

Camelback Road MANNING'S 'n' VALUES DETERMINATION REPORT

Loop 303 Corridor/White Tanks
Area Drainage Master Plan Update
Contract FCD 99-40

Prepared for
Flood Control District of Maricopa County



URS

URS Job No. E1-00001526

November 4, 2002

MANNING'S 'n' VALUE DETERMINATIONS REPORT

I. INTRODUCTION

An initial field reconnaissance investigation was conducted on June 27, 2001 to visit study areas, evaluate field conditions, and prepare a preliminary photographic log. Photographic documentation was also collected by the survey crew during their field work at representative cross sections and road crossings. Other site visits conducted to evaluate flooding conditions and direction of flow were also used to verify 'n' values estimates, such visits include a visit to Perryville Wash on January 7, 2001, and another to Camelback Wash on January 22, 2001. Photographic documentation for the estimation of Manning's 'n' values was done for these areas in, and adjacent to, I-10 Culvert Wash, Perryville Wash, Bullard Wash, and Camelback Road Wash.

II. METHODOLOGY

Manning's 'n' values were assigned based on field observation using the methodology described in *Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona*, a manual prepared by the U.S. Geological Survey for the FCDMC. A base 'n' value (n_b) was assigned according to the bed material. In accordance with the manual, adjustments to the base value were then made to account for factors affecting the roughness characteristics such as degree of surface irregularity (n_1), effects of obstructions (n_2), and vegetation (n_3). The composite value of n was computed using the following equation:

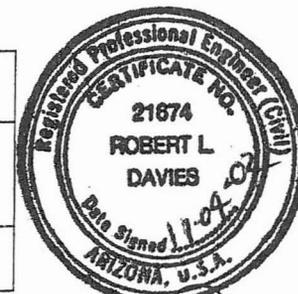
$$n = n_b + n_1 + n_2 + n_3$$

Typical photographs and calculations for the 'n' values for the areas are included in this report.

III. PHOTOGRAPHS AND 'n' VALUE ASSIGNMENTS

Along with the calculations for the 'n' value assignments, photographs are provided to illustrate typical conditions that exist in four different study areas, which are Bullard Perryville Wash, Bullard Wash, Camelback Wash, and I-10 Culvert Wash. Base n values used in all four study reaches are listed in the following table.

Channel Material	'n _b ' Value
Undisturbed Desert or Agricultural Lands	0.022 – 0.028
Asphalt	0.016



Examples of Manning's 'n' estimates at representative locations of the four washes are included in the next few pages, followed by a detailed listing of 'n' values and corresponding pictures at each cross section for the washes covered by this study.

MANNING'S 'n' VALUE DETERMINATIONS REPORT

I. INTRODUCTION

An initial field reconnaissance investigation was conducted on June 27, 2001 to visit study areas, evaluate field conditions, and prepare a preliminary photographic log. Photographic documentation was also collected by the survey crew during their field work at representative cross sections and road crossings. Other site visits conducted to evaluate flooding conditions and direction of flow were also used to verify 'n' values estimates, such visits include a visit to Perryville Wash on January 7, 2001, and another to Camelback Wash on January 22, 2001. Photographic documentation for the estimation of Manning's 'n' values was done for these areas in, and adjacent to, I-10 Culvert Wash, Perryville Wash, Bullard Wash, and Camelback Road Wash.

II. METHODOLOGY

Manning's 'n' values were assigned based on field observation using the methodology described in *Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona*, a manual prepared by the U.S. Geological Survey for the FCDMC. A base 'n' value (n_b) was assigned according to the bed material. In accordance with the manual, adjustments to the base value were then made to account for factors affecting the roughness characteristics such as degree of surface irregularity (n_1), effects of obstructions (n_2), and vegetation (n_3). The composite value of n was computed using the following equation:

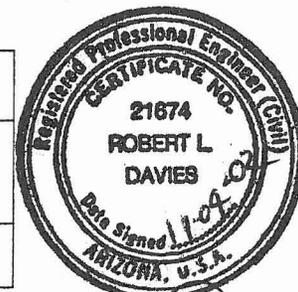
$$n = n_b + n_1 + n_2 + n_3$$

Typical photographs and calculations for the 'n' values for the areas are included in this report.

III. PHOTOGRAPHS AND 'n' VALUE ASSIGNMENTS

Along with the calculations for the 'n' value assignments, photographs are provided to illustrate typical conditions that exist in four different study areas, which are Bullard Perryville Wash, Bullard Wash, Camelback Wash, and I-10 Culvert Wash. Base n values used in all four study reaches are listed in the following table.

Channel Material	'n _b ' Value
Undisturbed Desert or Agricultural Lands	0.022 – 0.028
Asphalt	0.016



Examples of Manning's 'n' estimates at representative locations of the four washes are included in the next few pages, followed by a detailed listing of 'n' values and corresponding pictures at each cross section for the washes covered by this study.

MANNING'S 'n' VALUE DETERMINATIONS REPORT

I. INTRODUCTION

An initial field reconnaissance investigation was conducted on June 27, 2001 to visit study areas, evaluate field conditions, and prepare a preliminary photographic log. Photographic documentation was also collected by the survey crew during their field work at representative cross sections and road crossings. Other site visits conducted to evaluate flooding conditions and direction of flow were also used to verify 'n' values estimates, such visits include a visit to Perryville Wash on January 7, 2001, and another to Camelback Wash on January 22, 2001. Photographic documentation for the estimation of Manning's 'n' values was done for these areas in, and adjacent to, I-10 Culvert Wash, Perryville Wash, Bullard Wash, and Camelback Road Wash.

II. METHODOLOGY

Manning's 'n' values were assigned based on field observation using the methodology described in *Estimated Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona*, a manual prepared by the U.S. Geological Survey for the FCDMC. A base 'n' value (n_b) was assigned according to the bed material. In accordance with the manual, adjustments to the base value were then made to account for factors affecting the roughness characteristics such as degree of surface irregularity (n_1), effects of obstructions (n_2), and vegetation (n_3). The composite value of n was computed using the following equation:

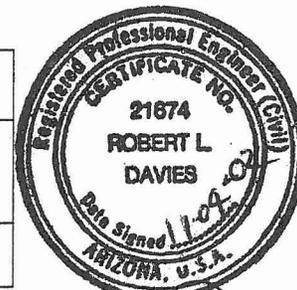
$$n = n_b + n_1 + n_2 + n_3$$

Typical photographs and calculations for the 'n' values for the areas are included in this report.

III. PHOTOGRAPHS AND 'n' VALUE ASSIGNMENTS

Along with the calculations for the 'n' value assignments, photographs are provided to illustrate typical conditions that exist in four different study areas, which are Bullard Perryville Wash, Bullard Wash, Camelback Wash, and I-10 Culvert Wash. Base n values used in all four study reaches are listed in the following table.

Channel Material	'n' Value
Undisturbed Desert or Agricultural Lands	0.022 – 0.028
Asphalt	0.016



Examples of Manning's 'n' estimates at representative locations of the four washes are included in the next few pages, followed by a detailed listing of 'n' values and corresponding pictures at each cross section for the washes covered by this study.

LOCATION: Perryville Wash Cross Section 33

CROSS SECTION DESCRIPTION: Undisturbed Desert (Photographs 1 - 3).

'n' VALUE CALCULATION

<u>Portion of Cross section</u>	<u>Components</u>	<u>Composite Values</u>
Channel	$n_b = 0.024$	
	$n_1 = 0.005$	
	$n_2 = 0.002$	
	$n_3 = 0.005$	$n = 0.036$
Left Overbank	$n_b = 0.024$	
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.015$	$n = 0.043$
Right Overbank	$n_b = 0.024$	
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.015$	$n = 0.043$



Photo 1. Perryville Wash from Cross Section 33 looking downstream.

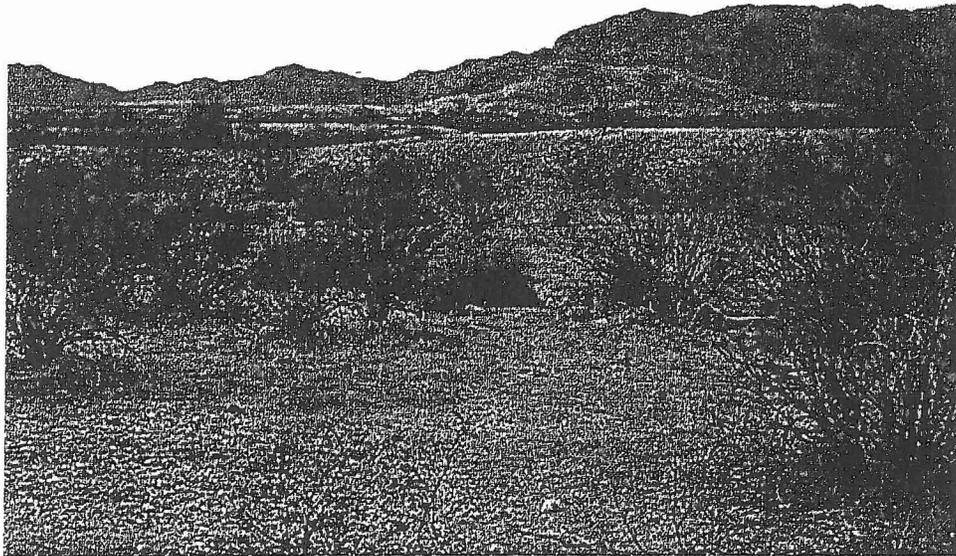


Photo 2. Perryville Wash Left Overbank from Cross Section 33.



