.4        0.05       0.05
  28              35          30           2           2         0.4        0.05       0.05
  29              35          30           2           2         0.4        0.05       0.05
  30              35          30           2           2         0.4        0.05       0.05
END PWAT-PARM3
PWAT-PARM4
  <PLS >      PWATER input info: Part 4                                          ***
  # -  #      CEPSC       UZSN       NSUR      INTFW       IRC      LZETP      ***
  1           0.08        0.6        0.2         1.5       0.7        0.5
 19           0.08        0.6        0.2         1.5       0.7        0.5
 20           0.08        0.6        0.2         1.5       0.7        0.5
 21           0.08        0.6        0.2         1.5       0.7        0.5
 28           0.08        0.6        0.2         1.5       0.7        0.5
 29           0.08        0.6        0.2         1.5       0.7        0.5
 30           0.08        0.6        0.2         1.5       0.7        0.5
END PWAT-PARM4
MON-LZETPARM
  <PLS >      PWATER input info: Part 3          ***
  # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
  1       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
 19       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
 20       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
 21       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
 28       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
 29       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
 30       0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
END MON-LZETPARM
MON-INTERCEP
  <PLS >      PWATER input info: Part 3          ***
  # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
  1       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
 19       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
 20       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
 21       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
 28       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
 29       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
 30       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
END MON-INTERCEP

PWAT-STATE1
  <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
  # -  # ***  CEPS       SURS        UZS        IFWS        LZS        AGWS        GWVS
  1             0          0       0.15           0          4        0.05           0
 19             0          0       0.15           0          4        0.05           0
 20             0          0       0.15           0          4        0.05           0
 21             0          0       0.15           0          4        0.05           0
 28             0          0       0.15           0          4        0.05           0
 29             0          0       0.15           0          4        0.05           0
 30             0          0       0.15           0          4        0.05           0
END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                   in  out              ***
    1      IMPERVIOUS-FLAT        1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
```

```
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -   # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1          0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -   # CSNO RTOP  VRS  VNN RTLI     ***
    1          0    0    0    0    1
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >       IWATER input info: Part 2          ***
    # -   # ***  LSUR     SLSUR      NSUR     RETSC
    1             100     0.035      0.05       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >       IWATER input info: Part 3          ***
    # -   # ***PETMAX    PETMIN
    1              0          0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -   # ***  RETS      SURS
    1              0          0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK    ***
<Name>   #                  <-factor->     <Name>   #   Tbl#    ***
Basin  1***
PERLND   1                        0.01     RCHRES   1      2
PERLND   1                        0.01     RCHRES   1      3
PERLND  19                        9.47     RCHRES   1      2
PERLND  19                        9.47     RCHRES   1      3
PERLND  20                        0.65     RCHRES   1      2
PERLND  20                        0.65     RCHRES   1      3
PERLND  21                       35.82     RCHRES   1      2
PERLND  21                       35.82     RCHRES   1      3
PERLND  28                        0.07     RCHRES   1      2
PERLND  28                        0.07     RCHRES   1      3
PERLND  29                        0.06     RCHRES   1      2
PERLND  29                        0.06     RCHRES   1      3
PERLND  30                         7.4     RCHRES   1      2
PERLND  30                         7.4     RCHRES   1      3
IMPLND   1                       27.74     RCHRES   1      5
Basin  3***
PERLND   1                        0.22     COPY   501     12
PERLND   1                        0.22     COPY   601     12
PERLND   1                        0.22     COPY   501     13
PERLND   1                        0.22     COPY   601     13
PERLND  19                        0.15     COPY   501     12
PERLND  19                        0.15     COPY   601     12
PERLND  19                        0.15     COPY   501     13
PERLND  19                        0.15     COPY   601     13
IMPLND   1                        1.22     COPY   501     15
IMPLND   1                        1.22     COPY   601     15

******Routing******
RCHRES   1                           1     RCHRES   2      6
RCHRES   1                                 COPY     1     16
RCHRES   2                           1     COPY     2     18
RCHRES   2                                 RCHRES   3      8
RCHRES   2                           1     COPY   501     17
RCHRES   2                           1     COPY   601     17
RCHRES   3                           1     COPY   502     16
```

```
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   12.1        DISPLY   2     INPUT  TIMSER 1


<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name         Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                        in  out                               ***
    1     Vault  1-WQV              1    1    1    1   28    0    1
    2     Flow Splitter  1-020      2    1    1    1   28    0    1
    3     Vault  2                  1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1          1    0    0    0    0    0    0    0    0    0
    2          1    0    0    0    0    0    0    0    0    0
    3          1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1          4    0    0    0    0    0    0    0    0    0    1    9
    2          4    0    0    0    0    0    0    0    0    0    1    9
    3          4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
          FG FG FG FG  possible  exit  *** possible  exit       possible  exit
           *  *  *  *   *  *  *  *  *      *  *  *  *  *          ***
    1      0  1  0  0    4  0  0  0  0      0  0  0  0  0          2  2  2  2  2
    2      0  1  0  0    4  5  0  0  0      0  0  0  0  0          2  2  2  2  2
    3      0  1  0  0    4  0  0  0  0      0  0  0  0  0          2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN      DELTH      STCOR       KS       DB50       ***
  <------><--------><--------><--------><--------><--------><--------->       ***
    1              1      0.03       0.0        0.0       0.5       0.0
    2              2      0.01       0.0        0.0       0.5       0.0
    3              3      0.03       0.0        0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial value of COLIND     Initial value of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->    <---><---><---><---><---> *** <---><---><---><---><--->
    1             0       4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2             0       4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3             0       4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
```

END SPEC-ACTIONS
FTABLES
FTABLE 1
92 4

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.644467	0.000000	0.000000		
0.105556	0.644467	0.068027	0.338909		
0.211111	0.644467	0.136054	0.479289		
0.316667	0.644467	0.204081	0.587007		
0.422222	0.644467	0.272108	0.677817		
0.527778	0.644467	0.340136	0.757823		
0.633333	0.644467	0.408163	0.830153		
0.738889	0.644467	0.476190	0.896668		
0.844444	0.644467	0.544217	0.958578		
0.950000	0.644467	0.612244	1.016726		
1.055556	0.644467	0.680271	1.071723		
1.161111	0.644467	0.748298	1.124033		
1.266667	0.644467	0.816325	1.174014		
1.372222	0.644467	0.884353	1.221953		
1.477778	0.644467	0.952380	1.268080		
1.583333	0.644467	1.020407	1.312588		
1.688889	0.644467	1.088434	1.355635		
1.794444	0.644467	1.156461	1.397356		
1.900000	0.644467	1.224488	1.437868		
2.005556	0.644467	1.292515	1.477269		
2.111111	0.644467	1.360542	1.515646		
2.216667	0.644467	1.428570	1.553075		
2.322222	0.644467	1.496597	1.589622		
2.427778	0.644467	1.564624	1.625349		
2.533333	0.644467	1.632651	1.660307		
2.638889	0.644467	1.700678	2.604775		
2.744444	0.644467	1.768705	5.972257		
2.850000	0.644467	1.836732	10.68378		
2.955556	0.644467	1.904759	16.41688		
3.061111	0.644467	1.972786	22.99750		
3.166667	0.644467	2.040814	30.30176		
3.272222	0.644467	2.108841	38.22665		
3.377778	0.644467	2.176868	46.67773		
3.483333	0.644467	2.244895	55.56331		
3.588889	0.644467	2.312922	64.79151		
3.694444	0.644467	2.380949	74.26903		
3.800000	0.644467	2.448976	83.90083		
3.905556	0.644467	2.517003	93.59055		
4.011111	0.644467	2.585031	103.2414		
4.116667	0.644467	2.653058	112.7574		
4.222222	0.644467	2.721085	122.0449		
4.327778	0.644467	2.789112	131.0144		
4.433333	0.644467	2.857139	139.5826		
4.538889	0.644467	2.925166	147.6748		
4.644444	0.644467	2.993193	155.2266		
4.750000	0.644467	3.061220	162.1874		
4.855556	0.644467	3.129248	168.5224		
4.961111	0.644467	3.197275	174.2157		
5.066667	0.644467	3.265302	179.2733		
5.172222	0.644467	3.333329	183.7259		
5.277778	0.644467	3.401356	187.6326		
5.383333	0.644467	3.469383	191.0838		
5.488889	0.644467	3.537410	194.2048		
5.594444	0.644467	3.605437	199.3310		
5.700000	0.644467	3.673465	202.7713		
5.805556	0.644467	3.741492	206.1540		
5.911111	0.644467	3.809519	209.4820		
6.016667	0.644467	3.877546	212.7578		
6.122222	0.644467	3.945573	215.9838		
6.227778	0.644467	4.013600	219.1622		
6.333333	0.644467	4.081627	222.2951		
6.438889	0.644467	4.149654	225.3844		
6.544444	0.644467	4.217681	228.4318		
6.650000	0.644467	4.285709	231.4390		

6.755556	0.644467	4.353736	234.4076
6.861111	0.644467	4.421763	237.3390
6.966667	0.644467	4.489790	240.2346
7.072222	0.644467	4.557817	243.0956
7.177778	0.644467	4.625844	245.9233
7.283333	0.644467	4.693871	248.7188
7.388889	0.644467	4.761898	251.4832
7.494444	0.644467	4.829926	254.2175
7.600000	0.644467	4.897953	256.9226
7.705556	0.644467	4.965980	259.5996
7.811111	0.644467	5.034007	262.2491
7.916667	0.644467	5.102034	264.8722
8.022222	0.644467	5.170061	267.4695
8.127778	0.644467	5.238088	270.0417
8.233333	0.644467	5.306115	272.5897
8.338889	0.644467	5.374143	275.1141
8.444444	0.644467	5.442170	277.6155
8.550000	0.644467	5.510197	280.0945
8.655556	0.644467	5.578224	282.5517
8.761111	0.644467	5.646251	284.9878
8.866667	0.644467	5.714278	287.4031
8.972222	0.644467	5.782305	289.7984
9.077778	0.644467	5.850332	292.1739
9.183333	0.644467	5.918359	294.5303
9.288889	0.644467	5.986387	296.8680
9.394444	0.644467	6.054414	299.1874
9.500000	0.644467	6.122441	301.4890
9.605556	0.644467	6.190468	303.7731

END FTABLE 1

FTABLE 2

90 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.002296	0.000000	1.670000	0.000000		
0.111111	0.002296	0.000255	1.670000	0.000000		
0.222222	0.002296	0.000510	1.670000	0.000000		
0.333333	0.002296	0.000765	1.670000	0.000000		
0.444444	0.002296	0.001020	1.670000	0.000000		
0.555556	0.002296	0.001275	1.670000	0.000000		
0.666667	0.002296	0.001530	1.670000	11.00000		
0.777778	0.002296	0.001786	1.670000	21.00000		
0.888889	0.002296	0.002041	1.670000	31.00000		
1.000000	0.002296	0.002296	1.670000	41.00000		
1.111111	0.002296	0.002551	1.670000	51.00000		
1.222222	0.002296	0.002806	1.670000	61.00000		
1.333333	0.002296	0.003061	1.670000	71.00000		
1.444444	0.002296	0.003316	1.670000	81.00000		
1.555556	0.002296	0.003571	1.670000	91.00000		
1.666667	0.002296	0.003826	1.670000	101.0000		
1.777778	0.002296	0.004081	1.670000	111.0000		
1.888889	0.002296	0.004336	1.670000	121.0000		
2.000000	0.002296	0.004591	1.670000	131.0000		
2.111111	0.002296	0.004846	1.670000	141.0000		
2.222222	0.002296	0.005102	1.670000	151.0000		
2.333333	0.002296	0.005357	1.670000	161.0000		
2.444444	0.002296	0.005612	1.670000	171.0000		
2.555556	0.002296	0.005867	1.670000	181.0000		
2.666667	0.002296	0.006122	1.670000	191.0000		
2.777778	0.002296	0.006377	1.670000	201.0000		
2.888889	0.002296	0.006632	1.670000	211.0000		
3.000000	0.002296	0.006887	1.670000	221.0000		
3.111111	0.002296	0.007142	1.670000	231.0000		
3.222222	0.002296	0.007397	1.670000	241.0000		
3.333333	0.002296	0.007652	1.670000	251.0000		
3.444444	0.002296	0.007907	1.670000	261.0000		
3.555556	0.002296	0.008162	1.670000	271.0000		
3.666667	0.002296	0.008418	1.670000	281.0000		
3.777778	0.002296	0.008673	1.670000	291.0000		
3.888889	0.002296	0.008928	1.670000	301.0000		
4.000000	0.002296	0.009183	1.670000	311.0000		

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4.111111  0.002296  0.009438  1.670000  321.0000
4.222222  0.002296  0.009693  1.670000  331.0000
4.333333  0.002296  0.009948  1.670000  341.0000
4.444444  0.002296  0.010203  1.670000  351.0000
4.555556  0.002296  0.010458  1.670000  361.0000
4.666667  0.002296  0.010713  1.670000  371.0000
4.777778  0.002296  0.010968  1.670000  381.0000
4.888889  0.002296  0.011223  1.670000  391.0000
5.000000  0.002296  0.011478  1.670000  401.0000
5.111111  0.002296  0.011733  1.670000  411.0000
5.222222  0.002296  0.011989  1.670000  421.0000
5.333333  0.002296  0.012244  1.670000  431.0000
5.444444  0.002296  0.012499  1.670000  441.0000
5.555556  0.002296  0.012754  1.670000  451.0000
5.666667  0.002296  0.013009  1.670000  461.0000
5.777778  0.002296  0.013264  1.670000  471.0000
5.888889  0.002296  0.013519  1.670000  481.0000
6.000000  0.002296  0.013774  1.670000  491.0000
6.111111  0.002296  0.014029  1.670000  501.0000
6.222222  0.002296  0.014284  1.670000  511.0000
6.333333  0.002296  0.014539  1.670000  521.0000
6.444444  0.002296  0.014794  1.670000  531.0000
6.555556  0.002296  0.015049  1.670000  541.0000
6.666667  0.002296  0.015305  1.670000  551.0000
6.777778  0.002296  0.015560  1.670000  561.0000
6.888889  0.002296  0.015815  1.670000  571.0000
7.000000  0.002296  0.016070  1.670000  581.0000
7.111111  0.002296  0.016325  1.670000  591.0000
7.222222  0.002296  0.016580  1.670000  601.0000
7.333333  0.002296  0.016835  1.670000  611.0000
7.444444  0.002296  0.017090  1.670000  621.0000
7.555556  0.002296  0.017345  1.670000  631.0000
7.666667  0.002296  0.017600  1.670000  641.0000
7.777778  0.002296  0.017855  1.670000  651.0000
7.888889  0.002296  0.018110  1.670000  661.0000
8.000000  0.002296  0.018365  1.670000  671.0000
8.111111  0.002296  0.018621  1.670000  681.0000
8.222222  0.002296  0.018876  1.670000  691.0000
8.333333  0.002296  0.019131  1.670000  701.0000
8.444444  0.002296  0.019386  1.670000  711.0000
8.555556  0.002296  0.019641  1.670000  721.0000
8.666667  0.002296  0.019896  1.670000  731.0000
8.777778  0.002296  0.020151  1.670000  741.0000
8.888889  0.002296  0.020406  1.670000  751.0000
9.000000  0.002296  0.020661  1.670000  761.0000
9.111111  0.002296  0.020916  1.670000  771.0000
9.222222  0.002296  0.021171  1.670000  781.0000
9.333333  0.002296  0.021426  1.670000  791.0000
9.444444  0.002296  0.021681  1.670000  801.0000
9.555556  0.002296  0.021937  1.670000  811.0000
9.666667  0.002296  0.022192  1.670000  821.0000
9.777778  0.002296  0.022447  1.670000  831.0000
9.888889  0.002296  0.022702  1.670000  841.0000
END FTABLE  2
FTABLE      3
 91    4
   Depth      Area     Volume  Outflow1 Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)    (ft/sec)    (Minutes)***
0.000000  0.644467  0.000000  0.000000
0.076889  0.644467  0.049552  3.318403
0.153778  0.644467  0.099105  4.692930
0.230667  0.644467  0.148657  5.747642
0.307556  0.644467  0.198210  6.636806
0.384444  0.644467  0.247762  7.420174
0.461333  0.644467  0.297314  8.128394
0.538222  0.644467  0.346867  8.779669
0.615111  0.644467  0.396419  9.385861
0.692000  0.644467  0.445971  9.955208
0.768889  0.644467  0.495524  10.49371
0.845778  0.644467  0.545076  11.00590
```

