

APPENDICES  
TO THE  
FINAL REPORT  
SOUTH BRANCH, UPPER CARMACK  
SUB-BASIN MANAGEMENT STUDY  
PHASE I

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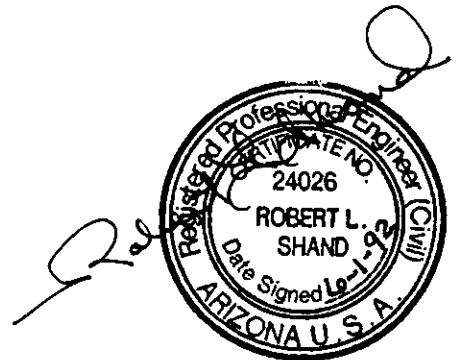
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June 1, 1992



Appendix A

Scope-of-Work for this Study

SOUTH BRANCH, UPPER CARMACK SUB-BASIN MANAGEMENT STUDY  
SCOPE OF WORK

PHASE I:     EXISTING CONDITIONS ANALYSIS

Task 1: Meet with representatives from Pima County's Flood Control District and Oro Valley to discuss the goals and objectives of the project.

Task 2: Collect and/or review all information that is currently available on the study area including:

- a. Existing zoning maps, land-use (area) plans, and other planning documents for Pima County and Oro Valley. This information will be used to establish the type and relative density of existing and future land uses at various locations within and adjacent to the study area.
- b. Soil Conservation Service, soil survey maps. These maps will be used to obtain the appropriate hydrologic soil groups associated with the South Branch watershed.
- c. Pima County's and Oro Valley's drainage complaint files. Information contained in these files will help to identify problem areas as noted by area residents.
- d. Pima County and the Arizona Department of Transportation drainage reports and improvement plans for the various residential subdivisions, commercial developments, and street-improvement projects that either exist or are proposed within the study area. These maps will help identify the location, type and size of any existing and/or proposed drainage structures.
- e. FEMA's Flood Insurance Rate Maps, Floodway Maps, and hydrologic calculations for the Carmack Wash and the South Brance, if available. This information can be used to substantiate the results obtained from both the hydrologic and hydraulic analyses.
- f. Historic and current aerial photographs and topographic maps. This information can be used to document changes in land-use and channel and watershed characteristics.

Task 3: Conduct a field investigation of the study area. The purpose of this investigation is to:

- a. Examine and document the physical characteristics of the watershed and stream channels to get a general feel for (1) the type and density of vegetation within the natural and landscaped subareas of the watershed; and (2) the type and roughness elements that make up the various segments of the watercourses.



- b. Clarify information shown on the newly-generated topographic maps that are to be provided (at a scale of 1" = 200' with two-foot contour intervals) by Pima County.
- c. Obtain or confirm the measurements of hydraulic structures that may regulate the magnitude and/or extent of flooding.
- d. Identify potential problem areas and make a preliminary assessment of the nature of the problem (i.e., a nuisance drainage problem versus a significant flood/erosion hazard).
- e. Note any significant physical characteristics along the watercourses that might, over time, affect the extent of flooding that will be determined as part of this study.

Task 4: Select appropriate runoff concentration points within the study area; then meet with Pima County's Project Manager for confirmation. Make any adjustments that may be necessary. This meeting will also include a discussion of the results of Tasks 2 and 3.

Task 5: Determine the full range of peak discharges at the selected concentration points using the Pima County Method. Recurrence intervals included will be the 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year discharge events. Provide copies of the hydrologic computation sheets for Pima County's review and approval.

Task 6: Determine the extent of the 5-year, 25-year, and 100-year floodprone areas along all watercourses where the 5-year peak discharge exceeds 100 cfs. Floodplains will be delineated using a combination of the U.S. Army Corps of Engineers' water-surface model, HEC-2, and the Federal Highway Administration's culvert analysis program, HY8. Since the HEC-2 program is rigid-boundary model, an attempt will be made, from a qualitative standpoint, to define any changes in the extent of flooding that may occur as a result of channel/bank erosion, migration and/or avulsion.

Task 7: Identify the number and type of residential, commercial and public improvements that are affected by or fall within the delineated and/or anticipated floodprone areas; then meet with Pima County's Project Manager to discuss the results of this task and Task 6.

Task 8: Conduct a field survey to determine the finished-floor elevations of all affected structures and contact the occupants and/or owners in an effort to establish a history of drainage and/or flooding problems. Residents may be contacted in person or by mail if the number of affected structures prohibits personal interviews. In addition, utility companies and roadway maintenance personnel will be contacted to determine any drainage problems they may have encountered and the costs incurred in repairing and/or maintaining their respective problem areas. This information will be useful when damage assessments are made as part of the economic analysis.

Task 9: Using the information gathered under Task 8 and information provided by the Tax Assessor's Office, estimate the cost of potential flood damages that may result during the 5-year, 25-year, 100-year events. These estimates will be broken down to include residential and commercial properties, existing roadways and/or drainage improvements, and other relevant public or private improvements. In addition, this task will also attempt to identify any potential life-threatening situations that may be attributable to the three recurrence intervals.

Task 10: Based on the combined results of Tasks 1 through 6, develop, at a concept level, several site-specific and/or regional flood-mitigation measures that can be used to address the area's drainage problems and/or hazards. These measures will be developed in a manner that takes into consideration their known cost effectiveness and general acceptability by affected parties in similar areas. Emphasis will be given to the current philosophy of the Oro Valley community and their Pima County neighbors.

Task 11: Meet with Pima County's Project Manager to discuss the appropriateness of each mitigation measure and its application to a particular problem area. The need to proceed with Phase II of the study will also be discussed at this meeting.

Task 12: Prepare a report that documents the procedures and results of the Phase I study. The need to either proceed or not proceed with the Phase II study will also be discussed. In addition, this report will include:

- a. A composite drainage basin map that documents the various elements used in the hydrologic calculations (i.e., concentration points, soil types, zoning classifications and/or land-uses, and basin roughness characteristics);
- b. A floodplain map showing cross-section locations, floodplain limits, water-surface elevations, and affected structures and/or improvements. If necessary, to avoid clutter, more than one map will be prepared.
- c. Hard copies and magnetic media files (on 5 1/4 floppy disks) of the input/output listings from all computer models.

A draft copy of this report will be provided for review and comment before it is finalized. An appropriate number of copies will then be delivered to Pima County's Project Manager.

## **PHASE II: EVALUATION OF ALTERNATIVE MITIGATION MEASURES**

Task 1: Meet with Pima County's Project Manager to determine which problem areas warrant a detailed evaluation and finalize the list of mitigation measures that will be evaluated in detail for each selected problem area.

Task 2: Develop preliminary designs for each of the selected mitigation measures and perform the appropriate analyses (hydrologic and/or hydraulic) to determine if the measure has a beneficial or a negative impact.

Task 3: Meet with Pima County's Project Manager to discuss the results of Task 2 and to establish an acceptable tolerance range for those mitigation measures that demonstrate a negative impact. Any measure that is not within the acceptable tolerance range will no longer be considered a viable alternative. Consequently, it will not be included in the preliminary cost analysis.

Task 4: Develop preliminary cost estimates of all viable alternatives including engineering, construction, right-of-way, land acquisition, and any other applicable costs. Evaluate the cost-effectiveness of each alternative for each problem area. Compare the most cost-effective alternative to the benefit derived by its implementation.

Task 5: Meet with Pima County's Project Manager to discuss the results of Task 4 and make adjustments accordingly.

Task 6: Prepare a composite report that documents the procedures and results of both phases of the study. This report will include all elements of the Phase I report. The Phase II discussion will include recommendations which address the urgency of implementation of those alternatives that were determined to be the most cost-effective for a particular problem area. A draft copy will be provided for review and comment before the report is finalized. At a minimum, ten copies of the final report will be delivered to Pima County's Project Manager with a reproducible version of the text and all exhibits.

Appendix B

Hydrologic Data Sheets for the 100-year Return Interval (individual data sheets for the more frequent return intervals are also provided in a compressed format on an accompanying 5 1/4" double-density diskette)







**HYDROLOGIC DATA SHEET - ANALYSIS BY THE PIMA COUNTY METHOD**

Client: Pima County  
 Project Name: South Branch Upper Carmack Sub-Basin Mgmt Study  
 Concentration Point: #3 @ Forest Service Boundary, SE Study Area

Prepared by: RLS  
 Date: 11/1/1991  
 Job #: 916001

Watershed Area (A): 61.0 Acres

Length of WaterCourse (Lc): 4450 feet      Length to Center of Gravity (LcA): 2400 feet

Incremental Change in Length (Li) ft.			Incremental Change in Elevation (Hi) ft.			Basin Factors (nb)		
1: <u>1000</u>	2: <u>450</u>	3: <u>350</u>	1: <u>800</u>	2: <u>200</u>	3: <u>120</u>	1: <u>0.060</u>	2: <u>0.060</u>	3: <u>0.060</u>
4: <u>1350</u>	5: <u>1300</u>	6: _____	4: <u>240</u>	5: <u>96</u>	6: _____	4: <u>0.060</u>	5: <u>0.060</u>	6: _____

I =  $\text{SUM}(L_i^3/H_i)^{0.5}$ : 10376      Mean Slope (Sc) =  $(Lc/I)^2$ : 0.18392

Watershed Type: Mountain (Natural)

Mean Basin Factor (nb): 0.060      Flood Frequency: 100 years

Precipitation Depths

P <sub>24</sub> (24-hour): <u>4.71</u> in.	Areal Value: <u>N/A</u> in.
P <sub>6</sub> ( 6-hour): <u>3.72</u> in.	Areal Value: <u>N/A</u> in.
P <sub>3</sub> ( 3-hour): <u>3.29</u> in.	Areal Value: <u>N/A</u> in.
P <sub>2</sub> ( 2-hour): <u>3.06</u> in.	Areal Value: <u>N/A</u> in.
P <sub>1</sub> ( 1-hour): <u>2.71</u> in.	Areal Value: <u>N/A</u> in.

Soil Groups: 0 %A  
0 %B  
0 %C  
100 %D

Vegetative Cover: 30 %      Impervious Cover: 0 %

Curve Numbers (CN): A) N/A      Adjusted Curve Numbers (CN\*): A) N/A      Runoff to Rainfall Ratios (C): A) N/A  
 B) N/A      B) N/A      B) N/A  
 C) N/A      C) N/A      C) N/A  
 D) 91.0      D) 93.27      D) 0.739

Impervious areas 99 (constant)      Impervious areas 0.000

Runoff Supply Rate (q): 0.739 \* i in./hr. (function of i)

Iterative Solution of Tc: 9 minutes  
 Rainfall Intensity (i) at Tc: 7.70 in./hr.  
 Runoff Supply Rate (q) at Tc: 5.69 in./hr.

Peak Discharge = 1.008qA(acres): 350 cfs

```
*****
*                                     *
*      Equation for Tc:              *
*      *                               *
*      Tc =  $\frac{nk(LcLcA)^{0.3}q^{-0.4}}{50(Sc)^{0.4}}$  hours *
*      *                               *
*      *                               *
*****
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Q<sub>2</sub> = 52 cfs    Q<sub>5</sub> = 116 cfs    Q<sub>10</sub> = 163 cfs    Q<sub>25</sub> = 224 cfs    Q<sub>50</sub> = 283 cfs

**HYDROLOGIC DATA SHEET - ANALYSIS BY THE PIMA COUNTY METHOD**

Client: Pima County  
 Project Name: South Branch Upper Carmack Sub-Basin Mgmt Study  
 Concentration Point: #4 @ Forest Service Boundary, SE Study Area

Prepared by: RLS  
 Date: 11/1/1991  
 Job #: 916001

Watershed Area (A): 470.0 Acres

Length of WaterCourse (Lc): 11300 feet      Length to Center of Gravity (Lc<sub>g</sub>): 6550 feet

Incremental Change in Length (L <sub>i</sub> ) ft.			Incremental Change in Elevation (H <sub>i</sub> ) ft.			Basin Factors (n <sub>b</sub> )		
1: <u>11300</u>	2: _____	3: _____	1: <u>1473</u>	2: _____	3: _____	1: <u>0.060</u>	2: _____	3: _____
4: _____	5: _____	6: _____	4: _____	5: _____	6: _____	4: _____	5: _____	6: _____

I =  $SUM(L_i^3/H_i)^{0.5}$ : 31298      Mean Slope (S<sub>c</sub>) =  $(L_c/I)^2$ : 0.13035

Watershed Type: Mountain (Natural)

Mean Basin Factor (n<sub>b</sub>): 0.060      Flood Frequency: 100 years

Precipitation Depths

P <sub>24</sub> (24-hour): <u>4.71 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>6</sub> ( 6-hour): <u>3.72 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>3</sub> ( 3-hour): <u>3.29 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>2</sub> ( 2-hour): <u>3.06 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>1</sub> ( 1-hour): <u>2.71 in.</u>	Areal Value: <u>N/A in.</u>

Soil Groups: 0 %A  
7 %B  
0 %C  
93 %D

Vegetative Cover: 30 %      Impervious Cover: 0 %

Curve Numbers (CN): A) <u>N/A</u>	Adjusted Curve Numbers (CN <sup>*</sup> ): A) <u>N/A</u>	Runoff to Rainfall Ratios (C): A) <u>N/A</u>
B) <u>83.0</u>	B) <u>87.16</u>	B) <u>0.554</u>
C) <u>N/A</u>	C) <u>N/A</u>	C) <u>N/A</u>
D) <u>91.0</u>	D) <u>93.27</u>	D) <u>0.739</u>
	Impervious areas <u>99 (constant)</u>	Impervious areas <u>0.000</u>

Runoff Supply Rate (q): 0.726 \* i in./hr. (function of i)

Iterative Solution of T<sub>c</sub>: 22 minutes  
 Rainfall Intensity (i) at T<sub>c</sub>: 5.13 in./hr.  
 Runoff Supply Rate (q) at T<sub>c</sub>: 3.72 in./hr.

Peak Discharge = 1.008qA(acres): 1764 cfs

```

*****
*                                     *
*          Equation for Tc:          *
*                                     *
* Tc =  $\frac{nh(LcLcg)^{0.3}q^{-0.4}}{50(Sc)^{0.4}}$  hours *
*                                     *
*                                     *
*****
    
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Q<sub>2</sub> = 212 cfs    Q<sub>5</sub> = 516 cfs    Q<sub>10</sub> = 749 cfs    Q<sub>25</sub> = 1086 cfs    Q<sub>50</sub> = 1424 cfs



**HYDROLOGIC DATA SHEET - ANALYSIS BY THE PIMA COUNTY METHOD**

Client: Pima County  
 Project Name: South Branch Upper Carmack Sub-Basin Mgmt Study  
 Concentration Point: #6 @ Rancho Catalina Ave, d/s segment

Prepared by: RLS  
 Date: 11/1/1991  
 Job #: 916001

Watershed Area (A): 194.0 Acres

Length of WaterCourse (Lc): 7340 feet      Length to Center of Gravity (LcA): 4600 feet

Incremental Change in Length (Li) ft.			Incremental Change in Elevation (Hi) ft.			Basin Factors (nb)		
1: <u>5140</u>	2: <u>900</u>	3: <u>1300</u>	1: <u>1123</u>	2: <u>76</u>	3: <u>48</u>	1: <u>0.060</u>	2: <u>0.060</u>	3: <u>0.045</u>
4: _____	5: _____	6: _____	4: _____	5: _____	6: _____	4: _____	5: _____	6: _____

I =  $\sum(L_i^3/H_i)^{0.5}$ : 20859      Mean Slope (Sc) =  $(Lc/I)^2$ : 0.12382

Watershed Type: Mixed

Mean Basin Factor (nb): 0.055      Flood Frequency: 100 years

Precipitation Depths

P <sub>24</sub> (24-hour): <u>4.71 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>6</sub> ( 6-hour): <u>3.72 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>3</sub> ( 3-hour): <u>3.29 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>2</sub> ( 2-hour): <u>3.06 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>1</sub> ( 1-hour): <u>2.71 in.</u>	Areal Value: <u>N/A in.</u>

Soil Groups:    0 %A  
                   10 %B  
                   0 %C  
                   90 %D

Vegetative Cover: 28 %      Impervious Cover: 4 %

Curve Numbers (CN): A) <u>N/A</u>	Adjusted Curve Numbers (CN*): A) <u>N/A</u>	Runoff to Rainfall Ratios (C): A) <u>N/A</u>
B) <u>83.0</u>	B) <u>87.16</u>	B) <u>0.554</u>
C) <u>N/A</u>	C) <u>N/A</u>	C) <u>N/A</u>
D) <u>91.0</u>	D) <u>93.27</u>	D) <u>0.739</u>
	Impervious areas <u>99 (constant)</u>	Impervious areas <u>0.957</u>

Runoff Supply Rate (q): 0.730 \* i in./hr. (function of i)

Iterative Solution of Tc: 15 minutes  
 Rainfall Intensity (i) at Tc: 6.18 in./hr.  
 Runoff Supply Rate (q) at Tc: 4.51 in./hr.

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*****
*
*      Equation for Tc:
*
*  Tc = nb(LcLcA)^0.3q^-0.4 hours
*      50(Sc)^0.4
*
*****
    
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Peak Discharge = 1.008qA(acres): 883 cfs

Q<sub>2</sub> = 122 cfs    Q<sub>5</sub> = 278 cfs    Q<sub>10</sub> = 393 cfs    Q<sub>25</sub> = 566 cfs    Q<sub>50</sub> = 730 cfs





**HYDROLOGIC DATA SHEET - ANALYSIS BY THE PIMA COUNTY METHOD**

Client: Pima County  
 Project Name: South Branch Upper Carmack Sub-Basin Mgmt Study  
 Concentration Point: #8 South Branch @ Oracle Rd, US 89

Prepared by: RLS  
 Date: 11/1/1991  
 Job #: 916001

Watershed Area (A): 778.0 Acres

Length of WaterCourse (Lc): 14800 feet      Length to Center of Gravity (Lca): 8300 feet

Incremental Change in Length (L <sub>i</sub> ) ft.			Incremental Change in Elevation (H <sub>i</sub> ) ft.			Basin Factors (n <sub>b</sub> )		
1: <u>11300</u>	2: <u>2200</u>	3: <u>1300</u>	1: <u>1473</u>	2: <u>84</u>	3: <u>45</u>	1: <u>0.060</u>	2: <u>0.050</u>	3: <u>0.037</u>
4: _____	5: _____	6: _____	4: _____	5: _____	6: _____	4: _____	5: _____	6: _____

I =  $SUM(L_i^3/H_i)^{0.5}$ : 49544      Mean Slope (S<sub>c</sub>) =  $(L_c/I)^2$ : 0.08924

Watershed Type: Mixed  
 Mean Basin Factor (n<sub>b</sub>): 0.054      Flood Frequency: 100 years

Precipitation Depths

P <sub>24</sub> (24-hour): <u>4.71 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>6</sub> ( 6-hour): <u>3.72 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>3</sub> ( 3-hour): <u>3.29 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>2</sub> ( 2-hour): <u>3.06 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>1</sub> ( 1-hour): <u>2.71 in.</u>	Areal Value: <u>N/A in.</u>

Soil Groups: 0 %A  
10 %B  
0 %C  
90 %D

Vegetative Cover: 29 %      Impervious Cover: 2 %

Curve Numbers (CN): A) <u>N/A</u>	Adjusted Curve Numbers (CN*): A) <u>N/A</u>	Runoff to Rainfall Ratios (C): A) <u>N/A</u>
B) <u>83.0</u>	B) <u>87.16</u>	B) <u>0.554</u>
C) <u>N/A</u>	C) <u>N/A</u>	C) <u>N/A</u>
D) <u>91.0</u>	D) <u>93.27</u>	D) <u>0.739</u>
	Impervious areas <u>99 (constant)</u>	Impervious areas <u>0.957</u>

Runoff Supply Rate (q): 0.725 \* i in./hr. (function of i)

Iterative Solution of T<sub>c</sub>: 29 minutes  
 Rainfall Intensity (i) at T<sub>c</sub>: 4.37 in./hr.  
 Runoff Supply Rate (q) at T<sub>c</sub>: 3.17 in./hr.

Peak Discharge = 1.008qA(acres): 2485 cfs

```

*****
*                                     *
*      Equation for Tc:              *
*                                     *
*  Tc = nb(LcLca)0.3q-0.4 hours    *
*          50(Sc)0.4                *
*                                     *
*****
    
```

Q<sub>2</sub> = 292 cfs    Q<sub>5</sub> = 718 cfs    Q<sub>10</sub> = 1040 cfs    Q<sub>25</sub> = 1530 cfs    Q<sub>50</sub> = 1976 cfs

**HYDROLOGIC DATA SHEET - ANALYSIS BY THE PIMA COUNTY METHOD**

Client: Pima County  
 Project Name: South Branch Upper Carmack Sub-Basin Mgmt Study  
 Concentration Point: #9 South Branch @ Carmack Wash, Northern Branch

Prepared by: RLS  
 Date: 11/1/1991  
 Job #: 916001

Watershed Area (A): 837.0 Acres

Length of WaterCourse (Lc): 18500 feet      Length to Center of Gravity (LcA): 10150 feet

Incremental Change in Length (L <sub>i</sub> ) ft.			Incremental Change in Elevation (H <sub>i</sub> ) ft.			Basin Factors (n <sub>b</sub> )		
1: <u>11300</u>	2: <u>2200</u>	3: <u>1300</u>	1: <u>1473</u>	2: <u>84</u>	3: <u>45</u>	1: <u>0.060</u>	2: <u>0.050</u>	3: <u>0.037</u>
4: <u>3700</u>	5: _____	6: _____	4: <u>89</u>	5: _____	6: _____	4: <u>0.045</u>	5: _____	6: _____

I =  $SUM(L_i^3/H_i)^{0.5}$ : 73401      Mean Slope (Sc) =  $(Lc/I)^2$ : 0.06352

Watershed Type: Mixed  
 Mean Basin Factor (n<sub>b</sub>): 0.051      Flood Frequency: 100 years

Precipitation Depths

P <sub>24</sub> (24-hour): <u>4.71 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>6</sub> ( 6-hour): <u>3.72 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>3</sub> ( 3-hour): <u>3.29 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>2</sub> ( 2-hour): <u>3.06 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>1</sub> ( 1-hour): <u>2.71 in.</u>	Areal Value: <u>N/A in.</u>

Soil Groups: 0 %A  
13 %B  
0 %C  
87 %D

Vegetative Cover: 28 %      Impervious Cover: 4 %

Curve Numbers (CN): A) <u>N/A</u>	Adjusted Curve Numbers (CN <sup>*</sup> ): A) <u>N/A</u>	Runoff to Rainfall Ratios (C): A) <u>N/A</u>
B) <u>83.0</u>	B) <u>87.16</u>	B) <u>0.554</u>
C) <u>N/A</u>	C) <u>N/A</u>	C) <u>N/A</u>
D) <u>91.0</u>	D) <u>93.27</u>	D) <u>0.739</u>
	Impervious areas <u>99 (constant)</u>	Impervious areas <u>0.957</u>

Runoff Supply Rate (q): 0.725 \* i in./hr. (function of i)

Iterative Solution of T<sub>c</sub>: 38 minutes  
 Rainfall Intensity (i) at T<sub>c</sub>: 3.69 in./hr.  
 Runoff Supply Rate (q) at T<sub>c</sub>: 2.67 in./hr.

