RECLAMATION
Managing Water in the West

Upper San Jacinto River Sediment Transport Study San Jacinto River, California

Southern California Area Office
Lower Colorado Region

U.S. Department of the Interior
Bureau of Reclamation
Technical Service Center
Denver, Colorado

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Upper San Jacinto River Sediment Transport Study San Jacinto River, California

Prepared: David Varyu
Hydraulic Engineer, Sedimentation and River Hydraulics Group 86-68240

Peer Review: Paula W. Makar, P.E.
Hydraulic Engineer, Sedimentation and River Hydraulics Group 86-68240

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Executive Summary

Evaluations of sediment transport using two methods for 87 years of simulated duration were performed on the San Jacinto River from near Lake Park Drive to Bridge Street. The model results incorporate present sediment, historical hydrologic, and future geometric conditions. There is no physical sediment transport data to which model results could be compared, so averages of four transport formulae are considered the best available estimate.

An average of approximately 6000 tons per year of bed material sediment can be expected to be delivered to Bridge Street during years of flow. Approximately 90% of that bed material sediment is within the categories of very fine sand, fine sand, and medium sand. About 10% of the material delivered to Bridge Street is coarse sand and larger.

Model results suggest that aggradation is likely for the entire river. A large section of concave bed profile occupies the upper-most 1.2 miles of river (just downstream of Lake Park Drive) and significant aggradation occurs here while the river attempts to reach an equilibrium condition. Excluding the upper 1.2 miles of simulated river, an average of approximately one foot of aggradation may be expected in the river channel for the proposed river channel modifications.

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1 Project Description

The San Jacinto River was diverted to bypass Mystic Lake for irrigation purposes in the early part of the 20th century. Since then, the river often breaches the diversion channel during storm events and flows to Mystic Lake. The diversion channel is no longer needed and redirecting the river to near its historical channel alignment is desirable. Allowing the river to naturally reconstruct its own channel is not feasible as there would be overland flow through agricultural lands entraining nutrients. These nutrients could cause Canyon Lake and Lake Elsinore to exceed EPA TMDL restrictions [(1)].

Members of the San Jacinto River Watershed Council (SJRWC) are sponsoring the reconnection of Mystic Lake to the San Jacinto River. Members of the SJRWC include Riverside County Flood Control (RCFC), local water municipalities, and local landowners and stakeholders. A constructed channel with levees has been suggested and designed by Tetra Tech Inc. The Tetra Tech design extends from Sanderson Avenue to Bridge Street. In addition to the Tetra Tech design, United States Army Corps of Engineers (USACOE) levee improvements designed by Webb Associates (Webb) extend upstream of Sanderson Avenue to near Lake Park Drive and are already approved. Figure 1-1 presents a schematic of study area identifying main aspects and landmarks of project.

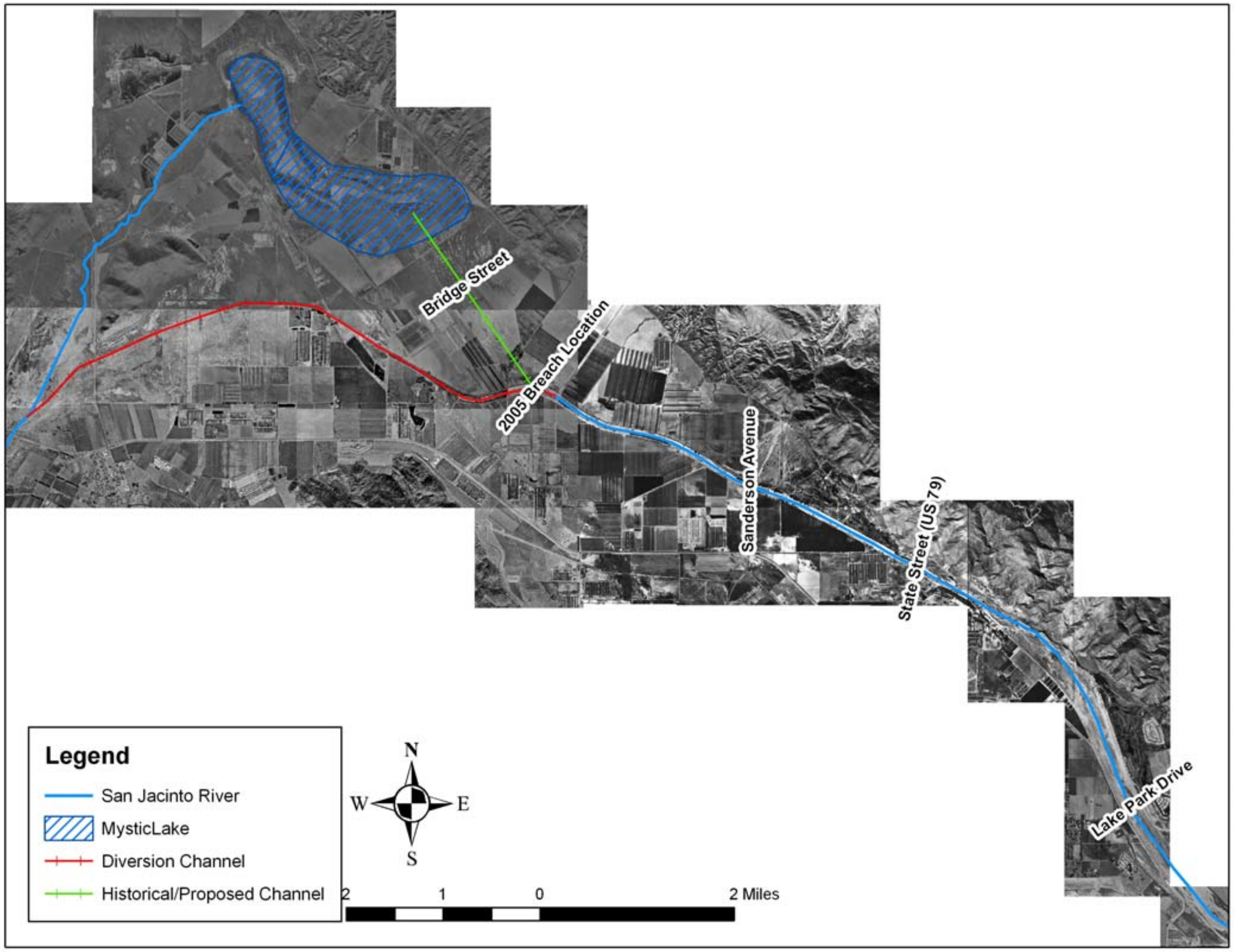

Figure 1-1. Schematic of San Jacinto Project Reach

A new sediment analysis of San Jacinto River assuming levee improvements has been completed. Levee improvements include the reconstruction and widening of the existing levee channel between Lake Park Drive and Sanderson Avenue (design- Webb & Associates) and the construction of the Tetra Tech designed levee channel between Sanderson Avenue and Bridge Street. The constructed Tetra Tech channel includes 5 drop structures immediately downstream of Sanderson Avenue and continues downstream with a constant slope of 0.10 percent. This design was chosen primarily to minimize cost of construction and earthwork without a detailed analysis of sediment transport. It is the purpose of this report to analyze the flow of sediment through the designed channel from downstream of Lake Park Drive to the terminus of the constructed channel just upstream of Bridge Street near Mystic Lake.

2 Data Collection and Model Development

This investigation provides information on the San Jacinto River's ability to transport current sediment supplies downstream of Lake Park Drive. Data sources include existing bed material descriptions and grain size distributions, United States Geological Survey (USGS) stream gages, and existing hydraulic models.

2.1 Sediment

A review of existing sediment data for the San Jacinto River was conducted with the help of Riverside County Flood Control (RCFC). Sediment data exists primarily as the result of investigations corresponding to levee design and construction. Much of the data was in the form of bore sample data with visual classification by means of the United Soil Classification System(2) (USCS) by depth as well as density and moisture content by depth. Some grain size distributions are also available from bore samples at various depths. This type of information was present for the levees along the Golden Era property (upstream of Potrero Creek on right side of San Jacinto River), within the Potrero Creek sediment basin, the channel and floodplain of Bautista Creek, and a few samples within the actual San Jacinto River channel. This data spanned 1959 to 1993. In addition, Tetra Tech collected seven sediment samples in 2007 of the bed material between Lake Park Drive and the Bridge Street and performed a standard sieve test to develop grain size distributions for each sample(3). The existing historical data was compared to the Tetra Tech data and invariably the older visual descriptions of the material fit with the grain size distributions resulting from the Tetra Tech samples. The Tetra Tech data was deemed most representative of current conditions and also covered the entire study reach. By comparison, the other existing data was localized to a specific area of interest and collected by different entities giving rise to issues of consistent collection and analysis methods. Figure 2-1 presents the Tetra Tech sediment sample locations.