0.922667	0.644467	0.594629	11.49528
0.999556	0.644467	0.644181	11.96467
1.076444	0.644467	0.693733	12.41633
1.153333	0.644467	0.743286	12.85212
1.230222	0.644467	0.792838	13.27361
1.307111	0.644467	0.842391	13.68213
1.384000	0.644467	0.891943	14.07879
1.460889	0.644467	0.941495	22.17859
1.537778	0.644467	0.991048	26.44416
1.614667	0.644467	1.040600	29.69100
1.691556	0.644467	1.090153	32.44467
1.768444	0.644467	1.139705	34.89017
1.845333	0.644467	1.189257	37.11868
1.922222	0.644467	1.238810	39.18319
1.999111	0.644467	1.288362	41.11779
2.076000	0.644467	1.337914	42.94597
2.152889	0.644467	1.387467	44.68477
2.229778	0.644467	1.437019	46.34701
2.306667	0.644467	1.486572	47.94264
2.383556	0.644467	1.536124	49.47958
2.460444	0.644467	1.585676	50.96426
2.537333	0.644467	1.635229	52.40197
2.614222	0.644467	1.684781	53.79715
2.691111	0.644467	1.734334	55.15358
2.768000	0.644467	1.783886	56.47446
2.844889	0.644467	1.833438	57.76260
2.921778	0.644467	1.882991	59.02043
2.998667	0.644467	1.932543	60.25008
3.075556	0.644467	1.982095	61.45345
3.152444	0.644467	2.031648	62.63223
3.229333	0.644467	2.081200	63.78791
3.306222	0.644467	2.130753	64.92187
3.383111	0.644467	2.180305	66.03531
3.460000	0.644467	2.229857	67.12936
3.536889	0.644467	2.279410	68.20503
3.613778	0.644467	2.328962	69.26324
3.690667	0.644467	2.378515	70.30484
3.767556	0.644467	2.428067	71.33062
3.844444	0.644467	2.477619	72.34129
3.921333	0.644467	2.527172	73.33751
3.998222	0.644467	2.576724	74.31992
4.075111	0.644467	2.626277	75.28908
4.152000	0.644467	2.675829	76.24553
4.228889	0.644467	2.725381	77.18976
4.305778	0.644467	2.774934	78.12225
4.382667	0.644467	2.824486	79.04342
4.459556	0.644467	2.874038	79.95370
4.536444	0.644467	2.923591	80.85346
4.613333	0.644467	2.973143	81.74307
4.690222	0.644467	3.022696	82.62288
4.767111	0.644467	3.072248	83.49320
4.844000	0.644467	3.121800	84.35434
4.920889	0.644467	3.171353	85.20659
4.997778	0.644467	3.220905	86.05022
5.074667	0.644467	3.270458	86.88551
5.151556	0.644467	3.320010	87.71268
5.228444	0.644467	3.369562	88.53198
5.305333	0.644467	3.419115	89.34364
5.382222	0.644467	3.468667	90.14785
5.459111	0.644467	3.518219	91.93054
5.536000	0.644467	3.567772	96.76774
5.612889	0.644467	3.617324	103.3064
5.689778	0.644467	3.666877	111.1340
5.766667	0.644467	3.716429	120.0440
5.843556	0.644467	3.765981	129.9049
5.920444	0.644467	3.815534	140.6232
5.997333	0.644467	3.865086	152.1273
6.074222	0.644467	3.914639	164.3595
6.151111	0.644467	3.964191	177.2716
6.228000	0.644467	4.013743	190.8222

```
  6.304889  0.644467  4.063296  204.9742
  6.381778  0.644467  4.112848  219.6944
  6.458667  0.644467  4.162400  234.9519
  6.535556  0.644467  4.211953  250.7178
  6.612444  0.644467  4.261505  266.9644
  6.689333  0.644467  4.311058  283.6651
  6.766222  0.644467  4.360610  300.7942
  6.843111  0.644467  4.410162  318.3262
  6.920000  0.644467  4.459715  336.2360
  END FTABLE  3
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>    # <Name> # tem strg<-factor->strg <Name>    #    #        <Name> # #  ***
WDM       2 PREC     ENGL    1              PERLND    1 999 EXTNL  PREC
WDM       2 PREC     ENGL    1              IMPLND    1 999 EXTNL  PREC
WDM       1 EVAP     ENGL    1              PERLND    1 999 EXTNL  PETINP
WDM       1 EVAP     ENGL    1              IMPLND    1 999 EXTNL  PETINP
WDM       1 EVAP     ENGL    1              RCHRES    1     EXTNL  POTEV
WDM       1 EVAP     ENGL    1              RCHRES    3     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>    #       <Name> # #<-factor->strg <Name>    # <Name>    tem strg strg***
RCHRES    2 HYDR  RO     1 1         1     WDM   1020 FLOW     ENGL       REPL
RCHRES    2 HYDR  O      1 1         1     WDM   1021 FLOW     ENGL       REPL
RCHRES    2 HYDR  O      2 1         1     WDM   1022 FLOW     ENGL       REPL
RCHRES    2 HYDR  STAGE  1 1         1     WDM   1023 STAG     ENGL       REPL
COPY      1 OUTPUT MEAN  1 1      12.1     WDM    701 FLOW     ENGL       REPL
COPY    501 OUTPUT MEAN  1 1      12.1     WDM    801 FLOW     ENGL       REPL
COPY    601 OUTPUT MEAN  1 1      12.1     WDM    901 FLOW     ENGL       REPL
RCHRES    3 HYDR  RO     1 1         1     WDM   1018 FLOW     ENGL       REPL
RCHRES    3 HYDR  STAGE  1 1         1     WDM   1019 STAG     ENGL       REPL
COPY      2 OUTPUT MEAN  1 1      12.1     WDM    702 FLOW     ENGL       REPL
COPY    502 OUTPUT MEAN  1 1      12.1     WDM    802 FLOW     ENGL       REPL
COPY    602 OUTPUT MEAN  1 1      12.1     WDM    902 FLOW     ENGL       REPL
END EXT TARGETS

MASS-LINK
<Volume>    <-Grp> <-Member-><--Mult-->     <Target>        <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                 <Name> # #***
  MASS-LINK         2
PERLND      PWATER SURO       0.083333      RCHRES          INFLOW IVOL
  END MASS-LINK     2

  MASS-LINK         3
PERLND      PWATER IFWO       0.083333      RCHRES          INFLOW IVOL
  END MASS-LINK     3

  MASS-LINK         5
IMPLND      IWATER SURO       0.083333      RCHRES          INFLOW IVOL
  END MASS-LINK     5

  MASS-LINK         6
RCHRES      ROFLOW                          RCHRES          INFLOW
  END MASS-LINK     6

  MASS-LINK         8
RCHRES      OFLOW  OVOL   2                 RCHRES          INFLOW IVOL
  END MASS-LINK     8

  MASS-LINK        12
PERLND      PWATER SURO       0.083333      COPY            INPUT  MEAN
  END MASS-LINK    12

  MASS-LINK        13
PERLND      PWATER IFWO       0.083333      COPY            INPUT  MEAN
```

```
  END MASS-LINK    13

  MASS-LINK        15
IMPLND     IWATER SURO        0.083333      COPY            INPUT  MEAN
  END MASS-LINK    15

  MASS-LINK        16
RCHRES     ROFLOW                           COPY            INPUT  MEAN
  END MASS-LINK    16

  MASS-LINK        17
RCHRES     OFLOW  OVOL    1                 COPY            INPUT  MEAN
  END MASS-LINK    17

  MASS-LINK        18
RCHRES     OFLOW  OVOL    2                 COPY            INPUT  MEAN
  END MASS-LINK    18


END MASS-LINK

END RUN
```

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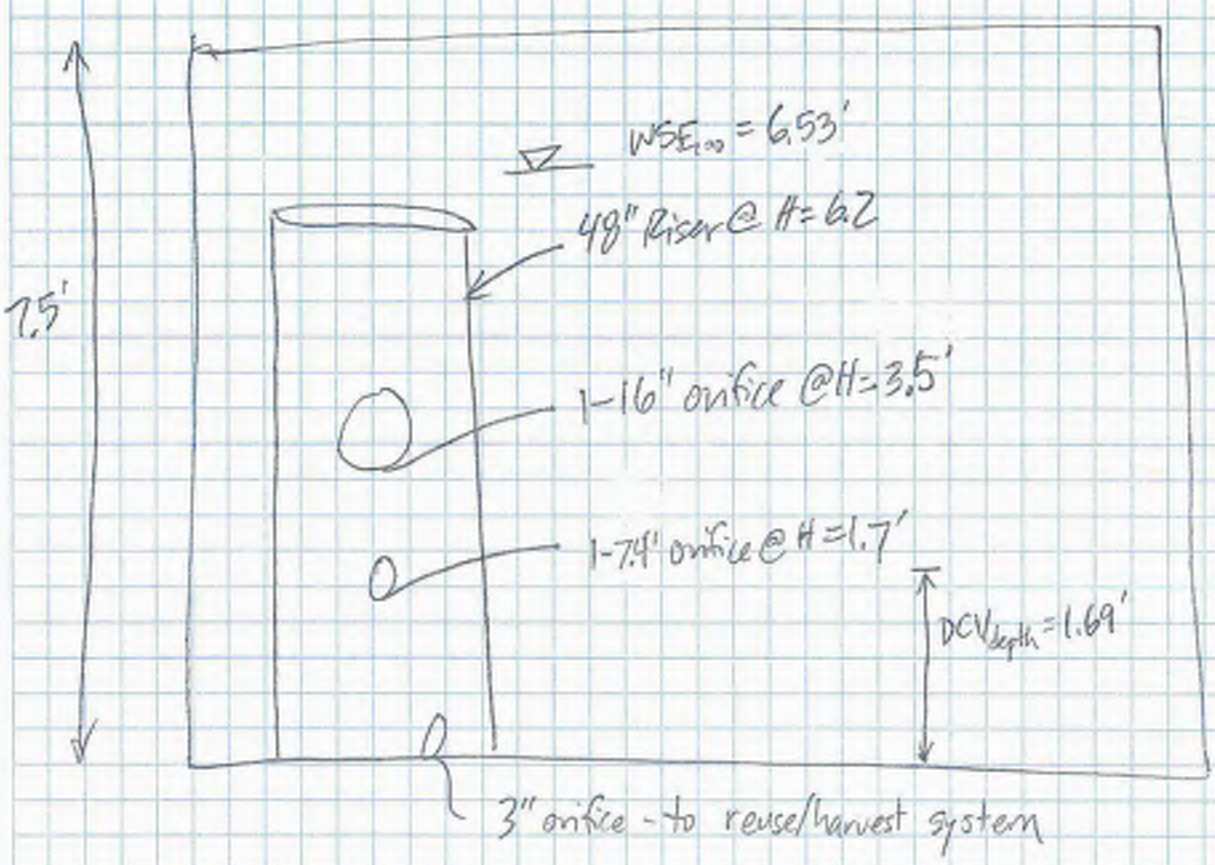
PROJECT HGVS
SUBJECT Detention Vault Cross Section
PAGE : 1 OF 1 JOB NO.: 4095.01
DRAWN BY : af DATE : 1/16/16
CHECKED BY : _____ DATE : _____



SOUTH BASIN

NTS

SDHM

PROJECT REPORT

General Model Information

Project Name:	POC2
Site Name:	HGVS-South Basin
Site Address:	Country Club Dr, Drive C&D
City:	County of SD
Report Date:	1/16/2016
Gage:	ESCONDID
Data Start:	1964/10/01 00:00
Data End:	2004/09/30 00:00
Timestep:	Hourly
Precip Scale:	1.00
Version:	2015/09/23

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year
Low Flow Threshold for POC2:	50 Percent of the 2 Year
High Flow Threshold for POC2:	10 Year

Landuse Basin Data
Predeveloped Land Use

Basin 1 to POC A

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C,Grass,FLAT(0-5%)	0.26
C,Grass,MOD(5-10%)	0.81
C,Grass,STEEP(10-20	10.27
D,Grass,FLAT(0-5%)	0.03
D,Grass,MOD(5-10%)	0.03
D,Grass,STEEP(10-20	2.73
Pervious Total	14.13
Impervious Land Use	acre
Impervious Total	0
Basin Total	14.13

Element Flows To:

Surface	Interflow	Groundwater

Basin 1 to POC B

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C,Grass,FLAT(0-5%)	0.26
C,Grass,MOD(5-10%)	0.81
C,Grass,STEEP(10-20	10.27
D,Grass,FLAT(0-5%)	0.03
D,Grass,MOD(5-10%)	0.03
D,Grass,STEEP(10-20	2.73
Pervious Total	14.13

Impervious Land Use	acre
Impervious Total	0
Basin Total	14.13

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C,Grass,FLAT(0-5%)	2.7
C,Grass,STEEP(10-20	1.37
D,Grass,FLAT(0-5%)	0.42
D,Grass,STEEP(10-20	0.64
Pervious Total	5.13

Impervious Land Use	acre
IMPERVIOUS-FLAT	9
Impervious Total	9
Basin Total	14.13

Element Flows To:

Surface	Interflow	Groundwater
Vault 1-WQV	Vault 1-WQV	

Routing Elements
Predeveloped Routing

Mitigated Routing

Vault 1-WQV

Width: 67 ft.
Length: 154.33 ft.
Depth: 7.5 ft.
Discharge Structure
Riser Height: 1.7 ft.
Riser Diameter: 72 in.
Orifice 1 Diameter: 3 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2
Flow Splitter 1