Photo 3. Right overbank area at Cross Section 33.

LOCATION: Bullard Wash Cross Section 27

CROSS SECTION DESCRIPTION: (Photographs 4 - 6).

'n' VALUE CALCULATION

<u>Portion of Cross section</u>	<u>Components</u>	<u>Composite Values</u>
Channel	$n_b = 0.024$	
	$n_1 = 0.003$	
	$n_2 = 0.003$	
	$n_3 = 0.01$	$n = 0.04$
Left Overbank	$n_b = 0.024$	
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.015$	$n = 0.045$
Right Overbank	$n_b = 0.024$	
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.015$	$n = 0.045$



Photo 4. Bullard Wash from Cross Section 27 looking downstream.

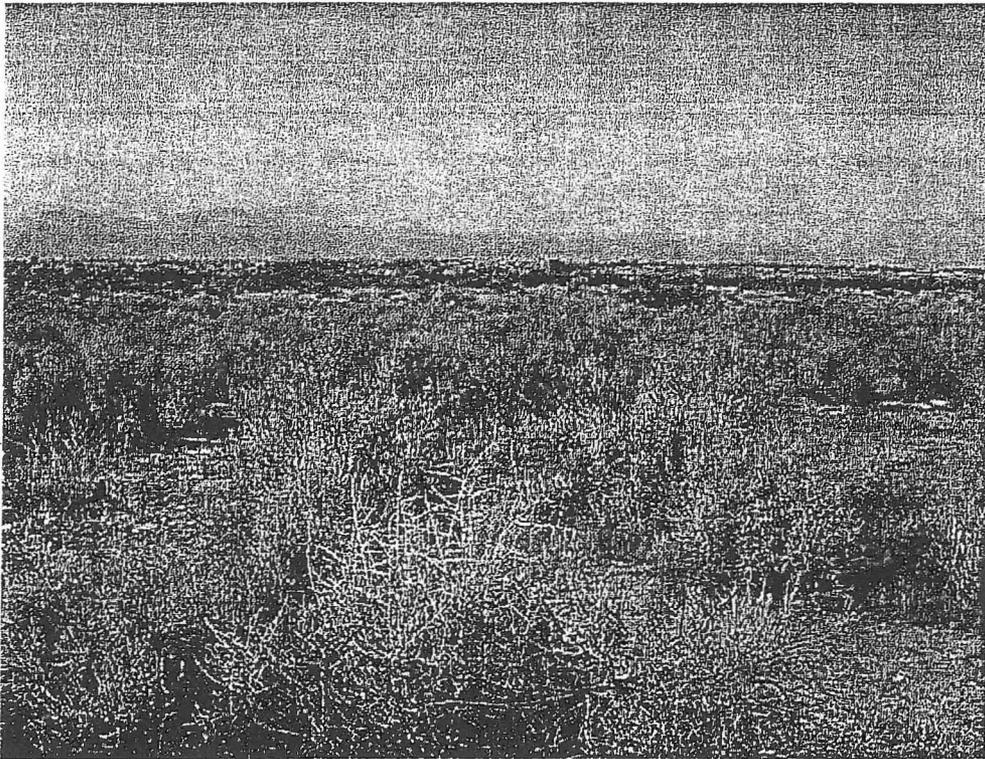


Photo 5. Left overbank area at Cross Section 27.

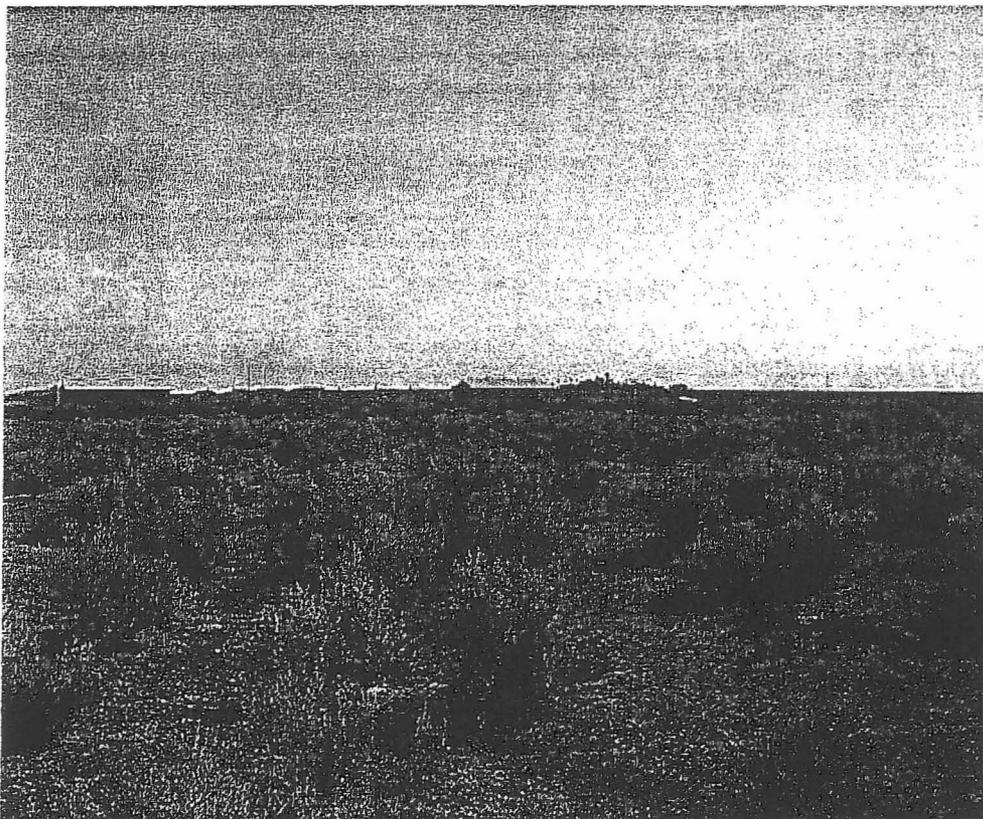


Photo 6. Right overbank area at Cross Section 27.

LOCATION: Camelback Wash Cross Section 36

CROSS SECTION DESCRIPTION: (Photographs 7 - 9).

'n' VALUE CALCULATION

<u>Portion of Cross section</u>	<u>Components</u>	<u>Composite Values</u>
Channel	$n_b = 0.016$	
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.001$	n = 0.021
Left Overbank	$n_b = 0.24$	
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.03$	n = 0.06
Right Overbank	$n_b = 0.024$	
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	n = 0.03

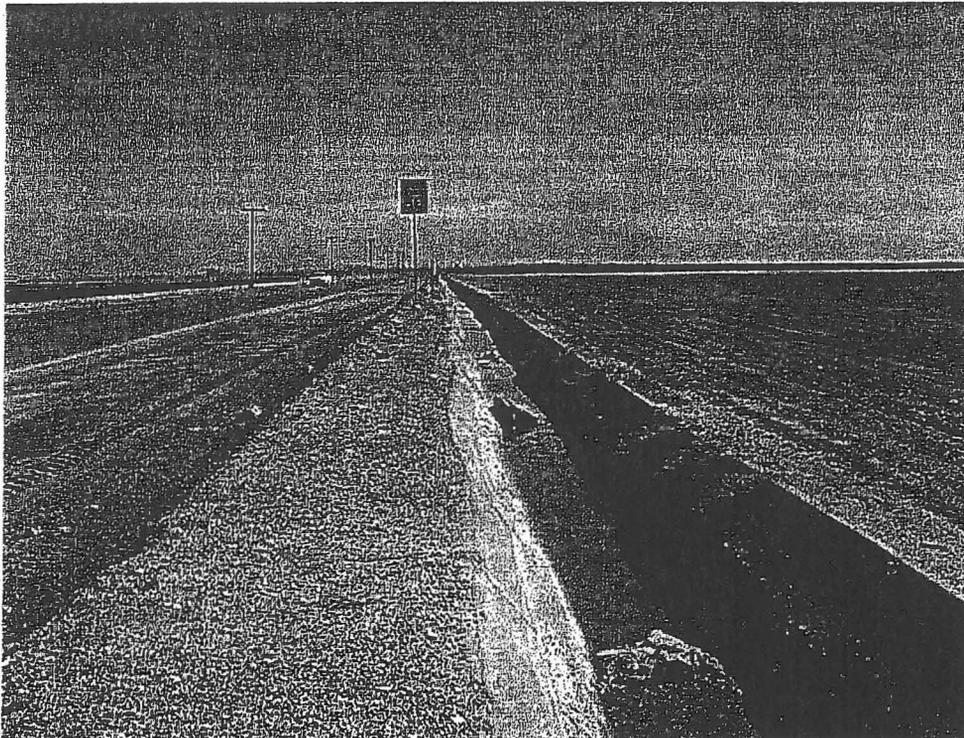


Photo 7. Camelback Wash from Cross Section 36 looking upstream.



Photo 8. Left overbank area from Cross Section 36.