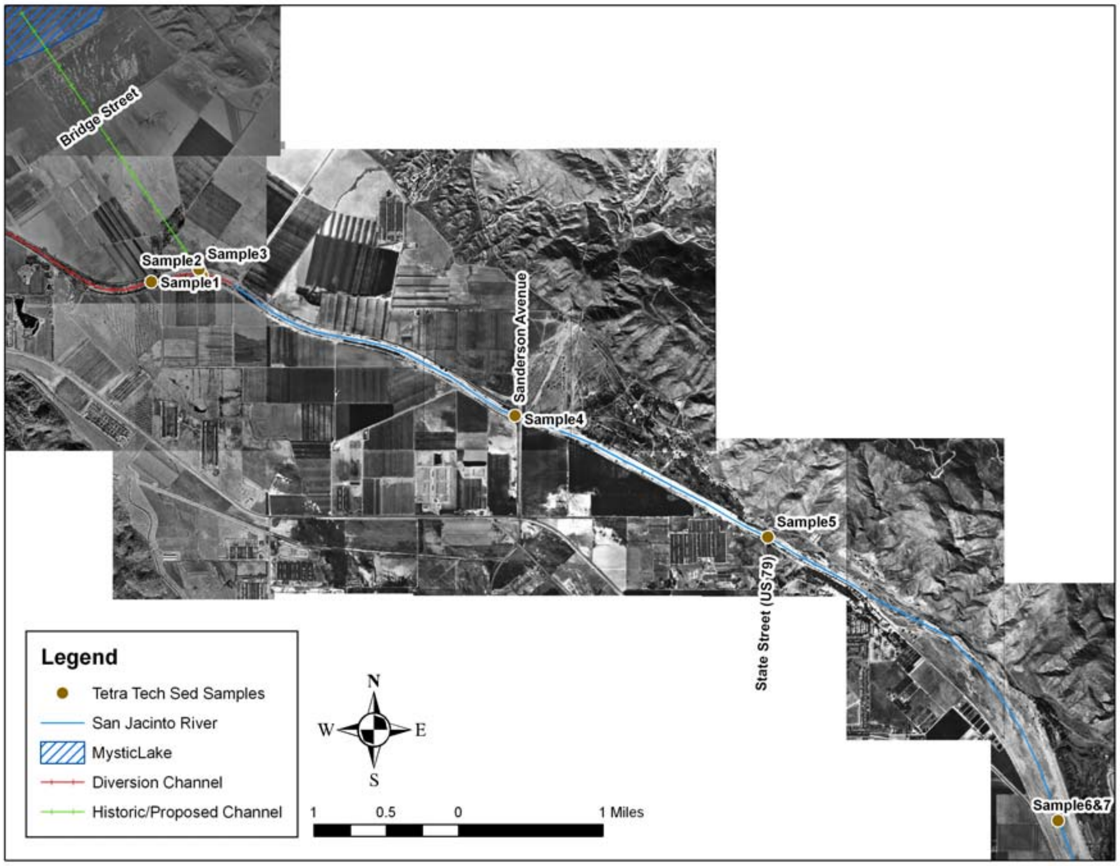

Figure 2-1. Tetra Tech Sediment Sample Locations

The Tetra Tech samples were typically taken at a depth of one foot, except for sample 6 which was taken at the surface above sample 7. Samples 1 and 2 were taken in the ponded area of the diversion channel, and are not useful for determining sediment that is transported as bed material load in active reaches of a channel. For consistency, sample 6 was not used as all other samples were taken at a depth of one foot. The sediment gradations as provided by Tetra Tech were interpolated to phi-class sizes for use in the sediment transport models. The phi class definitions are presented in Table 2-1, and Table 2-2 presents the grain size distribution resulting from the phi class interpolation. Figure 2-2 presents the grain size distributions for the original Tetra Tech samples TT1-TT7 where "TT" stands for Tetra Tech. Figure 2-3 presents the phi-class interpolations of the grain size distributions.

Table 2-1. Phi Class Definitions

Name	Phi	Mean Diameter	Lower Diameter	Upper Diameter	Comment
Clay	-8.5	0.002762	0.001953	0.003906	Clay
VFM	-7.5	0.005524	0.003906	0.007813	Very Fine Silt
FM	-6.5	0.011049	0.007813	0.015625	Fine Silt
MM	-5.5	0.022097	0.015625	0.03125	Medium Silt
CM	-4.5	0.044194	0.03125	0.0625	Course Silt
VFS	-3.5	0.088388	0.0625	0.125	Very Fine Sand
FS	-2.5	0.176777	0.125	0.25	Fine Sand
MS	-1.5	0.353553	0.25	0.5	Medium Sand
CS	-0.5	0.707107	0.5	1	Course Sand
VCS	0.5	1.414214	1	2	Very Course Sand
VFG	1.5	2.828427	2	4	Very Fine Gravel
FG	2.5	5.656854	4	8	Fine Gravel
MG	3.5	11.31371	8	16	Medium Gravel
CG	4.5	22.62742	16	32	Course Gravel
VCG	5.5	45.25483	32	64	Very Course Gravel
SC	6.5	90.50967	64	128	Small Cobble
LC	7.5	181.0193	128	256	Large Cobble
SB	8.5	362.0387	256	512	Small Boulder
MB	9.5	724.0773	512	1024	Medium Boulder
LB	10.5	1448.155	1024	2048	Large Boulder
VLB	11.5	2896.309	2048	4096	Very Large Boulder

Table 2-2. Grain Size Distribution Resulting From Phi Class Interpolation*

Key	CM	VFS	FS	MS	CS	VCS	VFG	FG	MG	CG	Comment
TT1	0.241	0.439	0.268	0.033	0.011	0.006	0.002	0.001	0.000	0.000	Sample 1 1-ft Depth-Interp
TT2	0.542	0.084	0.111	0.133	0.082	0.033	0.009	0.004	0.002	0.000	Sample 2 1-ft Depth-Interp
TT3	0.014	0.019	0.159	0.457	0.297	0.047	0.005	0.002	0.000	0.000	Sample 3 1-ft Depth-Interp
TT4	0.005	0.007	0.074	0.294	0.294	0.199	0.093	0.031	0.003	0.000	Sample 4 1-ft Depth-Interp
TT5	0.000	0.007	0.048	0.195	0.271	0.241	0.165	0.065	0.008	0.000	Sample 5 1-ft Depth-Interp
TT6	0.006	0.030	0.135	0.252	0.195	0.173	0.122	0.045	0.015	0.027	Sample 6 Surface-Interp
TT7	0.007	0.022	0.098	0.234	0.255	0.220	0.117	0.042	0.004	0.000	Sample 7 1-ft Depth-Interp