Vault Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.237	0.000	0.000	0.000
0.0833	0.237	0.019	0.070	0.000
0.1667	0.237	0.039	0.099	0.000
0.2500	0.237	0.059	0.122	0.000
0.3333	0.237	0.079	0.141	0.000
0.4167	0.237	0.098	0.157	0.000
0.5000	0.237	0.118	0.172	0.000
0.5833	0.237	0.138	0.186	0.000
0.6667	0.237	0.158	0.199	0.000
0.7500	0.237	0.178	0.211	0.000
0.8333	0.237	0.197	0.223	0.000
0.9167	0.237	0.217	0.233	0.000
1.0000	0.237	0.237	0.244	0.000
1.0833	0.237	0.257	0.254	0.000
1.1667	0.237	0.276	0.263	0.000
1.2500	0.237	0.296	0.273	0.000
1.3333	0.237	0.316	0.282	0.000
1.4167	0.237	0.336	0.290	0.000
1.5000	0.237	0.356	0.299	0.000
1.5833	0.237	0.375	0.307	0.000
1.6667	0.237	0.395	0.315	0.000
1.7500	0.237	0.415	1.035	0.000
1.8333	0.237	0.435	3.430	0.000
1.9167	0.237	0.455	6.754	0.000
2.0000	0.237	0.474	10.79	0.000
2.0833	0.237	0.494	15.43	0.000
2.1667	0.237	0.514	20.59	0.000
2.2500	0.237	0.534	26.21	0.000
2.3333	0.237	0.553	32.23	0.000
2.4167	0.237	0.573	38.62	0.000
2.5000	0.237	0.593	45.32	0.000
2.5833	0.237	0.613	52.30	0.000
2.6667	0.237	0.633	59.49	0.000
2.7500	0.237	0.652	66.87	0.000
2.8333	0.237	0.672	74.38	0.000
2.9167	0.237	0.692	81.98	0.000
3.0000	0.237	0.712	89.61	0.000
3.0833	0.237	0.731	97.23	0.000
3.1667	0.237	0.751	104.8	0.000
3.2500	0.237	0.771	112.2	0.000

3.3333	0.237	0.791	119.5	0.000
3.4167	0.237	0.811	126.7	0.000
3.5000	0.237	0.830	133.5	0.000
3.5833	0.237	0.850	140.1	0.000
3.6667	0.237	0.870	146.4	0.000
3.7500	0.237	0.890	152.4	0.000
3.8333	0.237	0.909	158.0	0.000
3.9167	0.237	0.929	163.2	0.000
4.0000	0.237	0.949	168.0	0.000
4.0833	0.237	0.969	172.5	0.000
4.1667	0.237	0.989	176.5	0.000
4.2500	0.237	1.008	180.1	0.000
4.3333	0.237	1.028	183.4	0.000
4.4167	0.237	1.048	186.3	0.000
4.5000	0.237	1.068	189.0	0.000
4.5833	0.237	1.088	191.5	0.000
4.6667	0.237	1.107	193.9	0.000
4.7500	0.237	1.127	198.5	0.000
4.8333	0.237	1.147	201.2	0.000
4.9167	0.237	1.167	203.9	0.000
5.0000	0.237	1.186	206.5	0.000
5.0833	0.237	1.206	209.1	0.000
5.1667	0.237	1.226	211.6	0.000
5.2500	0.237	1.246	214.2	0.000
5.3333	0.237	1.266	216.6	0.000
5.4167	0.237	1.285	219.1	0.000
5.5000	0.237	1.305	221.6	0.000
5.5833	0.237	1.325	224.0	0.000
5.6667	0.237	1.345	226.4	0.000
5.7500	0.237	1.364	228.7	0.000
5.8333	0.237	1.384	231.1	0.000
5.9167	0.237	1.404	233.4	0.000
6.0000	0.237	1.424	235.7	0.000
6.0833	0.237	1.444	237.9	0.000
6.1667	0.237	1.463	240.2	0.000
6.2500	0.237	1.483	242.4	0.000
6.3333	0.237	1.503	244.6	0.000
6.4167	0.237	1.523	246.8	0.000
6.5000	0.237	1.542	249.0	0.000
6.5833	0.237	1.562	251.1	0.000
6.6667	0.237	1.582	253.3	0.000
6.7500	0.237	1.602	255.4	0.000
6.8333	0.237	1.622	257.5	0.000
6.9167	0.237	1.641	259.6	0.000
7.0000	0.237	1.661	261.6	0.000
7.0833	0.237	1.681	263.7	0.000
7.1667	0.237	1.701	265.7	0.000
7.2500	0.237	1.721	267.7	0.000
7.3333	0.237	1.740	269.7	0.000
7.4167	0.237	1.760	271.7	0.000
7.5000	0.237	1.780	273.7	0.000
7.5833	0.237	1.800	275.7	0.000
7.6667	0.000	0.000	277.6	0.000

Flow Splitter 1

Bottom Length: 10.00 ft.
Bottom Length: 10.00 ft.
Depth: 10 ft.
Side slope 1: 0 To 1
Side slope 2: 0 To 1
Side slope 3: 0 To 1
Side slope 4: 0 To 1

Threshold Splitter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Primary(cfs)	Secondary(cfs)
0.000	0.002	0.000	0.320	0.000
0.111	0.002	0.000	0.320	0.000
0.222	0.002	0.000	0.320	0.000
0.333	0.002	0.000	0.320	0.000
0.444	0.002	0.001	0.320	0.000
0.555	0.002	0.001	0.320	0.000
0.666	0.002	0.001	0.320	0.000
0.777	0.002	0.001	0.320	0.000
0.888	0.002	0.002	0.320	0.000
1.000	0.002	0.002	0.320	0.000
1.111	0.002	0.002	0.320	0.000
1.222	0.002	0.002	0.320	0.000
1.333	0.002	0.003	0.320	0.000
1.444	0.002	0.003	0.320	0.000
1.555	0.002	0.003	0.320	0.000
1.666	0.002	0.003	0.320	0.000
1.777	0.002	0.004	0.320	0.000
1.888	0.002	0.004	0.320	0.000
2.000	0.002	0.004	0.320	0.000
2.111	0.002	0.004	0.320	0.000
2.222	0.002	0.005	0.320	0.000
2.333	0.002	0.005	0.320	0.000
2.444	0.002	0.005	0.320	0.000
2.555	0.002	0.005	0.320	0.000
2.666	0.002	0.006	0.320	0.000
2.777	0.002	0.006	0.320	0.000
2.888	0.002	0.006	0.320	1000
3.000	0.002	0.006	0.320	1000
3.111	0.002	0.007	0.320	1000
3.222	0.002	0.007	0.320	1000
3.333	0.002	0.007	0.320	1000
3.444	0.002	0.007	0.320	1000
3.555	0.002	0.008	0.320	1000
3.666	0.002	0.008	0.320	1000
3.777	0.002	0.008	0.320	1000
3.888	0.002	0.008	0.320	1000
4.000	0.002	0.009	0.320	1000
4.111	0.002	0.009	0.320	1000
4.222	0.002	0.009	0.320	1000
4.333	0.002	0.009	0.320	1000
4.444	0.002	0.010	0.320	1000
4.555	0.002	0.010	0.320	1000
4.666	0.002	0.010	0.320	1000
4.777	0.002	0.011	0.320	1000
4.888	0.002	0.011	0.320	1000
5.000	0.002	0.011	0.320	1000
5.111	0.002	0.011	0.320	1000

5.222	0.002	0.012	0.320	1000
5.333	0.002	0.012	0.320	1000
5.444	0.002	0.012	0.320	1000
5.555	0.002	0.012	0.320	1000
5.666	0.002	0.013	0.320	1000
5.777	0.002	0.013	0.320	1000
5.888	0.002	0.013	0.320	1000
6.000	0.002	0.013	0.320	1000
6.111	0.002	0.014	0.320	1000
6.222	0.002	0.014	0.320	1000
6.333	0.002	0.014	0.320	1000
6.444	0.002	0.014	0.320	1000
6.555	0.002	0.015	0.320	1000
6.666	0.002	0.015	0.320	1000
6.777	0.002	0.015	0.320	1000
6.888	0.002	0.015	0.320	1000
7.000	0.002	0.016	0.320	1000
7.111	0.002	0.016	0.320	1000
7.222	0.002	0.016	0.320	1000
7.333	0.002	0.016	0.320	1000
7.444	0.002	0.017	0.320	1000
7.555	0.002	0.017	0.320	1000
7.666	0.002	0.017	0.320	1000
7.777	0.002	0.017	0.320	1000
7.888	0.002	0.018	0.320	1000
8.000	0.002	0.018	0.320	1000
8.111	0.002	0.018	0.320	1000
8.222	0.002	0.018	0.320	1000
8.333	0.002	0.019	0.320	1000
8.444	0.002	0.019	0.320	1000
8.555	0.002	0.019	0.320	1000
8.666	0.002	0.019	0.320	1000
8.777	0.002	0.020	0.320	1000
8.888	0.002	0.020	0.320	1000
9.000	0.002	0.020	0.320	1000
9.111	0.002	0.020	0.320	1000
9.222	0.002	0.021	0.320	1000
9.333	0.002	0.021	0.320	1000
9.444	0.002	0.021	0.320	1000
9.555	0.002	0.021	0.320	1000
9.666	0.002	0.022	0.320	1000
9.777	0.002	0.022	0.320	1000
9.888	0.002	0.022	0.320	1000
10.00	0.002	0.023	0.320	1000
10.11	0.002	0.023	0.320	1000

Discharge Structure
Riser Height: 0 ft.
Riser Diameter: 0 in.
Element Flows To:
Outlet 1 Outlet 2
Vault 2

Vault 2

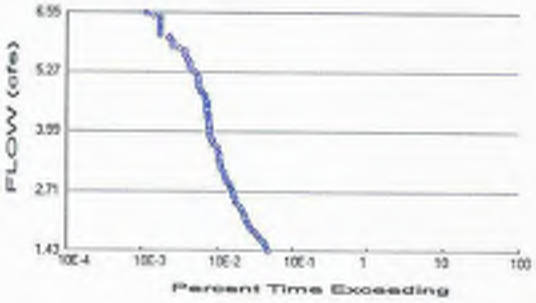
Width: 67 ft.
Length: 154.33 ft.
Depth: 5.8 ft.
Discharge Structure
Riser Height: 4.5 ft.
Riser Diameter: 48 in.
Orifice 1 Diameter: 7.4 in. Elevation:0 ft.
Orifice 3 Diameter: 16 in. Elevation:1.8 ft.
Element Flows To:
Outlet 1 Outlet 2

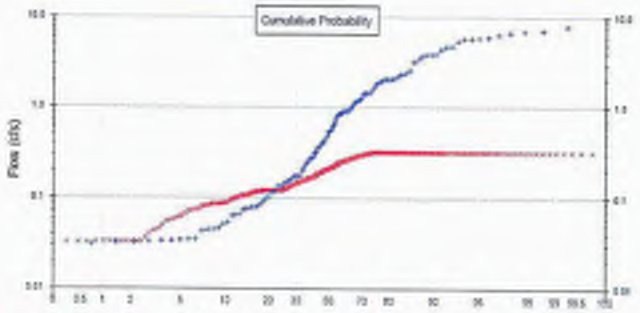
Vault Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.237	0.000	0.000	0.000
0.0644	0.237	0.015	0.377	0.000
0.1289	0.237	0.030	0.533	0.000
0.1933	0.237	0.045	0.653	0.000
0.2578	0.237	0.061	0.754	0.000
0.3222	0.237	0.076	0.843	0.000
0.3867	0.237	0.091	0.924	0.000
0.4511	0.237	0.107	0.998	0.000
0.5156	0.237	0.122	1.067	0.000
0.5800	0.237	0.137	1.131	0.000
0.6444	0.237	0.153	1.192	0.000
0.7089	0.237	0.168	1.251	0.000
0.7733	0.237	0.183	1.306	0.000
0.8378	0.237	0.198	1.360	0.000
0.9022	0.237	0.214	1.411	0.000
0.9667	0.237	0.229	1.461	0.000
1.0311	0.237	0.244	1.509	0.000
1.0956	0.237	0.260	1.555	0.000
1.1600	0.237	0.275	1.600	0.000
1.2244	0.237	0.290	1.644	0.000
1.2889	0.237	0.306	1.687	0.000
1.3533	0.237	0.321	1.728	0.000
1.4178	0.237	0.336	1.769	0.000
1.4822	0.237	0.351	1.809	0.000
1.5467	0.237	0.367	1.848	0.000
1.6111	0.237	0.382	1.886	0.000
1.6756	0.237	0.397	1.923	0.000
1.7400	0.237	0.413	1.960	0.000
1.8044	0.237	0.428	2.459	0.000
1.8689	0.237	0.443	3.854	0.000
1.9333	0.237	0.458	4.602	0.000
1.9978	0.237	0.474	5.189	0.000
2.0622	0.237	0.489	5.691	0.000
2.1267	0.237	0.504	6.137	0.000
2.1911	0.237	0.520	6.544	0.000
2.2556	0.237	0.535	6.920	0.000
2.3200	0.237	0.550	7.273	0.000
2.3844	0.237	0.566	7.605	0.000
2.4489	0.237	0.581	7.921	0.000
2.5133	0.237	0.596	8.223	0.000
2.5778	0.237	0.611	8.512	0.000

2.6422	0.237	0.627	8.791	0.000
2.7067	0.237	0.642	9.059	0.000
2.7711	0.237	0.657	9.319	0.000
2.8356	0.237	0.673	9.571	0.000
2.9000	0.237	0.688	9.816	0.000
2.9644	0.237	0.703	10.05	0.000
3.0289	0.237	0.719	10.28	0.000
3.0933	0.237	0.734	10.51	0.000
3.1578	0.237	0.749	10.73	0.000
3.2222	0.237	0.764	10.95	0.000
3.2867	0.237	0.780	11.16	0.000
3.3511	0.237	0.795	11.37	0.000
3.4156	0.237	0.810	11.57	0.000
3.4800	0.237	0.826	11.77	0.000
3.5444	0.237	0.841	11.97	0.000
3.6089	0.237	0.856	12.16	0.000
3.6733	0.237	0.872	12.35	0.000
3.7378	0.237	0.887	12.54	0.000
3.8022	0.237	0.902	12.72	0.000
3.8667	0.237	0.917	12.90	0.000
3.9311	0.237	0.933	13.08	0.000
3.9956	0.237	0.948	13.26	0.000
4.0600	0.237	0.963	13.43	0.000
4.1244	0.237	0.979	13.60	0.000
4.1889	0.237	0.994	13.77	0.000
4.2533	0.237	1.009	13.94	0.000
4.3178	0.237	1.024	14.11	0.000
4.3822	0.237	1.040	14.27	0.000
4.4467	0.237	1.055	14.43	0.000
4.5111	0.237	1.070	14.64	0.000
4.5756	0.237	1.086	15.63	0.000
4.6400	0.237	1.101	17.13	0.000
4.7044	0.237	1.116	18.98	0.000
4.7689	0.237	1.132	21.11	0.000
4.8333	0.237	1.147	23.50	0.000
4.8978	0.237	1.162	26.10	0.000
4.9622	0.237	1.177	28.88	0.000
5.0267	0.237	1.193	31.82	0.000
5.0911	0.237	1.208	34.89	0.000
5.1556	0.237	1.223	38.07	0.000
5.2200	0.237	1.239	41.33	0.000
5.2844	0.237	1.254	44.65	0.000
5.3489	0.237	1.269	48.00	0.000
5.4133	0.237	1.285	51.35	0.000
5.4778	0.237	1.300	54.67	0.000
5.5422	0.237	1.315	57.94	0.000
5.6067	0.237	1.330	61.13	0.000
5.6711	0.237	1.346	64.23	0.000
5.7356	0.237	1.361	67.19	0.000
5.8000	0.237	1.376	70.01	0.000
5.8644	0.237	1.200	72.67	0.000