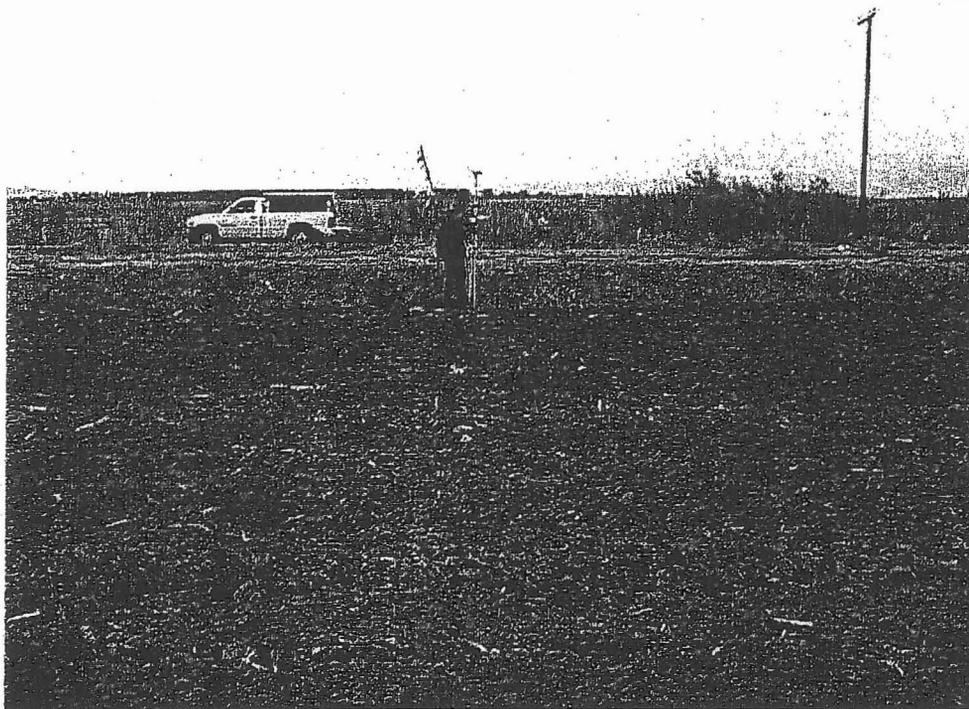


Photo 9. Right overbank area from Cross Section 36.

LOCATION: I-10 Culvert Wash Cross Section 10**CROSS SECTION DESCRIPTION:** (Photographs 10 - 12).**'n' VALUE CALCULATION**

<u>Portion of Cross section</u>	<u>Components</u>	<u>Composite Values</u>
Channel	$n_b = 0.024$	
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	n = 0.03
Left Overbank	$n_b = 0.024$	
	$n_1 = 0.002$	
	$n_2 = 0.001$	
	$n_3 = 0.005$	n = 0.032
Right Overbank	$n_b = 0.024$	
	$n_1 = 0.002$	
	$n_2 = 0.001$	
	$n_3 = 0.005$	n = 0.032

**Photo 10.** I-10 Culvert Wash from Cross Section 10 looking downstream.



Photo 11. Left overbank area from Cross Section 10.

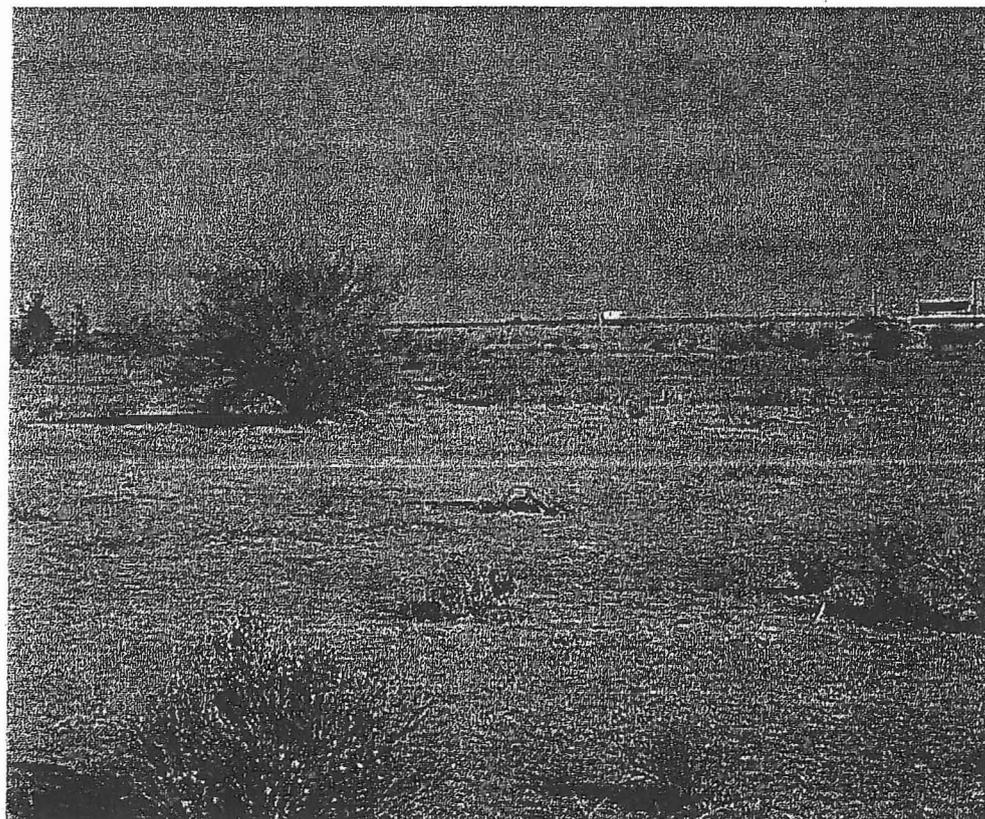


Photo 12. Right overbank area from Cross Section 10.

CAMELBACK WASH
Mannings n Summary Table

Cross Section #	LOB	Channel	ROB
1	0.03	0.038	0.03
2	0.03	0.038	0.03
3	0.035	0.051	0.033
4	0.035	0.051	0.033
5	0.03	0.061	0.034
6	0.03	0.061	0.034
7	0.03	0.031	0.03
8	0.03	0.031	0.03
9	0.03	0.031	0.03
10	0.03	0.031	0.03
11	0.033	0.032	0.031
12	0.033	0.032	0.031
13	0.033	0.032	0.031
14	0.036	0.036	0.03
15	0.04	0.052	0.03
16	0.039	0.052	0.03
17	0.035	0.036	0.03
18	0.036	0.036	0.03
19	0.036	0.026	0.03
20	0.039	0.026	0.03
21	0.031	0.034	0.031
22	0.031	0.034	0.031
23	0.031	0.034	0.031
24	0.03	0.078	0.078
25	0.03	0.078	0.078
26	0.03	0.033	0.03
27	0.03	0.033	0.03
28	0.03	0.033	0.03
29	0.031	0.032	0.038
30	0.031	0.032	0.038
31	0.031	0.035	0.038
32	0.031	0.035	0.038
33	0.03	0.035	0.03
34	0.03	0.035	0.03
35	0.06	0.026	0.03
36	0.06	0.026	0.03
37	0.033	0.026	0.032
38	0.033	0.026	0.032
39	0.033	0.026	0.032
40	0.036	0.026	0.034
41	0.036	0.026	0.034
42	0.036	0.026	0.034

Cross Section 1

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.038
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.01$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 2

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.038
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.01$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 3

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.035
	$n_1 = 0.002$	
	$n_2 = 0.005$	
	$n_3 = 0.004$	
Channel	$n_b = 0.024$	0.051
	$n_1 = 0.002$	
	$n_2 = 0.005$	
	$n_3 = 0.02$	
Right Over Bank	$n_b = 0.024$	0.033
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.005$	

Cross Section 4

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.035
	$n_1 = 0.002$	
	$n_2 = 0.005$	
	$n_3 = 0.004$	
Channel	$n_b = 0.024$	0.051
	$n_1 = 0.002$	
	$n_2 = 0.005$	
	$n_3 = 0.02$	
Right Over Bank	$n_b = 0.024$	0.033
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.005$	

Cross Section 5

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.061
	$n_1 = 0.002$	
	$n_2 = 0.005$	
	$n_3 = 0.03$	
Right Over Bank	$n_b = 0.024$	0.034
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.006$	

Cross Section 6

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.061
	$n_1 = 0.002$	
	$n_2 = 0.005$	
	$n_3 = 0.03$	
Right Over Bank	$n_b = 0.024$	0.034
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.006$	

Cross Section 7

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 8

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 9

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 10

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 11

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.033
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.005$	
Channel	$n_b = 0.024$	0.032
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.004$	
Right Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	

Cross Section 12

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.033
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.005$	
Channel	$n_b = 0.024$	0.032
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.004$	
Right Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	

Cross Section 13

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.033
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.005$	
Channel	$n_b = 0.024$	0.032
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.004$	
Right Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	

Cross Section 14

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	
Channel	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 15

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.04
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.01$	
Channel	$n_b = 0.024$	0.052
	$n_1 = 0.003$	
	$n_2 = 0.005$	
	$n_3 = 0.02$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 16

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.039
	$n_1 = 0.002$	
	$n_2 = 0.003$	
	$n_3 = 0.01$	
Channel	$n_b = 0.024$	0.052
	$n_1 = 0.003$	
	$n_2 = 0.005$	
	$n_3 = 0.02$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 17