Peak Discharge = 1.008qA(acres): 2256 cfs

```

*****
*                                     *
*      Equation for Tc:              *
*                                     *
*  Tc =  $\frac{n_b(LcLcA)^{0.3q-0.4}}{50(Sc)^{0.4}}$  hours *
*                                     *
*                                     *
*****
    
```

Q<sub>2</sub> = 246 cfs    Q<sub>5</sub> = 635 cfs    Q<sub>10</sub> = 939 cfs    Q<sub>25</sub> = 1382 cfs    Q<sub>50</sub> = 1815 cfs

**HYDROLOGIC DATA SHEET - ANALYSIS BY THE PIMA COUNTY METHOD**

Client: Pima County  
 Project Name: South Branch Upper Carmack Sub-Basin Mgmt Study  
 Concentration Point: #10 d/s of Sunnyslope Drive

Prepared by: RLS  
 Date: 11/1/1991  
 Job #: 916001

Watershed Area (A): 31.0 Acres

Length of WaterCourse (Lc): 2520 feet      Length to Center of Gravity (LcA): 1260 feet

Incremental Change in Length (L <sub>i</sub> ) ft.			Incremental Change in Elevation (H <sub>i</sub> ) ft.			Basin Factors (n <sub>b</sub> )		
1: <u>450</u>	2: <u>1600</u>	3: <u>470</u>	1: <u>50</u>	2: <u>146</u>	3: <u>22</u>	1: <u>0.060</u>	2: <u>0.045</u>	3: <u>0.045</u>
4: _____	5: _____	6: _____	4: _____	5: _____	6: _____	4: _____	5: _____	6: _____

I =  $\sum(L_i^3/H_i)^{0.5}$ : 8819      Mean Slope (Sc) =  $(Lc/I)^2$ : 0.08165

Watershed Type: Mixed  
 Mean Basin Factor (n<sub>b</sub>): 0.047      Flood Frequency: 100 years

Precipitation Depths

P <sub>24</sub> (24-hour): <u>4.71</u> in.	Areal Value: <u>N/A</u> in.
P <sub>6</sub> ( 6-hour): <u>3.72</u> in.	Areal Value: <u>N/A</u> in.
P <sub>3</sub> ( 3-hour): <u>3.29</u> in.	Areal Value: <u>N/A</u> in.
P <sub>2</sub> ( 2-hour): <u>3.06</u> in.	Areal Value: <u>N/A</u> in.
P <sub>1</sub> ( 1-hour): <u>2.71</u> in.	Areal Value: <u>N/A</u> in.

Soil Groups: 0 %A  
47 %B  
0 %C  
53 %D

Vegetative Cover: 21 %      Impervious Cover: 17 %

Curve Numbers (CN): A) N/A      Adjusted Curve Numbers (CN\*): A) N/A      Runoff to Rainfall Ratios (C): A) N/A  
 B) 83.0      B) 87.16      B) 0.554  
 C) N/A      C) N/A      C) N/A  
 D) 91.0      D) 93.27      D) 0.739  
 Impervious areas 99 (constant)      Impervious areas 0.957

Runoff Supply Rate (q): 0.704 \* i in./hr. (function of i)

Iterative Solution of Tc: 7 minutes  
 Rainfall Intensity (i) at Tc: 8.54 in./hr.  
 Runoff Supply Rate (q) at Tc: 6.01 in./hr.

Peak Discharge = 1.008qA(acres): 188 cfs

```

*****
*                                     *
*      Equation for Tc:              *
*                                     *
*  Tc =  $\frac{n_b(LcLcA)^{0.3}q^{-0.4}}{50(Sc)^{0.4}}$  hours *
*                                     *
*                                     *
*****
    
```

Q<sub>2</sub> = 34 cfs    Q<sub>5</sub> = 65 cfs    Q<sub>10</sub> = 90 cfs    Q<sub>25</sub> = 124 cfs    Q<sub>50</sub> = 159 cfs

**HYDROLOGIC DATA SHEET - ANALYSIS BY THE PIMA COUNTY METHOD**

Client: Pima County  
 Project Name: South Branch Upper Carmack Sub-Basin Mgmt Study  
 Concentration Point: #11A @ Oracle Road, US 89 (u/s CP #11)

Prepared by: RLS  
 Date: 11/1/1991  
 Job #: 916001

Watershed Area (A): 41.0 Acres

Length of WaterCourse (Lc): 3510 feet      Length to Center of Gravity (Lc<sub>G</sub>): 1750 feet

Incremental Change in Length (L <sub>i</sub> ) ft.			Incremental Change in Elevation (H <sub>i</sub> ) ft.			Basin Factors (n <sub>b</sub> )		
1: <u>1000</u>	2: <u>1650</u>	3: <u>200</u>	1: <u>182</u>	2: <u>158</u>	3: <u>12</u>	1: <u>0.060</u>	2: <u>0.045</u>	3: <u>0.045</u>
4: <u>200</u>	5: <u>460</u>	6: _____	4: <u>8</u>	5: <u>16</u>	6: _____	4: <u>0.020</u>	5: <u>0.020</u>	6: _____

I =  $\sum(L_i^3/H_i)^{0.5}$ : 11959      Mean Slope (S<sub>c</sub>) =  $(L_c/I)^2$ : 0.08614

Watershed Type: Mixed  
 Mean Basin Factor (n<sub>b</sub>): 0.041      Flood Frequency: 100 years

Precipitation Depths

P <sub>24</sub> (24-hour): <u>4.71</u> in.	Areal Value: <u>N/A</u> in.
P <sub>6</sub> ( 6-hour): <u>3.72</u> in.	Areal Value: <u>N/A</u> in.
P <sub>3</sub> ( 3-hour): <u>3.29</u> in.	Areal Value: <u>N/A</u> in.
P <sub>2</sub> ( 2-hour): <u>3.06</u> in.	Areal Value: <u>N/A</u> in.
P <sub>1</sub> ( 1-hour): <u>2.71</u> in.	Areal Value: <u>N/A</u> in.

Soil Groups: 0 %A  
43 %B  
0 %C  
57 %D

Vegetative Cover: 21 %      Impervious Cover: 28 %

Curve Numbers (CN): A) N/A      Adjusted Curve Numbers (CN<sup>\*</sup>): A) N/A      Runoff to Rainfall Ratios (C): A) N/A  
 B) 83.0      B) 87.16      B) 0.554  
 C) N/A      C) N/A      C) N/A  
 D) 91.0      D) 93.27      D) 0.739  
 Impervious areas 99 (constant)      Impervious areas 0.957

Runoff Supply Rate (q): 0.743 \* i in./hr. (function of i)

Iterative Solution of T<sub>c</sub>: 7 minutes  
 Rainfall Intensity (i) at T<sub>c</sub>: 8.54 in./hr.  
 Runoff Supply Rate (q) at T<sub>c</sub>: 6.34 in./hr.

Peak Discharge = 1.008qA(acres): 262 cfs

```

*****
*                                     *
*      Equation for Tc:              *
*                                     *
*  Tc = (nb(LcLcg)0.3q-0.4) hours *
*          50(Sc)0.4                 *
*                                     *
*****
    
```

Q<sub>2</sub> = 54 cfs    Q<sub>5</sub> = 98 cfs    Q<sub>10</sub> = 131 cfs    Q<sub>25</sub> = 177 cfs    Q<sub>50</sub> = 225 cfs





**HYDROLOGIC DATA SHEET - ANALYSIS BY THE PIMA COUNTY METHOD**

Client: Pima County  
 Project Name: South Branch Upper Carmack Sub-Basin Mgmt Study  
 Concentration Point: #12 southern tributary to Hardy Wash

Prepared by: RLS  
 Date: 11/1/1991  
 Job #: 916001

Watershed Area (A): 32.0 Acres

Length of WaterCourse (Lc): 2800 feet

Length to Center of Gravity (LcA): 1400 feet

Incremental Change in Length (Li) ft.  
 1: 40    2: 2760    3: \_\_\_\_\_  
 4: \_\_\_\_\_    5: \_\_\_\_\_    6: \_\_\_\_\_

Incremental Change in Elevation (Hi) ft.  
 1: 6    2: 70    3: \_\_\_\_\_  
 4: \_\_\_\_\_    5: \_\_\_\_\_    6: \_\_\_\_\_

Basin Factors (nb)  
 1: 0.025    2: 0.045    3: \_\_\_\_\_  
 4: \_\_\_\_\_    5: \_\_\_\_\_    6: \_\_\_\_\_

I =  $\sum(L_i^3/H_i)$ <sup>0.5</sup>: 17434

Mean Slope (Sc) =  $(Lc/I)^2$ : 0.02579

Watershed Type: Mixed

Mean Basin Factor (nb): 0.045

Flood Frequency: 100 years

Precipitation Depths

P<sub>24</sub> (24-hour): 4.71 in.  
 P<sub>6</sub> ( 6-hour): 3.72 in.  
 P<sub>3</sub> ( 3-hour): 3.29 in.  
 P<sub>2</sub> ( 2-hour): 3.06 in.  
 P<sub>1</sub> ( 1-hour): 2.71 in.

Areal Value: N/A in.  
 Areal Value: N/A in.  
 Areal Value: N/A in.  
 Areal Value: N/A in.  
 Areal Value: N/A in.

Soil Groups: 0 %A  
50 %B  
0 %C  
50 %D

Vegetative Cover: 20 %

Impervious Cover: 20 %

Curve Numbers (CN): A) N/A  
 B) 83.0  
 C) N/A  
 D) 91.0

Adjusted Curve Numbers (CN\*): A) N/A  
 B) 87.16  
 C) N/A  
 D) 93.27

Runoff to Rainfall Ratios (C): A) N/A  
 B) 0.554  
 C) N/A  
 D) 0.739

Impervious areas 99 (constant)

Impervious areas 0.957

Runoff Supply Rate (q): 0.709 \* i in./hr. (function of i)

Iterative Solution of Tc: 12 minutes  
 Rainfall Intensity (i) at Tc: 6.83 in./hr.  
 Runoff Supply Rate (q) at Tc: 4.84 in./hr.

Peak Discharge =  $1.008qA$ (acres): 156 cfs

```

*****
*                                     *
*      Equation for Tc:              *
*                                     *
*  Tc =  $\frac{n_b(LcLcA)^{0.3}q^{-0.4}}{50(Sc)^{0.4}}$  hours *
*                                     *
*                                     *
*****
    
```

Q<sub>2</sub> = 27 cfs    Q<sub>5</sub> = 54 cfs    Q<sub>10</sub> = 73 cfs    Q<sub>25</sub> = 103 cfs    Q<sub>50</sub> = 129 cfs

**HYDROLOGIC DATA SHEET - ANALYSIS BY THE PIMA COUNTY METHOD**

Client: Pima County  
 Project Name: South Branch Upper Carmack Sub-Basin Mgmt Study  
 Concentration Point: #13 Hardy Wash, u/s of confluence (CP #12)

Prepared by: RLS  
 Date: 11/1/1991  
 Job #: 916001

Watershed Area (A): 98.0 Acres

Length of WaterCourse (Lc): 6510 feet

Length to Center of Gravity (LcA): 3250 feet

Incremental Change in Length (L <sub>i</sub> ) ft.			Incremental Change in Elevation (H <sub>i</sub> ) ft.			Basin Factors (n <sub>b</sub> )		
1: <u>3610</u>	2: <u>800</u>	3: <u>2100</u>	1: <u>308</u>	2: <u>20</u>	3: <u>50</u>	1: <u>0.040</u>	2: <u>0.045</u>	3: <u>0.035</u>
4: _____	5: _____	6: _____	4: _____	5: _____	6: _____	4: _____	5: _____	6: _____

I =  $\sum(L_i^3/H_i)^{0.5}$ : 31028

Mean Slope (Sc) =  $(Lc/I)^2$ : 0.04402

Watershed Type: Mixed

Mean Basin Factor (n<sub>b</sub>): 0.039

Flood Frequency: 100 years

Precipitation Depths

P<sub>24</sub> (24-hour): 4.71 in.  
 P<sub>6</sub> ( 6-hour): 3.72 in.  
 P<sub>3</sub> ( 3-hour): 3.29 in.  
 P<sub>2</sub> ( 2-hour): 3.06 in.  
 P<sub>1</sub> ( 1-hour): 2.71 in.

Areal Value: N/A in.  
 Areal Value: N/A in.  
 Areal Value: N/A in.  
 Areal Value: N/A in.  
 Areal Value: N/A in.

Soil Groups: 0 %A  
46 %B  
0 %C  
54 %D

Vegetative Cover: 21 %

Impervious Cover: 31 %

Curve Numbers (CN): A) N/A  
 B) 83.0  
 C) N/A  
 D) 91.0

Adjusted Curve Numbers (CN\*): A) N/A  
 B) 87.16  
 C) N/A  
 D) 93.27

Runoff to Rainfall Ratios (C): A) N/A  
 B) 0.554  
 C) N/A  
 D) 0.739

Impervious areas 99 (constant)

Impervious areas 0.957

Runoff Supply Rate (q): 0.748 \* i in./hr. (function of i)

Iterative Solution of T<sub>c</sub>: 14 minutes  
 Rainfall Intensity (i) at T<sub>c</sub>: 6.43 in./hr.  
 Runoff Supply Rate (q) at T<sub>c</sub>: 4.81 in./hr.

Peak Discharge = 1.008qA(acres): 475 cfs

```

*****
*                                     *
*      Equation for Tc:              *
*                                     *
*  Tc =  $\frac{n_b(LcLcA)^{0.3}q^{-0.4}}{50(Sc)^{0.4}}$  hours *
*                                     *
*****
    
```

Q<sub>2</sub> = 94 cfs    Q<sub>5</sub> = 171 cfs    Q<sub>10</sub> = 235 cfs    Q<sub>25</sub> = 318 cfs    Q<sub>50</sub> = 392 cfs

**HYDROLOGIC DATA SHEET - ANALYSIS BY THE PIMA COUNTY METHOD**

Client: Pima County  
 Project Name: South Branch Upper Carmack Sub-Basin Mgmt Study  
 Concentration Point: #14 Hardy Wash @ Carmack Wash

Prepared by: RLS  
 Date: 11/1/1991  
 Job #: 916001

Watershed Area (A): 135.0 Acres

Length of WaterCourse (Lc): 7200 feet      Length to Center of Gravity (LcA): 3590 feet

Incremental Change in Length (L <sub>i</sub> ) ft.			Incremental Change in Elevation (H <sub>i</sub> ) ft.			Basin Factors (n <sub>b</sub> )		
1: <u>3610</u>	2: <u>800</u>	3: <u>2100</u>	1: <u>308</u>	2: <u>20</u>	3: <u>50</u>	1: <u>0.040</u>	2: <u>0.045</u>	3: <u>0.035</u>
4: <u>690</u>	5: _____	6: _____	4: <u>10</u>	5: _____	6: _____	4: <u>0.045</u>	5: _____	6: _____

I = SUM(L<sub>i</sub><sup>3</sup>/H<sub>i</sub>)<sup>0.5</sup>: 36760      Mean Slope (S<sub>c</sub>) = (L<sub>c</sub>/I)<sup>2</sup>: 0.03836

Mean Basin Factor (n<sub>b</sub>): 0.040      Watershed Type: Mixed      Flood Frequency: 100 years

Precipitation Depths

P <sub>24</sub> (24-hour): <u>4.71 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>6</sub> ( 6-hour): <u>3.72 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>3</sub> ( 3-hour): <u>3.29 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>2</sub> ( 2-hour): <u>3.06 in.</u>	Areal Value: <u>N/A in.</u>
P <sub>1</sub> ( 1-hour): <u>2.71 in.</u>	Areal Value: <u>N/A in.</u>

Soil Groups: 0 %A  
47 %B  
0 %C  
53 %D

Vegetative Cover: 21 %      Impervious Cover: 28 %

Curve Numbers (CN): A) N/A      Adjusted Curve Numbers (CN<sup>\*</sup>): A) N/A      Runoff to Rainfall Ratios (C): A) N/A  
 B) 83.0      B) 87.16      B) 0.554  
 C) N/A      C) N/A      C) N/A  
 D) 91.0      D) 93.27      D) 0.739

Impervious areas 99 (constant)      Impervious areas 0.957

Runoff Supply Rate (q): 0.737 \* i in./hr. (function of i)

Iterative Solution of T<sub>c</sub>: 16 minutes  
 Rainfall Intensity (i) at T<sub>c</sub>: 6.02 in./hr.  
 Runoff Supply Rate (q) at T<sub>c</sub>: 4.44 in./hr.

Peak Discharge = 1.008qA(acres): 604 cfs

```

*****
*                                     *
*      Equation for Tc:              *
*                                     *
*  Tc = (nb(LcLcA)^0.3q^-0.4) hours *
*          50(Sc)^0.4                *
*                                     *
*****
    
```

Q<sub>2</sub> = 107 cfs    Q<sub>5</sub> = 206 cfs    Q<sub>10</sub> = 284 cfs    Q<sub>25</sub> = 385 cfs    Q<sub>50</sub> = 489 cfs

Appendix C

Input and Summary Output Listings for all HEC-2 Analyses (detailed output listings are also provided in a compressed format on the accompanying 5 1/4" double-density diskettes)



T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
 T2 Prepared for Pima County under Contract #07-04-S-115368-0891  
 T3 South Branch Wash 5-year

J1	ICHECK	INQ	NIMV	IOIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	0	0.0125	0	0	0	2534.0	0

J2	HPROF	IPLOT	PRFYS	XSECV	XSECH	FW	ALLDC	IBW	CHNIM	ITRACE
	1	0	-1	0	0	0	-1	0	0	15

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	55	26	56	13	14	15	8	4
53	54	0	38	1	2	3	11	12	42
5	33	39	67	68					

J6 IHLEQ ICOPY SUBDIV STRTOS RMILE

1

MC	0.045	0.045	0.045	0.1	0.3					
QT	3	511	1259	2182						
X1	1.0	10	1105	1145	0	0	0	0	0	0
GR	2536.0	1000.0	2532.0	1105.0	2530.6	1125.0	2532.0	1145.0	2536.0	1345.0
GR	2536.0	1510.0	2535.0	1610.0	2536.0	1740.0	2536.0	2070.0	2538.0	2215.0
X1	2.0	23	1040	1190	315	270	300	0	0	0
X3					1820					
GR	2542.0	1000.0	2538.0	1040.0	2538.0	1110.0	2536.5	1135.0	2538.0	1190.0
GR	2540.0	1270.0	2541.0	1320.0	2541.5	1600.0	2541.5	1710.0	2542.0	1740.0
GR	2542.5	1820.0	2542.0	1930.0	2542.0	2050.0	2540.0	2090.0	2542.0	2110.0
GR	2540.0	2210.0	2540.0	2230.0	2538.0	2245.0	2540.0	2255.0	2540.8	2270.0
GR	2540.0	2320.0	2540.0	2430.0	2542.0	2570.0				
X1	3.0	29	1185	1330	250	250	250	0	0	0
X3					1730					
GR	2548.0	1000.0	2546.0	1175.0	2544.0	1185.0	2542.7	1200.0	2544.0	1220.0
GR	2545.0	1250.0	2545.0	1285.0	2544.0	1310.0	2543.3	1320.0	2544.0	1330.0
GR	2546.0	1350.0	2548.0	1660.0	2548.0	1730.0	2546.0	1960.0	2546.0	2040.0
GR	2544.6	2070.0	2546.0	2100.0	2546.5	2210.0	2546.0	2280.0	2544.0	2310.0
GR	2544.0	2355.0	2542.0	2365.0	2544.0	2370.0	2545.0	2395.0	2545.0	2450.0
GR	2546.0	2570.0	2547.0	2750.0	2546.0	2850.0	2548.0	2990.0		





X1	12.0	8	1185	1210	130	130	130	0	0	0
GR	2584.0	1000.0	2582.0	1050.0	2580.0	1185.0	2578.0	1200.0	2580.0	1210.0
GR	2580.5	1240.0	2581.0	1290.0	2581.0	1320.0				
X1	13.0	6	1160	1185	200	200	200	0	0	0
GR	2588.0	1000.0	2586.0	1060.0	2584.0	1160.0	2583.0	1170.0	2584.0	1185.0
GR	2584.6	1235.0								
X1	14.0	8	1210	1340	240	230	240	0	0	0
GR	2593.0	1140.0	2592.0	1165.0	2590.0	1210.0	2589.0	1240.0	2589.0	1290.0
GR	2588.2	1305.0	2590.0	1340.0	2592.0	1390.0				
X1	15.0	9	1160	1255	170	180	175	0	0	0
GR	2596.0	1000.0	2595.0	1060.0	2594.7	1130.0	2594.0	1160.0	2592.0	1205.0
GR	2591.2	1215.0	2592.0	1220.0	2594.0	1255.0	2594.4	1280.0		
X1	15.5	8	1195	1210	95	125	110	0	0	0
GR	2598.0	1000.0	2596.0	1130.0	2594.0	1195.0	2593.2	1205.0	2594.0	1210.0
GR	2596.0	1235.0	2598.0	1275.0	2599.0	1310.0				
X1	16.0	9	1105	1215	95	145	120	0	0	0
GR	2600.0	1000.0	2600.0	1105.0	2598.0	1150.0	2596.2	1160.0	2598.0	1175.0
GR	2599.4	1215.0	2599.4	1265.0	2600.0	1285.0	2602.0	1315.0		
X1	17.0	9	1095	1120	135	145	140	0	0	0
GR	2604.7	970.0	2604.7	1000.0	2604.0	1040.0	2602.0	1095.0	2600.3	1110.0
GR	2602.0	1120.0	2602.0	1135.0	2604.0	1170.0	2605.0	1230.0		
X1	18.0	9	1045	1075	170	170	170	0	0	0
X3						1165.0				
GR	2609.0	1000.0	2608.0	1045.0	2606.0	1050.0	2604.9	1055.0	2606.0	1060.0
GR	2606.6	1075.0	2607.3	1125.0	2607.3	1165.0	2608.0	1180.0		
X1	19.0	7	1020	1060	150	150	150	0	0	0
GR	2614.0	1000.0	2610.0	1020.0	2608.8	1040.0	2608.8	1050.0	2610.0	1060.0
GR	2612.0	1085.0	2614.0	1105.0						

TW SEC 11 TO SEC 12

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
5.77	5.74	.63	5.77	5.74	.63	7	2577.710	2581.118	11.000	12.000

TW SEC 12 TO SEC 13

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
185.43	185.57	.07	191.21	191.30	.05	7	2581.118	2585.342	12.000	13.000

TW SEC 13 TO SEC 14

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
4.77	4.77	.05	195.97	196.07	.05	7	2585.342	2590.227	13.000	14.000

TW SEC 14 TO SEC 15

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
.00	.00	.00	195.97	196.07	.05	7	2590.227	2594.035	14.000	15.000

TW SEC 15 TO SEC 15.5

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
.00	.00	.00	195.97	196.07	.05	7	2594.035	2596.149	15.000	15.500

## TW SEC 11 TO SEC 12

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
23.80	23.75	.21	23.80	23.75	.21	7	2578.090	2581.474	11.000	12.000

## TW SEC 12 TO SEC 13

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
425.64	425.01	.15	449.43	448.76	.15	7	2581.474	2585.979	12.000	13.000

## TW SEC 13 TO SEC 14

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
23.67	23.59	.35	473.10	472.34	.16	7	2585.979	2590.729	13.000	14.000

## TW SEC 14 TO SEC 15

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
67.57	67.38	.27	540.67	539.72	.18	7	2590.729	2594.937	14.000	15.000

## TW SEC 15 TO SEC 15.5

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
10.19	10.31	1.17	550.86	550.04	.15	7	2594.937	2596.907	15.000	15.500

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
T3 South Branch Wash 100-year

J1	ICHECK	INQ	NINY	IDIR	STRT	METRIC	HVMS	Q	WSEL	FQ
	0	4	0	0	0.0125	0	0	0	2534.0	0
J2	HPROF	IPLOT	PRFYS	XSECY	XSECH	FM	ALLOC	IBW	CHWIM	ITRACE
	15	0	-1	0	0	0	-1	0	0	15

INLEQ = 1. THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF PROFILE TYPE, WHICH CAN VARY FROM REACH TO REACH. SEE DOCUMENTATION FOR DETAILS.