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 14.13
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 5.13
Total Impervious Area: 9

Flow Frequency Method: Cunnane

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	2.856374
5 year	5.737343
10 year	6.549086
25 year	7.198396

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.32
5 year	0.32
10 year	0.32
25 year	0.32

Duration Flows

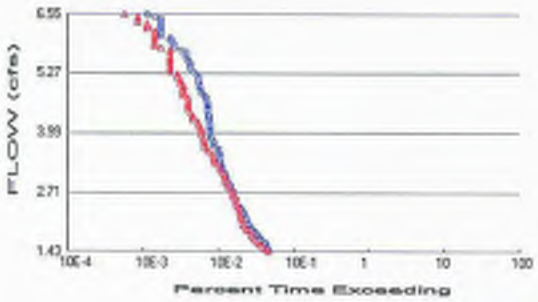
The Facility PASSED

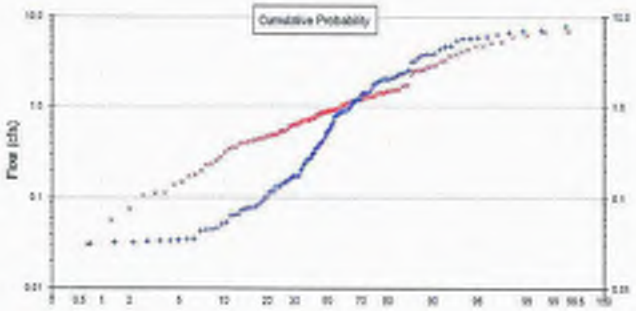
Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.4282	169	0	0	Pass
1.4799	161	0	0	Pass
1.5316	158	0	0	Pass
1.5834	152	0	0	Pass
1.6351	144	0	0	Pass
1.6868	130	0	0	Pass
1.7385	124	0	0	Pass
1.7903	120	0	0	Pass
1.8420	110	0	0	Pass
1.8937	101	0	0	Pass
1.9454	95	0	0	Pass
1.9972	92	0	0	Pass
2.0489	86	0	0	Pass
2.1006	84	0	0	Pass
2.1524	82	0	0	Pass
2.2041	80	0	0	Pass
2.2558	78	0	0	Pass
2.3075	74	0	0	Pass
2.3593	72	0	0	Pass
2.4110	66	0	0	Pass
2.4627	62	0	0	Pass
2.5144	61	0	0	Pass
2.5662	60	0	0	Pass
2.6179	57	0	0	Pass
2.6696	57	0	0	Pass
2.7213	56	0	0	Pass
2.7731	54	0	0	Pass
2.8248	51	0	0	Pass
2.8765	50	0	0	Pass
2.9282	46	0	0	Pass
2.9800	45	0	0	Pass
3.0317	44	0	0	Pass
3.0834	43	0	0	Pass
3.1352	42	0	0	Pass
3.1869	39	0	0	Pass
3.2386	39	0	0	Pass
3.2903	38	0	0	Pass
3.3421	37	0	0	Pass
3.3938	37	0	0	Pass
3.4455	37	0	0	Pass
3.4972	37	0	0	Pass
3.5490	36	0	0	Pass
3.6007	35	0	0	Pass
3.6524	35	0	0	Pass
3.7041	31	0	0	Pass
3.7559	30	0	0	Pass
3.8076	30	0	0	Pass
3.8593	28	0	0	Pass
3.9110	28	0	0	Pass
3.9628	27	0	0	Pass
4.0145	27	0	0	Pass
4.0662	27	0	0	Pass
4.1180	27	0	0	Pass

4.1697	27	0	0	Pass
4.2214	27	0	0	Pass
4.2731	26	0	0	Pass
4.3249	26	0	0	Pass
4.3766	26	0	0	Pass
4.4283	25	0	0	Pass
4.4800	25	0	0	Pass
4.5318	25	0	0	Pass
4.5835	25	0	0	Pass
4.6352	25	0	0	Pass
4.6869	24	0	0	Pass
4.7387	24	0	0	Pass
4.7904	23	0	0	Pass
4.8421	21	0	0	Pass
4.8938	21	0	0	Pass
4.9456	20	0	0	Pass
4.9973	20	0	0	Pass
5.0490	19	0	0	Pass
5.1008	19	0	0	Pass
5.1525	19	0	0	Pass
5.2042	19	0	0	Pass
5.2559	18	0	0	Pass
5.3077	16	0	0	Pass
5.3594	15	0	0	Pass
5.4111	15	0	0	Pass
5.4628	15	0	0	Pass
5.5146	14	0	0	Pass
5.5663	14	0	0	Pass
5.6180	13	0	0	Pass
5.6697	13	0	0	Pass
5.7215	13	0	0	Pass
5.7732	11	0	0	Pass
5.8249	9	0	0	Pass
5.8766	9	0	0	Pass
5.9284	9	0	0	Pass
5.9801	8	0	0	Pass
6.0318	8	0	0	Pass
6.0835	6	0	0	Pass
6.1353	6	0	0	Pass
6.1870	6	0	0	Pass
6.2387	6	0	0	Pass
6.2905	6	0	0	Pass
6.3422	6	0	0	Pass
6.3939	6	0	0	Pass
6.4456	6	0	0	Pass
6.4974	5	0	0	Pass
6.5491	4	0	0	Pass

Water Quality

POC 2





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 14.13
Total Impervious Area: 0

Mitigated Landuse Totals for POC #2
Total Pervious Area: 5.13
Total Impervious Area: 9

Flow Frequency Method: Cunnane

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	**Flow(cfs)**
2 year	2.856374
5 year	5.737343
10 year	6.549086
25 year	7.198396

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	**Flow(cfs)**
2 year	2.555802
5 year	4.577523
10 year	5.592384
25 year	6.861155

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.4282	169	164	97	Pass
1.4799	161	151	93	Pass
1.5316	158	139	87	Pass
1.5834	152	126	82	Pass
1.6351	144	117	81	Pass
1.6868	130	107	82	Pass
1.7385	124	103	83	Pass
1.7903	120	97	80	Pass
1.8420	110	93	84	Pass
1.8937	101	86	85	Pass
1.9454	95	82	86	Pass
1.9972	92	78	84	Pass
2.0489	86	73	84	Pass
2.1006	84	73	86	Pass
2.1524	82	71	86	Pass
2.2041	80	69	86	Pass
2.2558	78	68	87	Pass
2.3075	74	67	90	Pass
2.3593	72	67	93	Pass
2.4110	66	63	95	Pass
2.4627	62	62	100	Pass
2.5144	61	61	100	Pass
2.5662	60	60	100	Pass
2.6179	57	57	100	Pass
2.6696	57	55	96	Pass
2.7213	56	54	96	Pass
2.7731	54	51	94	Pass
2.8248	51	48	94	Pass
2.8765	50	46	92	Pass
2.9282	46	44	95	Pass
2.9800	45	43	95	Pass
3.0317	44	43	97	Pass
3.0834	43	42	97	Pass
3.1352	42	40	95	Pass
3.1869	39	39	100	Pass
3.2386	39	37	94	Pass
3.2903	38	35	92	Pass
3.3421	37	32	86	Pass
3.3938	37	31	83	Pass
3.4455	37	31	83	Pass
3.4972	37	30	81	Pass
3.5490	36	29	80	Pass
3.6007	35	25	71	Pass
3.6524	35	25	71	Pass
3.7041	31	23	74	Pass
3.7559	30	23	76	Pass
3.8076	30	23	76	Pass
3.8593	28	22	78	Pass
3.9110	28	22	78	Pass
3.9628	27	21	77	Pass
4.0145	27	21	77	Pass
4.0662	27	21	77	Pass
4.1180	27	20	74	Pass

4.1697	27	19	70	Pass
4.2214	27	19	70	Pass
4.2731	26	16	61	Pass
4.3249	26	16	61	Pass
4.3766	26	18	61	Pass
4.4283	25	15	60	Pass
4.4800	25	14	56	Pass
4.5318	25	14	56	Pass
4.5835	25	14	56	Pass
4.6352	25	14	56	Pass
4.6869	24	14	58	Pass
4.7387	24	14	58	Pass
4.7904	23	12	52	Pass
4.8421	21	12	57	Pass
4.8938	21	12	57	Pass
4.9456	20	12	60	Pass
4.9973	20	12	60	Pass
5.0490	19	11	57	Pass
5.1008	19	11	57	Pass
5.1525	19	11	57	Pass
5.2042	19	10	52	Pass
5.2559	18	10	55	Pass
5.3077	16	8	50	Pass
5.3594	15	8	53	Pass
5.4111	15	8	53	Pass
5.4628	15	8	53	Pass
5.5146	14	8	57	Pass
5.5663	14	8	57	Pass
5.6180	13	8	61	Pass
5.6697	13	8	61	Pass
5.7215	13	8	61	Pass
5.7732	11	8	72	Pass
5.8249	9	6	66	Pass
5.8766	9	5	55	Pass
5.9284	9	5	55	Pass
5.9801	8	5	62	Pass
6.0318	8	5	62	Pass
6.0835	6	5	83	Pass
6.1353	6	5	83	Pass
6.1870	6	5	83	Pass
6.2387	6	4	66	Pass
6.2905	6	4	66	Pass
6.3422	6	4	66	Pass
6.3939	6	3	50	Pass
6.4456	6	3	50	Pass
6.4974	5	3	60	Pass
6.5491	4	2	50	Pass

Water Quality

Model Default Modifications

Total of 0 changes have been made.

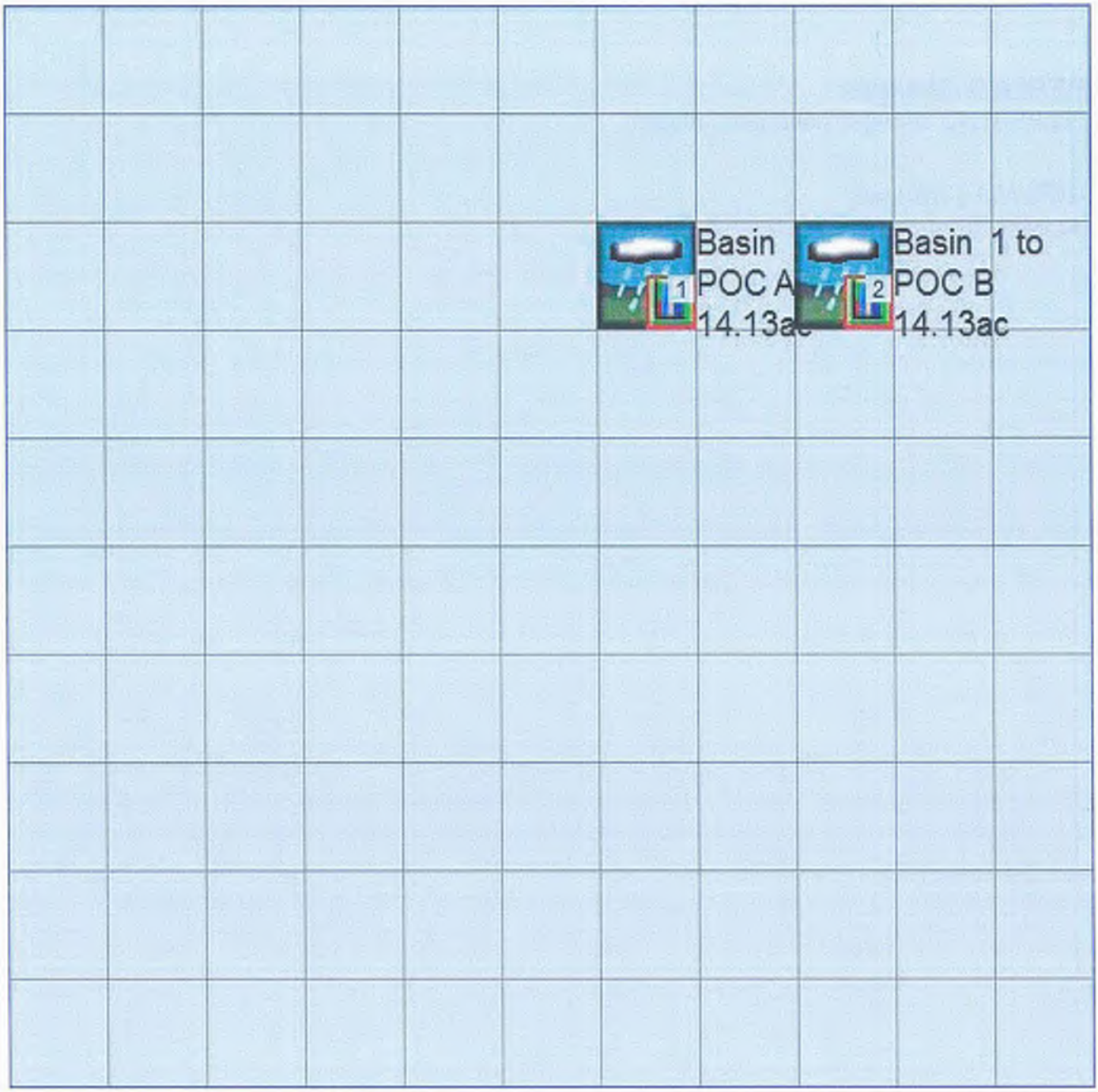
PERLND Changes

No PERLND changes have been made.