*Samples 1 and 2 (TT1, TT2) not appropriate for bed material load calculations

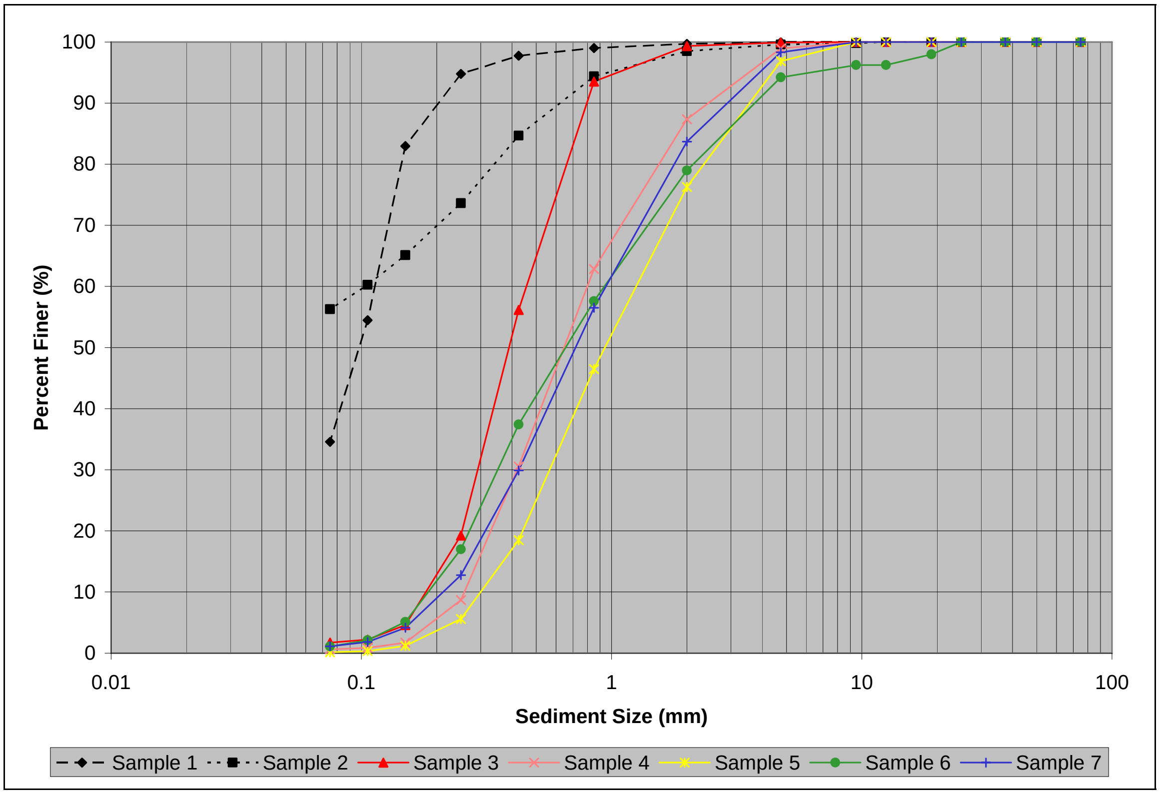

Figure 2-2. Grain Size Distributions for Tetra Tech Sediment Samples

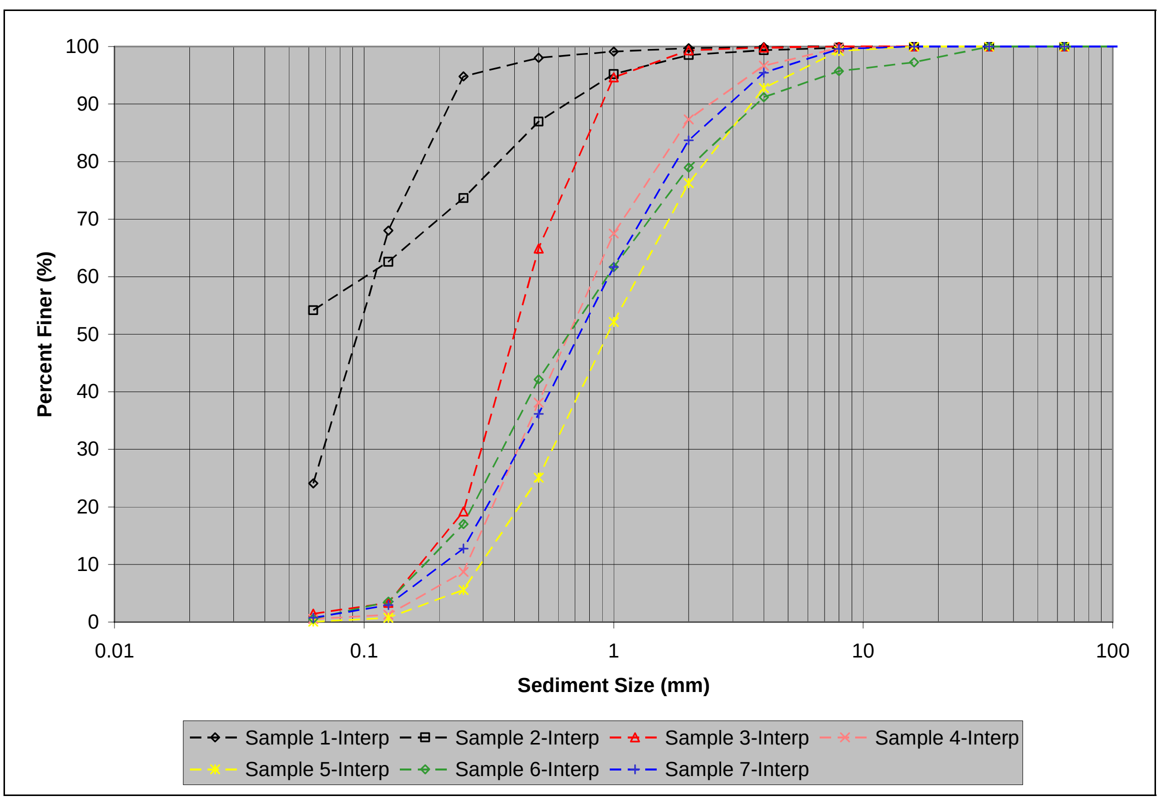

Figure 2-3. Grain Size Distributions Interpolated to Phi Classes

2.2 Hydrology

A flood frequency analysis was developed by Tetra Tech based on precipitation data and existing flow records for the San Jacinto basin. Flood frequency data considers the annual peak storm flow data for a gage record. An annual sediment load was necessary for this study. This required development of a flow duration curve for the basin which reflects the daily flows for the river and not the major storm events. USGS flow gage summaries are presented in Table 2-3 and Figure 2-4 presents the flow gage locations and the major tributaries.

Table 2-3. USGS Gages on the San Jacinto River

Site #	Station Name	Drainage Area (mi^2)	Q_{daily} begin date	Q_{daily} end date	Q_{daily} count	Q_{peak} begin date	Q_{peak} end date	Q_{peak} count
11069200	LK HEMET WC UP CN NR SAN JACINTO CA		10/1/1965	9/30/1991	6916	N/A	N/A	0
11069300	WF SAN JACINTO TRIB NR VALLE VISTA CA	2.2	10/1/1961	9/30/1967	2191	3/6/1962	2/11/1973	12
11069500	SAN JACINTO R NR SAN JACINTO	142	10/1/1920	11/9/2007	29963	3/13/1921	2/28/2006	74
11069501	SAN JACINTO R NR SAN JACINTO + CANALS CA		10/1/1948	9/30/1990	15340	N/A	N/A	0
11070150	SAN JACINTO R AB STATE STREET NR SAN JACINTO CA	252	10/1/1996	9/30/2006	3652	1/26/1997	2006-00-00	10
11070185	LAMB CYN C A VICTORY RANCH NR SAN JACINTO CA	3.97	N/A	N/A	0	1/26/1997	4/5/2006	10
11070190	LABORDE C NR SAN JACINTO CA	7.57	N/A	N/A	0	1/21/1962	2/11/1973	12
11070210	SAN JACINTO R A RAMONA EXPRESSWAY NR LAKEVIEW CA	365	8/23/2000	3/31/2007	2412	1/26/2001	2006-00-00	6

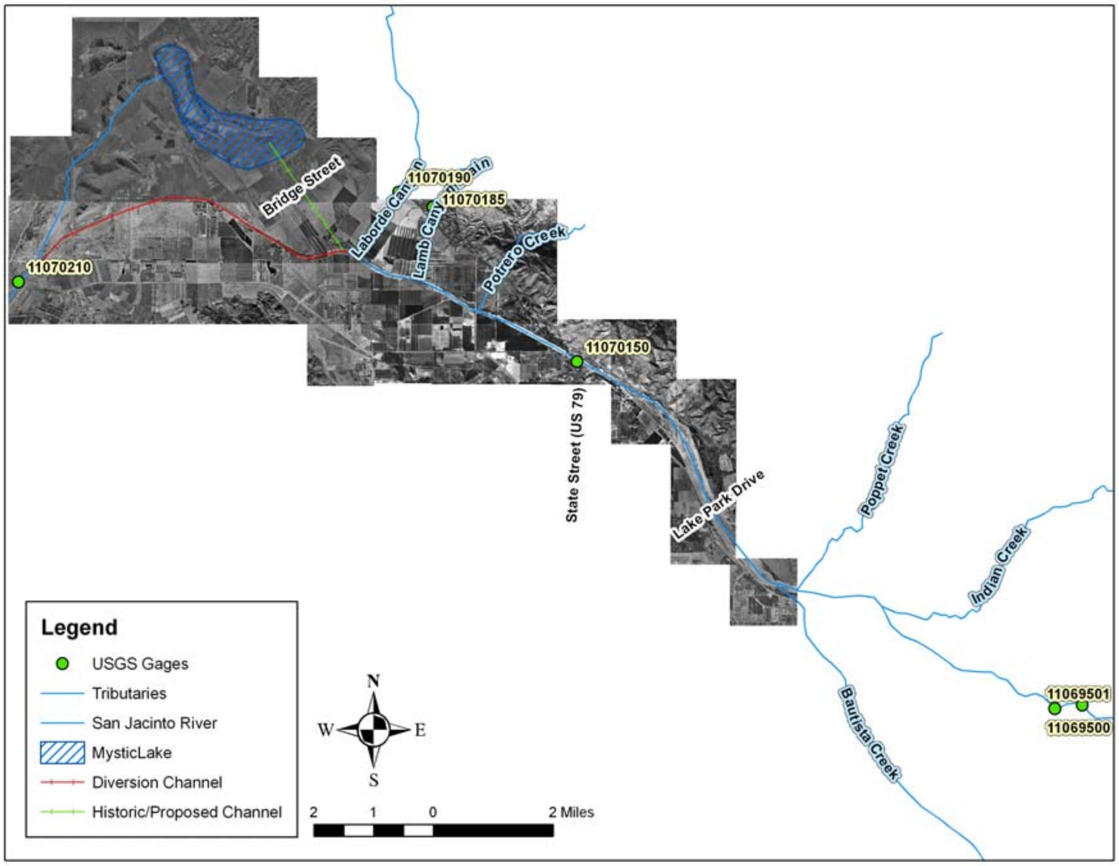

Figure 2-4. USGS Gage Locations and Major Tributaries

2.2.1 Mean Daily Flow Records

Gage number 11070150 would be the ideal gage in terms of location but it only has a record of ten years. The longest record gage was USGS 11069500 with nearly ninety years. The drainage area does increase approximately twofold between the two gages.

The ten year record for 11070150 overlaps a portion of the 11069500 gage record. The flow records from the two gages between 10/01/1996 and 9/30/2006 are shown in Figure 2-5. The flow values from the two gages were compared to each other on a daily basis and a linear regression was developed in order to predict the flow for gage 11070150 as a function of the flow for gage 11069500 (Figure 2-6). Note that all flows below 101 cubic feet per second (cfs) for 11069500 correspond to zero flow at 11070150. A linear regression was performed on all records corresponding to a flow greater than 101 cfs for gage 11069500. A mean daily flow record was synthesized for USGS gage 11070150 with the same gage record length as for USGS gage 11069500. The gage record synthesis followed these rules:

- if the mean daily flow exists for 11070150, then use the flow record from 11070150;
- if the mean daily flow at 11069500 is less than or equal to 101 cfs and does not exist for 11070150, then flow for 11070150 is zero;

- if the mean daily flow at 11069500 is greater than 101 cfs and does not exist for 11070150, then use the equation generated by the linear regression.

Figure 2-7 and Figure 2-8 present the predicted discharge for gage 11070150 based on linear regression along with the actual records at USGS gage 11069500 and 11070150 for the two significant storms during the overlapping periods of record.