## TW SEC 11 TO SEC 12

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
43.02	42.93	.21	43.02	42.93	.21	7	2578.364	2581.776	11.000	12.000

## TW SEC 12 TO SEC 13

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
643.46	643.60	.02	686.48	686.53	.01	7	2581.776	2586.362	12.000	13.000

## TW SEC 13 TO SEC 14

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
46.97	46.88	.19	733.45	733.41	.01	7	2586.362	2591.168	13.000	14.000

## TW SEC 14 TO SEC 15

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
285.13	284.33	.28	1018.58	1017.74	.08	7	2591.168	2595.537	14.000	15.000

## TW SEC 15 TO SEC 15.5

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
86.95	86.78	.19	1105.53	1104.52	.09	7	2595.537	2597.447	15.000	15.500



THIS RUN EXECUTED 12/ 5/91 17:55:39

\*\*\*\*\*  
 HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01,02,03  
 MODIFICATION -

\*\*\*\*\*

NOTE- ASTERISK (\*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

South Branch Wash

SUMMARY PRINTOUT

SECNO	CWSEL	YLOB	VCH	YROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	ENDST	
1.000	2532.75	1.92	4.74	1.92	14.04	274.22	26.76	2.15	96.87	1085.42	1182.29	
1.000	2533.37	2.89	6.03	2.89	71.54	500.28	136.31	2.77	144.69	1068.96	1213.65	
1.000	2533.77	3.41	6.75	3.41	140.74	667.55	268.18	3.17	175.24	1058.44	1233.68	
2.000	2538.19	1.05	3.53	1.05	.20	314.04	.79	1.69	159.67	1038.07	1197.73	
2.000	2538.57	2.09	4.75	2.10	3.40	691.12	13.62	2.07	178.48	1034.30	1212.78	
2.000	2538.84	2.69	5.55	2.69	9.40	1029.37	37.70	2.34	191.82	1031.64	1223.46	
3.000	2544.51	2.24	4.76	2.26	1.47	310.58	2.98	2.51	90.94	1182.43	1335.13	
*	3.000	2545.10	3.85	5.30	3.88	11.65	672.94	23.54	3.10	161.51	1179.50	1341.01
*	3.000	2545.34	4.44	6.31	4.49	19.85	1016.53	40.09	3.34	165.05	1178.32	1343.37
3.500	2547.95	.00	4.43	.00	.00	315.03	.00	3.45	87.11	1046.33	1229.56	
3.500	2548.54	2.09	5.22	2.09	6.95	695.79	5.40	4.04	146.11	1032.78	1239.50	
3.500	2548.90	2.90	5.69	2.90	26.17	1029.95	20.35	4.40	182.59	1024.84	1245.68	
4.000	2550.99	1.75	4.47	.00	9.58	305.45	.00	3.69	91.94	1080.32	1219.68	
4.000	2551.58	3.05	5.32	.00	83.64	624.50	.00	4.28	144.03	1068.30	1231.70	
4.000	2551.94	3.72	5.84	.00	180.81	895.66	.00	4.64	175.15	1061.12	1238.88	
5.000	2554.09	.65	4.60	.65	.11	295.85	.07	1.09	86.41	1090.94	1177.35	
*	5.000	2554.63	2.27	5.99	2.27	21.40	646.36	12.38	1.63	127.22	1065.09	1192.32
*	5.000	2555.03	2.93	6.61	2.92	73.61	924.25	42.61	2.03	157.20	1046.11	1203.31
6.000	2557.85	.00	4.90	.00	.00	251.03	.00	1.85	55.42	1112.29	1167.71	
*	6.000	2558.53	1.91	6.15	1.91	14.55	563.34	11.24	2.53	111.34	1081.04	1192.38
*	6.000	2558.98	2.62	6.63	2.62	68.92	787.29	53.25	2.98	155.43	1056.17	1211.60
* 7.000	2561.20	.00	3.23	.00	.00	144.03	.00	1.20	74.63	1143.13	1217.76	
* 7.000	2561.70	.00	4.13	.00	.00	373.14	.00	1.70	106.25	1131.75	1238.00	
* 7.000	2561.99	.00	4.85	.00	.00	603.47	.00	1.99	124.69	1125.11	1249.80	

	SECMO	CWSEL	VLOB	VCH	VROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	ENDST
*	8.000	2565.15	.00	3.45	.00	.00	96.03	.00	.85	65.29	1049.91	1115.20
*	8.000	2565.50	.00	4.18	.00	.00	235.14	.00	1.20	92.72	1041.47	1134.19
*	8.000	2565.78	.00	4.56	.00	.00	387.47	.00	1.48	114.02	1034.92	1148.94
	9.000	2570.25	1.17	2.86	1.17	1.01	75.06	5.96	1.25	102.56	1093.12	1195.67
	9.000	2570.44	1.70	3.57	1.79	4.56	131.12	28.46	1.44	144.50	1087.87	1232.37
	9.000	2570.57	2.05	4.06	2.20	9.19	178.31	62.96	1.57	187.16	1084.28	1271.44
*	10.000	2574.28	.00	3.88	4.77	.00	82.31	461.72	1.58	176.88	1191.49	1370.00
*	10.000	2574.63	.00	4.52	5.80	.00	164.91	844.23	1.93	188.98	1181.02	1370.00
*	10.000	2574.89	.00	5.01	6.57	.00	250.97	1193.50	2.19	196.73	1173.27	1370.00
	11.000	2577.71	.00	4.20	2.98	.00	370.51	173.51	1.71	181.38	1158.62	1340.00
	11.000	2578.09	.54	5.01	4.17	.09	616.00	393.04	2.09	193.87	1146.13	1340.00
	11.000	2578.36	1.36	5.72	4.92	3.81	850.38	590.28	2.36	205.43	1134.57	1340.00
*	12.000	2581.12	2.50	6.02	2.61	105.50	319.00	125.30	3.12	210.48	1109.52	1320.00
*	12.000	2581.47	3.35	7.44	3.76	245.49	460.16	327.28	3.47	234.50	1085.50	1320.00
*	12.000	2581.78	3.75	7.95	4.46	399.17	551.76	536.56	3.78	254.86	1065.14	1320.00
*	13.000	2585.34	3.60	7.04	4.78	162.01	324.26	248.96	2.34	142.09	1092.91	1235.00
*	13.000	2585.98	4.43	8.16	6.19	433.62	505.42	519.53	2.98	173.93	1061.07	1235.00
*	13.000	2586.36	5.45	9.02	7.10	753.32	645.57	732.06	3.36	185.85	1049.15	1235.00
	14.000	2590.23	1.08	5.03	1.08	.62	738.69	.69	2.03	140.73	1204.92	1345.65
	14.000	2590.73	2.51	6.79	2.51	15.37	1449.78	17.08	2.53	165.05	1193.40	1358.44
*	14.000	2591.17	3.30	7.69	3.31	50.70	2070.89	56.34	2.97	185.47	1183.73	1369.19
	15.000	2594.04	.05	6.18	.05	.00	739.99	.00	2.84	99.14	1158.32	1257.46
*	15.000	2594.94	2.41	6.97	3.36	58.19	1429.66	61.96	3.74	205.25	1074.75	1280.00
*	15.000	2595.54	3.40	7.62	4.57	314.09	1996.19	152.77	4.34	252.23	1027.77	1280.00
	15.500	2596.15	4.36	7.45	4.36	328.87	284.91	126.22	2.95	117.64	1120.34	1237.97
*	15.500	2596.91	5.42	8.75	5.53	816.98	434.14	308.88	3.71	182.09	1071.05	1253.14
*	15.500	2597.45	6.30	10.18	6.48	1430.70	587.48	531.81	4.25	228.00	1035.94	1263.94
*	16.000	2599.58	.00	5.77	1.58	.00	724.65	15.35	3.38	156.75	1114.37	1271.12
*	16.000	2600.28	1.85	6.49	3.77	53.48	1296.06	210.46	4.08	289.14	1000.00	1289.14
*	16.000	2600.70	3.46	7.52	4.93	255.32	1856.52	438.16	4.50	295.54	1000.00	1295.54
*	17.000	2603.51	3.48	7.38	4.56	109.28	436.03	194.69	3.21	108.05	1053.41	1161.46
*	17.000	2604.41	4.64	8.42	5.48	380.22	685.46	494.32	4.10	177.45	1016.85	1194.30
*	17.000	2605.02	5.25	9.36	5.91	773.84	905.86	870.30	4.72	260.00	970.00	1230.00
*	18.000	2608.04	.04	6.64	4.25	.00	380.46	359.53	3.14	122.01	1042.99	1165.00
*	18.000	2608.67	2.25	8.55	6.28	22.97	651.42	885.62	3.77	150.29	1014.71	1165.00
*	18.000	2609.37	3.90	9.28	7.35	152.29	901.04	1496.66	4.47	165.00	1000.00	1165.00
*	19.000	2611.43	3.63	7.72	3.67	18.65	674.22	47.13	2.63	65.08	1012.84	1077.91
*	19.000	2612.61	4.87	9.25	5.50	83.19	1244.59	232.21	3.81	84.21	1006.93	1091.14
*	19.000	2613.56	5.86	10.68	6.88	185.39	1840.73	523.88	4.76	98.38	1002.21	1100.58

## South Branch Wash

## SUMMARY PRINTOUT

	SECD	CWSEL	CRWS	EG	HL	OLOSS	ELMIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
	1.000	2532.75	2532.60	2533.06	.00	.00	2530.60	126.53	.00	.00	1.14	.69
	1.000	2533.37	2533.26	2533.81	.00	.00	2530.60	126.70	.00	.00	1.64	.74
	1.000	2533.77	2533.65	2534.28	.00	.00	2530.60	125.17	.00	.00	1.93	.76
	2.000	2538.19	2538.10	2538.39	5.32	.01	2536.50	229.12	19.67	300.00	.85	.81
	2.000	2538.57	2538.50	2538.92	5.10	.01	2536.50	215.91	19.67	300.00	1.31	.85
	2.000	2538.84	2538.76	2539.30	5.02	.00	2536.50	212.99	19.67	300.00	1.64	.88
	3.000	2544.51	2544.48	2544.86	6.43	.05	2542.00	288.40	22.00	250.00	.81	1.25
*	3.000	2545.10	2545.10	2545.53	7.72	-1.24	2542.00	308.82	22.00	250.00	1.69	1.00
*	3.000	2545.34	2545.34	2545.94	7.95	-1.40	2542.00	317.81	22.00	250.00	2.20	1.05
	3.500	2547.95	2547.86	2548.25	3.39	.00	2544.50	237.61	19.23	130.00	.58	1.25
	3.500	2548.54	2548.47	2548.95	3.43	.00	2544.50	229.26	19.23	130.00	1.03	1.08
	3.500	2548.90	2548.85	2549.38	3.43	.01	2544.50	224.98	19.23	130.00	1.37	1.01
	4.000	2550.99	2550.82	2551.29	3.04	.00	2547.30	187.12	19.31	145.00	.89	.90
	4.000	2551.58	2551.44	2551.99	3.03	.00	2547.30	192.43	19.31	145.00	1.38	.87
	4.000	2551.94	2551.81	2552.42	3.04	.00	2547.30	195.71	19.31	145.00	1.72	.87
	5.000	2554.09	2554.03	2554.42	3.12	.01	2553.00	259.52	40.71	140.00	1.30	.90
*	5.000	2554.63	2554.63	2555.16	3.09	-.16	2553.00	221.20	40.71	140.00	1.86	.91
*	5.000	2555.03	2555.03	2555.65	2.66	.08	2553.00	190.38	40.71	140.00	2.08	.88
	6.000	2557.85	2557.76	2558.22	3.79	.01	2556.00	246.00	20.00	150.00	1.42	.90
*	6.000	2558.53	2558.53	2559.09	2.97	.17	2556.00	197.91	20.00	150.00	1.89	.88
*	6.000	2558.98	2558.98	2559.58	2.44	.19	2556.00	162.80	20.00	150.00	2.01	.83
*	7.000	2561.20	2561.06	2561.36	3.12	.02	2560.00	190.73	27.59	145.00	.71	.74
*	7.000	2561.70	2561.54	2561.97	2.85	.03	2560.00	194.59	27.59	145.00	1.03	.79
*	7.000	2561.99	2561.87	2562.36	2.75	.02	2560.00	216.70	27.59	145.00	1.35	.86
*	8.000	2565.15	2565.12	2565.34	3.97	.01	2564.30	338.90	28.67	150.00	.90	.93
*	8.000	2565.50	2565.48	2565.78	3.81	.00	2564.30	313.02	28.67	150.00	1.18	.95
*	8.000	2565.78	2565.74	2566.10	3.74	.00	2564.30	282.07	28.67	150.00	1.31	.93
	9.000	2570.25	2570.19	2570.37	5.02	.01	2569.00	201.09	23.50	200.00	.60	.73
	9.000	2570.44	2570.41	2570.61	4.82	.01	2569.00	199.99	23.50	200.00	.83	.77
	9.000	2570.57	2570.55	2570.77	4.66	.01	2569.00	204.23	23.50	200.00	1.02	.80
*	10.000	2574.28	2574.27	2574.62	4.19	.07	2572.70	301.43	21.76	170.00	1.04	.92
*	10.000	2574.63	2574.63	2575.12	4.74	-.63	2572.70	278.71	21.76	170.00	1.30	.92
*	10.000	2574.89	2574.89	2575.51	4.63	-.49	2572.70	272.21	21.76	170.00	1.50	.94
	11.000	2577.71	2577.59	2577.94	3.31	.01	2576.00	157.54	20.63	160.00	1.00	.73
	11.000	2578.09	2577.92	2578.43	3.30	.01	2576.00	163.52	20.63	160.00	1.32	.78
	11.000	2578.36	2578.17	2578.82	3.29	.02	2576.00	164.97	20.63	160.00	1.61	.81

	SECHO	CMSEL	CRWS	EG	HL	OLOSS	ELNIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
*	12.000	2581.12	2581.12	2581.49	1.62	.23	2578.00	124.49	15.38	130.00	1.65	.73
*	12.000	2581.47	2581.47	2581.97	2.01	.10	2578.00	154.35	15.38	130.00	2.38	.83
*	12.000	2581.78	2581.78	2582.31	1.97	.11	2578.00	151.26	15.38	130.00	2.62	.84
*	13.000	2585.34	2585.34	2585.85	4.05	-.74	2583.00	202.34	25.00	200.00	2.33	.91
*	13.000	2585.98	2585.98	2586.64	3.65	-.23	2583.00	182.70	25.00	200.00	2.83	.91
*	13.000	2586.36	2586.36	2587.18	3.69	-.25	2583.00	184.56	25.00	200.00	3.30	.94
	14.000	2590.23	2590.09	2590.62	4.76	.01	2588.20	197.36	21.67	240.00	1.39	.83
	14.000	2590.73	2590.71	2591.43	4.78	.01	2588.20	218.71	21.67	240.00	2.24	.93
*	14.000	2591.17	2591.17	2592.05	4.89	-.23	2588.20	205.51	21.67	240.00	2.66	.94
	15.000	2594.04	2593.99	2594.63	3.95	.06	2591.20	257.99	17.14	175.00	2.03	.97
*	15.000	2594.94	2594.94	2595.64	2.81	.43	2591.20	160.40	17.14	175.00	2.16	.84
*	15.000	2595.54	2595.54	2596.31	2.41	.49	2591.20	137.97	17.14	175.00	2.37	.81
	15.500	2596.15	2596.10	2596.66	2.03	.01	2593.20	147.53	18.18	110.00	2.35	.82
*	15.500	2596.91	2596.91	2597.57	1.55	.09	2593.20	143.76	18.18	110.00	2.97	.85
*	15.500	2597.45	2597.45	2598.30	1.70	-.09	2593.20	159.01	18.18	110.00	3.82	.91
*	16.000	2599.58	2599.58	2600.09	2.66	-.47	2596.20	227.90	25.00	120.00	1.78	.91
*	16.000	2600.28	2600.28	2600.85	2.05	-.17	2596.20	174.68	25.00	120.00	1.98	.85
*	16.000	2600.70	2600.70	2601.43	2.07	-.09	2596.20	177.40	25.00	120.00	2.48	.89
*	17.000	2603.51	2603.51	2604.12	2.26	.42	2600.30	160.94	29.29	140.00	2.37	.85
*	17.000	2604.41	2604.41	2605.12	1.92	.28	2600.30	136.60	29.29	140.00	2.77	.82
*	17.000	2605.02	2605.02	2605.82	1.88	.28	2600.30	133.99	29.29	140.00	3.24	.84
*	18.000	2608.04	2608.04	2608.53	2.98	-.11	2604.90	175.03	27.06	170.00	2.09	.85
*	18.000	2608.67	2608.67	2609.50	3.38	-.50	2604.90	198.92	27.06	170.00	3.15	.95
*	18.000	2609.37	2609.37	2610.35	2.89	-.25	2604.90	169.84	27.06	170.00	3.43	.91
*	19.000	2611.43	2611.43	2612.29	2.91	-.03	2608.80	193.80	26.00	150.00	2.64	.92
*	19.000	2612.61	2612.61	2613.76	2.34	.38	2608.80	156.16	26.00	150.00	3.28	.89
*	19.000	2613.56	2613.56	2615.03	2.25	.29	2608.80	149.76	26.00	150.00	4.03	.91

THIS RUN EXECUTED 12/ 5/91 17:21:13

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HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01.02.03  
MODIFICATION -

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SPLIT FLOW BEING PERFORMED

SF SPLIT FLOW ANALYSIS SECTIONS 300 - 304

TW SEC 300 TO 300.5

WS	3	300	300.5	-1	2.7	
WC	0	2556.1	75 2558.0	85	2558.2	

TW SEC 300.5 TO 300.7

WS	2	300.5	300.7	-1	2.7	
WC	0	2558.2	50 2559.2			

TW SEC 300.7 TO 301

WS	3	300.7	301	-1	2.7	
WC	0	2559.2	35 2560.0	100	2561.0	

TW SEC 301 TO 302

WS	3	301	302	-1	2.7	
WC	0	2561.0	70 2562.0	165	2564.0	

TW SEC 302 TO 303

WS	3	302	303	-1	2.7	
WC	0	2564.0	95 2566.0	150	2567.2	

TW SEC 303 TO 304

WS	4	303	304	-1	2.7	
WC	0	2567.2	35 2568.0	120 2570.0	150 2570.6	

T1 South Branch Upper Carback Sub-Basin Mgmt Study  
 T2 Prepared for Pima County under Contract #07-04-S-115368-0891  
 T3 Sheet Flow Area 5-year

J1	ICHECK	IMQ	MINV	IDIR	STRT	METRIC	HVIMS	Q	WSEL	FQ
	0	2	0	0	0.0200	0	0	0	2557.0	0

J2	HPROF	IPLOT	PRFYS	XSECV	XSECH	FM	ALLOC	IBW	CHWIN	ITRACE
	1	0	-1	0	0	0	-1	0	0	15

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

30	1	55	26	56	13	14	15	8	4
53	54	0	38	1	2	3	11	12	42
5	33	39	67	68					

J6	INLEQ	ICOPY	SUBDIV	STRTDS	RHILE
	1				

MC	0.045	0.045	0.045	0.1	0.3					
QT	3	462	845	1194						
X1	300.0	2	1000	1370	0	0	0	0	0	0
GR	2556.0	1000.0	2556.0	1370.0						
X1	300.5	7	1000	1330	85	85	85	0	0	0
GR	2558.2	1000.0	2558.5	1045.0	2558.0	1080.0	2557.1	1095.0	2558.0	1140.0
GR	2558.3	1175.0	2558.3	1330.0						
X1	300.7	5	1000	1310	50	50	50	0	0	0
GR	2559.2	1000.0	2559.4	1025.0	2558.0	1075.0	2560.0	1140.0	2560.0	1310.0
X1	301.0	4	0	150	90	90	90	0	0	0
GR	2561.0	0.0	2560.0	50.0	2562.0	115.0	2562.5	150.0		
X1	302.0	6	0	180	140	140	140	0	0	0
GR	2564.0	0.0	2562.9	45.0	2563.4	75.0	2563.4	120.0	2564.0	150.0
GR	2564.6	180.0								
X1	303.0	7	0	240	155	155	155	0	0	0
GR	2567.2	0.0	2567.0	55.0	2566.0	80.0	2566.0	100.0	2567.2	120.0
GR	2567.0	180.0	2567.7	240.0						

X1	304.0	7	0	240	140	140	140	0	0	0
GR	2570.6	0.0	2570.3	45.0	2570.0	70.0	2568.7	100.0	2569.6	130.0
GR	2570.0	195.0	2570.5	240.0						
X1	305.0	4	0	135	165	165	165	0	0	0
GR	2574.3	0.0	2574.0	15.0	2573.0	60.0	2574.0	135.0		

## TW SEC 300 TO 300.5

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
18.62	18.65	.16	18.62	18.65	.16	8	2556.294	2558.428	300.000	300.500

## TW SEC 300.5 TO 300.7

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
18.46	18.15	1.66	37.07	36.80	.74	8	2558.428	2559.496	300.500	300.700

## TW SEC 300.7 TO 301

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
28.82	26.88	6.99	65.90	63.68	3.43	8	2559.496	2561.297	300.700	301.000

## TW SEC 301 TO 302

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
109.99	107.42	2.37	175.89	171.09	2.77	8	2561.297	2564.195	301.000	302.000

## TW SEC 302 TO 303

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
48.08	48.26	.37	223.97	219.35	2.08	8	2564.195	2567.462	302.000	303.000

## TW SEC 303 TO 304

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSMO	USSMO
13.73	13.67	.43	237.71	233.03	1.99	8	2567.462	2570.504	303.000	304.000



T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
 T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
 T3 Sheet Flow Area 25-year

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	0	0.0200	0	0	0	2557.0	0
J2	NPROF	IPLOT	PRFYS	XSECV	XSECH	FN	ALLDC	TBW	CHNIN	ITRACE
	2	0	-1	0	0	0	-1	0	0	15

INLEQ = 1. THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF PROFILE TYPE, WHICH CAN VARY FROM REACH TO REACH. SEE DOCUMENTATION FOR DETAILS.

TW SEC 300 TO 300.5

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
27.85	27.87	.05	27.85	27.87	.05	10	2556.350	2558.488	300.000	300.500

TW SEC 300.5 TO 300.7

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
28.42	28.44	.05	56.28	56.31	.05	10	2558.488	2559.618	300.500	300.700

TW SEC 300.7 TO 301

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
63.43	63.46	.05	119.71	119.76	.05	10	2559.618	2561.508	300.700	301.000

TW SEC 301 TO 302

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
215.92	215.99	.03	335.63	335.75	.04	10	2561.508	2564.448	301.000	302.000

TW SEC 302 TO 303

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
138.23	138.29	.05	473.86	474.04	.04	10	2564.448	2567.702	302.000	303.000

TW SEC 303 TO 304

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
71.65	71.48	.24	545.51	545.52	.00	10	2567.702	2570.773	303.000	304.000

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
 T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
 T3 Sheet Flow Area 100-year

J1	ICHECK	IMQ	MINV	IDIR	STRT	METRIC	HVINS	Q	MSEL	FQ
	0	4	0	0	0.0200	0	0	0	2557.0	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIN	ITRACE
	15	0	-1	0	0	0	-1	0	0	15

THLEQ = 1. THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF PROFILE TYPE, WHICH CAN VARY FROM REACH TO REACH. SEE DOCUMENTATION FOR DETAILS.