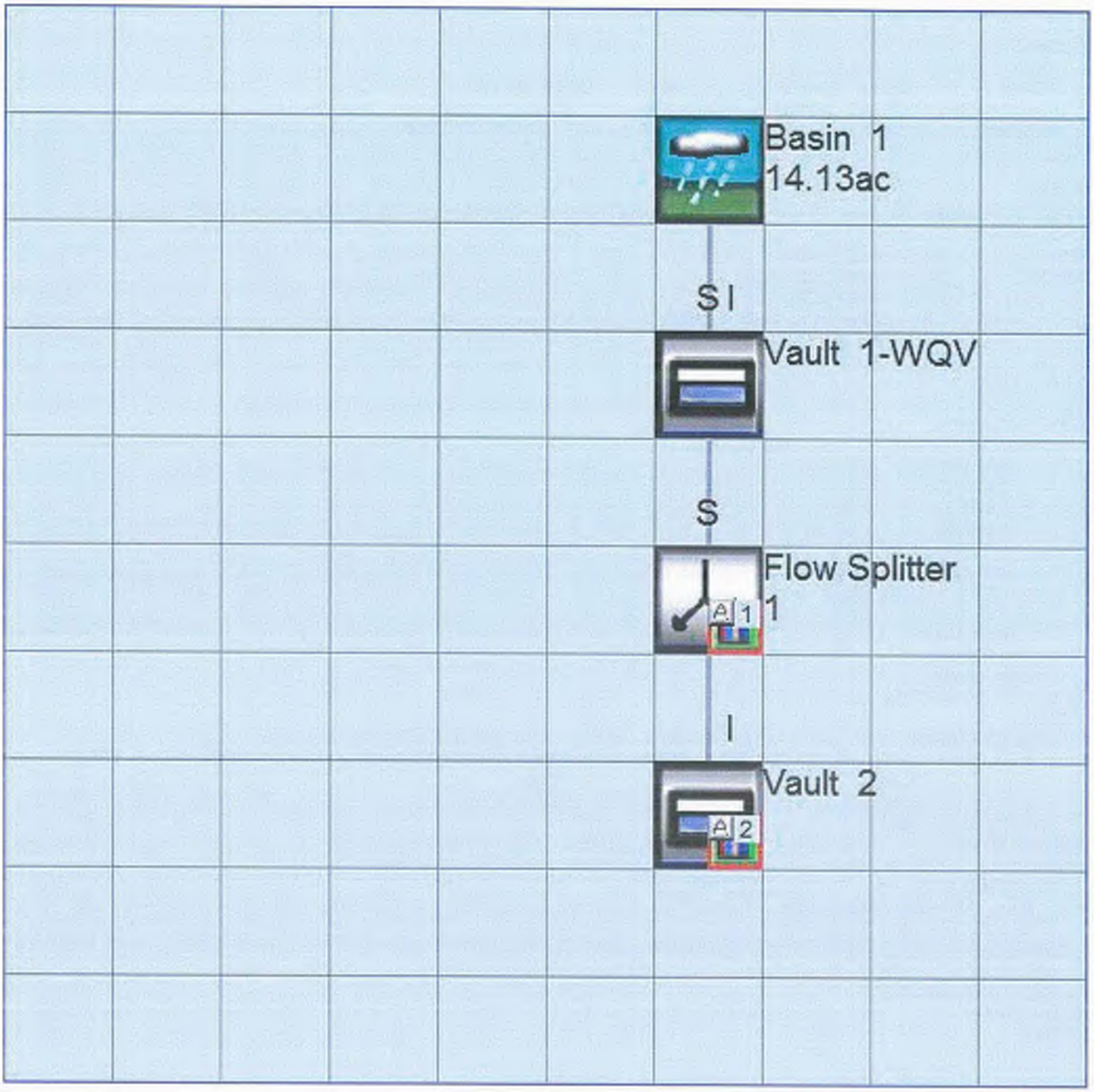
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1964 10 01         END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                               ***
WDM         26   POC2.wdm
MESSU       25   PrePOC2.MES
            27   PrePOC2.L61
            28   PrePOC2.L62
            30   POCPOC21.dat
            31   POCPOC22.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:60
      PERLND       19
      PERLND       20
      PERLND       21
      PERLND       28
      PERLND       29
      PERLND       30
      COPY        501
      COPY        502
      DISPLY        1
      DISPLY        2
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1 to POC A           MAX                   1    2   30    9
    2        Basin  1 to POC B           MAX                   1    2   31    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out              ***
   19      C,Grass,FLAT(0-5%)      1    1    1    1   27    0
   20      C,Grass,MOD(5-10%)      1    1    1    1   27    0
   21      C,Grass,STEEP(10-20     1    1    1    1   27    0
   28      D,Grass,FLAT(0-5%)      1    1    1    1   27    0
   29      D,Grass,MOD(5-10%)      1    1    1    1   27    0
   30      D,Grass,STEEP(10-20     1    1    1    1   27    0
```

```
END GEN-INFO
*** Section PWATER***

ACTIVITY
  <PLS > ************* Active Sections ******************************
  # -   # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
 19          0    0    1    0    0    0    0    0    0    0    0    0
 20          0    0    1    0    0    0    0    0    0    0    0    0
 21          0    0    1    0    0    0    0    0    0    0    0    0
 28          0    0    1    0    0    0    0    0    0    0    0    0
 29          0    0    1    0    0    0    0    0    0    0    0    0
 30          0    0    1    0    0    0    0    0    0    0    0    0
END ACTIVITY

PRINT-INFO
  <PLS > ***************** Print-flags ***************************** PIVL  PYR
  # -   # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC *********
 19          0    0    4    0    0    0    0    0    0    0    0    0    1    9
 20          0    0    4    0    0    0    0    0    0    0    0    0    1    9
 21          0    0    4    0    0    0    0    0    0    0    0    0    1    9
 28          0    0    4    0    0    0    0    0    0    0    0    0    1    9
 29          0    0    4    0    0    0    0    0    0    0    0    0    1    9
 30          0    0    4    0    0    0    0    0    0    0    0    0    1    9
END PRINT-INFO

PWAT-PARM1
  <PLS >  PWATER variable monthly parameter value flags  ***
  # -   # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
 19          0    1    1    1    0    0    0    0    1    1    0
 20          0    1    1    1    0    0    0    0    1    1    0
 21          0    1    1    1    0    0    0    0    1    1    0
 28          0    1    1    1    0    0    0    0    1    1    0
 29          0    1    1    1    0    0    0    0    1    1    0
 30          0    1    1    1    0    0    0    0    1    1    0
END PWAT-PARM1

PWAT-PARM2
  <PLS >       PWATER input info: Part 2          ***
  # -   # ***FOREST       LZSN      INFILT       LSUR      SLSUR      KVARY      AGWRC
 19               0        4.8       0.05        200       0.05          3       0.92
 20               0        4.5       0.04        200        0.1          3       0.92
 21               0        4.2       0.03        200       0.15          3       0.92
 28               0        4.8       0.04        200       0.05          3       0.92
 29               0        4.5       0.03        200        0.1          3       0.92
 30               0        4.2       0.02        200       0.15          3       0.92
END PWAT-PARM2

PWAT-PARM3
  <PLS >       PWATER input info: Part 3          ***
  # -   # ***PETMAX     PETMIN     INFEXP     INFILD     DEEPFR     BASETP     AGWETP
 19              35         30          2          2        0.4       0.05       0.05
 20              35         30          2          2        0.4       0.05       0.05
 21              35         30          2          2        0.4       0.05       0.05
 28              35         30          2          2        0.4       0.05       0.05
 29              35         30          2          2        0.4       0.05       0.05
 30              35         30          2          2        0.4       0.05       0.05
END PWAT-PARM3
PWAT-PARM4
  <PLS >       PWATER input info: Part 4                                    ***
  # -   #       CEPSC      UZSN      NSUR     INTFW       IRC     LZETP  ***
 19            0.08       0.6       0.2       1.5       0.7       0.5
 20            0.08       0.6       0.2       1.5       0.7       0.5
 21            0.08       0.6       0.2       1.5       0.7       0.5
 28            0.08       0.6       0.2       1.5       0.7       0.5
 29            0.08       0.6       0.2       1.5       0.7       0.5
 30            0.08       0.6       0.2       1.5       0.7       0.5
END PWAT-PARM4
MON-LZETPARM
  <PLS >       PWATER input info: Part 3          ***
  # -   #   JAN   FEB   MAR   APR   MAY   JUN   JUL   AUG   SEP   OCT   NOV   DEC  ***
```

```
  19        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
  20        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
  21        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
  28        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
  29        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
  30        0.4   0.4   0.4   0.4   0.6   0.6   0.6   0.6   0.6   0.4   0.4   0.4
 END MON-LZETPARM
 MON-INTERCEP
   <PLS >       PWATER input info: Part 3          ***
   # -   #  JAN   FEB   MAR   APR   MAY   JUN   JUL   AUG   SEP   OCT   NOV   DEC  ***
  19        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
  20        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
  21        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
  28        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
  29        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
  30        0.1   0.1   0.1   0.1  0.06  0.06  0.06  0.06  0.06   0.1   0.1   0.1
 END MON-INTERCEP

 PWAT-STATE1
   <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
   # -   # ***  CEPS      SURS       UZS       IFWS       LZS       AGWS       GWVS
  19              0         0      0.15          0         4       0.05          0
  20              0         0      0.15          0         4       0.05          0
  21              0         0      0.15          0         4       0.05          0
  28              0         0      0.15          0         4       0.05          0
  29              0         0      0.15          0         4       0.05          0
  30              0         0      0.15          0         4       0.05          0
 END PWAT-STATE1

END PERLND

IMPLND
 GEN-INFO
   <PLS ><-------Name-------->   Unit-systems   Printer ***
   # -   #                     User  t-series Engl Metr ***
                                    in   out           ***
 END GEN-INFO
 *** Section IWATER***

 ACTIVITY
   <PLS > ************* Active Sections ******************************
   # -   # ATMP SNOW IWAT  SLD  IWG IQAL   ***
 END ACTIVITY

 PRINT-INFO
   <ILS > ******** Print-flags ******** PIVL  PYR
   # -   # ATMP SNOW IWAT  SLD  IWG IQAL    *********
 END PRINT-INFO

 IWAT-PARM1
   <PLS >  IWATER variable monthly parameter value flags  ***
   # -   # CSNO RTOP  VRS  VNN RTLI     ***
 END IWAT-PARM1

 IWAT-PARM2
   <PLS >       IWATER input info: Part 2          ***
   # -   # ***  LSUR      SLSUR       NSUR      RETSC
 END IWAT-PARM2

 IWAT-PARM3
   <PLS >       IWATER input info: Part 3          ***
   # -   # ***PETMAX     PETMIN
 END IWAT-PARM3

 IWAT-STATE1
   <PLS > *** Initial conditions at start of simulation
   # -   # ***  RETS       SURS
 END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->      <-Target->   MBLK   ***
<Name>   #                  <-factor->      <Name>   #   Tbl#   ***
Basin  1 to POC A***
PERLND  19                       0.26      COPY   501      12
PERLND  19                       0.26      COPY   501      13
PERLND  20                       0.81      COPY   501      12
PERLND  20                       0.81      COPY   501      13
PERLND  21                      10.27      COPY   501      12
PERLND  21                      10.27      COPY   501      13
PERLND  28                       0.03      COPY   501      12
PERLND  28                       0.03      COPY   501      13
PERLND  29                       0.03      COPY   501      12
PERLND  29                       0.03      COPY   501      13
PERLND  30                       2.73      COPY   501      12
PERLND  30                       2.73      COPY   501      13
Basin  1 to POC B***
PERLND  19                       0.26      COPY   502      12
PERLND  19                       0.26      COPY   502      13
PERLND  20                       0.81      COPY   502      12
PERLND  20                       0.81      COPY   502      13
PERLND  21                      10.27      COPY   502      12
PERLND  21                      10.27      COPY   502      13
PERLND  28                       0.03      COPY   502      12
PERLND  28                       0.03      COPY   502      13
PERLND  29                       0.03      COPY   502      12
PERLND  29                       0.03      COPY   502      13
PERLND  30                       2.73      COPY   502      12
PERLND  30                       2.73      COPY   502      13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   12.1        DISPLY   2     INPUT  TIMSER 1


<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name         Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG             ***
                                       in  out                                ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
```

```
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN      DELTH     STCOR        KS       DB50        ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                              ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL     1             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL     1             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL     1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL     1             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    501 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     12.1      WDM    502 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>    <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    12

  MASS-LINK        13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1964 10 01         END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   POC2.wdm
MESSU       25   MitPOC2.MES
            27   MitPOC2.L61
            28   MitPOC2.L62
            30   POCPOC21.dat
            31   POCPOC22.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:60
      PERLND       19
      PERLND       21
      PERLND       28
      PERLND       30
      IMPLND        1
      RCHRES        1
      RCHRES        2
      RCHRES        3
      COPY          1
      COPY        501
      COPY          2
      COPY        502
      DISPLY        1
      DISPLY        2
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Flow Splitter  1           MAX                    1    2   30    9
    2        Vault  2                   MAX                    1    2   31    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1          1    1
  501          1    1
    2          1    1
  502          1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name-------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                        in  out             ***
   19      C,Grass,FLAT(0-5%)      1    1    1    1   27    0
```

```
 21       C,Grass,STEEP(10-20     1     1     1     1    27     0
 28       D,Grass,FLAT(0-5%)      1     1     1     1    27     0
 30       D,Grass,STEEP(10-20     1     1     1     1    27     0
END GEN-INFO
*** Section PWATER***

ACTIVITY
  <PLS > ************ Active Sections ****************************
  # -   # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
 19         0    0    1    0    0    0    0    0    0    0    0    0
 21         0    0    1    0    0    0    0    0    0    0    0    0
 28         0    0    1    0    0    0    0    0    0    0    0    0
 30         0    0    1    0    0    0    0    0    0    0    0    0
END ACTIVITY

PRINT-INFO
  <PLS > ***************** Print-flags ***************************** PIVL  PYR
  # -   # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
 19         0    0    4    0    0    0    0    0    0    0    0    0    1     9
 21         0    0    4    0    0    0    0    0    0    0    0    0    1     9
 28         0    0    4    0    0    0    0    0    0    0    0    0    1     9
 30         0    0    4    0    0    0    0    0    0    0    0    0    1     9
END PRINT-INFO

PWAT-PARM1
  <PLS >  PWATER variable monthly parameter value flags  ***
  # -   # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
 19         0    1    1    1    0    0    0    0    1    1    0
 21         0    1    1    1    0    0    0    0    1    1    0
 28         0    1    1    1    0    0    0    0    1    1    0
 30         0    1    1    1    0    0    0    0    1    1    0
END PWAT-PARM1

PWAT-PARM2
  <PLS >       PWATER input info: Part 2          ***
  # -   # ***FOREST      LZSN     INFILT      LSUR     SLSUR     KVARY      AGWRC
 19               0       4.8       0.05       200      0.05         3       0.92
 21               0       4.2       0.03       200      0.15         3       0.92
 28               0       4.8       0.04       200      0.05         3       0.92
 30               0       4.2       0.02       200      0.15         3       0.92
END PWAT-PARM2

PWAT-PARM3
  <PLS >       PWATER input info: Part 3          ***
  # -   # ***PETMAX    PETMIN     INFEXP     INFILD     DEEPFR     BASETP     AGWETP
 19              35         30          2          2        0.4       0.05       0.05
 21              35         30          2          2        0.4       0.05       0.05
 28              35         30          2          2        0.4       0.05       0.05
 30              35         30          2          2        0.4       0.05       0.05
END PWAT-PARM3
PWAT-PARM4
  <PLS >      PWATER input info: Part 4                                    ***
  # -   #      CEPSC      UZSN      NSUR     INTFW       IRC     LZETP  ***
 19           0.08       0.6       0.2       1.5       0.7       0.5
 21           0.08       0.6       0.2       1.5       0.7       0.5
 28           0.08       0.6       0.2       1.5       0.7       0.5
 30           0.08       0.6       0.2       1.5       0.7       0.5
END PWAT-PARM4
MON-LZETPARM
  <PLS >       PWATER input info: Part 3          ***
  # -   #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
 19        0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
 21        0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
 28        0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
 30        0.4  0.4  0.4  0.4  0.6  0.6  0.6  0.6  0.6  0.4  0.4  0.4
END MON-LZETPARM
MON-INTERCEP
  <PLS >       PWATER input info: Part 3          ***
  # -   #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
 19        0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
```

```
  21       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
  28       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
  30       0.1  0.1  0.1  0.1 0.06 0.06 0.06 0.06 0.06  0.1  0.1  0.1
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS       IFWS       LZS       AGWS       GWVS
   19              0         0      0.15          0         4       0.05          0
   21              0         0      0.15          0         4       0.05          0
   28              0         0      0.15          0         4       0.05          0
   30              0         0      0.15          0         4       0.05          0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name-------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                    in  out           ***
    1      IMPERVIOUS-FLAT        1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    ***
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    1
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            100     0.035      0.05       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK    ***
<Name>   #                 <-factor->     <Name>   #   Tbl#    ***
Basin  1***
PERLND  19                       2.7      RCHRES   1      2
PERLND  19                       2.7      RCHRES   1      3
```