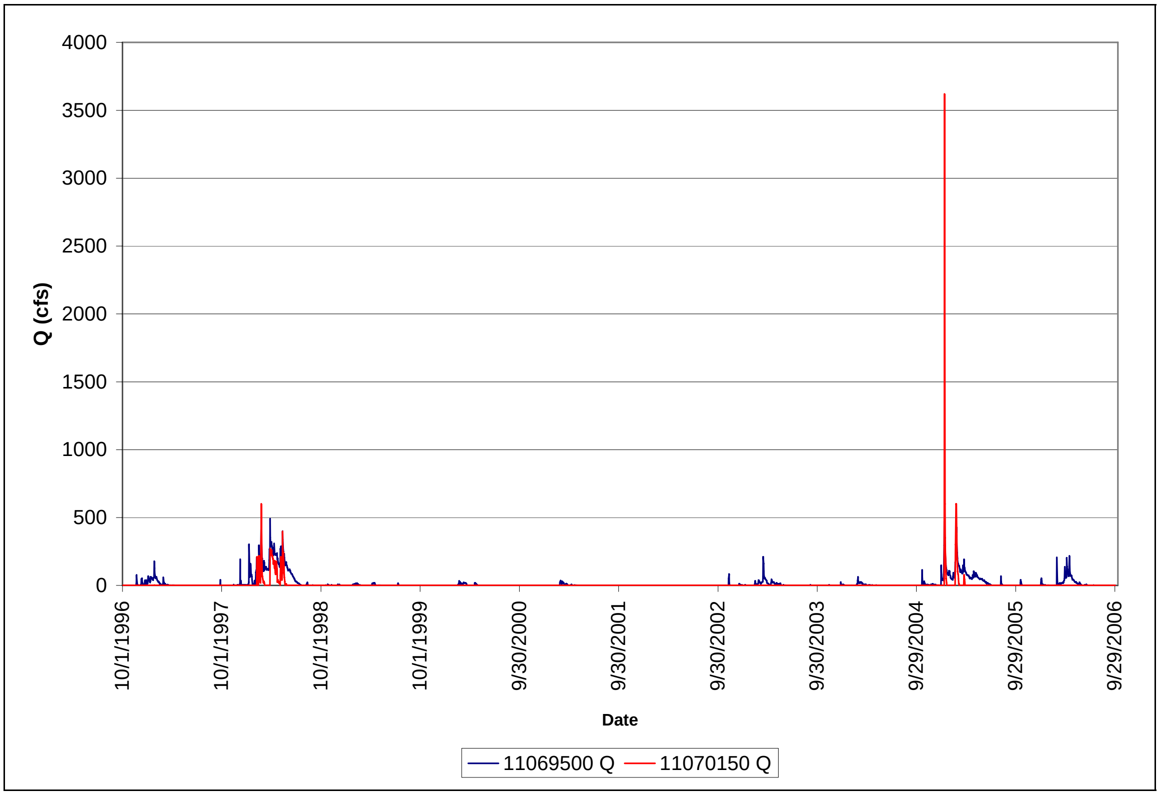

Figure 2-5. Flow records for overlapping 10 years of USGS gages 11069500 and 11070150