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.035
	$n_1 = 0.002$	
	$n_2 = 0.003$	
	$n_3 = 0.006$	
Channel	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 18

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	
Channel	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 19

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 20

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.039
	$n_1 = 0.002$	
	$n_2 = 0.003$	
	$n_3 = 0.01$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 21

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Channel	$n_b = 0.024$	0.034
	$n_1 = 0.002$	
	$n_2 = 0.003$	
	$n_3 = 0.005$	
Right Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	

Cross Section 22

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Channel	$n_b = 0.024$	0.034
	$n_1 = 0.002$	
	$n_2 = 0.003$	
	$n_3 = 0.005$	
Right Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	

Cross Section 23

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Channel	$n_b = 0.024$	0.034
	$n_1 = 0.002$	
	$n_2 = 0.003$	
	$n_3 = 0.005$	
Right Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	

Cross Section 24

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.078
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.05$	
Right Over Bank	$n_b = 0.024$	0.078
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.05$	

Cross Section 25

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.078
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.05$	
Right Over Bank	$n_b = 0.024$	0.078
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.05$	

Cross Section 26

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.033
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.005$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 27

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.033
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.005$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 28

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.033
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.005$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 29

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Channel	$n_b = 0.024$	0.032
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.004$	
Right Over Bank	$n_b = 0.024$	0.038
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.01$	

Cross Section 30

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Channel	$n_b = 0.024$	0.032
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.004$	
Right Over Bank	$n_b = 0.024$	0.038
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.01$	

Cross Section 31

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Channel	$n_b = 0.024$	0.035
	$n_1 = 0.002$	
	$n_2 = 0.003$	
	$n_3 = 0.006$	
Right Over Bank	$n_b = 0.024$	0.038
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.01$	

Cross Section 32

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.031
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.003$	
Channel	$n_b = 0.024$	0.035
	$n_1 = 0.002$	
	$n_2 = 0.003$	
	$n_3 = 0.006$	
Right Over Bank	$n_b = 0.024$	0.038
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.01$	

Cross Section 33

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.032
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.004$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 34

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Channel	$n_b = 0.024$	0.032
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.004$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 35

Portion of Cross Section	Components	Composite Values
Left Over Bank*	$n_b = 0.024$	0.06
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.03$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

*Rose Plantation

Cross Section 36

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.06
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.03$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.03
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	

Cross Section 37

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.033
	$n_1 = 0.003$	
	$n_2 = 0.003$	
	$n_3 = 0.003$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.032
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.004$	

Cross Section 38

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.033
	$n_1 = 0.003$	
	$n_2 = 0.003$	
	$n_3 = 0.003$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.032
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.004$	

Cross Section 39

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.033
	$n_1 = 0.003$	
	$n_2 = 0.003$	
	$n_3 = 0.003$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.032
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.004$	

Cross Section 40

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.034
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.004$	

Cross Section 41

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.034
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.004$	

Cross Section 42

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.034
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.004$	

Cross Section 43

Portion of Cross Section	Components	Composite Values
Left Over Bank*	$n_b = 0.024$	0.06
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.03$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.034
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.006$	

*Cotton Fields

Cross Section 44

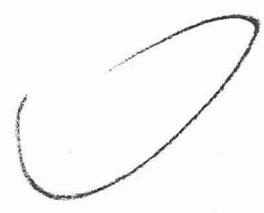
Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.06
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.03$	
Channel	$n_b = 0.02$	0.026
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.002$	
Right Over Bank	$n_b = 0.024$	0.034
	$n_1 = 0.002$	
	$n_2 = 0.002$	
	$n_3 = 0.006$	

Cross Section 45

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b = 0.024$	0.06
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.03$	
Channel	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	
Right Over Bank	$n_b = 0.024$	0.036
	$n_1 = 0.002$	
	$n_2 = 0.004$	
	$n_3 = 0.006$	

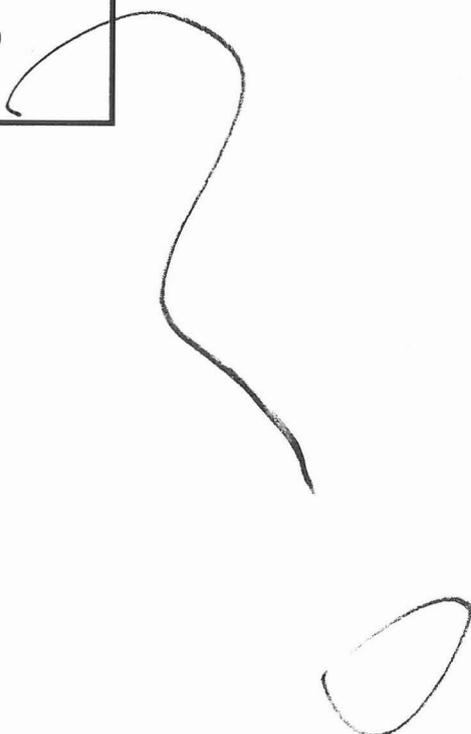
Cross Section 46

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	
Channel	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	
Right Over Bank	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	



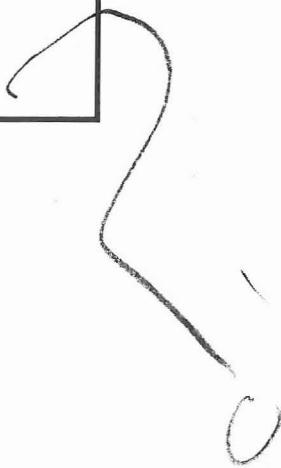
Cross Section 47

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	
Channel	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	
Right Over Bank	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	



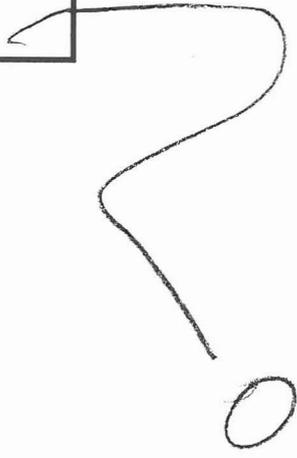
Cross Section 48

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	
Channel	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	
Right Over Bank	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	



Cross Section 49

Portion of Cross Section	Components	Composite Values
Left Over Bank	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	
Channel	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	
Right Over Bank	$n_b =$	0
	$n_1 =$	
	$n_2 =$	
	$n_3 =$	