```
PERLND  21                          1.37     RCHRES   1       2
PERLND  21                          1.37     RCHRES   1       3
PERLND  28                          0.42     RCHRES   1       2
PERLND  28                          0.42     RCHRES   1       3
PERLND  30                          0.64     RCHRES   1       2
PERLND  30                          0.64     RCHRES   1       3
IMPLND   1                             9     RCHRES   1       5

******Routing******
RCHRES   1                             1     RCHRES   2       6
RCHRES   1                                   COPY     1      16
RCHRES   2                             1     COPY     2      18
RCHRES   2                                   RCHRES   3       8
RCHRES   2                             1     COPY   501      17
RCHRES   2                             1     COPY   601      17
RCHRES   3                             1     COPY   502      16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   12.1        DISPLY   2     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name         Nexits   Unit Systems   Printer                ***
    # -  #<-----------------><---> User T-series  Engl Metr LKFG             ***
                                        in  out                              ***
    1     Vault  1-WQV             1    1    1    1   28    0    1
    2     Flow Splitter  1-020     2    1    1    1   28    0    1
    3     Vault  2                 1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                   ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
          FG FG FG FG  possible  exit  *** possible  exit       possible  exit
           *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1      0  1  0  0    4  0  0  0  0       0  0  0  0  0        2  2  2  2  2
    2      0  1  0  0    4  5  0  0  0       0  0  0  0  0        2  2  2  2  2
    3      0  1  0  0    4  0  0  0  0       0  0  0  0  0        2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN      DELTH     STCOR      KS      DB50        ***
    <------><--------><--------><--------><--------><--------><--------->    ***
```

```
    1              1      0.03       0.0       0.0       0.5       0.0
    2              2      0.01       0.0       0.0       0.5       0.0
    3              3      0.03       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                    ***
    # -  # ***   VOL     Initial value of COLIND     Initial value of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><--------->     <---><---><---><---><---> *** <---><---><---><---><---->
    1             0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2             0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3             0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   92    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)    (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.237376  0.000000  0.000000
  0.083333  0.237376  0.019781  0.070503
  0.166667  0.237376  0.039563  0.099707
  0.250000  0.237376  0.059344  0.122116
  0.333333  0.237376  0.079125  0.141007
  0.416667  0.237376  0.098907  0.157651
  0.500000  0.237376  0.118688  0.172698
  0.583333  0.237376  0.138469  0.186535
  0.666667  0.237376  0.158251  0.199414
  0.750000  0.237376  0.178032  0.211510
  0.833333  0.237376  0.197814  0.222952
  0.916667  0.237376  0.217595  0.233834
  1.000000  0.237376  0.237376  0.244231
  1.083333  0.237376  0.257158  0.254204
  1.166667  0.237376  0.276939  0.263800
  1.250000  0.237376  0.296720  0.273059
  1.333333  0.237376  0.316502  0.282014
  1.416667  0.237376  0.336283  0.290693
  1.500000  0.237376  0.356064  0.299121
  1.583333  0.237376  0.375846  0.307318
  1.666667  0.237376  0.395627  0.315301
  1.750000  0.237376  0.415408  1.035271
  1.833333  0.237376  0.435190  3.429972
  1.916667  0.237376  0.454971  6.754689
  2.000000  0.237376  0.474753  10.79343
  2.083333  0.237376  0.494534  15.43137
  2.166667  0.237376  0.514315  20.59051
  2.250000  0.237376  0.534097  26.21001
  2.333333  0.237376  0.553878  32.23773
  2.416667  0.237376  0.573659  38.62596
  2.500000  0.237376  0.593441  45.32901
  2.583333  0.237376  0.613222  52.30186
  2.666667  0.237376  0.633003  59.49937
  2.750000  0.237376  0.652785  66.87588
  2.833333  0.237376  0.672566  74.38502
  2.916667  0.237376  0.692347  81.97981
  3.000000  0.237376  0.712129  89.61278
  3.083333  0.237376  0.731910  97.23627
  3.166667  0.237376  0.751691  104.8028
  3.250000  0.237376  0.771473  112.2654
  3.333333  0.237376  0.791254  119.5785
  3.416667  0.237376  0.811036  126.6980
  3.500000  0.237376  0.830817  133.5822
  3.583333  0.237376  0.850598  140.1925
  3.666667  0.237376  0.870380  146.4937
  3.750000  0.237376  0.890161  152.4555
  3.833333  0.237376  0.909942  158.0525
  3.916667  0.237376  0.929724  163.2655
```

```
4.000000  0.237376  0.949505  168.0822
4.083333  0.237376  0.969286  172.4982
4.166667  0.237376  0.989068  176.5179
4.250000  0.237376  1.008849  180.1552
4.333333  0.237376  1.028630  183.4348
4.416667  0.237376  1.048412  186.3931
4.500000  0.237376  1.068193  189.0792
4.583333  0.237376  1.087975  191.5560
4.666667  0.237376  1.107756  193.9014
4.750000  0.237376  1.127537  198.5536
4.833333  0.237376  1.147319  201.2452
4.916667  0.237376  1.167100  203.9013
5.000000  0.237376  1.186881  206.5233
5.083333  0.237376  1.206663  209.1123
5.166667  0.237376  1.226444  211.6697
5.250000  0.237376  1.246225  214.1965
5.333333  0.237376  1.266007  216.6938
5.416667  0.237376  1.285788  219.1627
5.500000  0.237376  1.305569  221.6041
5.583333  0.237376  1.325351  224.0189
5.666667  0.237376  1.345132  226.4079
5.750000  0.237376  1.364914  228.7719
5.833333  0.237376  1.384695  231.1118
5.916667  0.237376  1.404476  233.4282
6.000000  0.237376  1.424258  235.7219
6.083333  0.237376  1.444039  237.9934
6.166667  0.237376  1.463820  240.2435
6.250000  0.237376  1.483602  242.4726
6.333333  0.237376  1.503383  244.6815
6.416667  0.237376  1.523164  246.8706
6.500000  0.237376  1.542946  249.0404
6.583333  0.237376  1.562727  251.1915
6.666667  0.237376  1.582508  253.3244
6.750000  0.237376  1.602290  255.4394
6.833333  0.237376  1.622071  257.5371
6.916667  0.237376  1.641852  259.6178
7.000000  0.237376  1.661634  261.6819
7.083333  0.237376  1.681415  263.7299
7.166667  0.237376  1.701197  265.7621
7.250000  0.237376  1.720978  267.7789
7.333333  0.237376  1.740759  269.7806
7.416667  0.237376  1.760541  271.7676
7.500000  0.237376  1.780322  273.7401
7.583333  0.237376  1.800103  275.6986
END FTABLE  1
FTABLE      2
 90    5
   Depth      Area     Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)    (acres) (acre-ft)    (cfs)     (cfs)   (ft/sec)     (Minutes)***
0.000000  0.002296  0.000000  0.320000  0.000000
0.111111  0.002296  0.000255  0.320000  0.000000
0.222222  0.002296  0.000510  0.320000  0.000000
0.333333  0.002296  0.000765  0.320000  0.000000
0.444444  0.002296  0.001020  0.320000  0.000000
0.555556  0.002296  0.001275  0.320000  0.000000
0.666667  0.002296  0.001530  0.320000  11.00000
0.777778  0.002296  0.001786  0.320000  21.00000
0.888889  0.002296  0.002041  0.320000  31.00000
1.000000  0.002296  0.002296  0.320000  41.00000
1.111111  0.002296  0.002551  0.320000  51.00000
1.222222  0.002296  0.002806  0.320000  61.00000
1.333333  0.002296  0.003061  0.320000  71.00000
1.444444  0.002296  0.003316  0.320000  81.00000
1.555556  0.002296  0.003571  0.320000  91.00000
1.666667  0.002296  0.003826  0.320000  101.0000
1.777778  0.002296  0.004081  0.320000  111.0000
1.888889  0.002296  0.004336  0.320000  121.0000
2.000000  0.002296  0.004591  0.320000  131.0000
2.111111  0.002296  0.004846  0.320000  141.0000
2.222222  0.002296  0.005102  0.320000  151.0000
```

2.333333	0.002296	0.005357	0.320000	161.0000
2.444444	0.002296	0.005612	0.320000	171.0000
2.555556	0.002296	0.005867	0.320000	181.0000
2.666667	0.002296	0.006122	0.320000	191.0000
2.777778	0.002296	0.006377	0.320000	201.0000
2.888889	0.002296	0.006632	0.320000	211.0000
3.000000	0.002296	0.006887	0.320000	221.0000
3.111111	0.002296	0.007142	0.320000	231.0000
3.222222	0.002296	0.007397	0.320000	241.0000
3.333333	0.002296	0.007652	0.320000	251.0000
3.444444	0.002296	0.007907	0.320000	261.0000
3.555556	0.002296	0.008162	0.320000	271.0000
3.666667	0.002296	0.008418	0.320000	281.0000
3.777778	0.002296	0.008673	0.320000	291.0000
3.888889	0.002296	0.008928	0.320000	301.0000
4.000000	0.002296	0.009183	0.320000	311.0000
4.111111	0.002296	0.009438	0.320000	321.0000
4.222222	0.002296	0.009693	0.320000	331.0000
4.333333	0.002296	0.009948	0.320000	341.0000
4.444444	0.002296	0.010203	0.320000	351.0000
4.555556	0.002296	0.010458	0.320000	361.0000
4.666667	0.002296	0.010713	0.320000	371.0000
4.777778	0.002296	0.010968	0.320000	381.0000
4.888889	0.002296	0.011223	0.320000	391.0000
5.000000	0.002296	0.011478	0.320000	401.0000
5.111111	0.002296	0.011733	0.320000	411.0000
5.222222	0.002296	0.011989	0.320000	421.0000
5.333333	0.002296	0.012244	0.320000	431.0000
5.444444	0.002296	0.012499	0.320000	441.0000
5.555556	0.002296	0.012754	0.320000	451.0000
5.666667	0.002296	0.013009	0.320000	461.0000
5.777778	0.002296	0.013264	0.320000	471.0000
5.888889	0.002296	0.013519	0.320000	481.0000
6.000000	0.002296	0.013774	0.320000	491.0000
6.111111	0.002296	0.014029	0.320000	501.0000
6.222222	0.002296	0.014284	0.320000	511.0000
6.333333	0.002296	0.014539	0.320000	521.0000
6.444444	0.002296	0.014794	0.320000	531.0000
6.555556	0.002296	0.015049	0.320000	541.0000
6.666667	0.002296	0.015305	0.320000	551.0000
6.777778	0.002296	0.015560	0.320000	561.0000
6.888889	0.002296	0.015815	0.320000	571.0000
7.000000	0.002296	0.016070	0.320000	581.0000
7.111111	0.002296	0.016325	0.320000	591.0000
7.222222	0.002296	0.016580	0.320000	601.0000
7.333333	0.002296	0.016835	0.320000	611.0000
7.444444	0.002296	0.017090	0.320000	621.0000
7.555556	0.002296	0.017345	0.320000	631.0000
7.666667	0.002296	0.017600	0.320000	641.0000
7.777778	0.002296	0.017855	0.320000	651.0000
7.888889	0.002296	0.018110	0.320000	661.0000
8.000000	0.002296	0.018365	0.320000	671.0000
8.111111	0.002296	0.018621	0.320000	681.0000
8.222222	0.002296	0.018876	0.320000	691.0000
8.333333	0.002296	0.019131	0.320000	701.0000
8.444444	0.002296	0.019386	0.320000	711.0000
8.555556	0.002296	0.019641	0.320000	721.0000
8.666667	0.002296	0.019896	0.320000	731.0000
8.777778	0.002296	0.020151	0.320000	741.0000
8.888889	0.002296	0.020406	0.320000	751.0000
9.000000	0.002296	0.020661	0.320000	761.0000
9.111111	0.002296	0.020916	0.320000	771.0000
9.222222	0.002296	0.021171	0.320000	781.0000
9.333333	0.002296	0.021426	0.320000	791.0000
9.444444	0.002296	0.021681	0.320000	801.0000
9.555556	0.002296	0.021937	0.320000	811.0000
9.666667	0.002296	0.022192	0.320000	821.0000
9.777778	0.002296	0.022447	0.320000	831.0000
9.888889	0.002296	0.022702	0.320000	841.0000

END FTABLE 2

FTABLE 3
91 4

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.237376	0.000000	0.000000		
0.064444	0.237376	0.015298	0.377238		
0.128889	0.237376	0.030595	0.533494		
0.193333	0.237376	0.045893	0.653395		
0.257778	0.237376	0.061190	0.754475		
0.322222	0.237376	0.076488	0.843529		
0.386667	0.237376	0.091785	0.924039		
0.451111	0.237376	0.107083	0.998077		
0.515556	0.237376	0.122381	1.066989		
0.580000	0.237376	0.137678	1.131713		
0.644444	0.237376	0.152976	1.192930		
0.708889	0.237376	0.168273	1.251155		
0.773333	0.237376	0.183571	1.306789		
0.837778	0.237376	0.198869	1.360149		
0.902222	0.237376	0.214166	1.411494		
0.966667	0.237376	0.229464	1.461035		
1.031111	0.237376	0.244761	1.508950		
1.095556	0.237376	0.260059	1.555390		
1.160000	0.237376	0.275356	1.600483		
1.224444	0.237376	0.290654	1.644340		
1.288889	0.237376	0.305952	1.687058		
1.353333	0.237376	0.321249	1.728720		
1.417778	0.237376	0.336547	1.769401		
1.482222	0.237376	0.351844	1.809168		
1.546667	0.237376	0.367142	1.848079		
1.611111	0.237376	0.382440	1.886188		
1.675556	0.237376	0.397737	1.923542		
1.740000	0.237376	0.413035	1.960184		
1.804444	0.237376	0.428332	2.459288		
1.868889	0.237376	0.443630	3.854850		
1.933333	0.237376	0.458927	4.602909		
1.997778	0.237376	0.474225	5.189864		
2.062222	0.237376	0.489523	5.691384		
2.126667	0.237376	0.504820	6.137619		
2.191111	0.237376	0.520118	6.544244		
2.255556	0.237376	0.535415	6.920650		
2.320000	0.237376	0.550713	7.272994		
2.384444	0.237376	0.566011	7.605573		
2.448889	0.237376	0.581308	7.921528		
2.513333	0.237376	0.596606	8.223238		
2.577778	0.237376	0.611903	8.512557		
2.642222	0.237376	0.627201	8.790966		
2.706667	0.237376	0.642498	9.059667		
2.771111	0.237376	0.657796	9.319653		
2.835556	0.237376	0.673094	9.571757		
2.900000	0.237376	0.688391	9.816685		
2.964444	0.237376	0.703689	10.05504		
3.028889	0.237376	0.718986	10.28735		
3.093333	0.237376	0.734284	10.51407		
3.157778	0.237376	0.749581	10.73559		
3.222222	0.237376	0.764879	10.95228		
3.286667	0.237376	0.780177	11.16445		
3.351111	0.237376	0.795474	11.37237		
3.415556	0.237376	0.810772	11.57631		
3.480000	0.237376	0.826069	11.77649		
3.544444	0.237376	0.841367	11.97312		
3.608889	0.237376	0.856665	12.16638		
3.673333	0.237376	0.871962	12.35645		
3.737778	0.237376	0.887260	12.54349		
3.802222	0.237376	0.902557	12.72765		
3.866667	0.237376	0.917855	12.90904		
3.931111	0.237376	0.933152	13.08781		
3.995556	0.237376	0.948450	13.26406		
4.060000	0.237376	0.963748	13.43789		
4.124444	0.237376	0.979045	13.60942		
4.188889	0.237376	0.994343	13.77873		