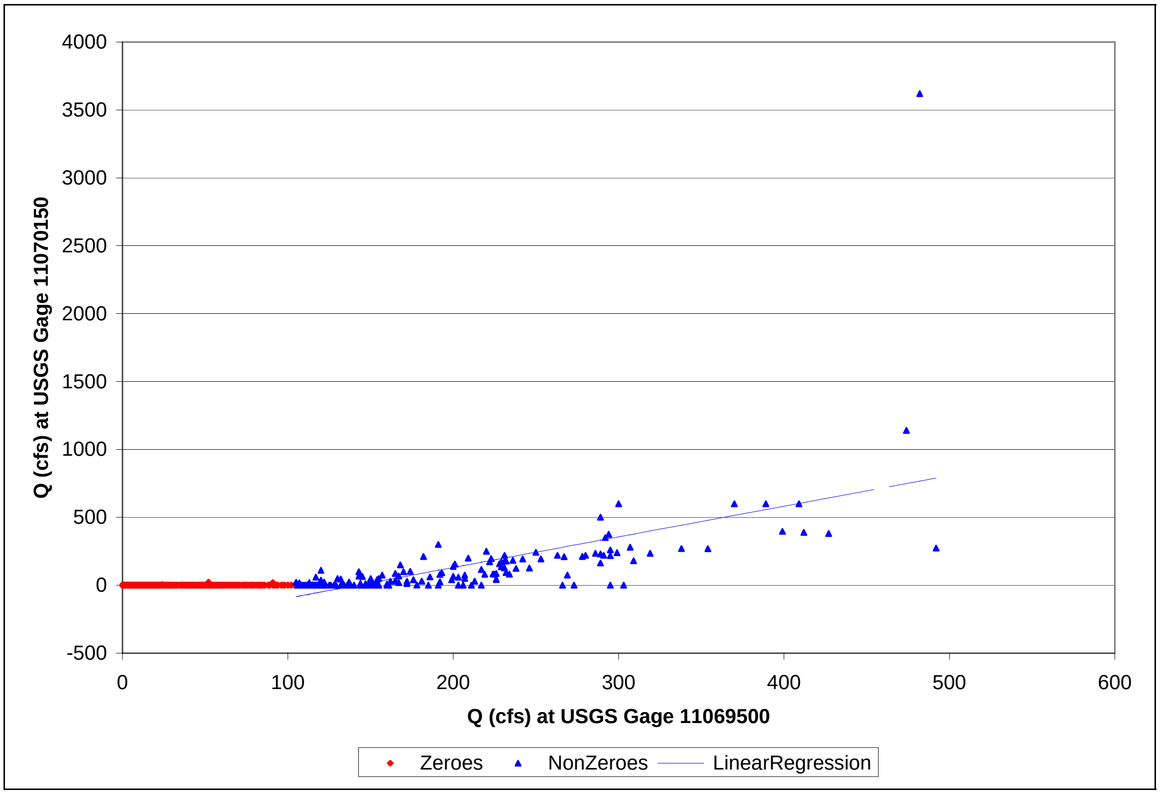

Figure 2-6. Flow at 11070150 as a Function of Flow at 11069500

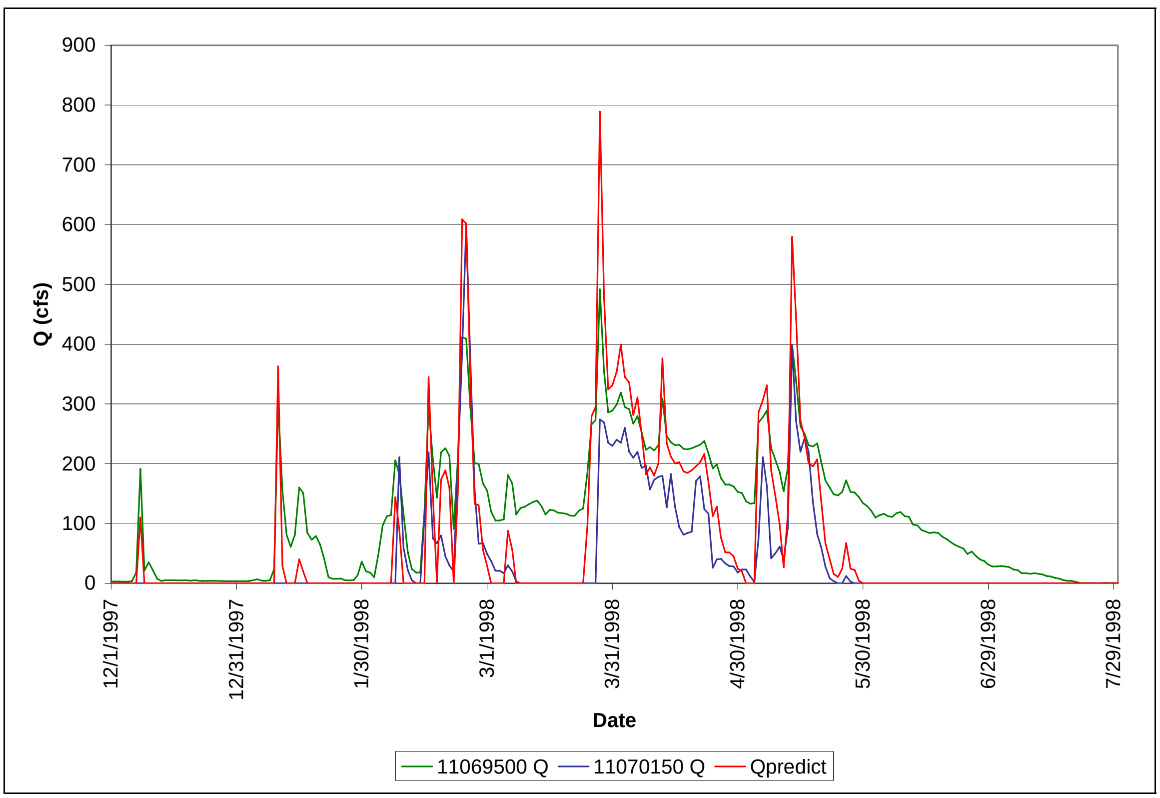

Figure 2-7. Predicted and Recorded Flows for Winter and Spring 1998

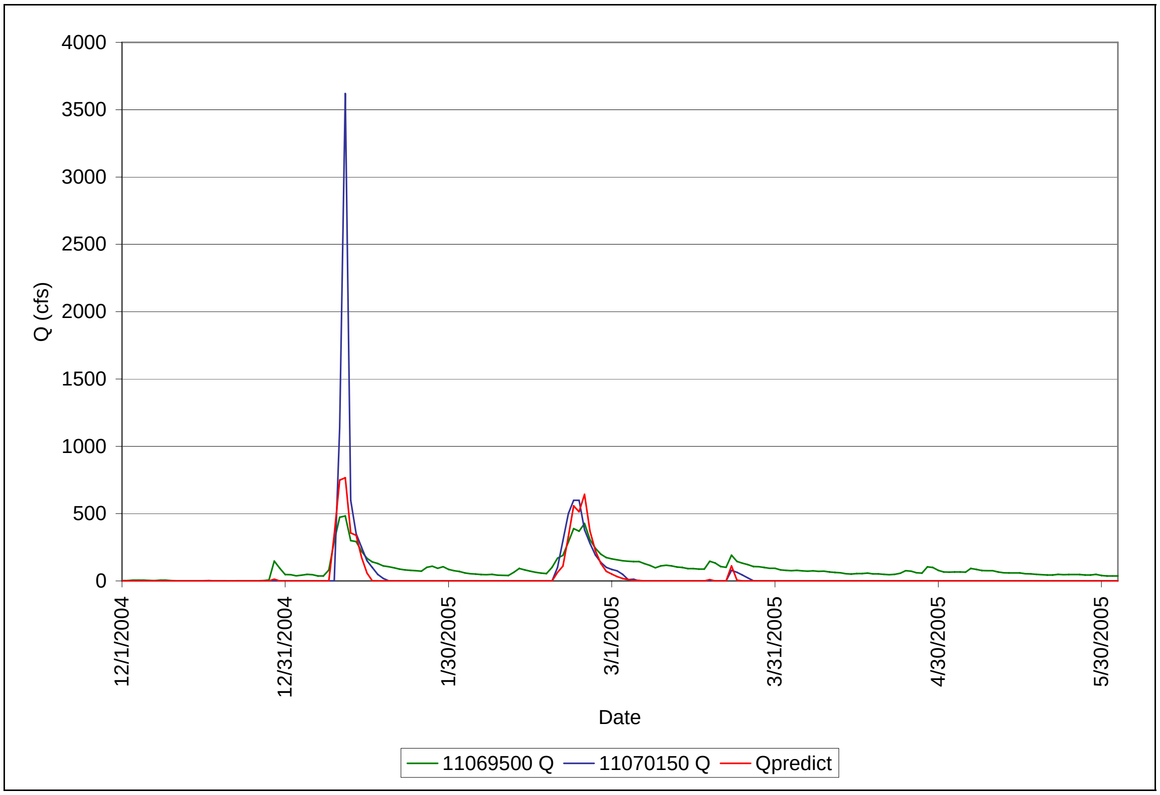

Figure 2-8. Predicted and Recorded Flows for Winter 2005

2.2.2 Mean Daily to Instantaneous Flow Transformation

Mean daily flow records for USGS gage 11070150 were synthesized as described in Section 2.2.1. Using mean daily flow values to compute a sediment transport rate can under-predict total loads on a 'flashy' ephemeral stream due to the non-linear relationship between sediment transport and discharge. A transformation to an instantaneous time series while preserving flow volume provides an improved estimate (Appendix A). Only three peak discharge records are available for USGS gage 11070150. Figure 2-9 presents a plot comparing the three peak discharge values on record for USGS gage 11070150, along with mean daily and instantaneous transform discharges.

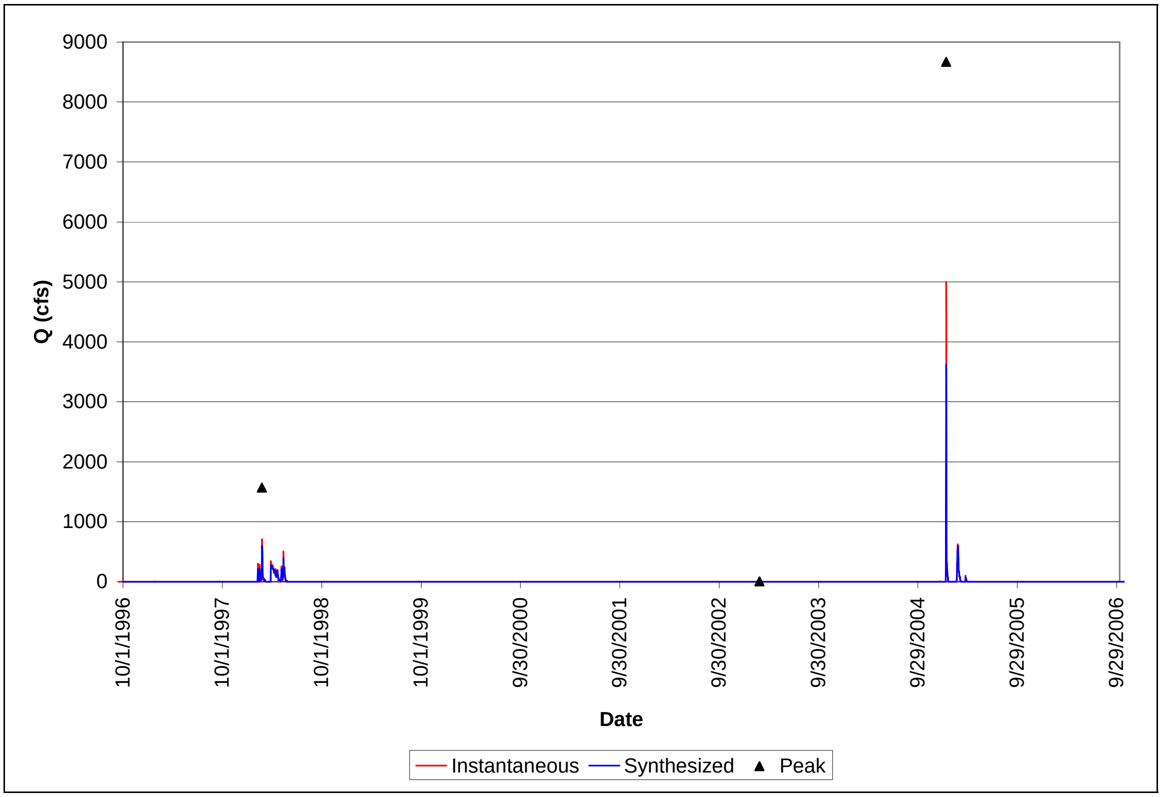

Figure 2-9. Peak, Mean Daily, and Instantaneous Transform of Flow for USGS Gage 11070150

2.2.3 Flow Duration Bins

A flow gage record can be statistically represented by a flow duration curve. This is a plot of the probability of a discharge event occurring as a function of the discharge event magnitude. This flow duration curve may then be simplified by representing the flows by flow duration bins (Appendix A). This process was performed on the instantaneous transform data based on the 87 years of synthesized record for USGS gage 11070150. These bins are created for representative flows to be used in defining reach breaks as described in Section 2.3.3. Table 2-4 presents the flow duration bins and their respective representative flow values, durations, probabilities, lower bin value/probability, and bin upper value and probability. Note that 97% of the instantaneous flow record is made up of zero flow values. The duration of a representative flow is simply the probability of that flow multiplied by the number of days in a year to generate an average or representative hydrology year. For the 10 years of recorded mean daily flow data at USGS gage 11070150, six water years are void of flow and 96% of the days have zero flow values. Figure 2-10 presents the data from Table 2-4 in graphical format.

Table 2-4. Flow Duration Bins and Representative Flow Rates

bin	Qrep (cfs)	Duration (days)	Probability	Q lower (cfs)	Prob. lower	Qupper (cfs)	Prob. Upper
1	223.1893	362.5638	0.99264556	0	0.97047	446.379	0.99266
2	601.5777	1.021678	0.0027972	446.379	0.99266	756.777	0.99546
3	917.4434	0.545278	0.00149289	756.777	0.99546	1078.11	0.99695
4	1258.605	0.332906	0.00091145	1078.11	0.99695	1439.1	0.99786
5	1669.794	0.212371	0.00058144	1439.1	0.99786	1900.49	0.99844
6	2157.694	0.149234	0.00040858	1900.49	0.99844	2414.9	0.99885
7	2722.304	0.097576	0.00026715	2414.9	0.99885	3029.71	0.99912
8	3475.305	0.074617	0.00020429	3029.71	0.99912	3920.9	0.99932
9	4202.925	0.051658	0.00014143	3920.9	0.99932	4484.95	0.99947
10	4891.061	0.040178	0.00011	4484.95	0.99947	5297.17	0.99958
11	5773.793	0.034439	9.4288E-05	5297.17	0.99958	6250.41	0.99967
12	6540.895	0.028699	7.8573E-05	6250.41	0.99967	6831.38	0.99975
13	7203.649	0.022959	6.2858E-05	6831.38	0.99975	7575.92	0.99981
14	8257.569	0.017219	4.7144E-05	7575.92	0.99981	8939.22	0.99986
15	9174.144	0.017219	4.7144E-05	8939.22	0.99986	9409.07	0.99991
16	10285.55	0.01148	3.1429E-05	9409.07	0.99991	11162	0.99994
17	12733.51	0.01148	3.1429E-05	11162	0.99994	14305	0.99997
18	18594.56	0.00574	1.5715E-05	14305	0.99997	22884.1	0.99998

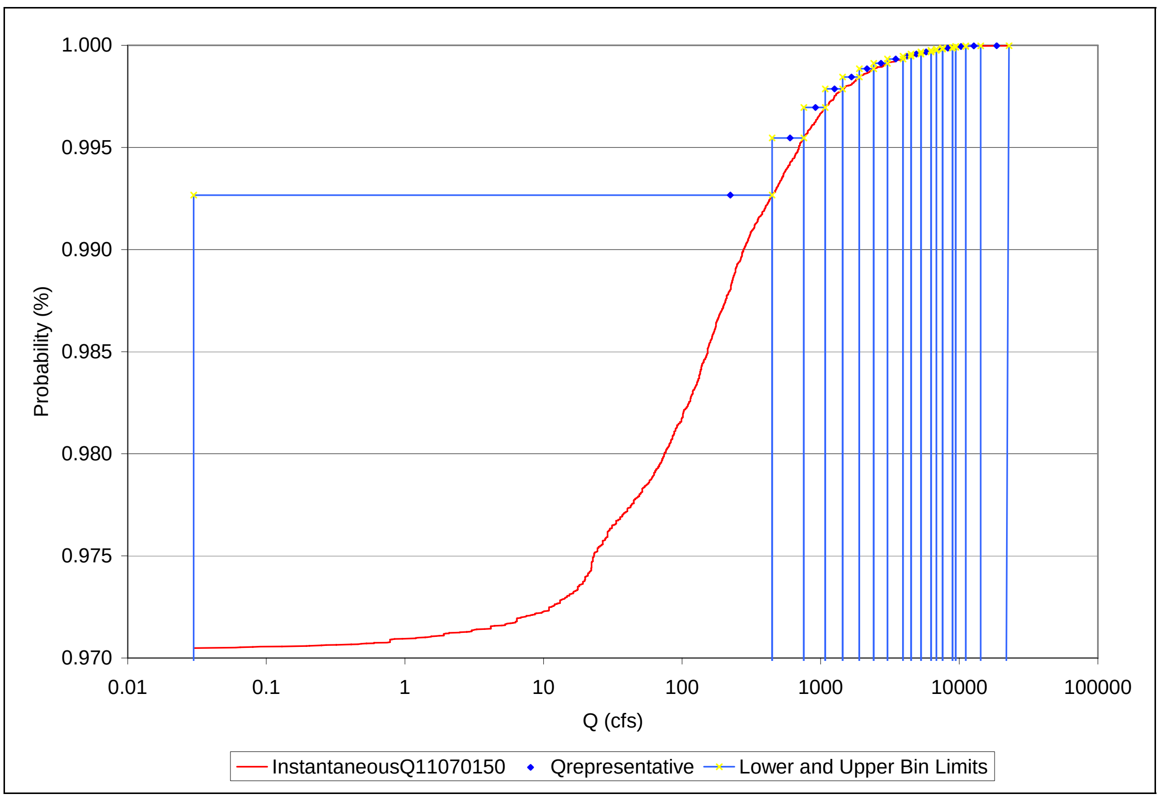

Figure 2-10. Flow Duration Bins and Representative Flows for 87-Year Flow Duration Curve