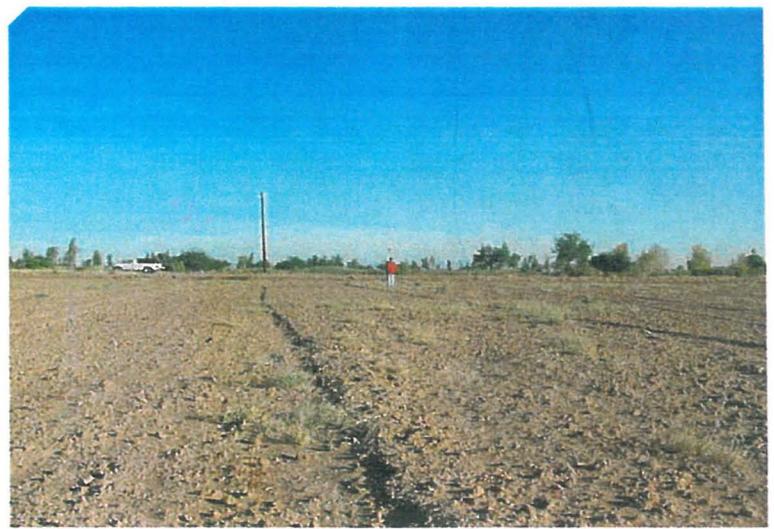
SL
missing

CAMELBACK ROAD PHOTOGRAPHS

n_1 : Irregularity
 n_2 : Obstruction
 n_3 : Vegetation

X-sec 1#2

$n_1 = 0.2$
 $n_2 = 0.002$
 $n_3 = 0.002$



X-sec 1#2 657 (E1) 1629 N ROB



$n_1 = 0.024$
 $n_2 = 0.002$
 $n_3 = 0.002$
 $n_4 = 0.01$

Channel X-sec 1#2 658 (E2) 1640 E Channel looking D/S



X-sec 1#2 659 (E3) 1640 W Channel looking U/S



$n_1 = 0.024$
 $n_2 = 0.002$
 $n_3 = 0.002$
 $n_4 = 0.002$

X-sec 1#2 660 (E4) 1652 N LOB



X-sec 1 & 2

661 (E5) 1652 S

LOB



X-sec 3 & 4

662 (E6) 1658 S - @ Dam X-sec #17

LOB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.005$
 $n_3 = 0.004$



X-sec 3 & 4

663 (E7) 1683 N

LOB



X-sec 3 & 4

664 (E8) 1683 E

channel looking
 D/S

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.005$
 $n_3 = 0.02$



X-sec 3 #4

665 (E9) 1683 S

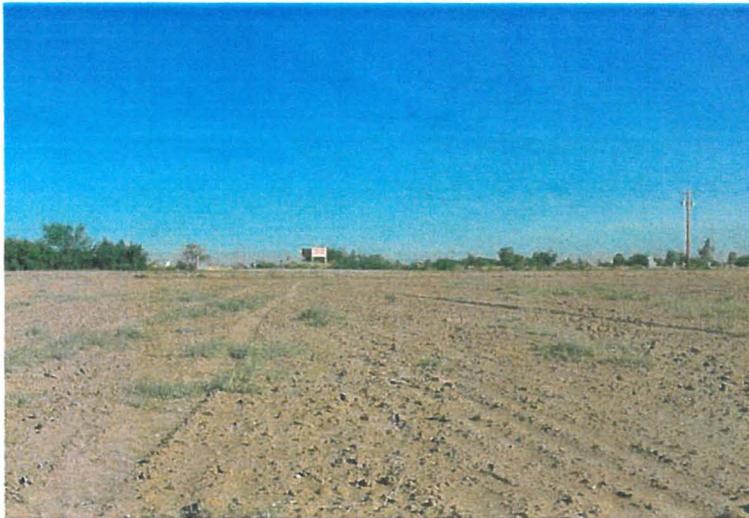


X-sec 3 #4

666 (E10) 1683 W

Channel looking U/S

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$



667 (E11) 1697 N - @ End X Sec #47

X-sec 3 #4

ROB



668 (E12) 1722 S - @ End X Sec #48

X-sec 4, 5, #6

LOB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.005$
 $n_3 = 0.03$



X-sec 5 #6 669 (E13) 1734-1735 N - 6736 From Channel



X-sec 5 #6 670 (E14) 1734-1735 E - 6735 Channel looking D/S

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.005$
 $n_3 = 0.03$



X-sec 5 #6 671 (E15) 1734-1735 S - 6736 From Channel



X-sec 5 #6 672 (E16) 1734-1735 W - 6736 Channel looking U/S

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.006$



X-sec 5 #6 673 (E17) 1748 N - ~~Field X-sec #46~~ ROB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$



X-sec 7 683 (F1) 1749 N - @ ~~Red X-sec #42~~ ROB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$



X-sec 7 684 (F2) 1758 N LOB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.003$



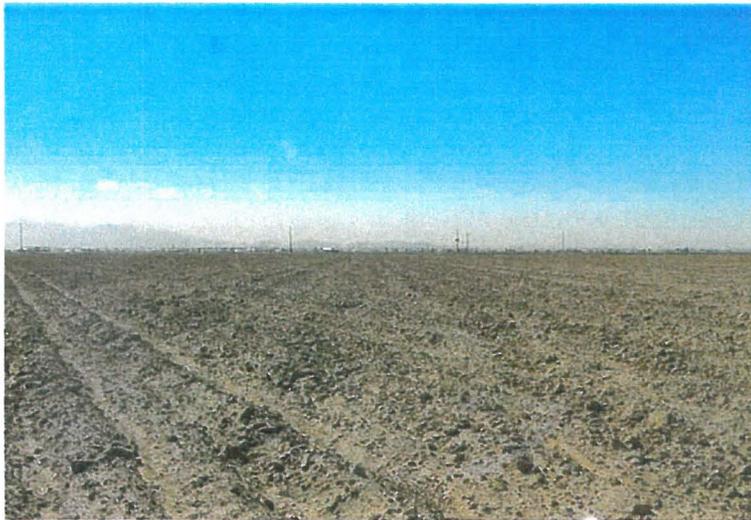
X-sec 7 #6 685 (F3) 1758 E channel looking DIS



X-sec 7#8 686 (F4) 1758 S channel



X-sec 7#8 687 (F5) 1758 W channel looking W/S



X-sec 7 688 (F6) 1766 S - ~~End X Sec 7#3~~ LOB



X-sec 8 689 (F7) 1767 S - ~~End X Sec 7#2~~ LOB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$



X-sec 8 690 (F8) 1786 N - @ ~~Cross Sec #12~~ RoB



X-sec 9 691 (F9) 1787 N - @ ~~Cross Sec #11~~ RoB



X-sec 9 & 10 692 (F10) 1793 W Channel looking u/s

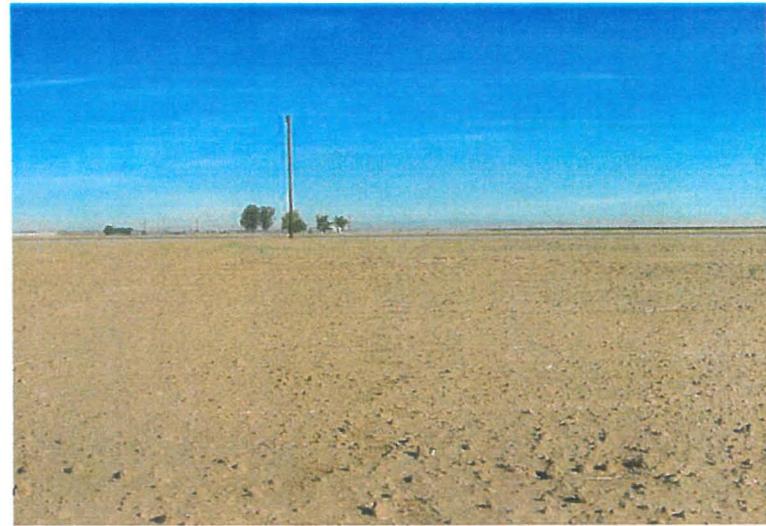


X-sec 9 & 10 693 (F11) 1793 E Channel Looking D/S

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.003$

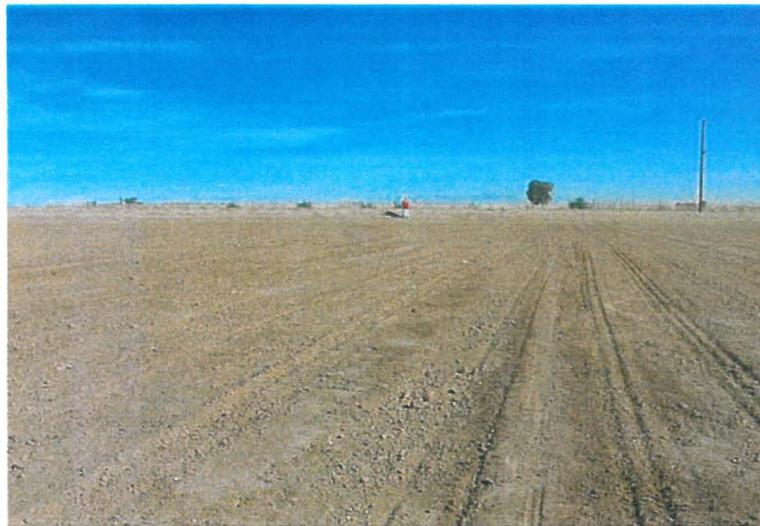


X-sec 9 & 10 694 (F12) 1804 S. [redacted] ROB



X-sec 10 695 (F13) 1823 N. [redacted] ROB

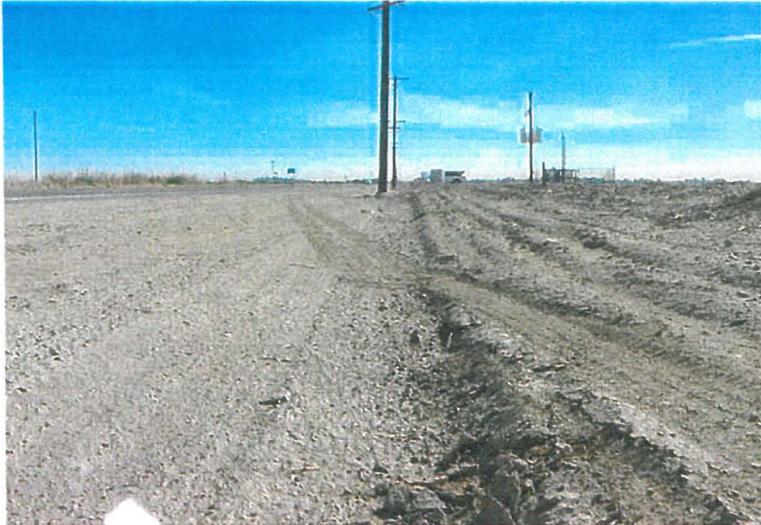
$N_b = 0.024$
 $N_1 = 0.002$
 $N_2 = 0.002$
 $N_3 = 0.002$