## TW SEC 300 TO 300.5

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
36.03	35.97	.16	36.03	35.97	.16	9	2556.396	2558.532	300.000	300.500

## TW SEC 300.5 TO 300.7

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
36.87	36.79	.22	72.90	72.76	.19	9	2558.532	2559.706	300.500	300.700

## TW SEC 300.7 TO 301

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
94.03	94.03	.00	166.93	166.79	.08	9	2559.706	2561.649	300.700	301.000

## TW SEC 301 TO 302

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
305.79	305.93	.04	472.72	472.72	.00	9	2561.649	2564.631	301.000	302.000

## TW SEC 302 TO 303

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
215.52	215.60	.04	688.25	688.32	.01	9	2564.631	2567.856	302.000	303.000

## TW SEC 303 TO 304

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
136.81	136.61	.14	825.06	824.94	.01	9	2567.856	2570.969	303.000	304.000

THIS RUN EXECUTED 12/ 5/91 17:22:27

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HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01,02,03  
 MODIFICATION -

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NOTE- ASTERISK (\*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Sheet Flow Area

SUMMARY PRINTOUT

SECNO	CWSEL	VLOB	YCH	YROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	ENDST
300.000	2556.29	.00	2.06	.00	.00	224.29	.00	.29	370.00	1000.00	1370.00
300.000	2556.35	.00	2.31	.00	.00	299.49	.00	.35	370.00	1000.00	1370.00
300.000	2556.40	.00	2.51	.00	.00	368.94	.00	.40	370.00	1000.00	1370.00
300.500	2558.43	.00	2.63	.00	.00	242.91	.00	1.33	314.00	1000.00	1330.00
300.500	2558.49	.00	2.92	.00	.00	327.35	.00	1.39	327.58	1000.00	1330.00
300.500	2558.53	.00	3.17	.00	.00	404.97	.00	1.43	330.00	1000.00	1330.00
* 300.700	2559.50	.00	3.22	.00	.00	261.37	.00	1.50	123.63	1000.00	1123.63
* 300.700	2559.62	.00	3.72	.00	.00	355.77	.00	1.62	127.40	1000.00	1127.40
300.700	2559.71	.00	4.11	.00	.00	441.84	.00	1.71	130.39	1000.00	1130.39
301.000	2561.30	.00	4.26	.00	.00	290.19	.00	1.30	92.48	.00	92.48
301.000	2561.51	.00	4.83	.00	.00	419.20	.00	1.51	98.83	.00	98.83
301.000	2561.65	.00	5.25	.00	.00	535.87	.00	1.65	103.76	.00	103.76
* 302.000	2564.19	.00	3.43	.00	.00	400.18	.00	1.29	159.78	.00	159.78
* 302.000	2564.45	.00	4.01	.00	.00	635.12	.00	1.55	172.37	.00	172.37
* 302.000	2564.63	.00	4.42	.00	.00	841.67	.00	1.73	180.00	.00	180.00
303.000	2567.46	.00	3.68	.00	.00	448.27	.00	1.46	219.85	.00	219.85
303.000	2567.70	.00	4.41	.00	.00	773.35	.00	1.70	239.73	.00	239.73
303.000	2567.86	.00	4.98	.00	.00	1057.19	.00	1.86	240.00	.00	240.00
304.000	2570.50	.00	3.24	.00	.00	462.00	.00	1.80	224.11	15.56	239.67
304.000	2570.77	.00	4.03	.00	.00	845.00	.00	2.07	240.00	.00	240.00
304.000	2570.97	.00	4.67	.00	.00	1194.00	.00	2.27	240.00	.00	240.00
305.000	2574.31	.00	4.65	.00	.00	462.00	.00	1.31	135.00	.00	135.00
* 305.000	2574.63	.00	5.92	.00	.00	845.00	.00	1.63	135.00	.00	135.00
* 305.000	2574.90	.00	6.64	.00	.00	1194.00	.00	1.90	135.00	.00	135.00

## Sheet Flow Area

## SUMMARY PRINTOUT

SECNO	CWSEL	CRWS	EG	HL	QLOSS	ELMIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
300.000	2556.29	2556.22	2556.36	.00	.00	2556.00	198.89	.00	.00	.37	.67
300.000	2556.35	2556.27	2556.43	.00	.00	2556.00	199.64	.00	.00	.44	.69
300.000	2556.40	2556.32	2556.49	.00	.00	2556.00	199.72	.00	.00	.49	.70
300.500	2558.43	2558.40	2558.54	2.16	.01	2557.10	325.38	12.94	85.00	.57	.88
300.500	2558.49	2558.44	2558.62	2.17	.01	2557.10	327.14	12.94	85.00	.69	.88
300.500	2558.53	2558.48	2558.69	2.18	.02	2557.10	328.20	12.94	85.00	.79	.90
* 300.700	2559.50	2559.32	2559.66	1.11	.02	2558.00	167.63	18.00	50.00	.69	.70
* 300.700	2559.62	2559.46	2559.83	1.19	.02	2558.00	186.69	18.00	50.00	.87	.76
300.700	2559.71	2559.57	2559.97	1.25	.03	2558.00	201.32	18.00	50.00	1.04	.80
301.000	2561.30	2561.23	2561.58	1.89	.04	2560.00	251.39	22.22	90.00	1.16	.87
301.000	2561.51	2561.43	2561.87	1.99	.04	2560.00	256.10	22.22	90.00	1.40	.91
301.000	2561.65	2561.60	2562.08	2.06	.05	2560.00	259.87	22.22	90.00	1.60	.93
* 302.000	2564.19	2564.03	2564.38	2.79	.01	2562.90	164.95	20.71	140.00	.75	.71
* 302.000	2564.45	2564.25	2564.70	2.82	.01	2562.90	165.65	20.71	140.00	.95	.74
* 302.000	2564.63	2564.42	2564.93	2.85	.01	2562.90	166.93	20.71	140.00	1.10	.76
303.000	2567.46	2567.40	2567.67	3.29	.01	2566.00	272.51	20.00	155.00	.94	.87
303.000	2567.70	2567.64	2568.00	3.29	.02	2566.00	272.11	20.00	155.00	1.24	.91
303.000	2567.86	2567.79	2568.24	3.28	.02	2566.00	268.50	20.00	155.00	1.48	.93
304.000	2570.50	2570.31	2570.67	2.99	.00	2568.70	175.64	19.29	140.00	.70	.72
304.000	2570.77	2570.63	2571.02	3.02	.01	2568.70	178.22	19.29	140.00	.97	.76
304.000	2570.97	2570.80	2571.31	3.06	.00	2568.70	184.64	19.29	140.00	1.23	.80
305.000	2574.31	2574.28	2574.64	3.92	.05	2573.00	299.85	26.06	165.00	1.38	.96
* 305.000	2574.63	2574.63	2575.17	4.98	-.93	2573.00	301.62	26.06	165.00	1.99	1.02
* 305.000	2574.90	2574.90	2575.59	4.61	-.68	2573.00	279.66	26.06	165.00	2.33	1.01

THIS RUN EXECUTED 1/24/92 13:49:38

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HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01.02.03  
MODIFICATION -

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SPLIT FLOW BEING PERFORMED

SF SPLIT FLOW ANALYSIS SECTIONS 103.5 - 202

TW	SEC 103.5 TO 202				
WS	2 103.5	200	-1	2.7	
WC	0 2552.0	40 2552.5			

TW	SEC 200 TO 201				
WS	2 200	201	-1	2.7	
WC	0 2552.5	130 2553.0			

TW	SEC 201 TO 202				
WS	5 201	202	-1	2.7	
WC	0 2553.0	25 2554.0	90 2556.0	180 2558.0	250 2559.6

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
 T2 Prepared for Pima County under Contract #07-04-S-115368-0891  
 T3 Shadow Mtn. Tributary 5-year

J1	ICHECK	INQ	MINV	IOIR	STRT	METRIC	HYINS	Q	WSEL	FQ
	0	2	0	0	0.0150	0	0	0	2562.0	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FM	ALLOC	TBW	CHNTH	ITRACE
	1	0	-1	0	0	0	-1	0	0	15

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	55	26	56	13	14	15	8	4
53	54	0	38	1	2	3	11	12	42
5	33	39	67	68					

J6	INLEQ	ICOPY	SUBDIV	STRTDS	RMILE
	1				

HC	0.045	0.045	0.045	0.1	0.3					
QT	3	197	550	1105						
X1	101.0	11	2230	2255	0	0	0	0	0	0
X3						2360				
GR	2542.0	2110.0	2540.0	2210.0	2540.0	2230.0	2538.0	2245.0	2540.0	2255.0
GR	2540.8	2270.0	2540.6	2300.0	2540.0	2320.0	2540.6	2360.0	2540.0	2430.0
GR	2542.0	2570.0								
X1	101.5	14	1110	1145	120	120	120	0	0	0
X3						1210				
GR	2544.3	1000.0	2544.0	1030.0	2542.0	1065.0	2542.0	1075.0	2542.8	1110.0
GR	2540.0	1120.0	2540.0	1125.0	2542.0	1135.0	2543.0	1145.0	2543.0	1160.0
GR	2542.3	1180.0	2543.2	1210.0	2542.2	1255.0	2544.0	1425.0		
X1	102.0	12	2355	2370	120	120	120	0	0	0
GR	2546.5	2210.0	2546.0	2280.0	2544.0	2310.0	2544.0	2355.0	2542.0	2365.0
GR	2544.0	2370.0	2545.0	2395.0	2545.0	2450.0	2546.0	2570.0	2547.0	2750.0
GR	2546.0	2850.0	2548.0	2990.0						
X1	103.0	8	2190	2250	135	135	135	0	0	0
GR	2549.0	2050.0	2548.0	2140.0	2546.0	2190.0	2544.5	2215.0	2546.0	2250.0
GR	2548.0	2340.0	2549.0	2590.0	2550.0	2870.0				



X1	103.5	10	2190	2240	150	140	145	0	0	0
GR	2552.0	1995.0	2550.0	2090.0	2550.0	2190.0	2548.0	2195.0	2547.3	2220.0
GR	2548.0	2225.0	2550.0	2240.0	2550.0	2310.0	2551.3	2410.0	2552.0	2870.0
X1	200.0	8	1140	1175	60	130	130	0	0	0
GR	2552.5	1000.0	2552.0	1045.0	2552.0	1140.0	2550.0	1150.0	2549.0	1155.0
GR	2550.0	1165.0	2552.0	1175.0	2554.0	1185.0				
X1	201.0	7	1050	1090	100	120	120	0	0	0
GR	2553.0	1000.0	2553.0	1050.0	2550.0	1075.0	2550.0	1085.0	2552.0	1090.0
GR	2554.0	1150.0	2556.0	1230.0						
X1	202.0	8	1075	1120	200	140	170	0	0	0
GR	2558.0	1000.0	2556.0	1065.0	2554.0	1075.0	2553.0	1085.0	2553.0	1105.0
GR	2554.0	1120.0	2556.0	1155.0	2558.0	1210.0				
X1	203.0	7	1085	1110	160	200	180	0	0	0
GR	2562.0	1000.0	2560.0	1065.0	2558.0	1085.0	2557.0	1095.0	2558.0	1110.0
GR	2560.0	1135.0	2562.0	1170.0						
X1	204.0	6	1070	1100	180	180	180	0	0	0
GR	2566.0	1000.0	2562.0	1070.0	2560.5	1090.0	2562.0	1100.0	2564.0	1125.0
GR	2566.0	1170.0								
X1	205.0	5	1025	1070	180	180	180	0	0	0
GR	2570.0	1000.0	2566.0	1025.0	2564.0	1040.0	2566.0	1070.0	2570.0	1185.0
Q7	3	191	526	1062						
X1	206.0	5	1035	1180	210	210	210	0	0	0
GR	2574.0	1000.0	2574.0	1035.0	2570.0	1075.0	2570.0	1145.0	2572.0	1180.0
Q7	3	5	102	419						
X1	207.0	5	1000	1150	205	205	205	0	0	0
GR	2578.0	1000.0	2574.0	1050.0	2574.0	1090.0	2576.0	1130.0	2577.0	1150.0
Q7	3	1	77	372						
X1	208.0	5	1020	1110	220	220	220	0	0	0
GR	2584.0	1000.0	2582.0	1020.0	2580.0	1045.0	2580.0	1090.0	2581.0	1110.0
X1	209.0	6	0	80	100	100	100	0	0	0
X3				10						
GR	2586.0	0.0	2584.0	25.0	2583.5	30.0	2583.5	45.0	2584.0	50.0
GR	2586.0	80.0								
X1	209.5	3	0	110	60	60	60	0	0	0
GR	2588.0	0.0	2586.0	55.0	2588.0	110.0				
X1	210.0	5	0	150	50	50	50	0	0	0
GR	2590.0	0.0	2588.6	70.0	2590.0	100.0	2590.0	130.0	2592.0	150.0

TW SEC 103.5 TO 202

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	OSWS	USWS	DSSMO	USSMO
.00	.00	.00	.00	.00	.00	2	2548.736	2551.470	103.500	200.000

TW SEC 200 TO 201

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	OSWS	USWS	DSSMO	USSMO
.00	.00	.00	.00	.00	.00	2	2551.470	2552.564	200.000	201.000

TW SEC 201 TO 202

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	OSWS	USWS	DSSMO	USSMO
.00	.00	.00	.00	.00	.00	2	2552.564	2554.289	201.000	202.000

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
 T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
 T3 Shadow Mtn. Drainageway 25-year

J1	ICHECK	INQ	NINW	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	0	0.0150	0	0	0	2561.0	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHMTM	ITRACE
	2	0	-1	0	0	0	-1	0	0	15

TW SEC 103.5 TO 202

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	WITER	DSWS	USWS	DSSMO	USSMO
.00	.00	200.00	.00	.00	200.00	5	2549.598	2552.504	103.500	200.000

TW SEC 200 TO 201

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	WITER	DSWS	USWS	DSSMO	USSMO
42.36	42.31	.11	42.36	42.31	.11	5	2552.504	2553.447	200.000	201.000

TW SEC 201 TO 202

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	WITER	DSWS	USWS	DSSMO	USSMO
4.33	4.33	.14	46.69	46.64	.11	5	2553.447	2555.109	201.000	202.000

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
T3 Shadow Mtn. Drainageway 100-year

J1	ICHECK	INQ	MINV	IOIR	STRT	METRIC	HWINS	Q	WSEL	FQ
	0	4	0	0	0.0150	0	0	0	2561.0	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FM	ALLOC	IBW	CHMIN	ITRACE
	15	0	-1	0	0	0	-1	0	0	15

MC	0.045	0.045	0.045	0.1	0.3					
QT	3	199	430	643						
X1	211.0	5	1015	1070	0	0	0	0	0	0
X5	3	2577.32	2577.91	2578.30						
GR	2579.0	1000.0	2578.0	1015.0	2576.0	1035.0	2576.0	1050.0	2577.0	1070.0
X1	212.0	5	100	225	60	60	60	0	0	0
GR	2580.0	100.0	2579.0	125.0	2578.0	160.0	2578.0	195.0	2579.5	225.0

TW SEC 103.5 TO 202

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
.91	.90	1.48	.91	.90	1.48	8	2550.519	2552.765	103.500	200.000

TW SEC 200 TO 201

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
193.94	194.04	.05	194.85	194.94	.05	8	2552.765	2554.043	200.000	201.000

TW SEC 201 TO 202

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
36.80	36.92	.35	231.65	231.86	.09	8	2554.043	2555.849	201.000	202.000

THIS RUN EXECUTED 1/24/92 13:51:18

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 HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01.02.03  
 MODIFICATION -

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NOTE- ASTERISK (\*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Shadow Mtn. Tributary

SUMMARY PRINTOUT

	SECNO	CWSEL	YLOB	VCH	YROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	ENOST
*	101.000	2540.42	1.77	4.53	1.28	22.73	160.84	13.43	2.42	115.98	2188.97	2348.04
*	101.000	2540.91	2.81	5.69	2.45	108.73	271.42	123.16	2.91	195.32	2164.68	2360.00
	101.000	2541.21	3.55	6.76	3.49	214.97	373.23	285.16	3.21	210.38	2149.62	2360.00
*	101.500	2542.32	1.71	5.35	.05	10.64	186.35	.00	2.32	56.76	1059.47	1180.53
*	101.500	2543.01	3.37	5.94	2.18	135.42	334.01	33.88	3.01	156.14	1047.39	1203.54
*	101.500	2543.36	4.37	6.92	3.20	276.93	474.93	121.49	3.36	168.81	1041.19	1210.00
*	102.000	2544.53	2.62	5.33	1.70	68.43	122.53	6.04	2.53	81.32	2302.01	2383.32
*	102.000	2545.13	4.07	6.43	2.26	244.82	205.21	53.29	3.13	172.04	2293.11	2465.15
*	102.000	2545.48	4.95	7.35	2.90	411.42	273.40	188.53	3.48	220.00	2287.78	2507.77
	103.000	2546.27	.82	3.20	.82	.72	194.98	1.30	1.77	78.51	2183.39	2261.90
	103.000	2546.87	1.94	4.65	1.94	18.29	452.09	32.93	2.37	120.84	2168.27	2289.11
	103.000	2547.31	2.69	5.77	2.69	57.52	712.26	103.58	2.81	151.62	2157.28	2308.90
*	103.500	2548.74	.00	5.58	.00	.00	197.00	.00	1.44	37.36	2193.16	2230.52
*	103.500	2549.60	.00	7.07	.00	.00	503.31	.00	2.30	45.98	2191.01	2236.98
*	103.500	2550.52	2.03	5.71	1.94	118.17	664.65	90.54	3.22	284.55	2065.36	2349.91
*	200.000	2551.47	.00	4.88	.00	.00	197.00	.00	2.47	29.70	1142.65	1172.35
*	200.000	2552.50	1.86	5.22	1.25	110.46	392.06	.79	3.50	177.52	1000.00	1177.52
*	200.000	2552.77	3.05	6.87	2.01	292.27	579.05	2.94	3.77	178.83	1000.00	1178.83
*	201.000	2552.56	.00	3.16	.97	.00	192.31	4.69	2.56	53.38	1053.61	1106.99
	201.000	2553.45	1.53	4.66	2.12	34.27	444.67	66.73	3.45	133.42	1000.00	1133.42
*	201.000	2554.04	3.00	6.07	3.04	155.79	722.95	189.46	4.04	151.58	1000.00	1151.58
*	202.000	2554.29	1.16	4.30	1.18	.24	195.89	.86	1.29	51.51	1073.55	1125.06
*	202.000	2555.11	2.76	6.18	2.79	8.56	511.10	30.34	2.11	70.07	1069.43	1139.50
*	202.000	2555.85	4.09	8.18	4.14	34.92	946.38	123.70	2.85	86.59	1065.76	1152.35



	SECHO	CWSEL	VLOB	VCH	VROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	ENDST
*	203.000	2558.75	2.58	5.76	2.58	7.34	180.48	9.18	1.75	41.97	1077.46	1119.43
*	203.000	2559.72	4.00	7.53	4.00	58.87	417.45	73.68	2.72	63.61	1067.84	1131.45
*	203.000	2560.68	4.84	8.42	5.19	198.25	668.69	238.06	3.68	103.81	1043.02	1146.83
	204.000	2562.49	1.74	5.14	1.74	3.62	190.79	2.59	1.99	44.62	1061.47	1106.09
*	204.000	2563.36	3.39	7.19	3.39	55.03	455.71	39.26	2.86	70.85	1046.17	1117.02
*	204.000	2564.26	4.38	8.40	4.62	196.38	759.07	149.55	3.76	100.52	1030.40	1130.92
	205.000	2565.97	.00	4.52	.00	.00	197.00	.00	1.97	44.28	1025.24	1069.52
	205.000	2566.74	2.38	6.69	2.40	4.17	526.48	19.34	2.74	71.21	1020.32	1091.53
*	205.000	2567.63	3.60	7.90	3.63	29.98	936.03	139.00	3.63	102.13	1014.80	1116.93
	206.000	2570.66	.00	3.64	.00	.00	191.00	.00	.66	88.24	1068.37	1156.61
	206.000	2571.25	.00	4.82	.00	.00	526.00	.00	1.25	104.41	1062.49	1166.90
	206.000	2571.82	.00	6.14	.00	.00	1062.00	.00	1.82	120.08	1056.79	1176.87
*	207.000	2574.14	.00	.90	.00	.00	5.00	.00	.14	44.28	1048.35	1092.64
*	207.000	2574.74	.00	2.66	.00	.00	102.00	.00	.74	63.97	1040.78	1104.75
*	207.000	2575.55	.00	4.13	.00	.00	419.00	.00	1.55	90.50	1030.58	1121.07
*	208.000	2580.03	.00	.76	.00	.00	1.00	.00	.03	45.94	1044.64	1090.58
*	208.000	2580.43	.00	3.43	.00	.00	77.00	.00	.43	59.01	1039.61	1098.62
*	208.000	2581.10	.00	5.38	.00	.00	372.00	.00	1.10	78.76	1031.24	1110.00
*	209.000	2583.57	.00	.88	.00	.00	1.00	.00	.07	16.45	29.28	45.72
*	209.000	2584.28	.00	4.25	.00	.00	77.00	.00	.78	32.73	21.48	54.22
*	209.000	2585.25	.00	5.93	.00	.00	372.00	.00	1.75	58.76	10.00	68.76
*	209.500	2586.15	.00	1.56	.00	.00	1.00	.00	.15	8.39	50.80	59.20
*	209.500	2586.86	.00	3.75	.00	.00	77.00	.00	.86	47.52	31.24	78.76
*	209.500	2587.62	.00	5.18	.00	.00	372.00	.00	1.62	88.89	10.55	99.45
	210.000	2588.75	.00	1.20	.00	.00	1.00	.00	.15	10.88	62.38	73.26
*	210.000	2589.37	.00	3.60	.00	.00	77.00	.00	.77	55.30	31.29	86.59
*	210.000	2590.11	.00	4.39	.00	.00	372.00	.00	1.51	131.13	.00	131.13
*	211.000	2577.32	.00	4.43	.00	.00	199.00	.00	1.32	48.20	1021.80	1070.00
*	211.000	2577.91	.00	5.73	.00	.00	430.00	.00	1.91	54.10	1015.90	1070.00
*	211.000	2578.30	1.31	6.65	.00	.89	642.11	.00	2.30	59.50	1010.50	1070.00
	212.000	2578.84	.00	4.01	.00	.00	199.00	.00	.84	81.74	130.26	212.00
	212.000	2579.35	.00	4.46	.00	.00	430.00	.00	1.35	105.58	116.35	221.92
	212.000	2579.74	.00	4.58	.00	.00	643.00	.00	1.74	118.41	106.59	225.00

## Shadow Mtn. Tributary

## SUMMARY PRINTOUT

	SECNO	CWSEL	CRWS	EG	HL	OLOSS	ELMIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
*	101.000	2540.42	2540.42	2540.69	.00	.00	2538.00	119.85	.00	.00	1.06	.67
*	101.000	2540.91	2540.91	2541.23	.00	.00	2538.00	128.02	.00	.00	1.52	.73
	101.000	2541.21	2541.21	2541.62	.00	.00	2538.00	148.49	.00	.00	2.05	.80
*	101.500	2542.32	2542.32	2542.74	2.24	-.36	2540.00	186.85	16.67	120.00	1.16	.95
*	101.500	2543.01	2543.01	2543.42	2.12	-.26	2540.00	176.29	16.67	120.00	1.77	.83
*	101.500	2543.36	2543.36	2543.88	2.20	-.18	2540.00	183.41	16.67	120.00	2.24	.87
*	102.000	2544.53	2544.53	2544.85	1.86	.18	2542.00	154.99	16.67	120.00	1.48	.76
*	102.000	2545.13	2545.13	2545.52	1.75	.17	2542.00	146.09	16.67	120.00	1.94	.78
*	102.000	2545.48	2545.48	2545.95	1.86	.16	2542.00	154.95	16.67	120.00	2.40	.82
	103.000	2546.27	2545.93	2546.43	1.56	.02	2544.50	92.50	18.52	135.00	.59	.56
	103.000	2546.87	2546.60	2547.18	1.65	.01	2544.50	104.63	18.52	135.00	1.06	.64
	103.000	2547.31	2547.11	2547.75	1.80	.00	2544.50	116.59	18.52	135.00	1.50	.71
*	103.500	2548.74	2548.74	2549.22	4.51	-1.96	2547.30	311.30	19.31	145.00	1.83	1.01
*	103.500	2549.60	2549.60	2550.37	3.76	-.98	2547.30	259.37	19.31	145.00	2.51	1.00
*	103.500	2550.52	2550.52	2550.92	1.42	.13	2547.30	98.28	19.31	145.00	1.43	.66
*	200.000	2551.47	2551.15	2551.84	2.61	.01	2549.00	148.03	13.08	130.00	1.26	.74
*	200.000	2552.50	2552.50	2552.84	1.13	.58	2549.00	92.07	13.08	130.00	1.23	.63
*	200.000	2552.77	2552.77	2553.30	1.55	-.18	2549.00	136.90	13.08	130.00	2.06	.78
*	201.000	2552.56	2551.69	2552.72	.85	.02	2550.00	46.83	8.33	120.00	.49	.43
	201.000	2553.45	2552.84	2553.73	.88	.01	2550.00	63.72	8.33	120.00	.95	.53
*	201.000	2554.04	2553.72	2554.48	1.17	.01	2550.00	80.41	8.33	120.00	1.49	.62
*	202.000	2554.29	2554.12	2554.57	1.82	.04	2553.00	167.68	17.65	170.00	1.06	.75
*	202.000	2555.11	2554.97	2555.67	1.85	.08	2553.00	156.34	17.65	170.00	1.79	.80
*	202.000	2555.85	2555.85	2556.78	2.94	-.64	2553.00	174.67	17.65	170.00	2.80	.90
*	203.000	2558.75	2558.75	2559.23	4.06	-.46	2557.00	225.65	22.22	180.00	1.77	.91
*	203.000	2559.72	2559.72	2560.45	3.27	-.17	2557.00	181.00	22.22	180.00	2.50	.89
*	203.000	2560.68	2560.68	2561.50	2.53	.29	2557.00	139.89	22.22	180.00	2.77	.83
	204.000	2562.49	2562.38	2562.89	3.65	.01	2560.50	183.75	19.44	180.00	1.42	.81
*	204.000	2563.36	2563.36	2564.06	3.18	.04	2560.50	176.42	19.44	180.00	2.32	.87
*	204.000	2564.26	2564.26	2565.11	2.69	-.08	2560.50	149.72	19.44	180.00	2.81	.85
	205.000	2565.97	2565.79	2566.28	3.39	.01	2564.00	192.66	19.44	180.00	1.18	.80
	205.000	2566.74	2566.72	2567.41	3.35	.00	2564.00	195.96	19.44	180.00	2.14	.89
*	205.000	2567.63	2567.63	2568.48	2.85	-.08	2564.00	158.47	19.44	180.00	2.60	.86
	206.000	2570.66	2570.59	2570.87	4.57	.01	2570.00	243.02	28.57	210.00	.90	.83
	206.000	2571.25	2571.11	2571.61	4.17	.03	2570.00	201.21	28.57	210.00	1.31	.83
	206.000	2571.82	2571.70	2572.41	3.89	.03	2570.00	212.42	28.57	210.00	1.91	.90