2.3 Hydraulics

The flow hydraulics determines the force of water upon the channel boundary and therefore the amount of energy available for sediment transport. Hydraulic analysis used an existing geometry and the one-dimensional backwater model HEC-RAS (Brunner, 2003) for the representative flows identified in Section 2.2.3.

2.3.1 Geometry

Geometric data as provided by Tetra Tech and Webb & Associates was the basis of the HEC-RAS model used to develop hydraulic properties. The RAS data includes the improved USACOE levee system as designed by Webb & Associates upstream of Sanderson Avenue. The topographic basis for the geometric model was 4-ft contour data as supplied by RCFC. State Street and Sanderson Avenue were both represented as bridges in the existing Webb HEC-RAS model. The Webb HEC-RAS model included a channel downstream of Sanderson Avenue. This reach of river downstream of Sanderson Avenue was modified to reflect the Tetra Tech channel design, including the series of in-line drop structures just downstream of Sanderson Avenue and constant slope thereafter to Bridge Street. The original Webb & Associates model used a numbering scheme that assigned the identification “63” to the upstream cross section and the numbering decreased in the downstream direction. The cross section number for State Street Bridge is 45.5 and for Sanderson Bridge is 24.5. Cross sections downstream of Sanderson Bridge were developed by Reclamation to reflect the Tetra Tech conceptual design and numbering of cross section continued to decrease in the downstream direction. The continuation of previous numbering results in downstream cross sections being negative. The length of the modeled river reach is just under 7.5 miles with cross section “63” being the upstream extent and cross section “-15” being the downstream extent. Final HEC-RAS model geometry can be found in Appendix B, and Figure 2-11 presents the final channel profile.

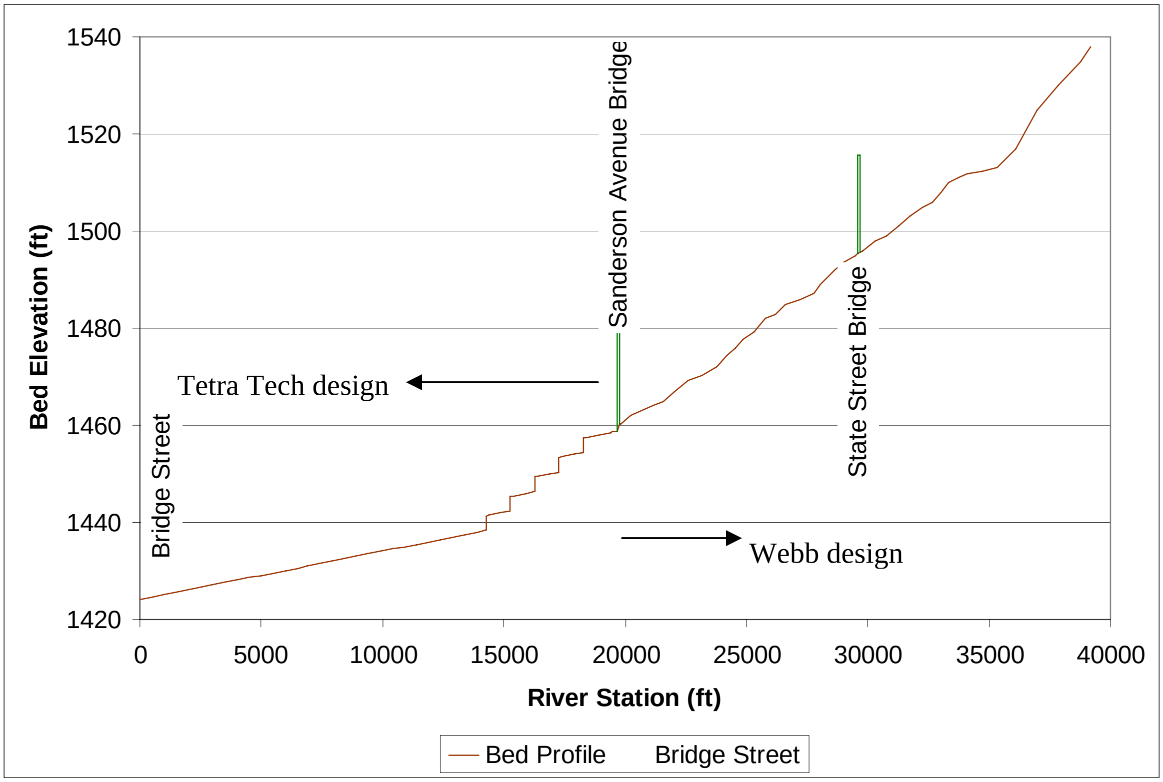

Figure 2-11. Profile of Minimum Channel Bed Elevation

2.3.2 One-Dimensional Hydraulic Modeling

The HEC-RAS backwater model used a Manning's n roughness as defined in the existing model. No modifications were made to the Manning's n roughness values in the reach of river upstream of Sanderson Avenue, and the in-channel and overbank values were continued downstream of Sanderson. The downstream boundary condition was a normal depth value using the same bed slope as the design channel of 0.1%. The steady-state flow rates mirrored the binned flows as presented in Table 2-4. Two flow rates were added to the eighteen representative flows; the low value of the low bin and the high value of the highest bin. Since zero flow produces zero hydraulics, an assumed representative value of 0.1 cfs was run in HEC-RAS so that the fact that the river is dry 97% of the time (Table 2-4) would be represented. The high value of the highest bin (22,884.1 cfs) has an associated duration of approximately 10 minutes per year.

2.3.3 Reach Average Hydraulics

The hydraulic characteristics of a reach were determined by averaging the hydraulic results from each cross section. Interpolated cross sections generated by HEC-RAS were not used when averaging hydraulics. Results were visually checked for outliers. Reach breaks were identified using the hydraulic parameters velocity, flow depth, top width, flow, hydraulic radius, hydraulic depth, and wetted perimeter. Only in-channel parameters were used as floodplain hydraulics do not contribute significantly to downstream transport of channel sediment. Five distinct reaches were identified between Lake Park Drive and Bridge Street. Table 2-5 presents a list of the reaches (upstream to downstream) and their corresponding upstream/downstream RAS cross sections. Figure 2-12 is an example of reach break definitions. The example is a plot of in-channel velocity, hydraulic radius, and wetted perimeter as a function of HEC-RAS cross sections by river station for a specific total flow rate of 6540.9 cfs. Figure 2-13 visually presents the reaches.

Table 2-5. Unique Reaches for San Jacinto Reach Average Hydraulics

Subreach	Upstream XS	Downstream XS
5	63	59
4	58	43
3	42	25
2	24	13.74
1	13.72	-15