X-sec 11, 12, & 13 696 (F14) 1825 N. [redacted] ROB



697 (F15) 1831 W



X-sec 11, 12, & 13

698 (F16) 1831 E

Channel Looking
DIS



699 (F17) 1846 W

~~Geo @ F15 of EW Force~~
Grade 1's of E.W. Force



700 (F18) 1846 E

~~Geo @ F15 of EW Force~~
Grade 1's of E.W. Force



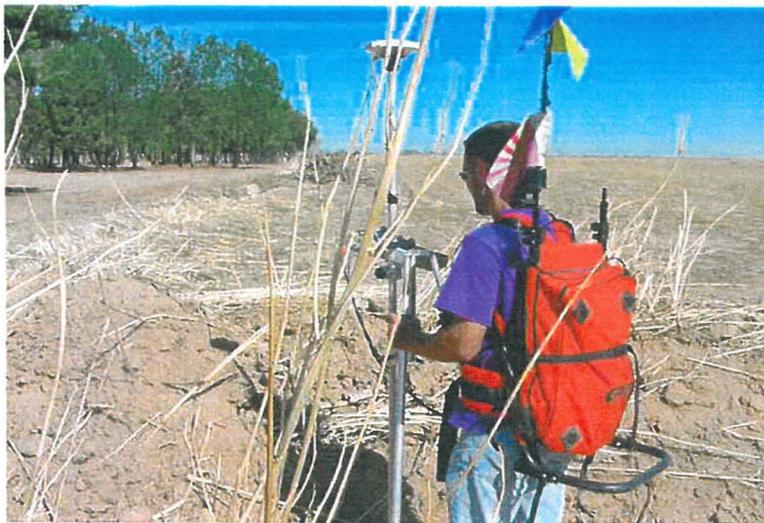
701 (F19) 1853 S

X-sec 11, 12, & 13

~~Geo @ F15 of EW Force~~
1853S

LOB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.004$
 $n_3 = 0.006$



X-sec 14

702 (G1) 1893-94 N

LOB



X-sec 14

703 (G2) 1893-94 E

Channel Looking D/S

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.004$
 $n_3 = 0.006$

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$



X-sec 14 & 15

704 (G3) 1893-94 S

ROB



X-sec 14

705 (G4) 1893-94 W

Channel Looking W/S

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.004$
 $n_3 = 0.01$



X-sec 15 #16 706 (G5) 1904 S - @ ~~706 (G5) 1904 S~~ LOB



$n_b = 0.024$
 $n_1 = 0.003$
 $n_2 = 0.005$
 $n_3 = 0.01$

X-sec 15 #16 707 (G6) 1910-11 W - TOE (@#1911) Channel Looking W/S



X-sec 15 #16 708 (G7) 1910-11 E - TOE (@#1911) Channel Looking D/S



$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$

X-sec 15 #16 709 (G8) 1926 N - @ ~~709 (G8) 1926 N~~ ROB



X-sec 17 & 18 710 (G9) 1950 N - @ ~~710~~ X Sec 133 RoB



X-sec 17 & 18 711 (G10) 1966-67 S - @ ~~711~~ channel

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.004$
 $n_3 = 0.006$

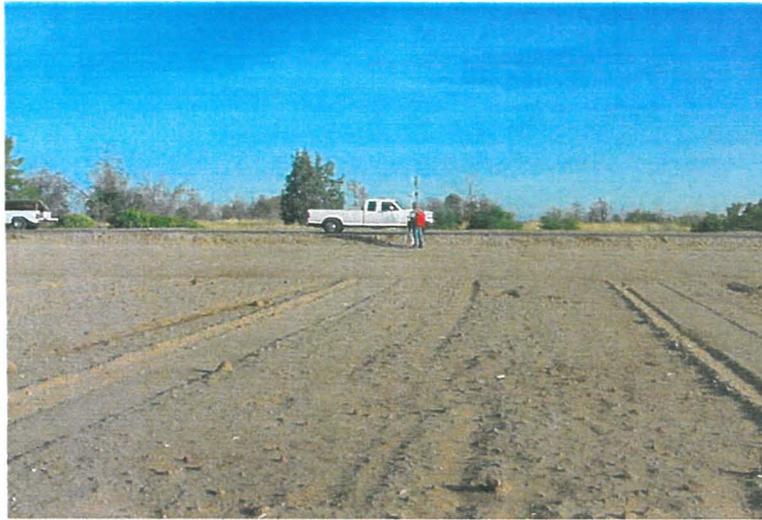


X-sec 17 & 18 712 (G11) 1966-67 N - @ ~~712~~ channel



X-sec 17 713 (G12) 1976 S - @ ~~713~~ LOB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.003$
 $n_3 = 0.006$



X-sec 117 714 (G13) 1977 N - @ ~~Em #39~~ LoB



X-sec 1817 715 (G14) 1996 S - @ ~~Em #41~~ LoB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.004$
 $n_3 = 0.006$