```
  4.253333  0.237376  1.009640  13.94590
  4.317778  0.237376  1.024938  14.11101
  4.382222  0.237376  1.040236  14.27415
  4.446667  0.237376  1.055533  14.43539
  4.511111  0.237376  1.070831  14.64454
  4.575556  0.237376  1.086128  15.63390
  4.640000  0.237376  1.101426  17.13025
  4.704444  0.237376  1.116723  18.98086
  4.768889  0.237376  1.132021  21.11945
  4.833333  0.237376  1.147319  23.50357
  4.897778  0.237376  1.162616  26.10058
  4.962222  0.237376  1.177914  28.88233
  5.026667  0.237376  1.193211  31.82264
  5.091111  0.237376  1.208509  34.89601
  5.155556  0.237376  1.223807  38.07689
  5.220000  0.237376  1.239104  41.33940
  5.284444  0.237376  1.254402  44.65723
  5.348889  0.237376  1.269699  48.00364
  5.413333  0.237376  1.284997  51.35171
  5.477778  0.237376  1.300294  54.67452
  5.542222  0.237376  1.315592  57.94554
  5.606667  0.237376  1.330890  61.13896
  5.671111  0.237376  1.346187  64.23018
  5.735556  0.237376  1.361485  67.19626
  5.800000  0.237376  1.376782  70.01644
  END FTABLE  3
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>    # <Name> # tem strg<-factor->strg <Name>    #    #         <Name> # #  ***
WDM       2 PREC     ENGL     1             PERLND    1  999 EXTNL  PREC
WDM       2 PREC     ENGL     1             IMPLND    1  999 EXTNL  PREC
WDM       1 EVAP     ENGL     1             PERLND    1  999 EXTNL  PETINP
WDM       1 EVAP     ENGL     1             IMPLND    1  999 EXTNL  PETINP
WDM       1 EVAP     ENGL     1             RCHRES    1      EXTNL  POTEV
WDM       1 EVAP     ENGL     1             RCHRES    3      EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>    #       <Name> # #<-factor->strg <Name>    # <Name>    tem strg strg***
RCHRES    2 HYDR  RO     1 1         1     WDM   1020 FLOW     ENGL       REPL
RCHRES    2 HYDR  O      1 1         1     WDM   1021 FLOW     ENGL       REPL
RCHRES    2 HYDR  O      2 1         1     WDM   1022 FLOW     ENGL       REPL
RCHRES    2 HYDR  STAGE  1 1         1     WDM   1023 STAG     ENGL       REPL
COPY      1 OUTPUT MEAN  1 1      12.1     WDM    701 FLOW     ENGL       REPL
COPY    501 OUTPUT MEAN  1 1      12.1     WDM    801 FLOW     ENGL       REPL
RCHRES    3 HYDR  RO     1 1         1     WDM   1018 FLOW     ENGL       REPL
RCHRES    3 HYDR  STAGE  1 1         1     WDM   1019 STAG     ENGL       REPL
COPY      2 OUTPUT MEAN  1 1      12.1     WDM    702 FLOW     ENGL       REPL
COPY    502 OUTPUT MEAN  1 1      12.1     WDM    802 FLOW     ENGL       REPL
END EXT TARGETS

MASS-LINK
<Volume>    <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK          2
PERLND      PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK      2

  MASS-LINK          3
PERLND      PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK      3

  MASS-LINK          5
IMPLND      IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK      5
```