	SECNO	CWSEL	CRIMS	EG	HL	OLOSS	ELMIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
*	207.000	2574.14	2574.08	2574.15	3.26	.02	2574.00	118.25	19.51	205.00	.09	.45
*	207.000	2574.74	2574.54	2574.85	3.22	.03	2574.00	128.56	19.51	205.00	.48	.61
*	207.000	2575.55	2575.25	2575.82	3.38	.03	2574.00	134.85	19.51	205.00	.94	.69
*	208.000	2580.03	2580.02	2580.04	13.43	-10.11	2580.00	610.67	27.27	220.00	.11	.79
*	208.000	2580.43	2580.43	2580.62	5.74	.02	2580.00	393.21	27.27	220.00	.93	.98
*	208.000	2581.10	2581.10	2581.55	6.98	-1.95	2580.00	317.20	27.27	220.00	1.74	1.01
*	209.000	2583.57	2583.55	2583.59	3.55	.00	2583.50	249.96	35.00	100.00	.11	.59
*	209.000	2584.28	2584.28	2584.56	3.65	.16	2583.50	365.46	35.00	100.00	1.26	1.01
*	209.000	2585.25	2585.25	2585.80	2.96	.13	2583.50	296.35	35.00	100.00	1.98	1.01
*	209.500	2586.15	2586.15	2586.19	4.13	-1.63	2586.00	688.38	41.67	60.00	.33	.99
*	209.500	2586.86	2586.86	2587.08	2.37	-.08	2586.00	395.38	41.67	60.00	1.07	1.01
*	209.500	2587.62	2587.62	2588.03	1.96	-.08	2586.00	327.02	41.67	60.00	1.65	1.02
	210.000	2588.75	2588.74	2588.77	2.58	.00	2588.60	411.97	52.00	50.00	.20	.77
*	210.000	2589.37	2589.37	2589.58	2.10	-.06	2588.60	420.87	52.00	50.00	1.02	1.02
*	210.000	2590.11	2590.11	2590.41	1.58	.04	2588.60	316.29	52.00	50.00	1.28	.96
*	211.000	2577.32	2577.18	2577.62	.00	.08	2576.00	200.03	-12600.10	.00	1.16	.81
*	211.000	2577.91	2577.76	2578.42	.00	.09	2576.00	199.20	-12600.10	.00	1.73	.86
*	211.000	2578.30	2578.17	2578.99	.00	.12	2576.00	198.50	-12600.10	.00	2.17	.89
	212.000	2578.84	2578.80	2579.09	1.46	.01	2578.00	287.38	33.33	60.00	1.09	.91
	212.000	2579.35	2579.21	2579.66	1.22	.02	2578.00	206.46	33.33	60.00	1.18	.82
	212.000	2579.74	2579.49	2580.06	1.04	.04	2578.00	153.65	33.33	60.00	1.14	.74

THIS RUN EXECUTED 1/28/92 11:44: 0

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 HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01.02.03  
 MODIFICATION -

T1 South Branch Upper Carmack Sub-Basin Mont Studv  
 T2 Prepared for Pima County under Contract #07-04-S-115368-0891  
 T3 South Branch Wash U/S 5-year

J1	ICHECK	INQ	MINV	IQIR	STRT	METRIC	HWINS	Q	WSEL	FQ
	0	2	0	0	0.0000	0	0	0	2618.6	0

J2	WPROF	IPLOT	PRFVS	XSECV	XSECH	FM	ALLOC	IBW	CHNIM	TRACE
	1	0	-1	0	0	0	-1	0	0	15

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	55	26	56	13	14	15	8	4
53	54	0	38	1	2	3	11	12	42
5	33	39	67	68					

J6	INLEQ	ICOPY	SUBDIV	STRTDS	RMILE
	1				

MC	0.045	0.045	0.045	0.1	0.3					
QT	3	740	1560	2550						
X1	20.0	8	1115	1225	0	0	0	0	0	0
BR	2624.0	1000.0	2622.0	1115.0	2620.0	1155.0	2617.0	1160.0	2617.0	1215.0
GR	2620.0	1220.0	2622.0	1225.0	2622.0	1280.0				

X1	21.0	14	1510	1570	50	50	50	0	0	0
GR	2627.0	1000.0	2626.0	1070.0	2624.0	1140.0	2624.0	1470.0	2623.0	1485.0
GR	2623.0	1510.0	2620.0	1525.0	2619.5	1535.0	2620.0	1545.0	2622.0	1560.0
GR	2623.0	1570.0	2623.0	1580.0	2624.0	1590.0	2625.0	1610.0		

X1	22.0	15	1485	1530	90	80	80	0	0	0
GR	2634.0	1000.0	2632.0	1020.0	2630.0	1050.0	2629.0	1165.0	2628.0	1210.0
GR	2628.0	1285.0	2629.0	1325.0	2629.0	1430.0	2628.0	1445.0	2627.5	1455.0
GR	2627.5	1485.0	2622.0	1510.0	2622.0	1520.0	2626.0	1530.0	2627.0	1550.0



X1	29.0	9	1115	1205	200	200	200	0	0	0
GR	2680.0	1000.0	2679.2	1030.0	2679.2	1115.0	2678.0	1140.0	2677.5	1150.0
GR	2677.5	1185.0	2678.0	1195.0	2680.0	1205.0	2684.0	1220.0		
X1	29.5	4	1000	1155	120	120	120	0	0	0
GR	2683.5	1000.0	2683.0	1055.0	2683.0	1120.0	2688.0	1155.0		
X1	30.0	6	1250	1420	90	80	85	0	0	0
X3				1200.0						
GR	2688.0	1000.0	2687.0	1130.0	2687.0	1250.0	2686.0	1330.0	2687.0	1420.0
GR	2688.0	1440.0								
X1	31.0	6	1190	1230	190	180	185	0	0	0
GR	2696.0	1000.0	2694.0	1030.0	2694.0	1190.0	2692.0	1210.0	2694.0	1230.0
GR	2696.0	1270.0								
X1	32.0	9	1010	1210	200	175	185	0	0	0
GR	2702.0	1000.0	2701.0	1010.0	2701.0	1140.0	2700.0	1170.0	2699.2	1175.0
GR	2700.0	1180.0	2702.0	1210.0	2702.0	1270.0	2704.0	1295.0		
X1	33.0	12	1205	1270	210	170	190	0	0	0
GR	2712.0	1000.0	2711.0	1070.0	2710.0	1100.0	2708.7	1130.0	2708.6	1205.0
GR	2708.0	1230.0	2707.4	1250.0	2708.0	1255.0	2708.4	1270.0	2708.4	1310.0
GR	2710.0	1325.0	2712.0	1350.0						
X1	34.0	9	1100	1250	200	200	200	0	0	0
GR	2722.0	1000.0	2720.0	1035.0	2718.0	1080.0	2716.0	1100.0	2715.3	1120.0
GR	2716.0	1145.0	2716.0	1220.0	2720.0	1250.0	2722.0	1280.0		
X1	35.0	8	1005	1165	200	200	200	0	0	0
GR	2730.0	1000.0	2728.0	1005.0	2724.0	1015.0	2722.6	1045.0	2723.2	1130.0
GR	2724.0	1140.0	2728.0	1165.0	2730.0	1190.0				
X1	36.0	8	1000	1225	190	190	190	0	0	0
GR	2736.0	1000.0	2732.0	1010.0	2731.5	1030.0	2731.3	1130.0	2730.7	1160.0
GR	2731.0	1190.0	2732.0	1200.0	2736.0	1225.0				
X1	37.0	7	1000	1220	200	200	200	0	0	0
GR	2746.0	1000.0	2742.0	1020.0	2740.8	1030.0	2740.0	1125.0	2738.4	1200.0
GR	2740.0	1210.0	2750.0	1220.0						
X1	38.0	6	1000	1160	210	210	210	0	0	0
GR	2754.0	1000.0	2750.0	1020.0	2748.4	1035.0	2748.9	1090.0	2748.5	1140.0
GR	2754.0	1160.0								
X1	38.6	4	1000	1110	240	240	240	0	0	0
GR	2768.0	1000.0	2758.0	1020.0	2758.0	1060.0	2768.0	1110.0		

X1	-37.0	7	1000	1220	200	200	200	0	0	0
GR	2746.0	1000.0	2742.0	1020.0	2740.8	1030.0	2740.0	1125.0	2738.4	1200.0
GR	2740.0	1210.0	2750.0	1220.0						
QT	3	116	224	350						
X1	38.5	5	1000	1055	250	250	250	0	0	0
GR	2752.0	1000.0	2748.0	1015.0	2746.6	1025.0	2748.0	1040.0	2752.0	1055.0

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
 T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
 T3 South Branch Wash U/S 25-year

J1	ICHECK	IHQ	HINW	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	0	0.0000	0	0	0	2620.6	0
J2	NPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIK	ITRACE
	2	0	-1	0	0	0	-1	0	0	15



T1 South Branch Upper Catawack Sub-Basin Mgmt Study  
 T2 Prepared for Piama County under Contract 07-04-S-115368-0891  
 T3 South Branch Wash U/S 100-year

J1	ICHECK	INQ	NINW	IOIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	4	0	0	0.0000	0	0	0	2622.7	0
J2	NPROF	IPLOT	PRFYS	XSECV	XSECH	FN	ALLOC	IBW	CHNIM	ITRACE
	15	0	-1	0	0	0	-1	0	0	15

THIS RUN EXECUTED 1/28/92 11:44:40

\*\*\*\*\*  
 HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01.02.03  
 MODIFICATION -

\*\*\*\*\*

NOTE- ASTERISK (\*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

South Branch Wash U/S

SUMMARY PRINTOUT

	SECNO	CMSEL	VLOB	YCH	VROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	EMOST
*	20.000	2618.74	.00	7.34	.00	.00	740.00	.00	1.74	60.81	1157.10	1217.90
	20.000	2620.60	.00	6.99	.00	.00	1560.00	.00	3.60	78.50	1143.00	1221.50
	20.000	2622.70	1.15	5.70	1.81	16.23	2463.94	69.83	5.70	205.25	1074.75	1280.00
*	21.000	2622.54	.00	7.68	.00	.00	740.00	.00	3.04	53.05	1512.32	1565.37
*	21.000	2624.34	1.78	5.97	2.80	285.17	1210.69	64.14	4.84	468.68	1128.11	1596.79
*	21.000	2624.71	2.68	7.17	3.55	814.37	1614.14	121.49	5.21	489.06	1115.14	1604.20
*	22.000	2625.68	.00	8.78	.00	.00	740.00	.00	3.68	35.89	1493.30	1529.19
*	22.000	2627.47	.00	9.43	4.01	.00	1482.51	77.49	5.47	64.85	1485.15	1550.00
*	22.000	2628.95	2.76	8.18	4.89	476.23	1833.96	239.82	6.95	275.29	1167.12	1550.00
*	23.000	2628.33	.00	9.91	.00	.00	740.00	.00	4.33	24.45	1507.78	1532.22
*	23.000	2631.43	1.91	8.14	3.20	77.06	1438.47	44.46	7.43	158.54	1391.46	1550.00
*	23.000	2632.43	2.55	7.73	4.08	718.86	1713.30	117.84	8.43	492.83	1057.17	1550.00
*	23.500	2631.93	.00	9.69	.00	.00	740.00	.00	4.93	26.36	1430.18	1456.54
*	23.500	2634.40	2.13	6.66	1.43	470.22	1026.66	63.12	7.40	478.62	1059.90	1570.00
*	23.500	2634.77	3.01	7.77	2.43	1046.45	1297.25	206.30	7.77	495.75	1046.01	1570.00
*	23.600	2635.60	2.07	6.71	.00	99.47	640.53	.00	5.60	131.19	1398.30	1529.49
*	23.600	2636.47	3.23	7.52	1.19	643.49	915.51	1.00	6.47	262.54	1271.02	1533.56
*	23.600	2636.96	4.29	8.75	2.05	1350.40	1192.53	7.08	6.96	285.59	1251.61	1537.20
	23.700	2637.13	.68	6.82	4.40	.18	540.45	199.37	3.13	92.55	1371.02	1506.99
*	23.700	2638.18	2.14	7.45	4.92	72.28	890.76	596.96	4.18	257.59	1263.74	1521.33
*	23.700	2638.78	3.17	8.07	5.54	356.44	1159.96	1033.61	4.78	300.29	1225.57	1525.85
*	23.800	2639.64	.00	6.99	5.66	.00	391.33	348.67	2.14	95.76	1241.80	1493.70
*	23.800	2640.55	1.62	6.71	4.42	24.61	605.19	930.19	3.05	326.15	1184.87	1511.03
*	23.800	2640.95	2.45	7.83	5.32	109.53	823.55	1616.91	3.45	373.58	1145.35	1518.93

	SECKO	CWSEL	VLOB	VCH	VROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	EWOST
*	24.000	2643.23	.00	3.73	5.65	.00	267.91	472.09	2.43	194.11	1116.25	1471.06
*	24.000	2643.71	.00	5.46	6.53	.00	689.70	870.30	2.91	240.60	1106.15	1489.04
*	24.000	2644.25	1.14	6.16	6.27	3.86	1187.56	1358.58	3.45	365.39	1072.60	1500.00
*	25.000	2650.19	1.03	6.86	1.03	.80	736.82	2.39	2.19	97.40	1076.88	1264.25
*	25.000	2651.23	2.52	6.73	2.81	81.26	1177.96	300.78	3.23	283.51	1032.66	1316.18
*	25.000	2651.68	3.29	7.91	3.95	198.13	1616.11	735.76	3.68	319.67	1013.46	1333.13
*	26.000	2657.75	.00	5.36	.00	.00	740.00	.00	1.75	157.63	1124.91	1282.54
*	26.000	2658.44	1.54	5.37	2.34	83.78	1394.44	81.78	2.44	513.51	864.21	1377.71
*	26.000	2658.80	2.19	5.96	3.35	390.74	1934.50	224.76	2.80	714.98	665.02	1380.00
*	27.000	2666.14	2.43	5.01	.86	42.41	497.27	.33	1.64	159.93	1060.39	1220.32
*	27.000	2666.64	4.04	6.33	2.27	197.61	944.73	17.65	2.14	195.05	1044.08	1239.13
*	27.000	2667.09	4.96	7.24	3.11	415.97	1404.77	69.25	2.59	226.34	1029.56	1255.90
*	28.000	2672.03	.06	4.96	.06	.00	540.00	.00	1.43	150.76	1034.56	1185.32
*	28.000	2672.53	2.24	6.24	2.24	5.48	1150.60	3.91	1.93	165.87	1025.74	1191.61
*	28.000	2673.00	3.19	7.22	3.19	27.97	1842.06	19.96	2.40	180.03	1017.48	1197.51
*	29.000	2678.99	.00	6.01	.00	.00	540.00	.00	1.49	80.63	1119.33	1199.96
*	29.000	2679.78	2.88	6.31	.00	161.50	998.50	.00	2.28	195.82	1008.10	1203.92
*	29.000	2680.23	4.18	7.28	1.00	445.43	1444.47	.10	2.73	205.87	1000.00	1205.87
*	29.500	2683.96	.00	5.17	.00	.00	540.00	.00	.96	126.71	1000.00	1126.71
*	29.500	2684.51	.00	6.62	.00	.00	1160.00	.00	1.51	130.56	1000.00	1130.56
*	29.500	2685.04	.00	7.70	.00	.00	1890.00	.00	2.04	134.28	1000.00	1134.28
*	30.000	2687.19	1.88	4.43	1.19	18.10	521.46	.44	1.19	223.85	1200.00	1423.85
*	30.000	2687.58	3.73	5.69	2.37	107.94	1044.14	7.92	1.58	231.57	1200.00	1431.57
*	30.000	2687.95	4.91	6.59	3.13	234.06	1627.50	28.44	1.95	239.06	1200.00	1439.06
*	31.000	2694.52	2.54	5.22	1.62	217.75	317.84	4.41	2.52	218.28	1022.17	1240.44
*	31.000	2694.93	4.02	6.61	2.57	626.35	511.27	22.38	2.93	232.67	1016.00	1248.67
*	31.000	2695.27	5.23	7.84	3.36	1124.37	711.54	54.09	3.27	244.40	1010.97	1255.37
*	32.000	2701.43	2.27	4.58	.00	2.10	537.89	.00	2.23	195.77	1005.69	1201.46
*	32.000	2701.87	3.18	5.66	.00	12.02	1147.98	.00	2.67	206.72	1001.31	1208.03
*	32.000	2702.33	4.09	6.14	2.23	33.86	1810.56	45.57	3.13	274.11	1000.00	1274.11
*	33.000	2709.09	2.72	4.92	3.64	95.51	335.24	109.25	1.69	195.62	1120.90	1316.51
*	33.000	2709.48	4.33	6.49	5.15	301.71	606.49	251.80	2.08	208.24	1111.92	1320.16
*	33.000	2709.87	5.40	7.48	6.13	579.85	887.35	422.80	2.47	220.82	1102.97	1323.79
*	34.000	2716.71	2.96	5.19	.00	7.42	532.58	.00	1.41	132.39	1092.92	1225.31
*	34.000	2717.26	3.95	6.54	.00	31.22	1128.77	.00	1.96	141.99	1087.43	1229.43
*	34.000	2717.77	4.70	7.57	.00	73.74	1816.26	.00	2.47	151.00	1082.29	1233.28
*	35.000	2723.87	.00	5.26	.00	.00	540.00	.00	1.27	120.60	1017.78	1138.38
*	35.000	2724.44	.00	6.65	.00	.00	1160.00	.00	1.84	128.85	1013.90	1142.75
*	35.000	2724.98	.00	7.70	.00	.00	1890.00	.00	2.38	133.59	1012.54	1146.14

	SECNO	CWSEL	VLOB	VCH	VROB	QLOB	QCH	QROB	DEPTH	TOPMID	SSTA	ENOST
*	36.000	2731.91	.00	4.60	.00	.00	540.00	.00	1.21	185.43	1013.65	1199.09
*	36.000	2732.33	.00	5.84	.00	.00	1160.00	.00	1.63	192.93	1009.16	1202.09
*	36.000	2732.74	.00	6.83	.00	.00	1890.00	.00	2.04	196.44	1008.16	1204.60
*	37.000	2740.34	.00	5.21	.00	.00	540.00	.00	1.94	125.55	1084.79	1210.34
*	37.000	2740.90	.00	6.02	.00	.00	1160.00	.00	2.50	181.74	1029.16	1210.90
*	37.000	2741.32	.00	7.01	.00	.00	1890.00	.00	2.92	185.66	1025.66	1211.32
*	38.000	2749.56	.00	5.30	.00	.00	540.00	.00	1.16	119.78	1024.09	1143.87
*	38.000	2750.15	.00	6.68	.00	.00	1160.00	.00	1.75	126.71	1019.27	1145.98
*	38.000	2750.68	.00	7.77	.00	.00	1890.00	.00	2.28	131.36	1016.58	1147.94
*	38.600	2759.69	.00	6.95	.00	.00	540.00	.00	1.69	51.84	1016.62	1068.46
*	38.600	2760.72	.00	8.62	.00	.00	1160.00	.00	2.72	59.03	1014.56	1073.59
*	38.600	2761.66	.00	9.79	.00	.00	1890.00	.00	3.66	65.59	1012.69	1078.28
	-37.000	2740.34	.00	5.21	.00	.00	540.00	.00	1.94	125.55	1084.79	1210.34
	-37.000	2740.90	.00	6.02	.00	.00	1160.00	.00	2.50	181.74	1029.16	1210.90
	-37.000	2741.32	.00	7.01	.00	.00	1890.00	.00	2.92	185.66	1025.66	1211.32
*	38.500	2748.19	.00	5.15	.00	.00	116.00	.00	1.59	26.46	1014.27	1040.73
*	38.500	2748.66	.00	6.27	.00	.00	224.00	.00	2.06	29.97	1012.51	1042.49
*	38.500	2749.11	.00	7.03	.00	.00	350.00	.00	2.51	33.31	1010.85	1044.15

## South Branch Wash U/S

## SUMMARY PRINTOUT

	SECMO	CWSEL	CRWS	EG	HL	CLOSS	ELMIN	10*KS	K*CMSL	XLCH	SHEAR	FRCH
*	20.000	2618.74	2618.74	2619.58	.00	.00	2617.00	256.70	.00	.00	2.66	1.00
	20.000	2620.60	2619.82	2621.36	.00	.00	2617.00	114.85	.00	.00	2.04	.73
	20.000	2622.70	2621.04	2623.19	.00	.00	2617.00	49.37	.00	.00	1.21	.51
*	21.000	2622.54	2622.54	2623.45	1.24	.05	2619.50	247.05	50.00	50.00	2.80	1.00
*	21.000	2624.34	2624.34	2624.78	.33	.12	2619.50	65.07	50.00	50.00	1.37	.57
*	21.000	2624.71	2624.71	2625.26	.41	-.06	2619.50	81.77	50.00	50.00	1.91	.65
*	22.000	2625.68	2625.68	2626.87	1.88	.13	2622.00	235.42	31.25	80.00	3.45	1.01
*	22.000	2627.47	2627.47	2628.79	1.29	-.12	2622.00	159.25	31.25	80.00	3.48	.89
*	22.000	2628.95	2628.95	2629.76	.62	.10	2622.00	75.12	31.25	80.00	2.33	.65
*	23.000	2628.33	2628.33	2629.86	1.73	.12	2624.00	230.55	26.67	75.00	4.39	1.00
*	23.000	2631.43	2631.43	2632.38	.81	.19	2624.00	107.92	26.67	75.00	2.64	.72
*	23.000	2632.43	2632.43	2633.09	.54	.03	2624.00	71.85	26.67	75.00	2.21	.61
*	23.500	2631.93	2631.93	2633.38	2.76	.01	2627.00	230.21	25.00	120.00	4.16	1.00
*	23.500	2634.40	2634.40	2634.88	.67	.22	2627.00	62.98	25.00	120.00	1.73	.56
*	23.500	2634.77	2634.77	2635.31	.72	-.01	2627.00	76.82	25.00	120.00	2.29	.63
*	23.600	2635.60	2635.60	2636.21	1.46	.69	2630.00	95.39	18.75	160.00	1.93	.66
*	23.600	2636.47	2636.47	2637.06	1.09	-.13	2630.00	89.04	18.75	160.00	2.25	.66
*	23.600	2636.96	2636.96	2637.67	1.13	-.10	2630.00	103.68	18.75	160.00	2.94	.72
	23.700	2637.13	2637.03	2637.74	1.53	.00	2634.00	158.23	29.63	135.00	1.96	.85
*	23.700	2638.18	2638.18	2638.82	1.26	-.15	2634.00	122.04	29.63	135.00	2.28	.76
*	23.700	2638.78	2638.78	2639.46	1.05	-.04	2634.00	112.20	29.63	135.00	2.52	.75
*	23.800	2639.64	2639.64	2640.28	2.64	-.48	2637.50	251.64	25.00	140.00	2.43	.99
*	23.800	2640.55	2640.55	2641.00	1.21	-.04	2637.50	134.16	25.00	140.00	1.99	.77
*	23.800	2640.95	2640.95	2641.54	1.22	-.14	2637.50	148.68	25.00	140.00	2.57	.83
*	24.000	2643.23	2643.23	2643.62	1.99	.15	2640.80	222.34	27.50	120.00	.92	.81
*	24.000	2643.71	2643.71	2644.28	2.22	-.48	2640.80	252.01	27.50	120.00	1.67	.93
*	24.000	2644.25	2644.25	2644.85	1.71	-.20	2640.80	195.38	27.50	120.00	1.88	.87
*	25.000	2650.19	2650.19	2650.92	4.88	.11	2648.00	221.83	32.73	220.00	2.29	.94
*	25.000	2651.23	2651.23	2651.79	2.45	.95	2648.00	111.36	32.73	220.00	1.87	.72
*	25.000	2651.68	2651.68	2652.38	2.75	.63	2648.00	124.98	32.73	220.00	2.45	.79
*	26.000	2657.75	2657.75	2658.20	6.61	-.95	2656.00	314.65	38.10	210.00	1.72	1.01
*	26.000	2658.44	2658.44	2658.85	3.41	-.52	2656.00	162.19	38.10	210.00	1.46	.79
*	26.000	2658.80	2658.80	2659.25	3.13	-.23	2656.00	148.87	38.10	210.00	1.67	.78
*	27.000	2666.14	2666.14	2666.51	6.03	.90	2664.50	233.16	32.69	260.00	1.44	.89
*	27.000	2666.64	2666.64	2667.19	5.51	-.63	2664.50	215.02	32.69	260.00	2.00	.91
*	27.000	2667.09	2667.09	2667.78	5.05	-.56	2664.50	198.62	32.69	260.00	2.41	.92