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.003$
 $n_3 = 0.01$

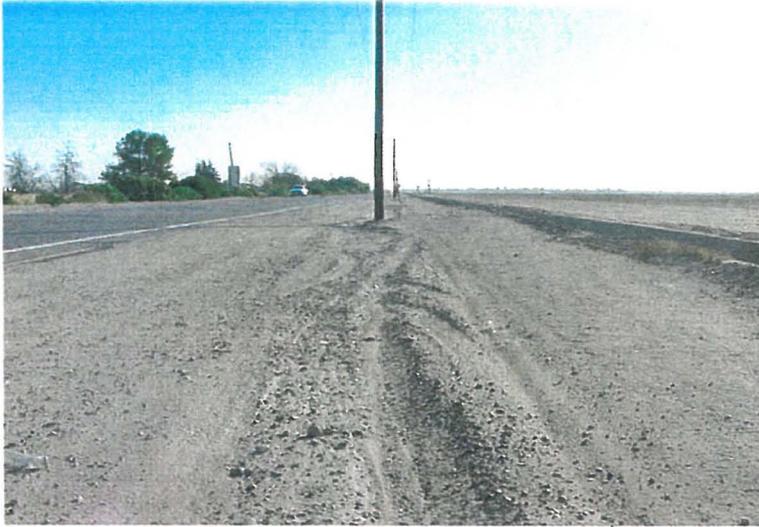


X-sec 20 716 (G15) 1997 S - @ ~~Em #30~~ LoB



X-sec 20 717 (G16) 2011 N LoB

$n_b = 0.02$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$



X-sec 19 #20 718 (G17) 2011 E Channel Looking D/S



$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$

X-sec 19, 20 719 (G18) 2011 S ROB

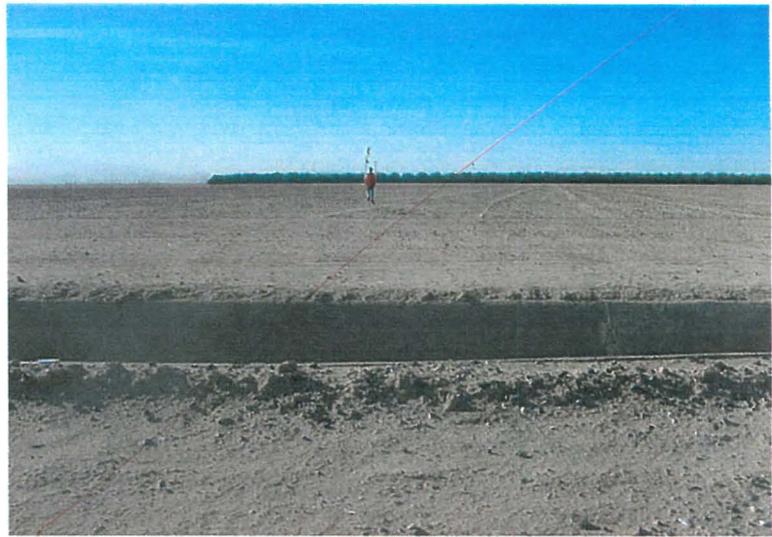


X-sec 20 720 (G19) 2011 W Channel Looking U/S

(H1) 2030 S - @ #2030



718 (G17) 2011 E



719 (G18) 2011 S



720 (G19) 2011 W



DT-11

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.003$

↳ Taken 1/7/2002 X-sec 34 Looking D/S #33



D1-12 X-sec 35 Looking W/S



D1-13 X-sec 33&34 L/O/B



X-sec 33&34 R/O/B
D1-14



X-sec 31,32 Looking D/S
D2-1

Dirt road
between Citrus Rd
& Cotton Lane



X-sec 32 Looking U/S
D2-2



D2-3 X-sec 31,32 LOB



X-sec 31,32 ROB
D2-4



X-sec 28 & 29 Looking D/S
D2-5



X-sec 30 D2-6 looking W/S



X-sec 29,30 D2-7 L/S



X-sec 29,30 ROB

D2-8



Cotton Lane

D2-9



D2-11 From Cotton Ln Looking D/S



D2-12



X-sec 26, 27, & 28 D2-12 LOR



X-sec 26, 27, & 28 D2-13 ROB



X-sec 25 & 24 D2-14 looking D/S



X-sec 24 D2-15 Looking W/S



X-sec 24 & 25 D2-16 LOB



X-sec 24 & 25 D2-17 ROB

Loop 303 Looking DS



D3 - 18

Loop 303 Looking W/S



D3 - 19



X - Sec 21, 22, 23
D3-20 LOB



X - sec 21, 22, 23 ROB
D3-21



(117) 2237 N - @ End X Sec #19



756 (J1) 2251 E

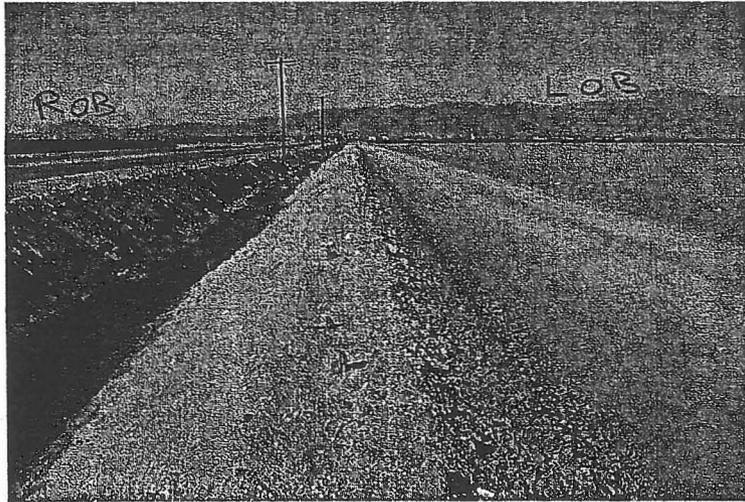


757 (J2) 2251 W

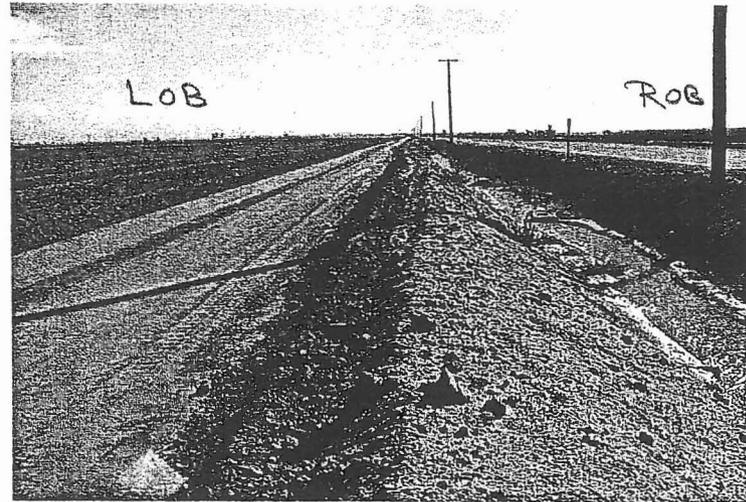


758 (J3) 2297 N

(117) 2237 N - @ End X Sec #19

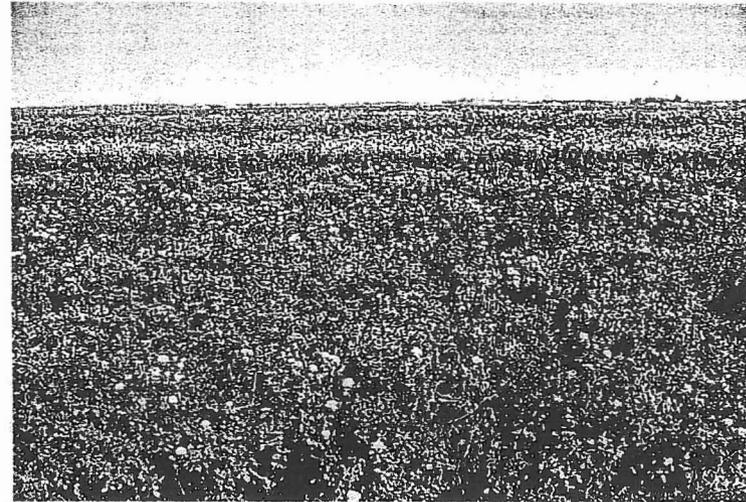


757 (J2) 2251 W
X-sec 32, 33, 34 Channel looking U/S

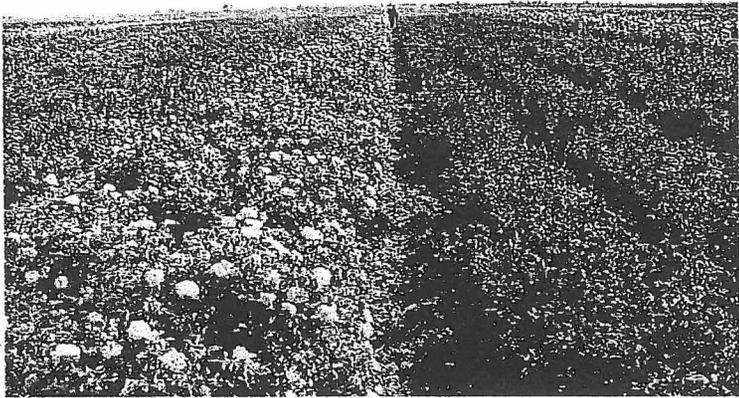


756 (J1) 2251 E
X-sec 32, 33, 34 Channel looking D/S

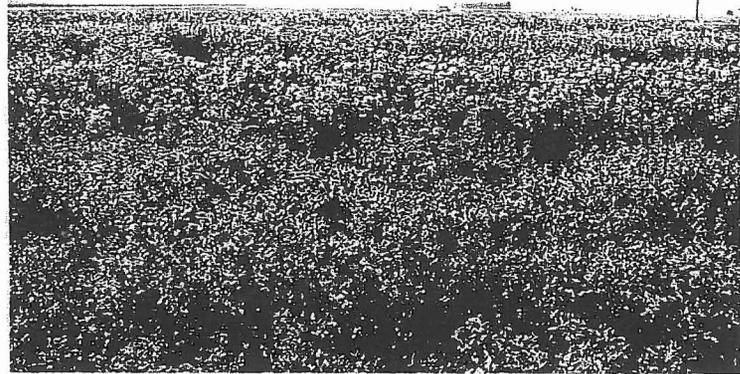
$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.003$
 $n_3 = 0.006$