```
  MASS-LINK         6
RCHRES      ROFLOW                          RCHRES          INFLOW
  END MASS-LINK     6

  MASS-LINK         8
RCHRES      OFLOW   OVOL    2               RCHRES          INFLOW IVOL
  END MASS-LINK     8

  MASS-LINK        16
RCHRES      ROFLOW                          COPY            INPUT  MEAN
  END MASS-LINK    16

  MASS-LINK        17
RCHRES      OFLOW   OVOL    1               COPY            INPUT  MEAN
  END MASS-LINK    17

  MASS-LINK        18
RCHRES      OFLOW   OVOL    2               COPY            INPUT  MEAN
  END MASS-LINK    18


END MASS-LINK

END RUN
```

Disclaimer

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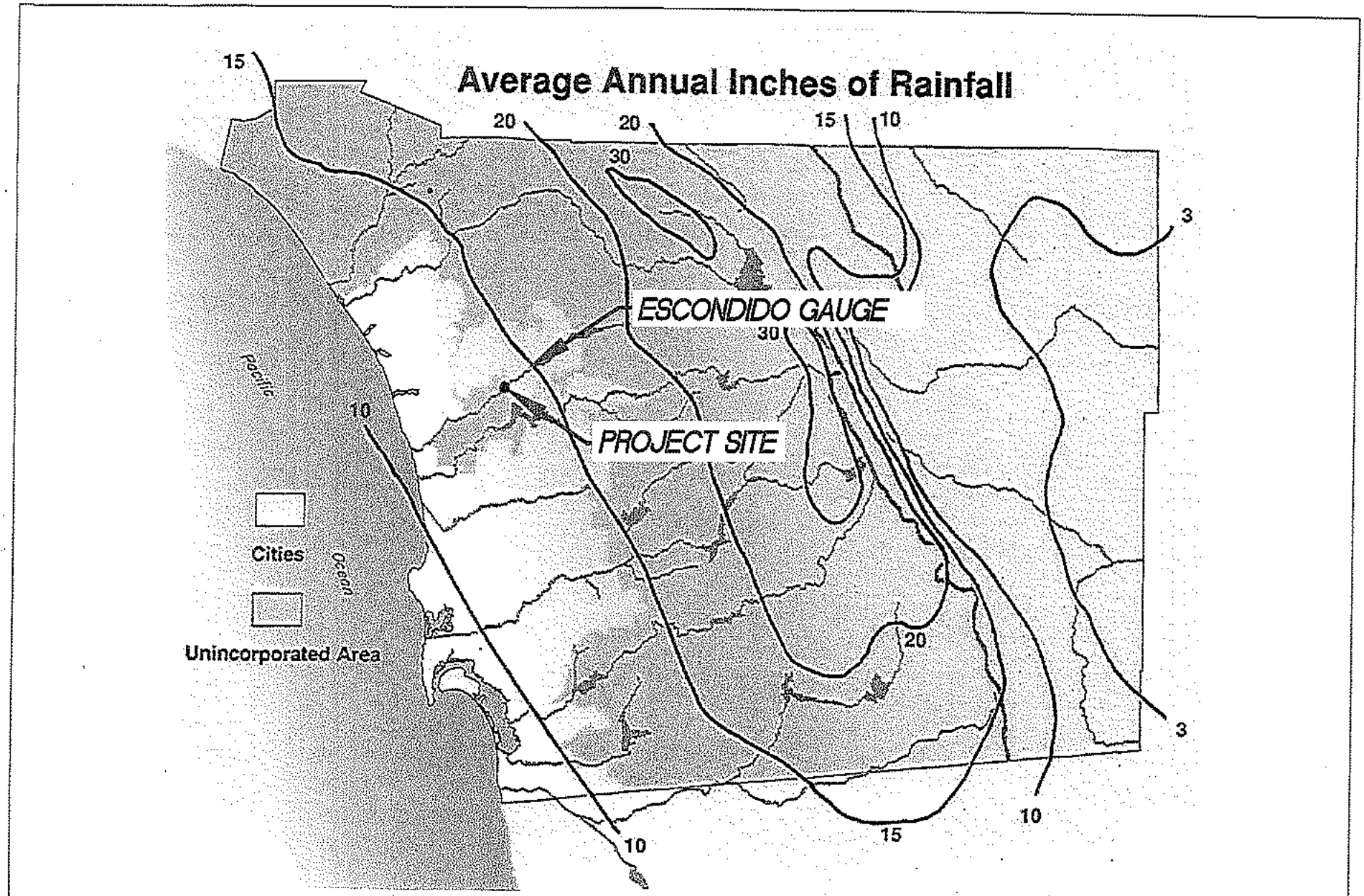
APPENDIX 3

Supplemental Information

Rain Gage Location Map

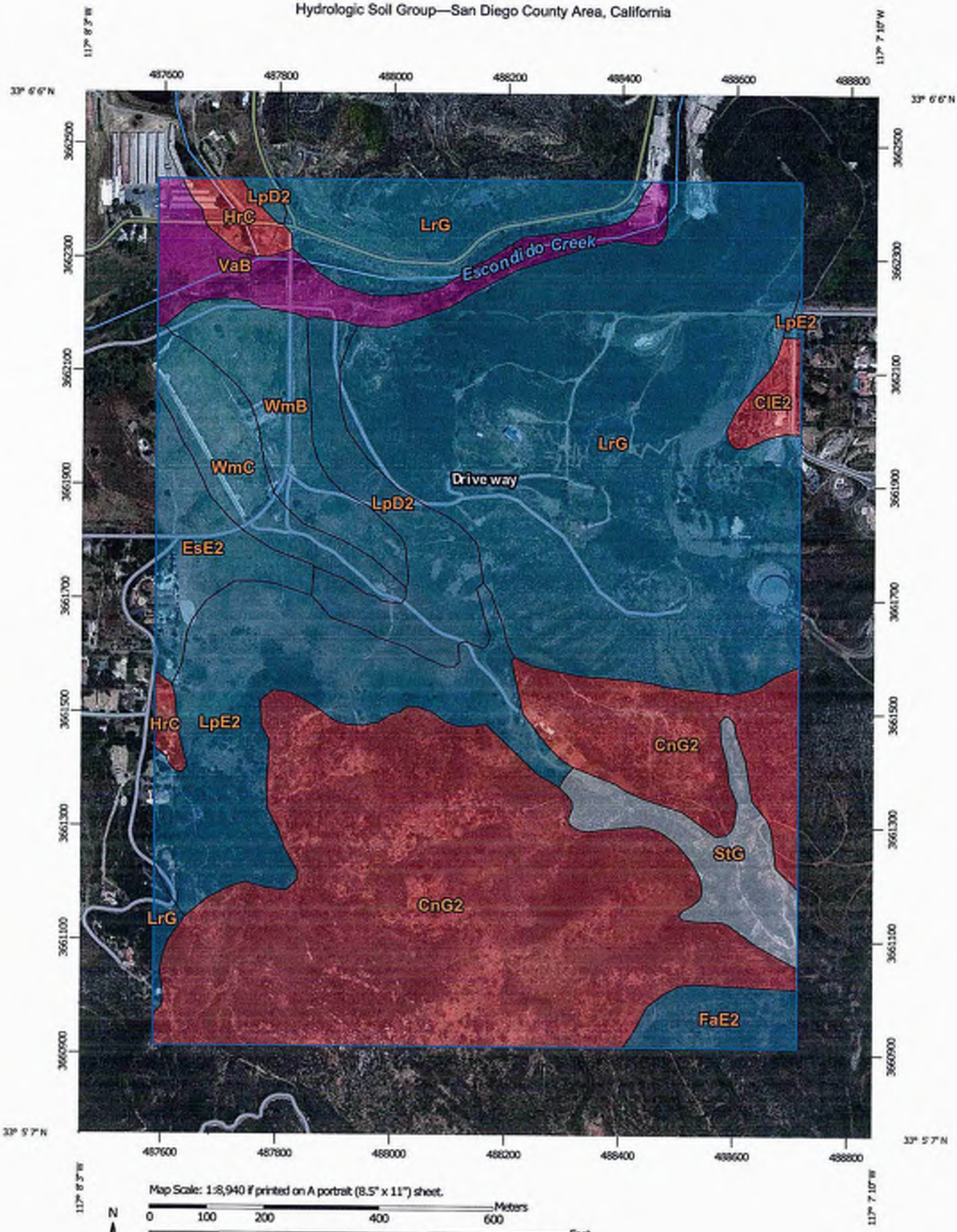


Average Annual Inches of Rainfall in San Diego
(not to be used for design calculations)

FIGURE
1-2

Hydrologic Soil Group Map

Hydrologic Soil Group—San Diego County Area, California



Map Scale: 1:8,940 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 100, 200, 400, 600

Feet: 0, 400, 800, 1600, 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 8, Sep 17, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 3, 2010—Jun 19, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — San Diego County Area, California (CA638)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ClE2	Cieneba coarse sandy loam, 15 to 30 percent slopes, ero ded	D	3.7	0.9%
CnG2	Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent s lopes, eroded	D	130.2	30.6%
EsE2	Escondido very fine sandy loam, 15 to 30 percent slopes , eroded	C	12.3	2.9%
FaE2	Fallbrook sandy loam, 15 to 30 percent slopes, eroded	C	7.2	1.7%
HrC	Huerhuero loam, 2 to 9 percent slopes	D	5.2	1.2%
LpD2	Las Posas fine sandy loam, 9 to 15 percent slopes, erod ed	C	18.1	4.3%
LpE2	Las Posas fine sandy loam, 15 to 30 percent slopes, ero ded	C	41.8	9.8%
LrG	Las Posas stony fine sandy loam, 30 to 65 percent slope s	C	147.3	34.6%
StG	Steep gullied land		13.5	3.2%
VaB	Visalia sandy loam, 2 to 5 percent slopes	A	17.2	4.0%
WmB	Wyman loam, 2 to 5 percent slopes	C	15.5	3.6%
WmC	Wyman loam, 5 to 9 percent slopes	C	13.7	3.2%
Totals for Area of Interest			425.6	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

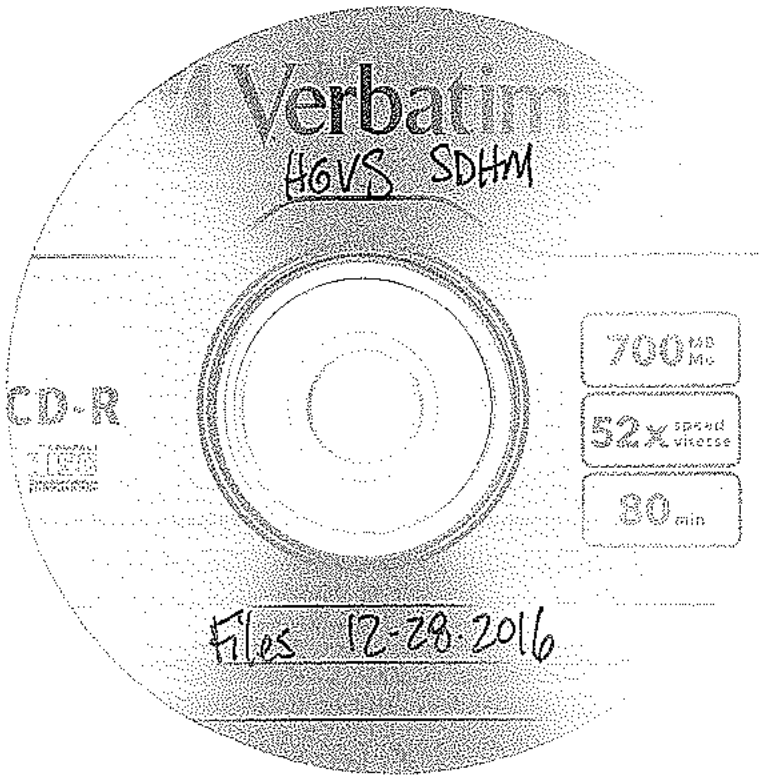
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher


Verbatim
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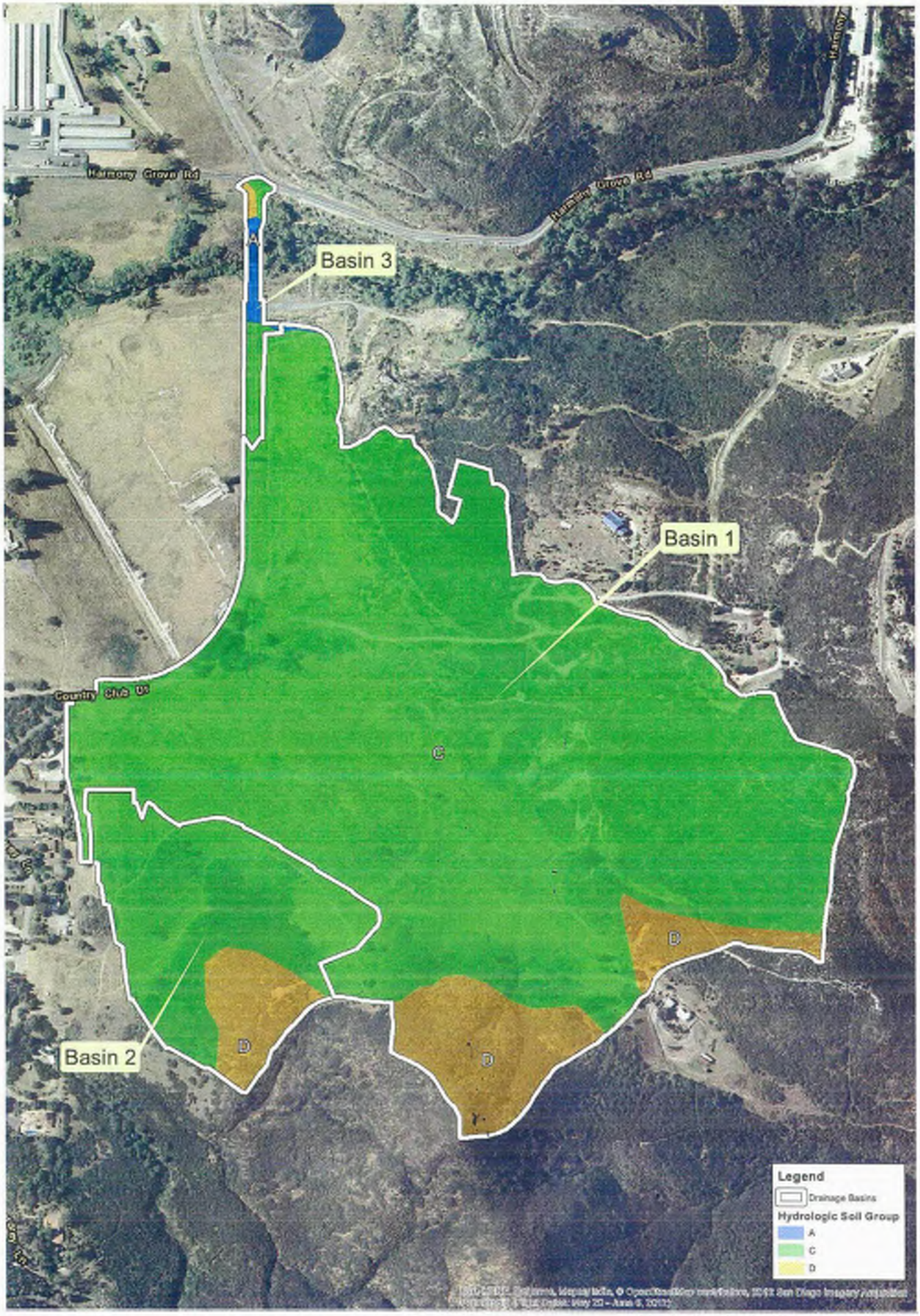
80 min
Files 12-28-2016

APPENDIX 5

Exhibits



Harmony Grove Village South

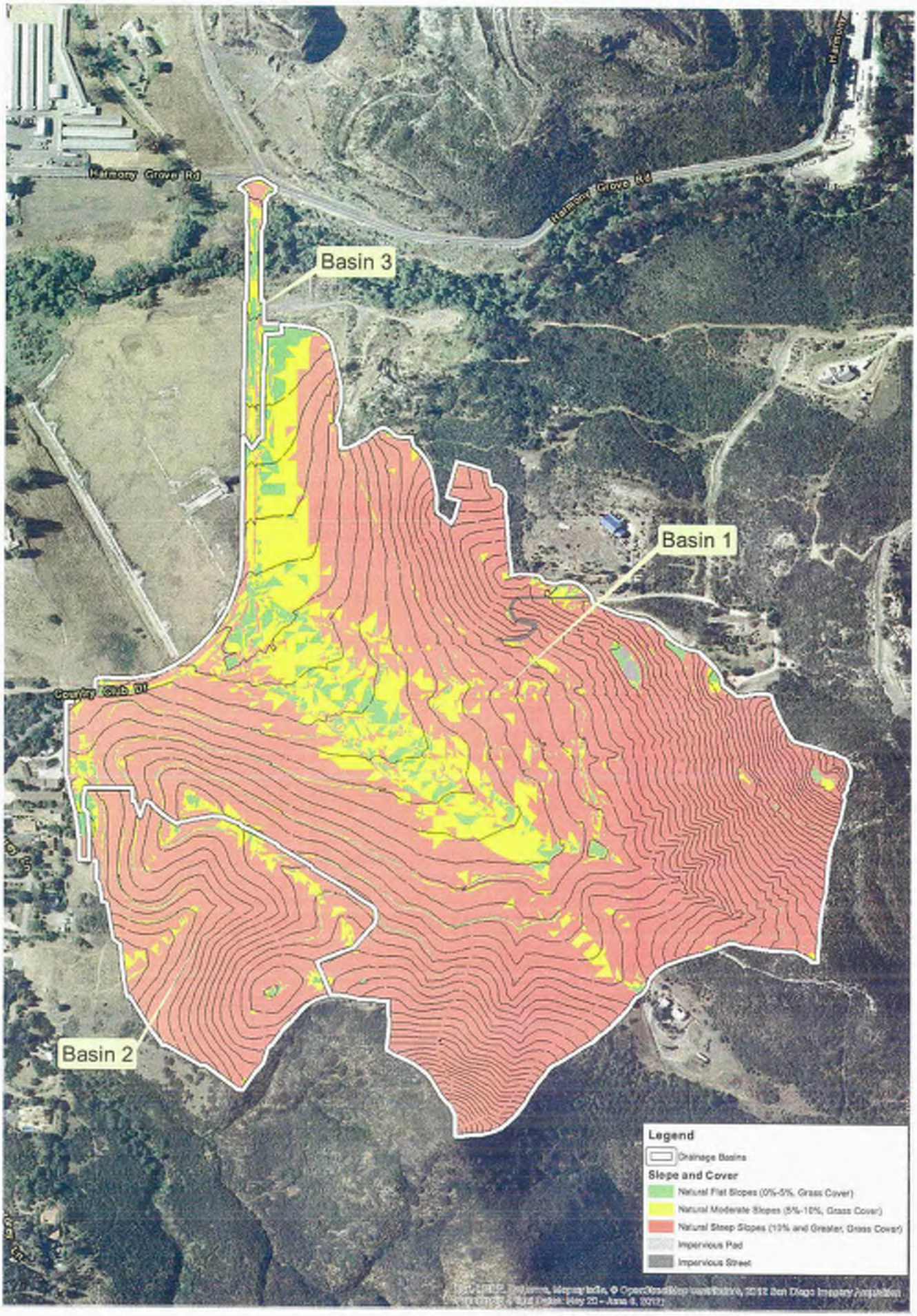
Hydrologic Soil Group Exhibit
For Hydromodification Analysis

Name: 4200_Pre_Pd_Soils
Path: P:\4200\Civil\exhibits\HDRDA\4200_Pre_Pd_Soils.mxd
Date: 11/11/2013

All exhibits must be reviewed from various sources with different levels of accuracy. For details on accuracy of any posted exhibit, refer to Metadata Report.

0 150 300 Feet

PROJECT DESIGN CONSULTANTS



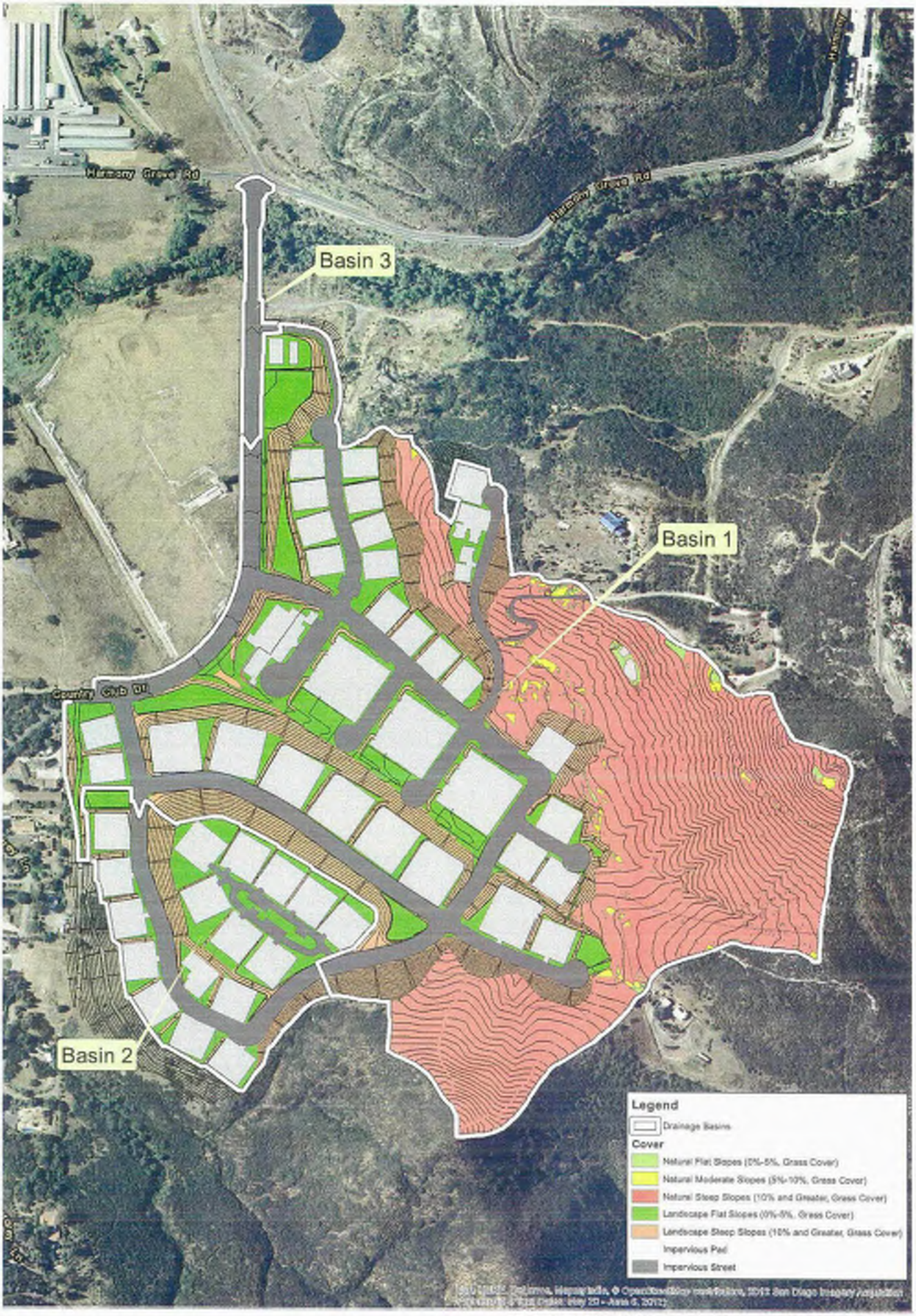
Harmony Grove Village South

Pre-Project Slope and Land Cover Exhibit For Hydromodification Analysis

Name: 4080_Pre_Pd_Hydromod
Path: P:\4080\GIS\MapFiles\HYDRO\HYDRO4080_Pre_Pd_Hydromod.mxd
Date: 11/7/2013

0 150 300 Feet

PROJECT DESIGN CONSULTANTS



Harmony Grove Village South

Post-Project Slope and Land Cover Exhibit For Hydromodification Analysis

Name: 4080_Post_Pc_Hydromod
Path: P:\4080\GIS\Mxd\VSROW\0040\4080_Post_Pc_Hydromod.mxd
Date: 11/11/2015

0 150 300 Feet

PROJECT DESIGN CONSULTANTS

BASIN 3 IS BYPASS AREA FOR POC#1. DRAINAGE AREA=1.59 ac.

DISCHARGE FOR BASIN #3

POC#1

PROPOSED BRIDGE LIMITS

ESCONDIDO CREEK

HARMONY GROVE ROAD

(1) PROPOSED NORTH HYDROMOD/DET BASIN. AREA DRAINING INTO BASIN=81.22 ac.

SELF-MITIGATING AREAS

SELF-MITIGATING AREAS

PRIVATE DRIVE 'J'

PRIVATE DRIVE 'K'

PRIVATE DRIVE 'I'

PRIVATE DRIVEWAY 'A'

COUNTRY CLUB DRIVE

PRIVATE DRIVE 'G'

(1) PROPOSED SOUTH HYDROMOD/DET BASIN. AREA DRAINING INTO BASIN=14.13 ac.

PRIVATE DRIVE 'D'

PRIVATE DRIVE 'F'

PRIVATE DRIVE 'C'

PRIVATE DRIVE 'B'

PRIVATE DRIVE 'E'

SELF-MITIGATING AREAS

POC#2

N

0 40 80 160 240

GRAPHICAL SCALE
SCALE: 1" = 80'

LEGEND

PROJECT BOUNDARY

DRAINAGE SUBAREA TO BMP

DRAINAGE FLOWPATH

DRAINAGE DIRECTION

SOIL TYPE A
(OTHER UNHATCHED AREAS WITHIN DRAINAGE BOUNDARY ARE SOIL TYPE C)

SOIL TYPE D
(OTHER UNHATCHED AREAS WITHIN DRAINAGE BOUNDARY ARE SOIL TYPE C)

SCALE:	1"=80'
JOB #:	4095.01
CREATED:	02/05/15

PREPARED BY:

PROJECT DESIGN CONSULTANTS
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COUNTY TO SAN DIEGO

HARMONY GROVE VILLAGE SOUTH

POST-PROJECT
DRAINAGE SUBBASIN AREAS
EXHIBIT

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