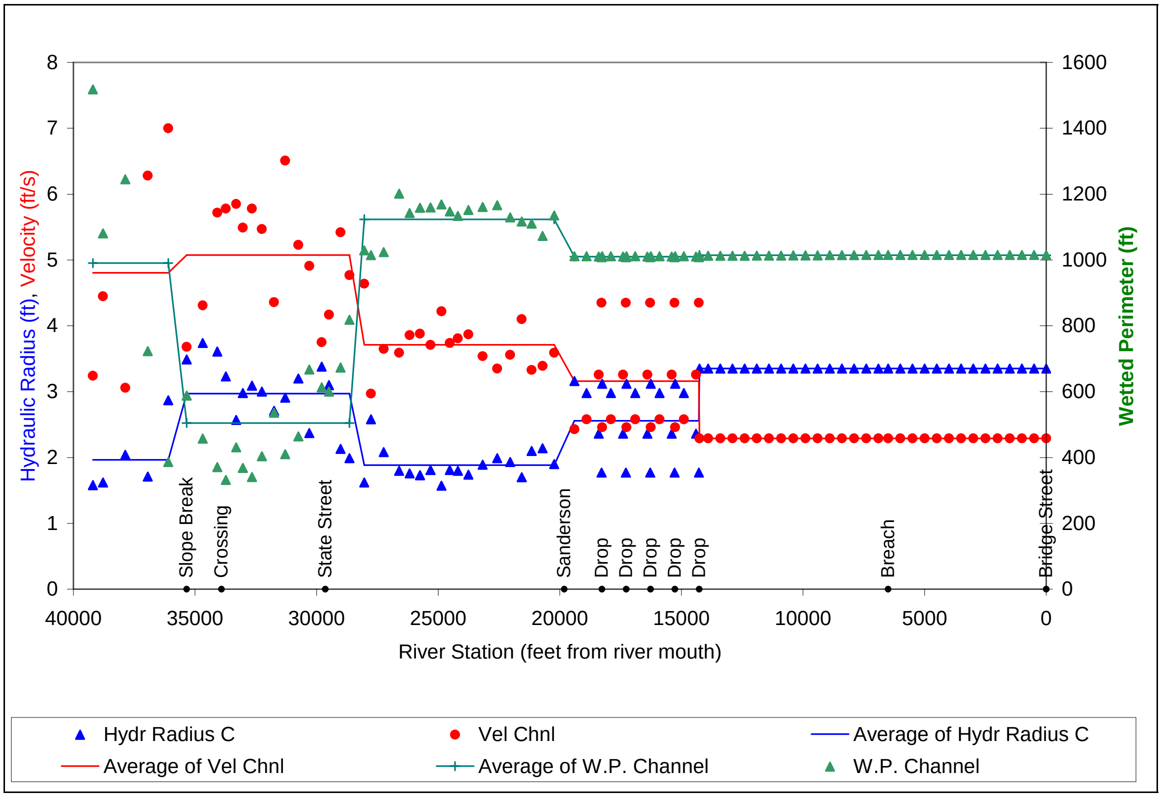

Figure 2-12. Example of Reach Breaks For Average Hydraulics, Q=6540.9 cfs

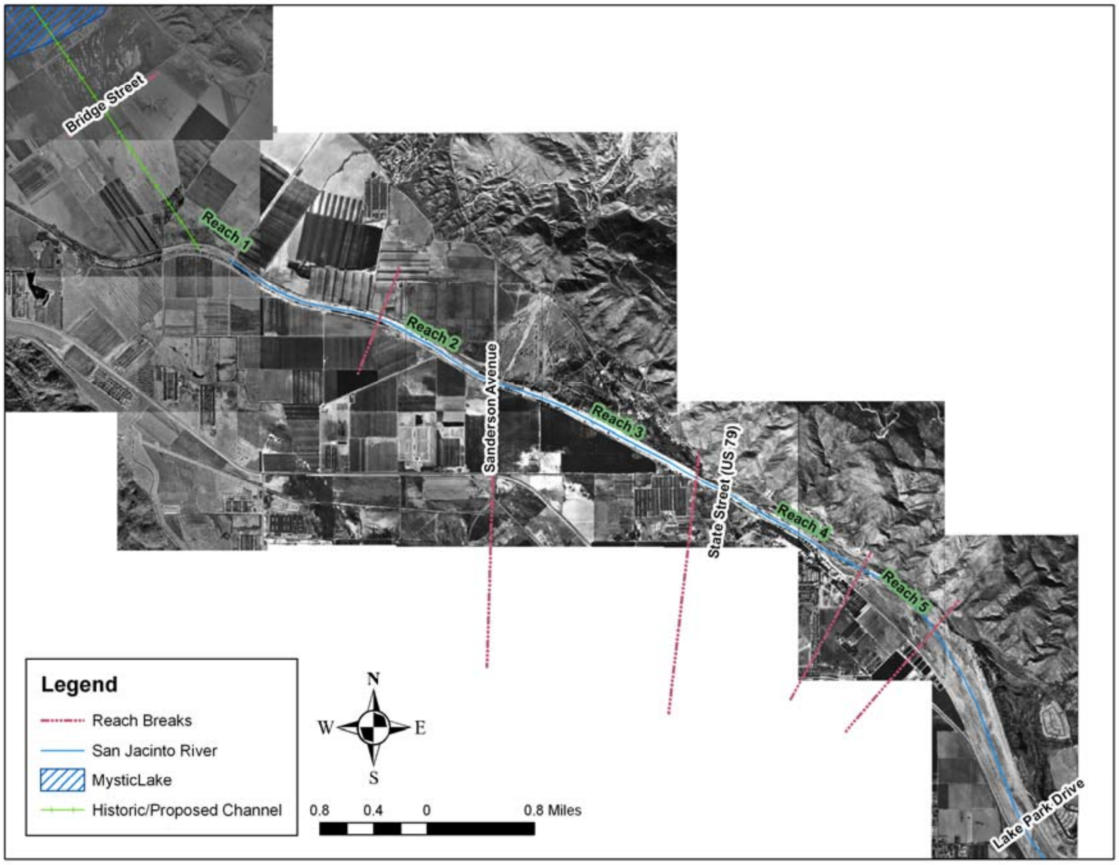

Figure 2-13. Reach Average Hydraulics Reaches

2.4 Sediment Transport

Two modeling schemes were used to estimate the transport of bed material sediment being delivered to the study reach of the San Jacinto River. The first model developed is a sediment budget which estimates the transport capacity of the reaches as defined in Table 2-5 for a given set of steady-state flow conditions. The second, SRH-1D[(4)], is a one-dimensional mobile-bed hydraulic and sediment transport model. Both models use four equations to estimate sediment transport; Ackers and White, Engelund and Hansen, Laursen, and Yang sand and gravel transport[(4)].

2.4.1 Sediment Budget

A sediment budget was developed based on the sediment grain size distributions presented in Section 2.1, the five reaches as defined in Table 2-5, the 20 representative flow values as presented in Section 2.3.2, and the associated reach-averaged hydraulic properties as discussed in Section 2.3.3. The sediment gradations were assigned to the five unique reaches as presented in Table 2-6.

Table 2-6. Sediment Budget Reaches and Applied Grain Size Distributions

Reach	Sediment Sample
5	TT7
4	TT5
3	TT5
2	TT4
1	TT3

Calculations of sediment budget incorporate multiple factors to determine the amount of material moving through a system. Sediment budget calculations include:

- Channel Conditions: Bed Material, Hydraulics, and Hydrology;
- Sediment Transport Potential;
- Sediment Transport Capacity; and
- Sediment Load

Channel conditions described in preceding sections combine to form a scenario of the channel composition (bed material), how water flows over the material (hydraulics), and the duration of time hydraulic forces act upon the channel boundary (hydrology). The sediment transport *potential* determines the ability of water to move material. The potential does not consider mitigating factors such as cohesive particles, armor control, and is defined by the rate of movement of material assuming a bed of a single uniform gradation. Thus, 5 reaches by 21 phi classes by 20 representative flow rates yields 2100 total potential loads for each transport formula used, with units of tons per day. The sediment transport *capacity* incorporates the fraction of material present in the bed (Table 2-2) available to move downstream. Finally the sediment *load* incorporates the duration of flow (Table 2-4) to compute the total bed material load. Figure 2-14 to Figure 2-17 present the resulting sediment transport load (tons/year) by phi class for each of the sediment transport formulae used. Note that for each transport equation, the sediment transport load decreases in the downstream direction.