	SECNO	CWSEL	CRWS	EG	HL	OLOSS	ELMIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
*	28.000	2672.03	2672.03	2672.41	6.59	-1.07	2670.60	346.72	32.11	190.00	1.57	1.03
*	28.000	2672.53	2672.53	2673.13	5.16	-.52	2670.60	271.43	32.11	190.00	2.08	.99
*	28.000	2673.00	2673.00	2673.79	4.47	-.32	2670.60	235.49	32.11	190.00	2.50	.98
*	29.000	2678.99	2678.99	2679.55	5.76	.59	2677.50	288.09	34.50	200.00	2.00	1.00
*	29.000	2679.78	2679.78	2680.33	3.40	.79	2677.50	170.14	34.50	200.00	1.89	.83
*	29.000	2680.23	2680.23	2680.92	3.41	.56	2677.50	170.25	34.50	200.00	2.34	.86
*	29.500	2683.96	2683.96	2684.37	3.83	-.17	2683.00	319.15	45.83	120.00	1.64	1.00
*	29.500	2684.51	2684.51	2685.19	3.29	-.59	2683.00	274.33	45.83	120.00	2.30	1.01
*	29.500	2685.04	2685.04	2685.96	2.96	-.39	2683.00	247.00	45.83	120.00	2.82	1.00
*	30.000	2687.19	2687.19	2687.49	2.50	.12	2686.00	293.87	35.29	85.00	1.27	.94
*	30.000	2687.58	2687.58	2688.05	2.29	.04	2686.00	268.84	35.29	85.00	1.81	.97
*	30.000	2687.95	2687.95	2688.58	2.06	.05	2686.00	241.85	35.29	85.00	2.19	.96
*	31.000	2694.52	2694.52	2694.81	2.67	.92	2692.00	143.65	32.43	185.00	1.36	.75
*	31.000	2694.93	2694.93	2695.37	3.12	.73	2692.00	167.52	32.43	185.00	2.02	.84
*	31.000	2695.27	2695.27	2695.89	3.55	.42	2692.00	190.41	32.43	185.00	2.70	.92
*	32.000	2701.43	2701.43	2701.75	6.92	-2.10	2699.20	368.32	38.92	185.00	1.41	1.03
*	32.000	2701.87	2701.87	2702.36	5.38	-1.09	2699.20	284.56	38.92	185.00	1.82	.98
*	32.000	2702.33	2702.33	2702.90	3.91	-.15	2699.20	206.55	38.92	185.00	1.90	.89
*	33.000	2709.09	2709.09	2709.39	3.96	1.10	2707.40	208.66	43.16	190.00	1.37	.85
*	33.000	2709.48	2709.48	2709.99	4.54	.40	2707.40	238.43	43.16	190.00	2.14	.95
*	33.000	2709.87	2709.87	2710.55	4.39	-.19	2707.40	230.36	43.16	190.00	2.62	.98
*	34.000	2716.71	2716.71	2717.12	6.45	-1.10	2715.30	322.62	39.50	200.00	1.65	1.01
*	34.000	2717.26	2717.26	2717.91	5.36	-.25	2715.30	268.04	39.50	200.00	2.23	1.00
*	34.000	2717.77	2717.77	2718.64	4.80	-.04	2715.30	239.86	39.50	200.00	2.70	.99
*	35.000	2723.87	2723.87	2724.30	6.31	.07	2722.60	315.57	36.50	200.00	1.67	1.01
*	35.000	2724.44	2724.44	2725.13	5.43	-.03	2722.60	271.66	36.50	200.00	2.29	1.01
*	35.000	2724.98	2724.98	2725.90	4.85	-.01	2722.60	242.30	36.50	200.00	2.78	1.00
*	36.000	2731.91	2731.91	2732.24	6.79	-.39	2730.70	357.47	42.63	190.00	1.41	1.02
*	36.000	2732.33	2732.33	2732.86	5.73	-.27	2730.70	301.40	42.63	190.00	1.94	1.01
*	36.000	2732.74	2732.74	2733.46	5.15	-.25	2730.70	271.06	42.63	190.00	2.38	1.01
*	37.000	2740.34	2740.34	2740.76	6.45	.36	2738.40	322.34	38.50	200.00	1.66	1.01
*	37.000	2740.90	2740.90	2741.46	6.18	-.07	2738.40	309.03	38.50	200.00	2.04	1.03
*	37.000	2741.32	2741.32	2742.08	5.50	-.03	2738.40	274.99	38.50	200.00	2.49	1.02
*	38.000	2749.56	2749.56	2750.00	6.73	.02	2748.40	320.69	47.62	210.00	1.70	1.01
*	38.000	2750.15	2750.15	2750.84	5.66	.43	2748.40	269.51	47.62	210.00	2.31	1.01
*	38.000	2750.68	2750.68	2751.62	5.15	.35	2748.40	245.07	47.62	210.00	2.83	1.01
*	38.600	2759.69	2759.69	2760.44	6.29	.73	2758.00	262.20	40.00	240.00	2.45	1.00
*	38.600	2760.72	2760.72	2761.87	5.56	.56	2758.00	231.57	40.00	240.00	3.30	1.01
*	38.600	2761.66	2761.66	2763.14	5.13	.52	2758.00	213.68	40.00	240.00	3.92	1.01

SECNO	CMSEL	CRWS	EG	HL	OLOSS	ELMIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
-37.000	2740.34	.00	2740.76	6.45	.57	2738.40	322.34	.00	200.00	1.66	1.01
-37.000	2740.90	.00	2741.46	6.18	-.06	2738.40	309.03	.00	200.00	2.04	1.03
-37.000	2741.32	.00	2742.08	5.50	.14	2738.40	274.99	.00	200.00	2.49	1.02
* 38.500	2748.19	2748.17	2748.60	7.84	.00	2746.60	305.31	32.80	250.00	1.62	.98
* 38.500	2748.66	2748.66	2749.27	7.24	.25	2746.60	289.74	32.80	250.00	2.15	1.01
* 38.500	2749.11	2749.11	2749.88	6.75	.06	2746.60	269.90	32.80	250.00	2.52	1.01

5/19/92 11:48:44

PAGE 1

THIS RUN EXECUTED 5/19/92 11:48:44

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HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01.02.03  
MODIFICATION -  
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SPLIT FLOW BEING PERFORMED

SF SPLIT FLOW ANALYSIS SECTIONS 39 - 40

TW	SEC 39 TO SEC 40									
WS	5	39	40	26	2.7					
WC	0	2668.0	35	2670.0	100	2672.0	160	2674.0	190	2676.0





X1	41.0	8	1080	1210	160	160	160	0	0	0
GR	2684.0	1000.0	2682.0	1020.0	2682.0	1080.0	2680.5	1120.0	2681.5	1140.0
GR	2680.0	1150.0	2682.0	1210.0	2683.0	1360.0				
X1	42.0	11	1040	1100	185	170	180	0	0	0
X3						1130				
GR	2690.0	1000.0	2688.0	1015.0	2688.0	1040.0	2686.0	1050.0	2685.0	1055.0
GR	2686.0	1070.0	2687.5	1100.0	2687.5	1140.0	2688.0	1170.0	2688.0	1250.0
GR	2689.0	1290.0								
X1	43.0	9	1035	1070	140	140	140	0	0	0
X3						1165				
GR	2696.0	1000.0	2694.0	1035.0	2690.0	1050.0	2689.5	1052.0	2690.0	1055.0
GR	2692.0	1070.0	2692.0	1110.0	2693.0	1165.0	2694.0	1245.0		
X1	44.0	10	1045	1080	130	130	130	0	0	0
GR	2700.0	1000.0	2698.0	1020.0	2696.0	1045.0	2694.0	1055.0	2696.0	1080.0
GR	2695.0	1090.0	2696.0	1120.0	2696.0	1155.0	2698.0	1190.0	2700.0	1195.0
X1	45.0	7	1105	1215	145	145	145	0	0	0
GR	2704.0	1000.0	2702.0	1055.0	2702.0	1105.0	2700.0	1145.0	2700.0	1155.0
GR	2702.0	1215.0	2704.0	1305.0						
X1	46.0	7	1030	1115	240	140	200	0	0	0
GR	2710.0	1000.0	2708.0	1030.0	2706.7	1040.0	2708.0	1065.0	2707.4	1090.0
GR	2708.0	1115.0	2710.0	1120.0						
X1	46.5	6	1075	1145	130	150	140	0	0	0
X3				1075.0						
GR	2716.0	1000.0	2714.0	1040.0	2712.5	1075.0	2712.0	1080.0	2714.0	1145.0
GR	2716.0	1200.0								
QT	3	204	409	632						
X1	47.0	7	1015	1130	50	70	60	0	0	0
GR	2720.0	1000.0	2716.0	1015.0	2715.0	1045.0	2714.4	1080.0	2714.4	1100.0
GR	2716.0	1130.0	2720.0	1165.0						
QT	3	130	252	380						
X1	48.0	6	1000	1180	200	200	200	0	0	0
GR	2728.0	1000.0	2722.0	1035.0	2721.0	1055.0	2721.0	1090.0	2722.0	1115.0
GR	2728.0	1180.0								
X1	49.0	6	1000	1220	200	200	200	0	0	0
GR	2740.0	1000.0	2730.0	1035.0	2728.5	1050.0	2728.5	1200.0	2729.5	1210.0
GR	2738.0	1220.0								
X1	50.0	8	1000	1190	200	200	200	0	0	0
GR	2740.0	1000.0	2736.0	1020.0	2736.0	1050.0	2735.5	1070.0	2735.0	1115.0
GR	2736.0	1145.0	2736.0	1155.0	2740.0	1190.0				

TW SEC 39 TO SEC 40

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	BSSNO	USSNO
.31	.33	4.96	.31	.33	4.96	6	2668.135	2674.792	39.000	40.000

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
T3 South Branch Wash U/S2 25-year

J1	ICHECK	INQ	MINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	0	0.0000	0	0	0	2643.71	0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2	0	-1	0	0	0	-1	0	0	15

TW SEC 39 TO SEC 40

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	DSSMO	USSMO
8.33	8.50	2.02	8.33	8.50	2.02	5	2668.471	2675.126	39.000	40.000

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
T3 South Branch Wash U/S2 100-year

J1	ICHECK	INQ	MINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	4	0	0	0.0000	0	0	0	2644.25	0
J2	MPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLOC	IBW	CHNIM	ITRACE
	15	0	-1	0	0	0	-1	0	0	15

TW SEC 39 TO SEC 40

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
55.41	55.12	.53	55.41	55.12	.53	5	2668.733	2675.378	39.000	40.000

THIS RUN EXECUTED 5/19/92 11:50: 7

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HEC2 RELEASE DATED SEP 88 UPOATED SEPT 1989

ERROR CORR - 01.02.03  
 MODIFICATION -

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NOTE- ASTERISK (\*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

South Branch Wash U/S2

SUMMARY PRINTOUT

SECNO	CWSEL	VLOB	VCH	YROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	ENOST
* 24.000	2643.25	.00	3.68	5.50	.00	271.67	468.33	2.45	195.98	1115.84	1471.78
* 24.000	2643.75	.00	5.31	6.27	.00	695.00	865.00	2.95	244.26	1105.36	1490.46
24.000	2644.25	1.15	6.15	6.25	3.99	1187.49	1358.51	3.45	366.61	1072.22	1500.00
* 25.000	2650.19	1.03	6.86	1.03	.80	736.83	2.38	2.19	97.36	1076.89	1264.24
* 25.000	2651.23	2.53	6.75	2.81	80.92	1179.73	299.35	3.23	283.22	1032.82	1316.04
* 25.000	2651.68	3.29	7.90	3.95	198.17	1615.97	735.87	3.68	319.69	1013.45	1333.13
* 26.000	2657.75	.00	5.35	.00	.00	740.00	.00	1.75	157.76	1124.82	1282.59
* 26.000	2658.44	1.54	5.37	2.34	83.78	1394.44	81.78	2.44	513.51	864.21	1377.71
* 26.000	2658.86	2.12	5.63	3.24	433.04	1882.76	234.20	2.86	746.28	633.72	1380.00
* 39.000	2668.14	1.53	4.30	.97	4.13	273.29	.27	1.14	124.06	980.00	1104.06
* 39.000	2668.47	3.26	5.35	2.08	30.68	520.05	6.93	1.47	134.14	980.00	1114.14
* 39.000	2668.73	4.17	6.04	2.69	61.13	744.79	21.67	1.73	141.99	980.00	1121.99
* 40.000	2674.79	.00	4.12	.00	.00	278.00	.00	.79	130.20	1024.16	1180.94
* 40.000	2675.13	.00	4.83	.00	.00	566.00	.00	1.13	165.98	1017.47	1183.45
* 40.000	2675.38	.00	5.52	.00	.00	883.00	.00	1.38	172.91	1012.43	1185.34
* 41.000	2681.47	.00	4.53	.00	.00	278.00	.00	1.47	98.98	1094.19	1194.03
* 41.000	2681.88	.00	5.29	.00	.00	566.00	.00	1.88	123.08	1083.26	1206.34
* 41.000	2682.25	1.92	5.47	1.22	29.37	847.92	5.71	2.25	230.00	1017.50	1247.50
42.000	2687.14	.00	5.67	.00	.00	278.00	.00	2.14	48.47	1044.31	1092.78
* 42.000	2687.81	.00	6.32	2.25	.00	545.08	20.92	2.81	89.05	1040.95	1130.00
* 42.000	2688.28	1.88	6.85	3.73	13.61	782.42	86.97	3.28	117.08	1012.91	1130.00
* 43.000	2692.37	.00	5.43	1.99	.00	240.66	37.34	2.87	89.47	1041.10	1130.57
* 43.000	2692.88	.00	6.40	3.31	.00	379.87	186.13	3.38	119.08	1039.21	1158.29
* 43.000	2693.25	.00	7.02	4.23	.00	498.42	384.58	3.75	127.18	1037.82	1165.00



	SECNO	CWSEL	YLOB	VCH	VROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	ENDST
*	44.000	2696.10	.05	5.00	3.05	.00	193.16	84.84	2.10	113.11	1043.71	1156.81
*	44.000	2696.51	1.85	6.03	4.03	3.02	318.78	244.20	2.51	125.34	1038.61	1163.95
*	44.000	2696.80	2.60	7.09	5.01	10.32	445.72	426.95	2.80	133.89	1035.05	1168.94
*	45.000	2701.31	.00	4.96	.00	.00	278.00	.00	1.31	75.50	1118.80	1194.30
*	45.000	2701.80	.00	5.71	.00	.00	566.00	.00	1.80	100.09	1108.96	1209.05
*	45.000	2702.24	1.84	5.84	1.18	23.85	857.57	1.58	2.24	177.65	1048.31	1225.95
*	46.000	2708.24	1.49	4.77	.06	.64	277.35	.00	1.54	89.20	1026.40	1115.60
*	46.000	2708.67	2.64	5.89	2.52	8.77	555.84	1.39	1.97	96.65	1020.02	1116.66
*	46.000	2709.04	3.36	6.77	3.20	27.05	851.65	4.30	2.34	103.13	1014.46	1117.59
*	46.500	2713.66	.00	5.38	.00	.00	278.00	.00	1.66	58.84	1075.00	1133.84
*	46.500	2714.22	.00	6.34	1.26	.00	565.15	.84	2.22	76.07	1075.00	1151.07
*	46.500	2714.69	.00	7.11	2.46	.00	866.94	16.06	2.69	88.94	1075.00	1163.94
	47.000	2715.42	.00	3.54	.00	.00	204.00	.00	1.02	86.47	1032.56	1119.03
	47.000	2715.86	.00	4.05	.00	.00	409.00	.00	1.46	108.28	1019.14	1127.41
	47.000	2716.22	.04	4.42	.90	.00	631.79	.21	1.82	117.87	1014.14	1132.01
*	48.000	2721.65	.00	4.04	.00	.00	130.00	.00	.65	64.20	1042.02	1106.22
*	48.000	2721.95	.00	4.73	.00	.00	252.00	.00	.95	77.59	1036.07	1113.66
*	48.000	2722.17	.00	5.32	.00	.00	380.00	.00	1.17	82.85	1034.00	1116.85
	49.000	2728.82	.00	2.72	.00	.00	130.00	.00	.32	156.25	1046.88	1203.12
	49.000	2728.96	.00	3.57	.00	.00	252.00	.00	.46	159.13	1045.43	1204.57
	49.000	2729.08	.00	4.22	.00	.00	380.00	.00	.58	161.56	1044.22	1205.78
	50.000	2735.79	.00	3.70	.00	.00	130.00	.00	.79	80.13	1058.50	1138.63
	50.000	2736.08	.00	3.88	.00	.00	252.00	.00	1.08	136.14	1019.58	1155.73
*	50.000	2736.22	.00	4.50	.00	.00	380.00	.00	1.22	138.09	1018.88	1156.97

## South Branch Wash U/S2

## SUMMARY PRINTOUT

	SECNO	CWSEL	CRWS	EG	HL	OLOSS	ELMIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
*	24.000	2643.25	2643.25	2643.62	.00	.00	2640.80	208.71	.00	.00	.88	.79
*	24.000	2643.75	2643.75	2644.28	.00	.00	2640.80	229.68	.00	.00	1.57	.89
*	24.000	2644.25	2644.25	2644.85	.00	.00	2640.80	193.92	.00	.00	1.87	.87
*	25.000	2650.19	2650.19	2650.92	4.88	-.04	2648.00	221.94	32.73	220.00	2.29	.94
*	25.000	2651.23	2651.23	2651.79	2.47	.86	2648.00	112.21	32.73	220.00	1.88	.73
*	25.000	2651.68	2651.68	2652.38	2.75	.63	2648.00	124.93	32.73	220.00	2.45	.79
*	26.000	2657.75	2657.75	2658.20	6.58	-.93	2656.00	313.25	38.10	210.00	1.71	1.01
*	26.000	2658.44	2658.44	2658.85	3.41	-.51	2656.00	162.19	38.10	210.00	1.46	.79
*	26.000	2658.86	2658.86	2659.25	2.67	.01	2656.00	127.24	38.10	210.00	1.48	.73
*	39.000	2668.14	2668.14	2668.42	8.39	.05	2667.00	310.90	40.74	270.00	1.23	.95
*	39.000	2668.47	2668.47	2668.90	7.38	-1.50	2667.00	273.48	40.74	270.00	1.66	.96
*	39.000	2668.73	2668.73	2669.27	6.84	-1.66	2667.00	253.20	40.74	270.00	1.95	.96
*	40.000	2674.79	2674.79	2675.06	7.13	-.61	2674.00	375.34	36.84	190.00	1.01	1.11
*	40.000	2675.13	2675.13	2675.49	6.46	-.62	2674.00	339.86	36.84	190.00	1.50	1.01
*	40.000	2675.38	2675.38	2675.85	5.90	-.54	2674.00	310.37	36.84	190.00	1.79	1.01
*	41.000	2681.47	2681.47	2681.79	5.71	.16	2680.00	357.16	37.50	160.00	1.37	1.02
*	41.000	2681.88	2681.88	2682.31	4.95	.25	2680.00	309.41	37.50	160.00	1.68	1.00
*	41.000	2682.25	2682.25	2682.70	3.48	.61	2680.00	217.50	37.50	160.00	1.62	.88
*	42.000	2687.14	2687.12	2687.64	5.80	.05	2685.00	293.29	27.78	180.00	1.85	.99
*	42.000	2687.81	2687.81	2688.41	4.01	.70	2685.00	222.99	27.78	180.00	2.03	.92
*	42.000	2688.28	2688.28	2688.95	3.31	.34	2685.00	184.06	27.78	180.00	2.19	.88
*	43.000	2692.37	2692.37	2692.78	2.20	.67	2689.50	157.03	32.14	140.00	1.50	.77
*	43.000	2692.88	2692.88	2693.36	2.25	.38	2689.50	160.88	32.14	140.00	1.93	.81
*	43.000	2693.25	2693.25	2693.80	2.27	.16	2689.50	161.93	32.14	140.00	2.23	.83
*	44.000	2696.10	2696.10	2696.42	2.64	-.29	2694.00	203.26	34.62	130.00	1.40	.84
*	44.000	2696.51	2696.51	2696.94	2.52	-.21	2694.00	194.00	34.62	130.00	1.83	.86
*	44.000	2696.80	2696.80	2697.38	2.77	-.32	2694.00	213.27	34.62	130.00	2.39	.93
*	45.000	2701.31	2701.31	2701.69	4.88	-.95	2700.00	336.80	41.38	145.00	1.56	1.02
*	45.000	2701.80	2701.80	2702.31	4.39	-.76	2700.00	302.65	41.38	145.00	1.87	1.01
*	45.000	2702.24	2702.24	2702.76	3.09	.01	2700.00	213.33	41.38	145.00	1.78	.89
*	46.000	2708.24	2708.24	2708.59	6.94	-.10	2706.70	347.17	33.50	200.00	1.48	1.02
*	46.000	2708.67	2708.67	2709.20	5.56	.25	2706.70	277.77	33.50	200.00	1.92	.99
*	46.000	2709.04	2709.04	2709.73	5.01	-.31	2706.70	249.54	33.50	200.00	2.30	.98
*	46.500	2713.66	2713.66	2714.11	4.55	.18	2712.00	325.08	37.86	140.00	1.78	1.01
*	46.500	2714.22	2714.22	2714.84	3.86	.04	2712.00	275.52	37.86	140.00	2.19	.99
*	46.500	2714.69	2714.69	2715.46	3.23	.15	2712.00	230.51	37.86	140.00	2.51	.95

SECNO	CWSEL	CRWS	EG	HL	OLOSS	ELMIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
47.000	2715.42	2715.28	2715.61	1.48	.03	2714.40	198.38	40.00	60.00	.82	.77
47.000	2715.86	2715.66	2716.12	1.24	.04	2714.40	164.54	40.00	60.00	.96	.74
47.000	2716.22	2715.96	2716.53	1.02	.05	2714.40	134.20	40.00	60.00	1.04	.70
* 48.000	2721.65	2721.65	2721.90	7.52	-1.76	2721.00	375.83	33.00	200.00	1.18	1.01
* 48.000	2721.95	2721.95	2722.29	6.77	-1.71	2721.00	338.75	33.00	200.00	1.45	1.01
* 48.000	2722.17	2722.17	2722.61	6.33	-1.78	2721.00	316.56	33.00	200.00	1.70	1.01
49.000	2728.82	2728.78	2728.93	7.02	.01	2728.50	328.84	37.50	200.00	.63	.87
49.000	2728.96	2728.94	2729.16	6.85	.01	2728.50	345.99	37.50	200.00	.96	.95
49.000	2729.08	2729.08	2729.36	6.73	.02	2728.50	356.55	37.50	200.00	1.24	1.00
50.000	2735.79	2735.78	2736.00	7.04	.03	2735.00	376.46	32.50	200.00	1.03	.98
50.000	2736.08	2736.07	2736.32	7.15	.01	2735.00	369.46	32.50	200.00	1.10	.99
* 50.000	2736.22	2736.22	2736.54	7.16	-.00	2735.00	357.87	32.50	200.00	1.37	1.01

THIS RUN EXECUTED 1/29/92 11:35:54

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HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01.02.03  
MODIFICATION -

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T1 South Branch Upper Carmack Sub-Basin Mgmt Studv  
T2 Prepared for Pima County under Contract #07-04-S-115368-0891  
T3 Glenhurst Wash 5-year

J1	ICHECK	INQ	MINV	IOIR	STRT	METRIC	HVIMS	Q	WSEL	FQ
	0	2	0	0	0.0900	0	0	0	2774.0	0
J2	MPROF	IPLOT	PRFVS	XSECV	XSECH	FW	ALLOC	IBW	CHNTM	ITRACE
	1	0	-1	0	0	0	-1	0	0	15