758 (J3) 2297 N
X-sec 35 LOB



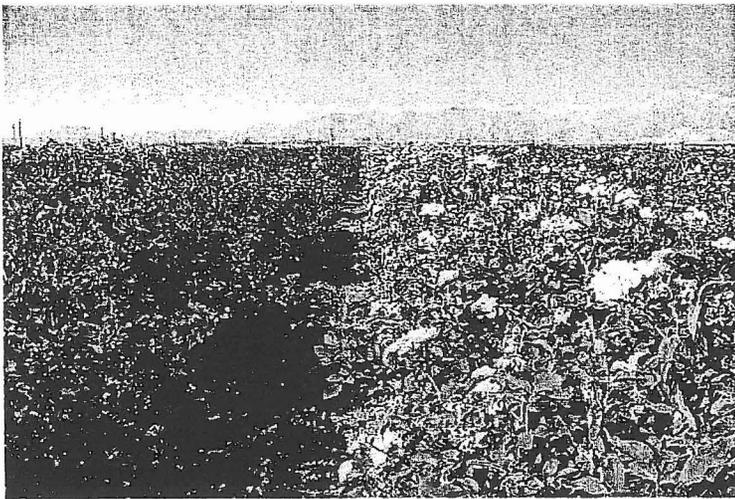
759 (J4) 2297 E



760 (J5) 2297 S

X-sec 35

LOB



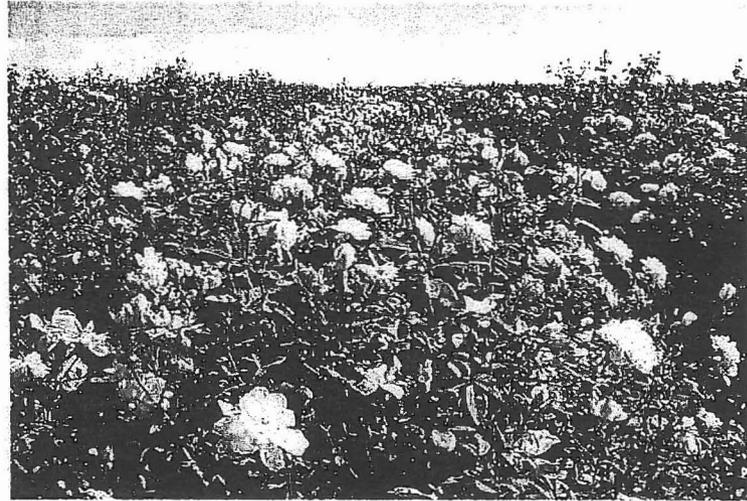
761 (J6) 2297 W



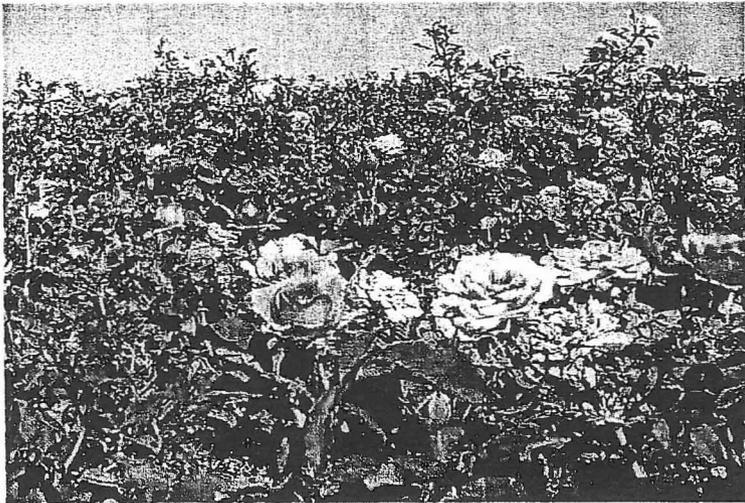
762 (J7) 2298 N



763 (J8) 2299 W



764 (J9) 2306 E



765 (J10) 2307 N

X-sec 36 LOB

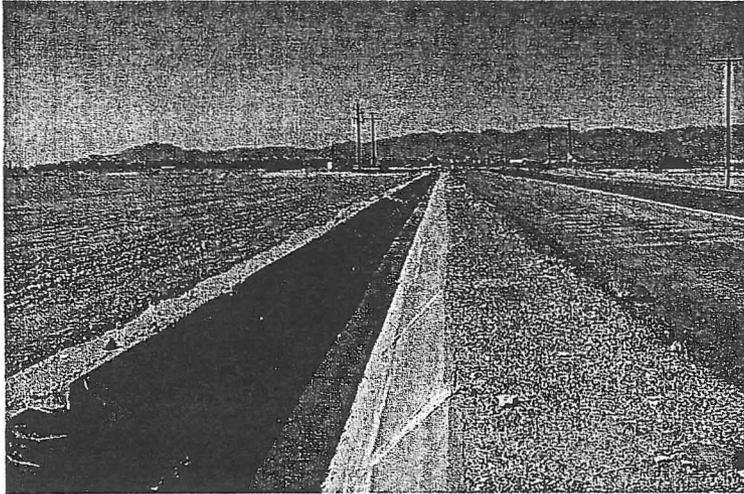


766 (J11) 2318 E

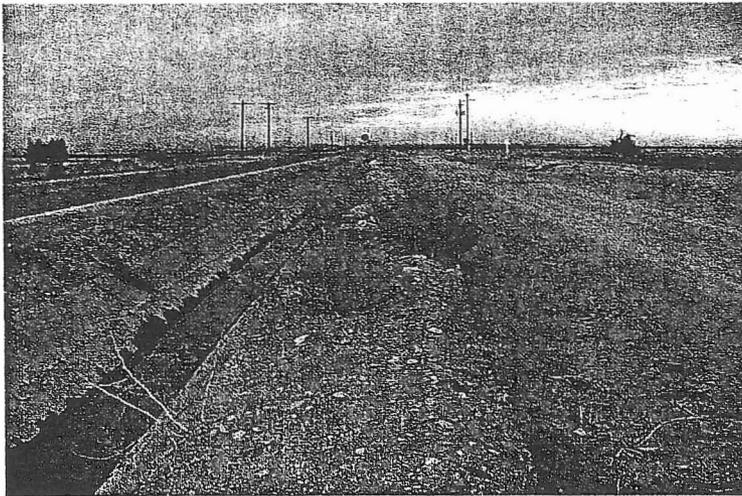
X-sec 33, 36 Channel Looking U/S

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$

$n_b = 0.02$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$



X-sec 36 767 (J12) 2318 W Channel Looking D/S

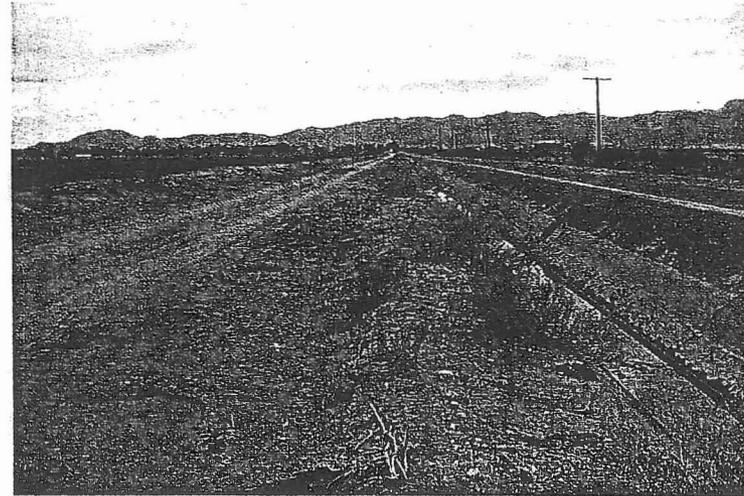


X-sec 37,38 769 (J14) 2332 E Channel Looking D/S



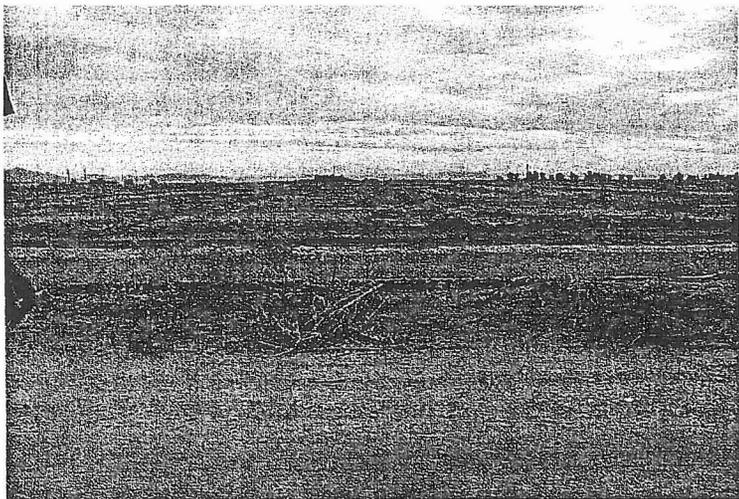
X-sec 37,38,39 768 (J13) 2324 N - @ Bgn X Sec #12 ROB used as photo for Roughness 'n' Req for ROB for Xs 36

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.004$



X-sec 38 770 (J15) 2332 W Channel Looking U/S

$n_b = 0.02$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$



771 (J16) 2357 S - @ End X Sec #12

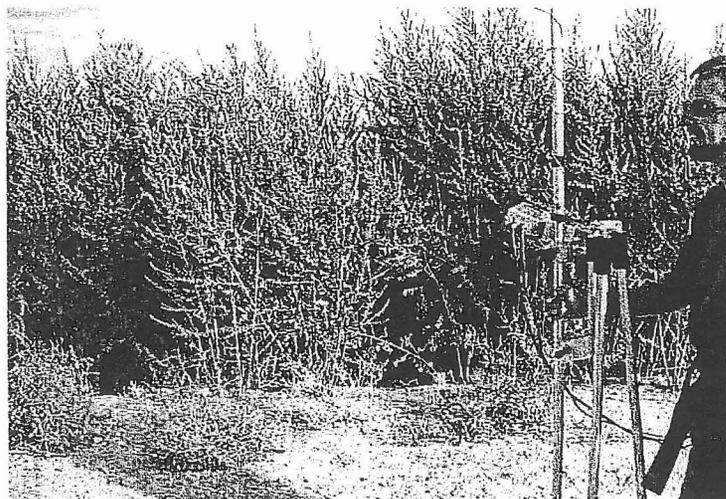
X-sec 37,38 LOB



772 (J17) 2358 S - @ Bgn X Sec #11

X-sec 38 LOB

773 (K1) 2392 N - @ Bgn X Sec #10



774 (K2) 2411 N

X-sec 40 LOB

767 (J12) 2318 W



X-sec 37,38 769 (J14) 2332 E Channel Looking D/S

768 (J13) 2324 N - @ Bog...



X-sec 38 770 (J15) 2332 W Channel Looking W/S

$n_1 = 0.02$
 $n_2 = 0.002$
 $n_3 = 0.002$



X-sec 37,38 771 (J16) 2357 S - @ Bog... #12 LOB



X-sec 38 772 (J17) 2358 S - @ Bog... #11 LOB

773 (K1) 2392 N - ~~© B. X. Sec. 40~~



X-sec 40

775 (K3) 2411 E



774 (K2) 2411 N

LOB



X-sec 40

776 (K4) 2411 S

ROB





X-sec 40

777 (K5) 2411 W

Channel Looking
U/S ??



X-sec 40, 41, 42

778 (K6) 2429 S

LOB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.002$
 $n_3 = 0.002$



X-sec 40, 41, 42

779 (K7) 2429 N

LOB



X-sec 41

780 (K8) 2440-41 E - @ #2440

LOB





X-sec 41,42

781 (K9) 2440-41 W - @ #2440

ROB



X-sec 41,42

782 (K10) 2461 N - @ ~~782 (K10) 2461 N~~

ROB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.004$
 $n_3 = 0.03$



X-sec 43,44

783 (K11) 2489 S - @ ~~783 (K11) 2489 S~~

LOB



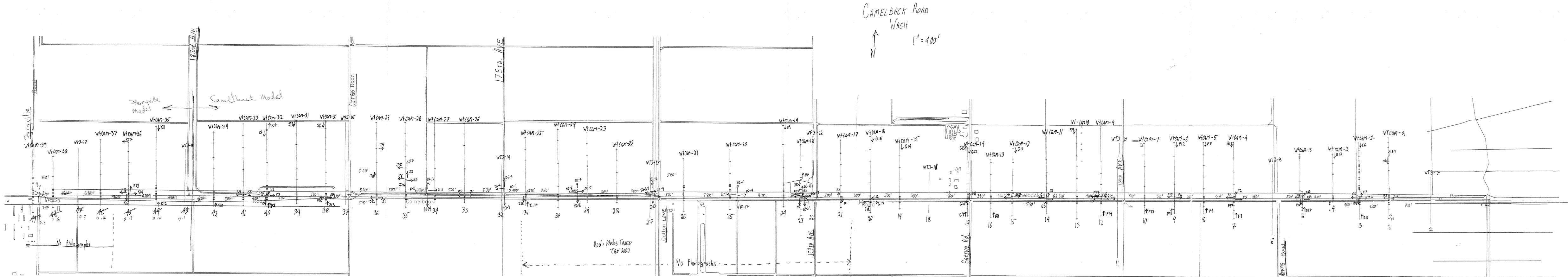
X-sec 43,44

784 (K12) 2520 N - @ ~~784 (K12) 2520 N~~

ROB

$n_b = 0.024$
 $n_1 = 0.002$
 $n_2 = 0.004$
 $n_3 = 0.01$





CAMELBACK ROAD
 WASH
 ↑
 N
 1" = 400'

Red: Photos TAKEN
 JAN 2002

No Photographs

No Photographs