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	55	26	56	13	14	15	8	4
53	54	0	38	1	2	3	11	12	42
5	33	39	67	68					

J6	INLEQ	ICOPY	SUBDIV	STRTDS	RMILE
	1				

MC	0.045	0.045	0.045	0.1	0.3					
QT	3	73	162	259						
X1	401.0	6	1000	1220	0	0	0	0	0	0
X3				1055		1155.0				
GR	2774.0	1000.0	2774.0	1085.0	2773.5	1110.0	2773.5	1170.0	2774.0	1200.0
GR	2774.5	1220.0								
X1	402.0	4	1000	1190	95	95	95	0	0	0
X3				1035		1110.0				
GR	2786.0	1000.0	2782.5	1035.0	2782.5	1160.0	2784.0	1190.0		
X1	403.0	4	1000	1070	70	70	70	0	0	0
GR	2794.0	1000.0	2788.0	1040.0	2788.0	1050.0	2790.0	1070.0		
X1	404.0	5	1000	1045	95	95	95	0	0	0
GR	2800.0	1000.0	2798.0	1010.0	2796.0	1025.0	2795.0	1040.0	2796.0	1045.0

X1	405.0	10	1000	1105	60	60	60	0	0	0
GR	2810.0	1000.0	2804.0	1012.0	2803.0	1020.0	2804.0	1040.0	2804.5	1050.0
GR	2804.0	1060.0	2802.0	1080.0	2801.5	1095.0	2802.0	1105.0	2802.0	1120.0
QT	3	159	316	486						
X1	405.5	10	1000	1100	40	40	40	0	0	0
X3						1150.0				
GR	2810.0	1000.0	2808.0	1015.0	2806.0	1030.0	2805.5	1050.0	2805.2	1070.0
GR	2805.5	1080.0	2805.3	1100.0	2805.0	1120.0	2806.0	1145.0	2806.0	1205.0
X1	406.0	8	1000	1070	40	40	40	0	0	0
GR	2814.0	1000.0	2810.0	1015.0	2808.7	1030.0	2809.0	1070.0	2808.0	1095.0
GR	2808.0	1100.0	2810.0	1125.0	2810.0	1185.0				
X1	407.0	8	1000	1060	80	80	80	0	0	0
GR	2820.0	1000.0	2816.0	1015.0	2816.0	1060.0	2816.0	1100.0	2817.0	1120.0
GR	2817.0	1135.0	2818.0	1150.0	2820.0	1165.0				
X1	408.0	8	1000	1055	95	95	95	0	0	0
GR	2830.0	1000.0	2826.0	1020.0	2825.0	1035.0	2826.0	1055.0	2826.0	1105.0
GR	2827.0	1140.0	2828.0	1150.0	2830.0	1160.0				
X1	409.0	9	1000	1070	100	100	100	0	0	0
GR	2840.0	1000.0	2834.0	1020.0	2834.0	1030.0	2834.5	1035.0	2834.0	1050.0
GR	2836.0	1070.0	2835.0	1090.0	2836.0	1100.0	2840.0	1120.0		

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
T3 Glenhurst Wash 25-year

J1	ICHECK	INQ	MINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	3	0	0	0.0900	0	0	0	2774.0	0
J2	MPROF	IPLOT	PRFVS	XSECV	XSECH	FM	ALLOC	IBW	CHNTH	ITRACE
	2	0	-1	0	0	0	-1	0	0	15

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
T3 Glenhurst Wash 100-year

J1	ICHECK	INQ	NINY	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	4	0	0	0.0900	0	0	0	2774.0	0
J2	MPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIN	ITRACE
	15	0	-1	0	0	0	-1	0	0	15

THIS RUN EXECUTED 1/29/92 11:36: 8

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 HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01.02.03  
 MODIFICATION -

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NOTE- ASTERISK (\*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Glenhurst Wash

SUMMARY PRINTOUT

	SECHO	CMSEL	VLOB	VCH	VROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	EMOST
*	401.000	2773.90	.00	3.31	.00	.00	73.00	.00	.40	65.03	1089.97	1155.00
*	401.000	2774.14	.00	3.76	.00	.00	162.00	.00	.64	100.00	1055.00	1155.00
*	401.000	2774.30	.00	4.38	.00	.00	259.00	.00	.80	100.00	1055.00	1155.00
*	402.000	2782.81	.00	3.16	.00	.00	73.00	.00	.31	75.00	1035.00	1110.00
*	402.000	2783.02	.00	4.13	.00	.00	162.00	.00	.52	75.00	1035.00	1110.00
*	402.000	2783.22	.00	4.83	.00	.00	259.00	.00	.72	75.00	1035.00	1110.00
*	403.000	2788.91	.00	4.56	.00	.00	73.00	.00	.91	25.18	1033.93	1059.11
*	403.000	2789.39	.00	5.43	.00	.00	162.00	.00	1.39	33.09	1030.76	1063.85
*	403.000	2789.76	.00	5.97	.00	.00	259.00	.00	1.76	39.32	1028.27	1067.59
*	404.000	2796.25	.00	4.76	.00	.00	73.00	.00	1.25	21.91	1023.09	1045.00
*	404.000	2796.76	.00	5.93	.00	.00	162.00	.00	1.76	25.69	1019.31	1045.00
*	404.000	2797.18	.00	6.67	.00	.00	259.00	.00	2.18	28.85	1016.15	1045.00
*	405.000	2802.32	.00	3.98	2.84	.00	59.21	13.79	.82	43.23	1076.77	1120.00
*	405.000	2802.64	.00	5.02	4.30	.00	121.09	40.91	1.14	46.35	1073.65	1120.00
*	405.000	2802.91	.00	5.69	5.24	.00	187.80	71.20	1.41	49.06	1070.94	1120.00
*	405.500	2805.80	.00	3.15	4.06	.00	73.60	85.40	.80	102.07	1037.96	1140.03
*	405.500	2806.05	.00	4.03	4.78	.00	162.32	153.68	1.05	120.40	1029.60	1150.00
*	405.500	2806.25	.00	4.78	5.41	.00	258.97	227.03	1.25	121.87	1028.13	1150.00
*	406.000	2809.16	.00	2.31	4.14	.00	31.59	127.41	1.16	89.84	1024.68	1114.51
*	406.000	2809.42	.00	3.59	5.19	.00	93.25	222.74	1.42	96.15	1021.65	1117.80
*	406.000	2809.67	.00	4.38	5.77	.00	167.96	318.04	1.67	102.12	1018.78	1120.90
*	407.000	2816.47	.00	3.82	3.72	.00	81.60	77.40	.47	96.05	1013.26	1109.31
*	407.000	2816.73	.00	4.72	4.55	.00	159.46	156.54	.73	102.29	1012.27	1114.56
*	407.000	2816.93	.00	5.55	5.30	.00	242.11	243.88	.93	107.17	1011.50	1118.67



	SECNO	CWSEL	VLOB	VCH	YROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	ENOST
*	408.000	2826.32	.00	4.15	2.19	.00	120.15	38.85	1.32	97.77	1018.40	1116.18
*	408.000	2826.57	.00	5.23	3.36	.00	200.52	115.47	1.57	107.91	1017.14	1125.05
*	408.000	2826.81	.00	5.80	4.07	.00	275.05	210.95	1.81	117.32	1015.96	1133.28
*	409.000	2835.01	.00	4.93	.06	.00	159.00	.00	1.01	43.92	1016.62	1090.13
*	409.000	2835.50	.00	5.60	2.09	.00	308.14	7.86	1.50	65.02	1015.00	1095.00
*	409.000	2835.85	.00	6.18	2.89	.00	454.46	31.53	1.85	80.31	1013.82	1098.53

## Glenhurst Wash

## SUMMARY PRINTOUT

	SECNO	CWSEL	CRISW	EG	HL	OLOSS	ELMIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
*	401.000	2773.90	2773.90	2774.07	.00	.00	2773.50	429.23	.00	.00	.91	1.00
*	401.000	2774.14	2774.14	2774.36	.00	.00	2773.50	402.01	.00	.00	1.08	1.01
*	401.000	2774.30	2774.30	2774.60	.00	.00	2773.50	359.98	.00	.00	1.33	1.00
*	402.000	2782.81	2782.81	2782.96	4.22	-.07	2782.50	444.64	94.74	95.00	.85	1.00
*	402.000	2783.02	2783.02	2783.29	3.60	.12	2782.50	378.86	94.74	95.00	1.24	1.01
*	402.000	2783.22	2783.22	2783.58	3.25	.10	2782.50	342.61	94.74	95.00	1.53	1.01
*	403.000	2788.91	2788.91	2789.23	2.45	.34	2788.00	350.24	78.57	70.00	1.39	1.01
*	403.000	2789.39	2789.39	2789.84	2.18	.27	2788.00	312.00	78.57	70.00	1.76	1.01
*	403.000	2789.76	2789.76	2790.31	2.02	.23	2788.00	288.78	78.57	70.00	1.99	1.00
*	404.000	2796.25	2796.25	2796.61	3.26	.04	2795.00	343.28	73.68	95.00	1.50	1.00
*	404.000	2796.76	2796.76	2797.30	2.95	.03	2795.00	310.89	73.68	95.00	2.06	1.01
*	404.000	2797.18	2797.18	2797.87	2.78	.02	2795.00	292.58	73.68	95.00	2.46	1.01
*	405.000	2802.32	2802.32	2802.55	2.06	.01	2801.50	343.19	108.33	60.00	1.13	.97
*	405.000	2802.64	2802.64	2803.00	1.97	-.03	2801.50	327.59	108.33	60.00	1.57	1.01
*	405.000	2802.91	2802.91	2803.39	1.86	-.03	2801.50	310.45	108.33	60.00	1.88	1.02
*	405.500	2805.80	2805.80	2806.01	1.34	.02	2805.00	334.75	87.50	40.00	.79	.90
*	405.500	2806.05	2806.05	2806.36	1.26	.03	2805.00	314.77	87.50	40.00	1.12	.94
*	405.500	2806.25	2806.25	2806.65	1.22	.02	2805.00	305.18	87.50	40.00	1.44	.97
*	406.000	2809.16	2809.16	2809.39	.97	.16	2808.00	242.01	75.00	40.00	.46	.74
*	406.000	2809.42	2809.42	2809.78	1.08	.10	2808.00	270.84	75.00	40.00	.91	.86
*	406.000	2809.67	2809.67	2810.11	1.04	.10	2808.00	259.27	75.00	40.00	1.21	.89
*	407.000	2816.47	2816.47	2816.69	3.05	-.56	2816.00	381.78	100.00	80.00	1.09	1.00
*	407.000	2816.73	2816.73	2817.06	2.61	-.22	2816.00	325.69	100.00	80.00	1.44	.99
*	407.000	2816.93	2816.93	2817.39	2.61	-.26	2816.00	326.18	100.00	80.00	1.83	1.03
*	408.000	2826.32	2826.32	2826.54	2.06	.57	2825.00	217.08	94.74	95.00	1.07	.82
*	408.000	2826.57	2826.57	2826.91	2.35	.32	2825.00	247.14	94.74	95.00	1.56	.92
*	408.000	2826.81	2826.81	2827.22	2.27	.35	2825.00	239.25	94.74	95.00	1.81	.93
*	409.000	2835.01	2835.01	2835.39	3.35	-.54	2834.00	334.71	90.00	100.00	1.26	1.12
*	409.000	2835.50	2835.50	2835.98	2.55	.00	2834.00	255.38	90.00	100.00	1.59	.99
*	409.000	2835.85	2835.85	2836.42	2.39	.05	2834.00	238.85	90.00	100.00	1.95	.95

THIS RUN EXECUTED 11/25/91 10:36:57

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HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01.02.03  
MODIFICATION -  
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SPLIT FLOW BEING PERFORMED

SF SPLIT FLOW ANALYSIS SECTIONS 112 - 115

TW	SEC 112 TO 113			
WS	3	112	113	-1 2.6
WC	0	2580.8	40 2582.0	70 2582.5

TW	SEC 113 TO 114			
WS	7	113	114	-1 2.6
WC	0	2582.5	30 2582.9	31 2588.9
WC	95	2584.0	120 2584.6	85 2588.9
				86 2583.9

TW	SEC 114 TO 115			
WS	6	114	115	-1 2.6
WC	0	2584.6	60 2586.0	120 2587.0
WC	230	2590.0	160 2588.0	180 2590.0

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
 T2 Prepared for Pima County under Contract #07-04-S-115368-0891  
 T3 Shadow Mtn. Drainageway 5-year

J1	ICHECK	INQ	MINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	0	0.0150	0	0	0	2562.0	0
J2	MPROF	IPLOT	PRFYS	XSECV	XSECH	FN	ALLDC	IBW	CHMIM	ITRACE
	1	0	-1	0	0	0	-1	0	0	15

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38	1	55	26	56	13	14	15	8	4
53	54	0	38	1	2	3	11	12	42
5	33	39	67	68					

J6	IHLQ	ICOPY	SUBDIV	STRTDS	RMILE
	1				

NC	0.045	0.045	0.045	0.1	0.3					
QT	3	206	385	604						
X1	101.0	11	2230	2255	0	0	0	0	0	0
X3						2360				
GR	2542.0	2110.0	2540.0	2210.0	2540.0	2230.0	2538.0	2245.0	2540.0	2255.0
GR	2540.8	2270.0	2540.6	2300.0	2540.0	2320.0	2540.6	2360.0	2540.0	2430.0
GR	2542.0	2570.0								
X1	101.5	14	1110	1145	120	120	120	0	0	0
X3						1210				
GR	2544.3	1000.0	2544.0	1030.0	2542.0	1065.0	2542.0	1075.0	2542.8	1110.0
GR	2540.0	1120.0	2540.0	1125.0	2542.0	1135.0	2543.0	1145.0	2543.0	1160.0
GR	2542.3	1180.0	2543.2	1210.0	2542.2	1255.0	2544.0	1425.0		
X1	102.0	12	2355	2370	120	120	120	0	0	0
GR	2546.5	2210.0	2546.0	2280.0	2544.0	2310.0	2544.0	2355.0	2542.0	2365.0
GR	2544.0	2370.0	2545.0	2395.0	2545.0	2450.0	2546.0	2570.0	2547.0	2750.0
GR	2546.0	2850.0	2548.0	2990.0						
X1	103.0	8	2190	2250	135	135	135	0	0	0
GR	2549.0	2050.0	2548.0	2140.0	2546.0	2190.0	2544.5	2215.0	2546.0	2250.0
GR	2548.0	2340.0	2549.0	2590.0	2550.0	2870.0				

X1	103.5	10	2190	2240	150	140	145	0	0	0
GR	2552.0	1995.0	2550.0	2090.0	2550.0	2190.0	2548.0	2195.0	2547.3	2220.0
GR	2548.0	2225.0	2550.0	2240.0	2550.0	2310.0	2551.3	2410.0	2552.0	2870.0
MC	0.045	0.045	0.035	0.1	0.3					
QT	3	205	360	475						
X1	104.0	9	1055	1120	155	135	145	0	0	0
GR	2554.0	1000.0	2553.0	1020.0	2553.3	1055.0	2552.0	1070.0	2550.3	1080.0
GR	2550.3	1095.0	2552.0	1105.0	2552.3	1120.0	2554.0	1220.0		
X1	105.0	9	1025	1085	165	150	160	0	0	0
GR	2560.0	1000.0	2557.0	1025.0	2556.0	1035.0	2554.0	1050.0	2553.6	1055.0
GR	2554.0	1065.0	2556.0	1070.0	2556.7	1085.0	2557.7	1165.0		
X1	106.0	7	1060	1120	170	170	170	0	0	0
GR	2562.9	1000.0	2562.0	1060.0	2560.0	1080.0	2558.0	1090.0	2560.0	1100.0
GR	2561.5	1120.0	2561.8	1200.0						
X1	107.0	7	1080	1140	145	145	145	0	0	0
GR	2567.4	1000.0	2567.0	1060.0	2566.0	1080.0	2564.0	1095.0	2562.0	1105.0
GR	2564.0	1120.0	2566.0	1140.0						
X1	108.0	6	1015	1075	130	130	130	0	0	0
GR	2569.8	1000.0	2569.5	1015.0	2568.0	1035.0	2566.2	1045.0	2568.0	1055.0
GR	2569.4	1075.0								
X1	109.0	8	1020	1065	145	145	145	0	0	0
GR	2572.6	1000.0	2572.6	1020.0	2572.0	1030.0	2570.0	1040.0	2569.0	1050.0
GR	2570.0	1055.0	2572.0	1065.0	2573.0	1075.0				
X1	110.0	6	1000	1060	125	125	125	0	0	0
GR	2575.1	1000.0	2574.0	1010.0	2572.0	1025.0	2572.0	1035.0	2574.0	1040.0
GR	2576.0	1060.0								
X1	111.0	7	1010	1070	95	95	95	0	0	0
GR	2577.5	1000.0	2577.3	1010.0	2576.0	1025.0	2574.4	1035.0	2574.4	1045.0
GR	2576.0	1055.0	2577.4	1070.0						
X1	112.0	7	1000	1100	145	165	155	0	0	0
GR	2580.8	1000.0	2580.0	1040.0	2578.0	1055.0	2577.6	1065.0	2578.0	1070.0
GR	2580.0	1075.0	2580.8	1100.0						
X1	113.0	8	1025	1085	75	140	120	0	0	0
GR	2582.5	1000.0	2582.0	1025.0	2581.3	1030.0	2581.0	1040.0	2580.4	1050.0
GR	2582.0	1060.0	2584.0	1065.0	2584.3	1085.0				
X1	114.0	7	1025	1085	120	140	130	0	0	0
GR	2584.6	1000.0	2584.0	1010.0	2583.6	1025.0	2582.0	1050.0	2584.0	1060.0
GR	2586.0	1070.0	2587.4	1085.0						

X1	115.0	8	1000	1100	190	190	190	0	0	0
GR	2590.0	1000.0	2586.0	1010.0	2585.0	1020.0	2586.0	1025.0	2586.5	1035.0
GR	2586.5	1065.0	2588.0	1080.0	2589.0	1100.0				
X1	115.5	9	1030	1065	60	60	60	0	0	0
GR	2591.0	1000.0	2590.0	1030.0	2588.0	1040.0	2586.0	1050.0	2588.0	1060.0
GR	2590.0	1065.0	2590.7	1075.0	2590.7	1105.0	2591.0	1140.0		
X1	116.0	8	1055	1160	105	105	105	0	0	0
GR	2594.0	1000.0	2592.0	1055.0	2592.0	1095.0	2591.0	1110.0	2591.0	1140.0
GR	2592.0	1160.0	2593.6	1185.0	2593.6	1210.0				
NC	0.045	0.045	0.045	0.1	0.3					
X1	117.0	8	1080	1120	220	220	220	0	0	0
GR	2600.0	1000.0	2598.0	1080.0	2596.0	1100.0	2598.0	1120.0	2598.0	1175.0
GR	2598.0	1195.0	2598.0	1210.0	2598.8	1240.0				
X1	118.0	11	1190	1225	200	200	200	0	0	0
GR	2606.0	1000.0	2605.0	1155.0	2604.0	1190.0	2602.0	1200.0	2601.5	1205.0
GR	2602.0	1210.0	2603.0	1225.0	2603.5	1280.0	2603.5	1340.0	2603.5	1360.0
GR	2604.0	1380.0								
X1	119.0	9	1170	1215	210	250	230	0	0	0
GR	2611.6	1000.0	2611.0	1075.0	2610.7	1130.0	2610.7	1170.0	2610.0	1185.0
GR	2608.0	1190.0	2610.0	1215.0	2611.4	1295.0	2612.0	1365.0		
X1	120.0	7	1055	1075	140	140	140	0	0	0
X3				1035		1095				
GR	2616.0	1000.0	2614.0	1055.0	2612.0	1065.0	2614.0	1075.0	2614.5	1095.0
GR	2614.5	1150.0	2616.0	1190.0						

TW SEC 112 TO 113

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	OSWS	USWS	DSSMO	USSMO
.00	.00	.00	.00	.00	.00	2	2579.382	2582.145	112.000	113.000

TW SEC 113 TO 114

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	OSWS	USWS	DSSMO	USSMO
.00	.00	.00	.00	.00	.00	2	2582.145	2584.021	113.000	114.000

TW SEC 114 TO 115

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	OSWS	USWS	DSSMO	USSMO
.00	.00	.00	.00	.00	.00	2	2584.021	2586.941	114.000	115.000

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
T3 Shadow Mtn. Drainageway 25-year

J1	ICHECK	INQ	MINV	IDIR	STRT	METRIC	MVINS	Q	WSEL	FQ
	0	3	0	0	0.0150	0	0	0	2561.0	0
J2	NPROF	IPLOT	PRFYS	XSECV	XSECH	FN	ALLOC	IBW	CHMIM	ITRACE
	2	0	-1	0	0	0	-1	0	0	15



TW SEC 112 TO 113

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
.44	.43	1.01	.44	.43	1.01	5	2579.911	2582.654	112.000	113.000

TW SEC 113 TO 114

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
5.42	5.39	.65	5.86	5.82	.68	5	2582.654	2584.366	113.000	114.000

TW SEC 114 TO 115

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
.00	.00	.00	5.86	5.82	.68	5	2584.366	2587.305	114.000	115.000

T1 South Branch Upper Carmack Sub-Basin Mgmt Study  
 T2 Prepared for Pima County under Contract 07-04-S-115368-0891  
 T3 Shadow Mtn. Drainageway 100-year

J1	ICHECK	INQ	MIWV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	4	0	0	0.0150	0	0	0	2561.0	0
J2	WPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15	0	-1	0	0	0	-1	0	0	15

TW SEC 112 TO 113

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	OSSMO	USSMO
4.12	4.09	.74	4.12	4.09	.74	10	2580.427	2582.846	112.000	113.000

TW SEC 113 TO 114

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	OSSMO	USSMO
24.66	24.51	.61	28.78	28.60	.63	10	2582.846	2584.637	113.000	114.000

TW SEC 114 TO 115

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	MITER	DSWS	USWS	OSSMO	USSMO
.03	.03	7.84	28.81	28.62	.64	10	2584.637	2587.499	114.000	115.000

THIS RUN EXECUTED 11/25/91 10:39: 6

\*\*\*\*\*  
 HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01.02.03  
 MODIFICATION -

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NOTE- ASTERISK (\*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Shadow Mtn. Drainageway

SUMMARY PRINTOUT

	SECMO	CWSEL	VLOB	VCH	VROB	QLOB	QCH	QROB	DEPTH	TOPWTD	SSTA	EMOST
*	101.000	2540.40	1.87	4.87	1.34	22.55	170.60	12.85	2.40	112.72	2189.93	2346.75
*	101.000	2540.78	2.45	5.16	2.03	75.28	229.44	74.42	2.78	185.14	2171.11	2360.00
	101.000	2540.94	3.10	6.23	2.75	126.41	301.78	147.00	2.94	196.92	2163.08	2360.00
*	101.500	2542.36	1.82	5.32	.04	14.03	191.96	.01	2.36	63.30	1058.63	1182.12
*	101.500	2542.84	2.81	5.53	1.77	84.09	279.10	15.95	2.84	126.47	1050.31	1197.98
*	101.500	2543.10	3.57	6.07	2.32	164.67	361.22	49.30	3.10	160.97	1045.73	1206.70
*	102.000	2544.54	2.72	5.48	1.76	72.59	126.87	6.54	2.54	81.78	2301.83	2383.61
*	102.000	2544.89	3.78	6.41	2.50	173.24	181.32	24.58	2.89	95.47	2296.70	2392.17
*	102.000	2545.21	4.29	6.66	2.37	279.70	220.56	74.93	3.21	182.98	2291.89	2474.87
	103.000	2546.30	.88	3.24	.88	.97	203.29	1.74	1.80	80.75	2182.59	2263.34
	103.000	2546.69	1.57	4.06	1.57	9.57	352.35	17.23	2.19	108.86	2172.55	2281.41
	103.000	2546.97	2.11	4.89	2.11	24.87	505.55	44.78	2.47	128.03	2165.70	2293.74
*	103.500	2548.77	.00	5.64	.00	.00	206.00	.00	1.47	37.70	2193.08	2230.77
*	103.500	2549.29	.00	6.61	.00	.00	379.14	.00	1.99	42.85	2191.79	2234.64
*	103.500	2549.73	.00	7.45	.00	.00	575.19	.00	2.43	47.27	2190.68	2237.95
	104.000	2551.81	.00	5.69	.00	.00	205.00	.00	1.51	32.75	1071.12	1103.88
	104.000	2552.40	.00	5.78	.57	.00	353.97	.17	2.10	60.61	1065.37	1125.97
	104.000	2552.65	.00	5.82	1.21	.00	441.53	4.66	2.35	78.94	1062.36	1141.30
*	105.000	2555.38	.00	6.15	.00	.00	205.00	.00	1.78	28.84	1039.62	1068.46
*	105.000	2555.93	.00	6.99	.00	.00	354.14	.00	2.33	34.33	1035.50	1069.83
*	105.000	2556.30	.00	6.87	.00	.00	446.19	.00	2.70	44.44	1032.00	1076.44
*	106.000	2560.55	.00	5.92	.00	.00	205.00	.00	2.55	32.92	1074.46	1107.38
*	106.000	2561.09	.00	6.36	.00	.00	354.14	.00	3.09	45.46	1069.09	1114.55
*	106.000	2561.30	.00	6.77	.00	.00	446.19	.00	3.30	50.40	1066.97	1117.37

	SECNO	CWSEL	VLOB	VCH	VROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	ENOST
*	107.000	2564.32	.00	6.04	.00	.00	205.00	.00	2.32	30.61	1092.59	1123.21
*	107.000	2564.87	.00	6.64	.00	.00	354.14	.00	2.87	40.22	1088.48	1128.70
*	107.000	2565.13	.00	6.93	.00	.00	446.19	.00	3.13	44.77	1086.53	1131.30
*	108.000	2568.63	.00	5.69	.00	.00	205.00	.00	2.43	37.37	1026.61	1063.98
*	108.000	2569.14	.00	6.05	.00	.00	354.14	.00	2.94	51.39	1019.85	1071.24
*	108.000	2569.35	.00	6.33	.00	.00	446.19	.00	3.16	57.42	1016.93	1074.36
*	109.000	2571.19	.00	6.30	.00	.00	205.00	.00	2.19	26.95	1034.03	1060.97
*	109.000	2571.78	.00	7.10	.00	.00	354.14	.00	2.78	32.75	1031.12	1063.88
*	109.000	2572.09	.00	7.33	.04	.00	446.19	.00	3.09	37.51	1028.43	1065.94
*	110.000	2573.75	.00	6.25	.00	.00	205.00	.00	1.75	27.49	1011.88	1039.37
*	110.000	2574.36	.00	6.80	.00	.00	354.14	.00	2.36	36.90	1006.71	1043.62
*	110.000	2574.66	.00	6.97	.00	.00	446.19	.00	2.66	42.64	1003.98	1046.62
*	111.000	2576.09	.00	5.92	.00	.00	205.00	.00	1.69	31.90	1024.02	1055.91
*	111.000	2576.63	.00	6.42	.00	.00	354.14	.00	2.23	43.94	1017.77	1061.71
*	111.000	2576.88	.00	6.68	.00	.00	446.19	.00	2.48	49.49	1014.90	1064.38
*	112.000	2579.38	.00	6.16	.00	.00	205.00	.00	1.78	28.82	1044.64	1073.45
*	112.000	2579.91	.00	7.10	.00	.00	354.14	.00	2.31	34.11	1040.67	1074.78
*	112.000	2580.43	.00	5.92	.00	.00	446.19	.00	2.83	69.69	1018.65	1088.34
*	113.000	2582.14	.75	5.63	.00	.39	204.61	.00	1.74	42.59	1017.77	1060.36
*	113.000	2582.65	1.99	6.12	.00	20.14	354.43	.00	2.25	61.64	1000.00	1061.64
*	113.000	2582.85	2.61	6.66	.00	38.82	411.50	.00	2.45	62.11	1000.00	1062.11
*	114.000	2584.02	1.28	4.90	.00	4.36	200.64	.00	2.02	50.57	1009.56	1060.13
*	114.000	2584.37	2.49	6.32	.00	23.89	356.11	.00	2.37	57.93	1003.90	1061.83
*	114.000	2584.64	3.02	6.74	.00	48.09	426.88	.00	2.64	63.19	1000.00	1063.19
*	115.000	2586.94	.00	4.68	.00	.00	205.00	.00	1.94	61.76	1007.65	1069.41
*	115.000	2587.31	.00	5.33	.00	.00	360.00	.00	2.31	66.40	1006.72	1073.12
*	115.000	2587.50	.00	5.91	.00	.00	475.00	.00	2.50	68.76	1006.25	1075.00
*	115.500	2588.51	.00	6.55	.00	.00	205.00	.00	2.51	23.86	1037.43	1061.29
*	115.500	2589.18	.00	7.39	.00	.00	360.00	.00	3.18	28.81	1034.12	1062.94
*	115.500	2589.55	.00	7.91	.00	.00	475.00	.00	3.55	31.63	1032.25	1063.88
*	116.000	2592.03	.05	4.05	.05	.00	205.00	.00	1.03	106.30	1054.17	1160.47
*	116.000	2592.26	1.20	4.79	1.20	1.11	358.26	.63	1.26	116.18	1047.87	1164.05
*	116.000	2592.41	1.55	5.20	1.55	3.53	469.46	2.01	1.41	122.57	1043.79	1166.37
*	117.000	2597.91	.00	5.65	.00	.00	205.00	.00	1.91	38.10	1080.95	1119.05
*	117.000	2598.42	1.33	4.74	2.06	4.81	269.77	85.43	2.42	162.88	1063.03	1225.91
*	117.000	2598.51	1.70	5.54	2.60	8.79	334.58	131.63	2.51	169.43	1059.65	1229.08
*	118.000	2603.57	.00	4.21	1.46	.00	170.45	34.55	2.07	170.78	1192.14	1362.92
*	118.000	2603.81	.00	4.80	2.19	.00	233.16	126.84	2.31	181.61	1190.93	1372.54
*	118.000	2603.89	.00	5.61	2.73	.00	286.78	188.22	2.39	184.91	1190.57	1375.48

	SECNO	CWSEL	VLOB	YCH	VROB	QLOB	QCH	QROB	DEPTH	TOPWID	SSTA	ENDST
*	119.000	2610.21	.00	5.55	1.18	.00	203.56	1.44	2.21	46.21	1180.58	1226.79
*	119.000	2610.80	.85	5.16	2.31	4.17	313.62	42.21	2.80	148.95	1111.74	1260.69
*	119.000	2611.01	1.54	5.27	2.50	32.49	369.71	72.79	3.01	198.84	1073.84	1272.68
*	120.000	2614.62	1.86	5.54	2.09	9.88	179.61	15.51	2.62	57.07	1037.93	1095.00
*	120.000	2615.01	3.13	6.62	3.46	40.59	266.69	52.72	3.01	60.00	1035.00	1095.00
*	120.000	2615.23	3.88	7.31	4.18	67.13	326.01	81.86	3.23	60.00	1035.00	1095.00

## Shadow Mtn. Drainagewav

## SUMMARY PRINTOUT

SECNO	CWSEL	CRWS	EG	HL	OLOSS	ELMIN	10*KS	K*CHSL	XLCH	SHEAR	FRCH
* 101.000	2540.40	2540.40	2540.71	.00	.00	2538.00	141.11	.00	.00	1.23	.72
* 101.000	2540.78	2540.78	2541.06	.00	.00	2538.00	115.47	.00	.00	1.28	.68
101.000	2540.94	2540.93	2541.32	.00	.00	2538.00	149.72	.00	.00	1.81	.79
* 101.500	2542.36	2542.36	2542.78	2.18	-.21	2540.00	181.52	16.67	120.00	1.17	.92
* 101.500	2542.84	2542.84	2543.22	1.98	-.27	2540.00	165.33	16.67	120.00	1.49	.81
* 101.500	2543.10	2543.10	2543.52	2.04	-.11	2540.00	170.25	16.67	120.00	1.81	.82
* 102.000	2544.54	2544.54	2544.87	1.95	.12	2542.00	162.09	16.67	120.00	1.56	.78
* 102.000	2544.89	2544.89	2545.30	2.04	-.02	2542.00	169.87	16.67	120.00	2.00	.82
* 102.000	2545.21	2545.21	2545.62	1.79	.12	2542.00	148.98	16.67	120.00	2.05	.79
103.000	2546.30	2545.96	2546.46	1.57	.02	2544.50	90.66	18.52	135.00	.59	.56
103.000	2546.69	2546.36	2546.93	1.61	.02	2544.50	92.23	18.52	135.00	.83	.59
103.000	2546.97	2546.71	2547.31	1.68	.01	2544.50	106.57	18.52	135.00	1.15	.66
* 103.500	2548.77	2548.77	2549.26	4.44	-1.93	2547.30	306.41	19.31	145.00	1.85	1.01
* 103.500	2549.29	2549.29	2549.96	3.99	-1.20	2547.30	275.52	19.31	145.00	2.30	1.01
* 103.500	2549.73	2549.73	2550.59	3.88	-1.01	2547.30	268.07	19.31	145.00	2.73	1.03
104.000	2551.81	2551.77	2552.31	3.05	.00	2550.30	159.87	20.69	145.00	1.10	.96
104.000	2552.40	2552.36	2552.92	2.94	.02	2550.30	160.19	20.69	145.00	1.12	.96
104.000	2552.65	2552.59	2553.18	2.55	.03	2550.30	131.12	20.69	145.00	1.08	.89
* 105.000	2555.38	2555.38	2555.97	2.82	-.11	2553.60	176.18	20.63	160.00	1.27	1.01
* 105.000	2555.93	2555.93	2556.69	2.63	.04	2553.60	164.36	20.63	160.00	1.51	1.01
* 105.000	2556.30	2556.30	2557.03	2.57	-.17	2553.60	160.71	20.63	160.00	1.47	1.00
* 106.000	2560.55	2560.55	2561.10	3.14	-.07	2558.00	184.61	25.88	170.00	1.21	1.02
* 106.000	2561.09	2561.09	2561.72	2.95	-.06	2558.00	173.40	25.88	170.00	1.33	1.01
* 106.000	2561.30	2561.30	2562.02	3.07	-.17	2558.00	180.58	25.88	170.00	1.47	1.04
* 107.000	2564.32	2564.32	2564.89	2.60	.04	2562.00	179.56	27.59	145.00	1.24	1.01
* 107.000	2564.87	2564.87	2565.55	2.47	.04	2562.00	170.03	27.59	145.00	1.41	1.02
* 107.000	2565.13	2565.13	2565.87	2.41	.11	2562.00	166.12	27.59	145.00	1.49	1.02
* 108.000	2568.63	2568.63	2569.13	2.48	-.07	2566.20	190.83	32.31	130.00	1.15	1.02
* 108.000	2569.14	2569.14	2569.70	2.24	-.00	2566.20	172.18	32.31	130.00	1.22	1.00
* 108.000	2569.35	2569.35	2569.98	2.22	-.02	2566.20	171.04	32.31	130.00	1.31	1.01
* 109.000	2571.19	2571.19	2571.81	2.53	.15	2569.00	174.14	19.31	145.00	1.31	1.01
* 109.000	2571.78	2571.78	2572.56	2.36	.13	2569.00	162.81	19.31	145.00	1.55	1.01
* 109.000	2572.09	2572.09	2572.93	2.24	.18	2569.00	154.17	19.31	145.00	1.60	1.00
* 110.000	2573.75	2573.75	2574.36	2.19	-.01	2572.00	175.16	24.00	125.00	1.30	1.01
* 110.000	2574.36	2574.36	2575.08	2.06	-.01	2572.00	155.14	24.00	125.00	1.45	1.01
* 110.000	2574.66	2574.66	2575.42	1.99	-.02	2572.00	159.32	24.00	125.00	1.49	1.00

	SECNO	CWSEL	CRWS	EG	HL	OLOSS	ELMIN	LO*KS	K*CHSL	XLCH	SHEAR	FRCH
*	111.000	2576.09	2576.09	2576.63	1.67	.00	2574.40	175.97	25.26	95.00	1.19	1.00
*	111.000	2576.63	2576.63	2577.27	1.62	-.02	2574.40	170.43	25.26	95.00	1.34	1.01
*	111.000	2576.88	2576.88	2577.57	1.59	-.03	2574.40	167.34	25.26	95.00	1.41	1.01
*	112.000	2579.38	2579.38	2579.97	2.74	.01	2577.60	176.91	20.65	155.00	1.27	1.01
*	112.000	2579.91	2579.91	2580.69	2.66	.03	2577.60	171.51	20.65	155.00	1.57	1.03
*	112.000	2580.43	2580.43	2580.97	2.75	-.06	2577.60	177.14	20.65	155.00	1.20	1.00
*	113.000	2582.14	2582.14	2582.64	2.05	.04	2580.40	171.10	23.33	120.00	1.10	.98
*	113.000	2582.65	2582.65	2583.21	1.46	.26	2580.40	123.12	23.33	120.00	1.15	.88
*	113.000	2582.85	2582.85	2583.49	1.49	.28	2580.40	126.62	23.33	120.00	1.31	.91
*	114.000	2584.02	2583.89	2584.39	1.74	.01	2582.00	109.84	12.31	130.00	.80	.80
*	114.000	2584.37	2584.37	2584.95	1.78	-.08	2582.00	137.43	12.31	130.00	1.24	.93
*	114.000	2584.64	2584.64	2585.29	1.68	-.02	2582.00	129.89	12.31	130.00	1.34	.92
*	115.000	2586.94	2586.94	2587.28	3.68	-.79	2585.00	193.45	15.79	190.00	.86	.98
*	115.000	2587.31	2587.24	2587.75	2.78	.01	2585.00	155.06	15.79	190.00	.99	.93
*	115.000	2587.50	2587.47	2588.04	2.74	.01	2585.00	159.05	15.79	190.00	1.16	.96
*	115.500	2588.51	2588.51	2589.18	1.03	.16	2586.00	170.94	16.67	60.00	1.40	1.01
*	115.500	2589.18	2589.18	2590.02	.94	.12	2586.00	155.89	16.67	60.00	1.64	1.00
*	115.500	2589.55	2589.55	2590.52	.92	.15	2586.00	153.20	16.67	60.00	1.81	1.01
*	116.000	2592.03	2592.03	2592.28	2.52	-.32	2591.00	240.35	47.62	105.00	.72	1.03
*	116.000	2592.26	2592.26	2592.61	2.11	-.19	2591.00	200.85	47.62	105.00	.89	1.00
*	116.000	2592.41	2592.41	2592.82	1.93	-.10	2591.00	183.58	47.62	105.00	.98	.99
*	117.000	2597.91	2597.90	2598.41	6.05	.07	2596.00	314.51	22.73	220.00	1.87	1.02
*	117.000	2598.42	2598.42	2598.70	2.84	.63	2596.00	129.15	22.73	220.00	1.15	.70
*	117.000	2598.51	2598.51	2598.87	3.61	.21	2596.00	163.95	22.73	220.00	1.54	.80
*	118.000	2603.57	2603.57	2603.81	2.48	1.10	2601.50	124.03	27.50	200.00	.95	.67
*	118.000	2603.81	2603.81	2604.07	2.66	-.04	2601.50	133.16	27.50	200.00	1.18	.71
*	118.000	2603.89	2603.89	2604.23	3.45	-.08	2601.50	172.69	27.50	200.00	1.60	.81
*	119.000	2610.21	2610.21	2610.68	6.14	-1.56	2608.00	265.06	28.26	230.00	1.76	.95
*	119.000	2610.80	2610.80	2611.17	3.90	-.36	2608.00	166.32	28.26	230.00	1.40	.78
*	119.000	2611.01	2611.01	2611.36	3.35	.32	2608.00	142.81	28.26	230.00	1.39	.74
*	120.000	2614.62	2614.62	2615.05	2.12	.58	2612.00	151.77	28.57	140.00	1.54	.77
*	120.000	2615.01	2615.01	2615.56	2.28	.08	2612.00	162.52	28.57	140.00	2.04	.82
*	120.000	2615.23	2615.23	2615.88	2.42	-.12	2612.00	172.76	28.57	140.00	2.40	.86



Appendix D

Input and Output from the FHWA Culvert Analysis  
(HY-8) of the South Branch Wash Box Culvert  
Beneath Oracle Road

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 FHWA CULVERT ANALYSIS  
 HY-8, VERSION 3.2  
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C U L V E R T #	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	2615.82	2613.98	139.01	5 RCB	10.00	6.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

-----  
 SUMMARY OF CULVERT FLOWS (CFS)  
 -----

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
2618.25	600	600	0	0	0	0	0		0 1
2618.77	800	800	0	0	0	0	0		0 1
2619.27	1000	1000	0	0	0	0	0		0 1
2619.75	1200	1200	0	0	0	0	0		0 1
2620.21	1400	1400	0	0	0	0	0		0 1
2620.66	1600	1600	0	0	0	0	0		0 1
2621.09	1800	1800	0	0	0	0	0		0 1
2621.52	2000	2000	0	0	0	0	0		0 1
2621.96	2200	2200	0	0	0	0	0		0 1
2622.39	2400	2400	0	0	0	0	0		0 1
2622.72	2550	2550	0	0	0	0	0		0 1
2624.00	3106	3106	0	0	0	0	0	OVERTOPPING	

-----  
 SUMMARY OF ITERATIVE SOLUTION ERRORS  
 -----

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
2618.25	0.00	600	0	0.00
2618.77	0.00	800	0	0.00
2619.27	0.00	1000	0	0.00
2619.75	0.00	1200	0	0.00
2620.21	0.00	1400	0	0.00
2620.66	0.00	1600	0	0.00
2621.09	0.00	1800	0	0.00
2621.52	0.00	2000	0	0.00
2621.96	0.00	2200	0	0.00
2622.39	0.00	2400	0	0.00
2622.72	0.00	2550	0	0.00

<1> TOLERANCE (FT) = 0.010

<2> TOLERANCE (%) = 1.000

CULVERT # 1

PERFORMANCE CURVE FOR 5 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
600	2618.25	2615.55	2.43	2.08	6-FF	0.00	0.00	0.00	11.58
800	2618.77	2615.86	2.95	2.32	6-FF	0.00	0.00	0.00	12.60
1000	2619.27	2616.13	3.45	2.57	6-FF	0.00	0.00	0.00	13.40
1200	2619.75	2616.39	3.93	2.83	6-FF	0.00	0.00	0.00	14.07
1400	2620.21	2616.63	4.39	3.10	6-FF	0.00	0.00	0.00	14.66
1600	2620.66	2616.86	4.84	3.39	6-FF	0.00	0.00	0.00	15.11
1800	2621.09	2617.08	5.27	3.69	6-FF	0.00	0.00	0.00	15.56
2000	2621.52	2617.30	5.70	4.00	6-FF	0.00	0.00	0.00	15.97
2200	2621.96	2617.50	6.14	4.33	6-FF	0.00	0.00	0.00	16.33
2400	2622.39	2617.70	6.57	4.68	6-FF	0.00	0.00	0.00	16.68
2550	2622.72	2617.84	6.90	4.95	6-FF	0.00	0.00	0.00	16.92

El. inlet face invert 2615.82 ft El. outlet invert 2613.98 ft  
 El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

\*\*\*\*\* SITE DATA \*\*\*\*\* CULVERT INVERT \*\*\*\*\*  
 INLET STATION (FT) 139.00  
 INLET ELEVATION (FT) 2615.82  
 OUTLET STATION (FT) 0.00  
 OUTLET ELEVATION (FT) 2613.98  
 NUMBER OF BARRELS 5.00  
 SLOPE (V-FT/H-FT) 0.0132  
 CULVERT LENGTH ALONG SLOPE (FT) 139.01

\*\*\*\*\* CULVERT DATA SUMMARY \*\*\*\*\*  
 BARREL SHAPE BOX  
 BARREL SPAN 10.00 FT  
 BARREL RISE 6.00 FT  
 BARREL MATERIAL CONCRETE  
 BARREL MANNING'S N 0.012  
 INLET TYPE CONVENTIONAL  
 INLET EDGE AND WALL BEVELED EDGE (1.5:1)  
 INLET DEPRESSION NONE

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 ----- TAILWATER -----  
 -----

\*\*\*\*\* REGULAR CHANNEL CROSS SECTION \*\*\*\*\*  
 BOTTOM WIDTH (FT) 55.00  
 SIDE SLOPE H/V (X:1) 0.0  
 CHANNEL SLOPE V/H (FT/FT) 0.026  
 MANNING'S N (.01-0.1) 0.045  
 CHANNEL INVERT ELEVATION (FT) 2613.98  
 CULVERT NO.1 OUTLET INVERT ELEVATION 2613.98 FT

\*\*\*\*\* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
600.00	2615.55	0.975	6.94	2.55
800.00	2615.86	0.997	7.75	3.05
1000.00	2616.13	1.014	8.44	3.49
1200.00	2616.39	1.027	9.05	3.91
1400.00	2616.63	1.038	9.59	4.30
1600.00	2616.86	1.047	10.09	4.68
1800.00	2617.08	1.055	10.54	5.04
2000.00	2617.30	1.061	10.97	5.38
2200.00	2617.50	1.068	11.37	5.71
2400.00	2617.70	1.074	11.74	6.03
2550.00	2617.84	1.077	12.01	6.26

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 ----- ROADWAY OVERTOPPING DATA -----  
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ROADWAY SURFACE PAVED  
 EMBANKMENT TOP WIDTH (FT) 139.00  
 CREST LENGTH (FT) 1000.00  
 OVERTOPPING CREST ELEVATION (FT) 2624.00

Appendix E

Input and Output from the FHWA Culvert Analysis (HY-8) of the  
Shadow Mountain Wash Box Culvert Beneath Oracle Road

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 FHWA CULVERT ANALYSIS  
 HY-8, VERSION 3.2  
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C U L V #	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	616.90	614.00	140.03	1 RCB	8.00	5.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

-----  
 SUMMARY OF CULVERT FLOWS (CFS)  
 -----

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
620.99	200	200	0	0	0	0	0	0	0 1
621.58	240	240	0	0	0	0	0	0	0 1
622.17	280	280	0	0	0	0	0	0	0 1
622.78	320	320	0	0	0	0	0	0	0 1
623.32	360	355	0	0	0	0	0	4	4 4
623.66	400	376	0	0	0	0	0	23	5 5
623.89	440	389	0	0	0	0	0	48	4 4
624.07	480	401	0	0	0	0	0	77	4 4
624.23	520	409	0	0	0	0	0	109	4 4
624.35	560	417	0	0	0	0	0	139	3 3
624.47	600	423	0	0	0	0	0	172	3 3
623.00	334	334	0	0	0	0	0	0	OVERTOPPING

-----  
 SUMMARY OF ITERATIVE SOLUTION ERRORS  
 -----

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
620.99	0.00	200	0	0.00
621.58	0.00	240	0	0.00
622.17	0.00	280	0	0.00
622.78	0.00	320	0	0.00
623.32	-0.01	360	1	0.29
623.66	-0.00	400	1	0.19
623.89	-0.01	440	2	0.47
624.07	-0.01	480	2	0.40
624.23	-0.00	520	2	0.31
624.35	-0.01	560	4	0.76
624.47	-0.01	600	4	0.71

<1> TOLERANCE (FT) = 0.010

<2> TOLERANCE (%) = 1.000



-----  
 ----- TAILWATER -----  
 -----

\*\*\*\*\* REGULAR CHANNEL CROSS SECTION \*\*\*\*\*  
 BOTTOM WIDTH (FT) 8.00  
 SIDE SLOPE H/V (X:1) 0.0  
 CHANNEL SLOPE V/H (FT/FT) 0.031  
 MANNING'S N (.01-0.1) 0.035  
 CHANNEL INVERT ELEVATION (FT) 614.00  
 CULVERT NO.1 OUTLET INVERT ELEVATION 614.00 FT

\*\*\*\*\* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
200.00	616.51	1.111	9.97	4.85
240.00	616.85	1.096	10.51	5.52
280.00	617.19	1.082	10.96	6.17
320.00	617.52	1.067	11.36	6.81
360.00	617.84	1.053	11.71	7.43
400.00	618.16	1.039	12.02	8.04
440.00	618.47	1.026	12.31	8.64
480.00	618.77	1.013	12.56	9.23
520.00	619.08	1.001	12.80	9.82
560.00	619.38	0.989	13.01	10.40
600.00	619.67	0.977	13.21	10.98

-----  
 ----- ROADWAY OVERTOPPING DATA -----  
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WEIR COEFFICIENT 2.50  
 EMBANKMENT TOP WIDTH (FT) 50.00  
 \*\*\*\*\* USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	0.00	626.00
2	55.00	624.00
3	80.00	623.00
4	120.00	624.00
5	150.00	624.60
6	151.00	625.10

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