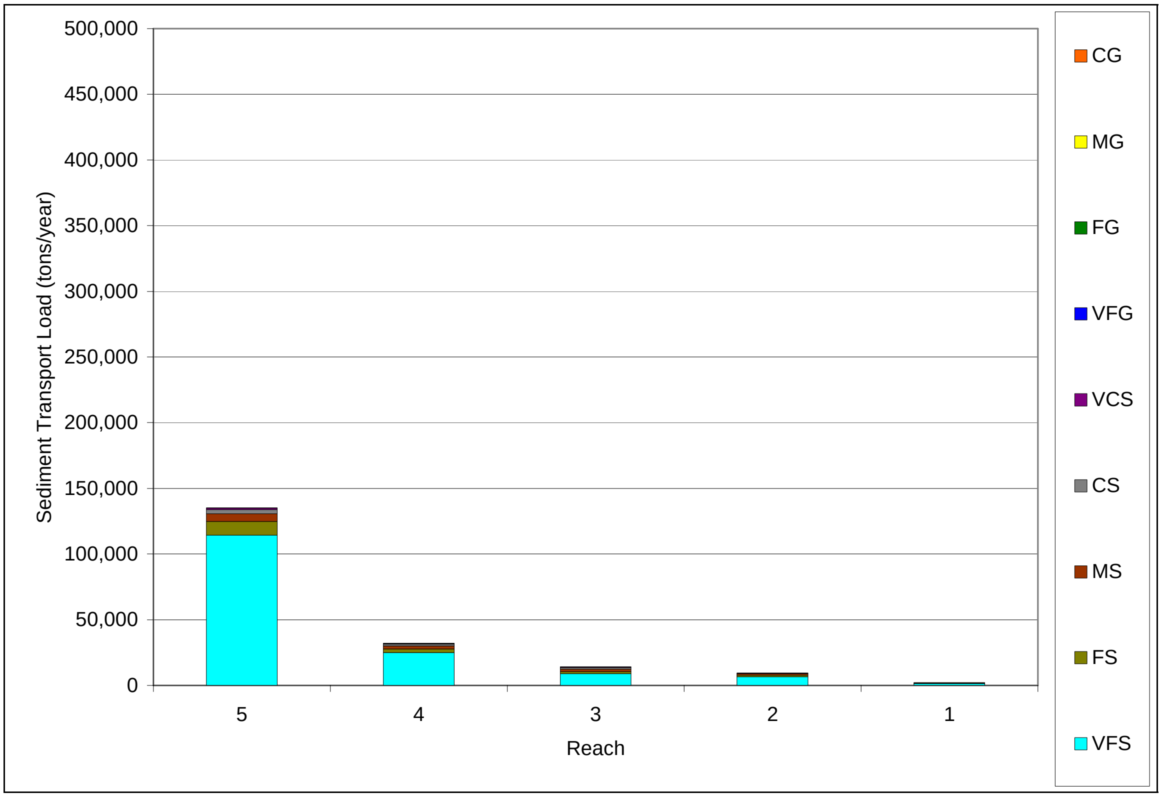

Figure 2-14. Sediment Transport Load from the Ackers and White Transport Formula

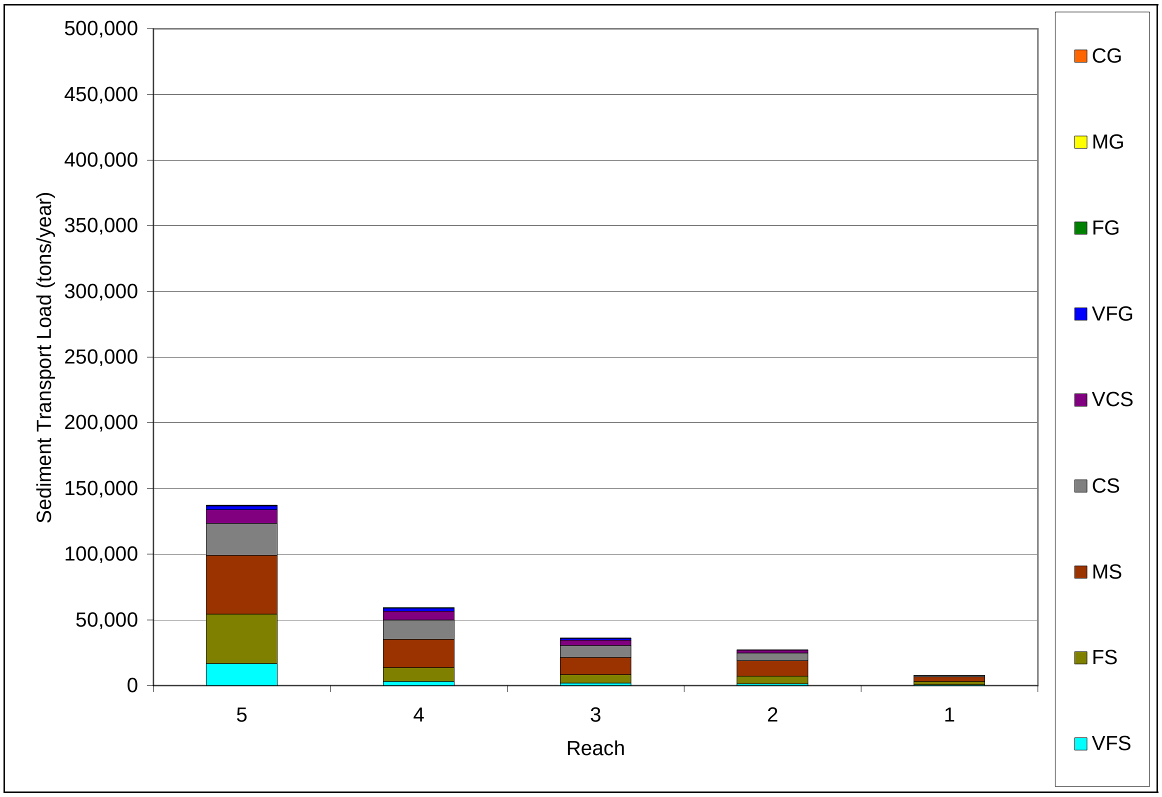

Figure 2-15. Sediment Transport Load from the Engelund and Hansen Transport Formula

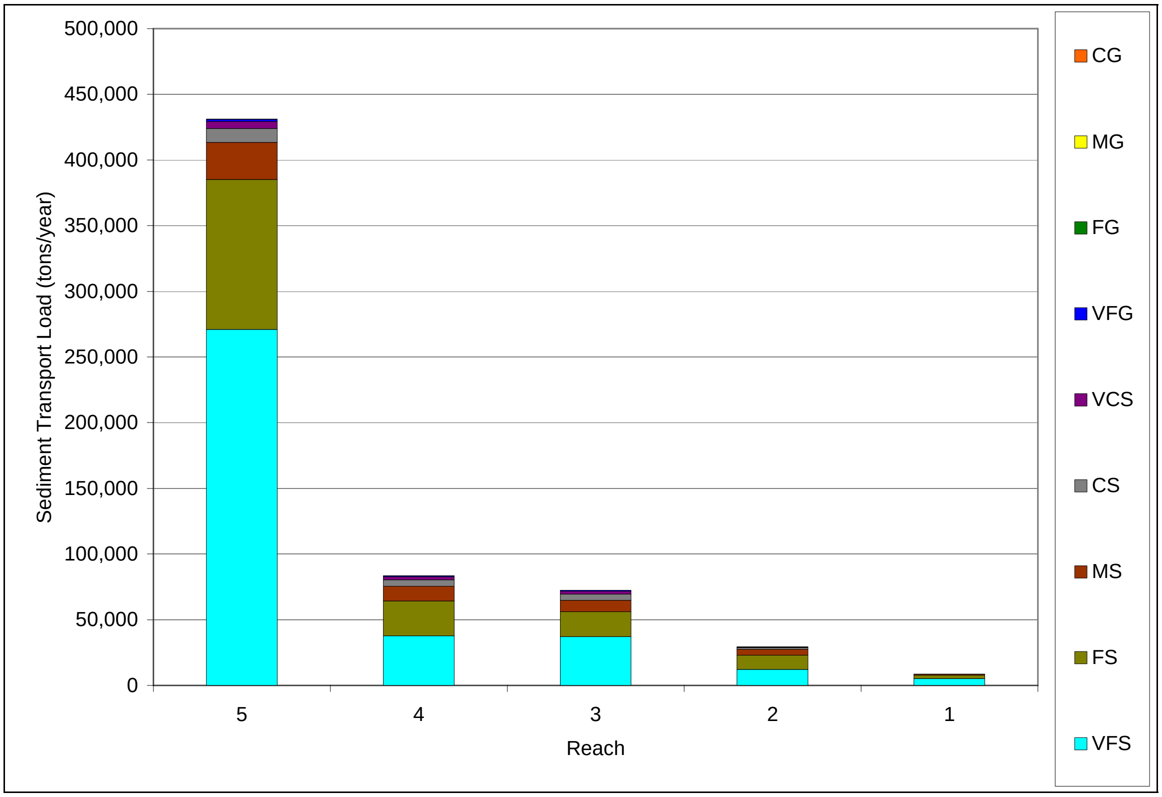

Figure 2-16. Sediment Transport Load from the Laursen Transport Formula

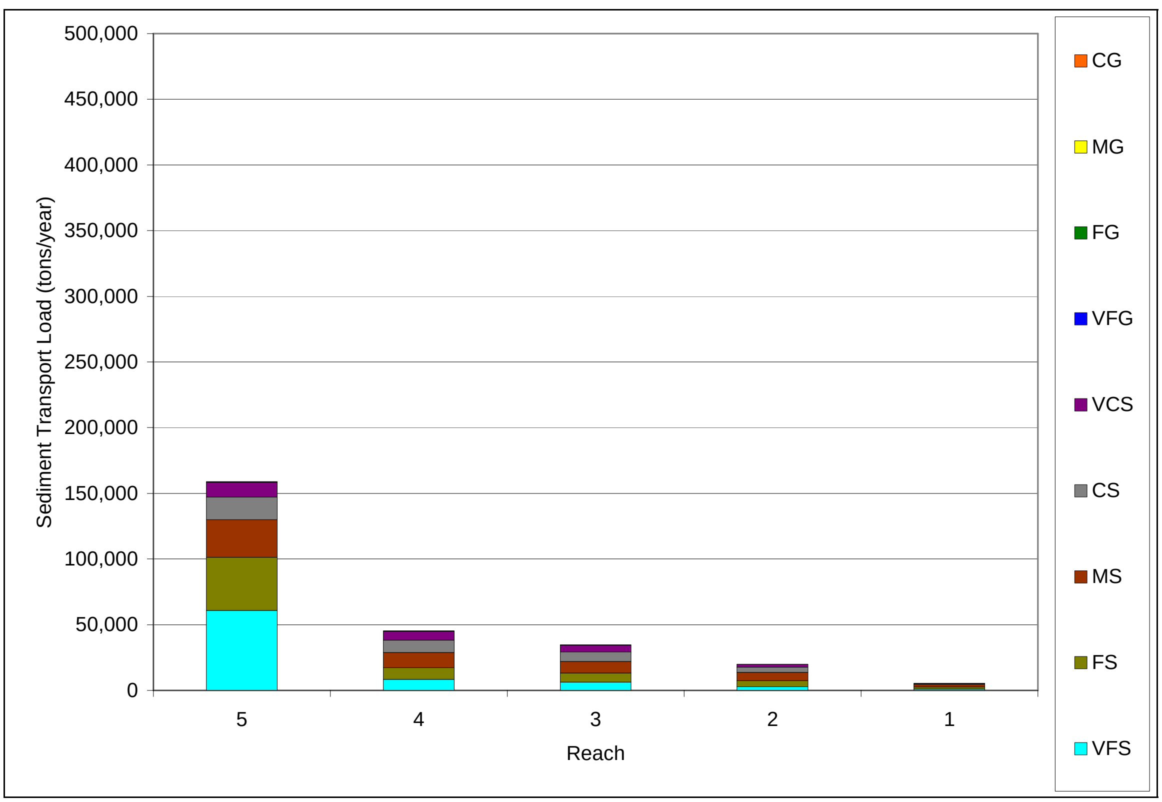

Figure 2-17. Sediment Transport Load from the Yang Sand and Gravel Transport Formula

2.4.1.1 Results

Bed material loads were determined by multiplying the sediment transport capacity (tons/day) by the average number of days per year experiencing the flow rate to obtain an average annual sediment load in tons per year. Table 2-7 shows the sediment loads resulting from the four transport equations used. The resulting high transport loads for Reach 5 may be due in part to the geometric representation of Reach 5, but are also a function of the steep slope of the reach. There are five cross sections comprising Reach 5 which are spaced relatively far apart as compared to the rest of the channel cross sections. The combination of few cross sections spaced far apart may reduce the resolution of the model and yield artificially high transport load rates.

Table 2-7. Sediment Loads (tons/year) by Reach for Four Transport Formulae

Reach	Ackers and White	Yang	Laursen	Engelund and Hansen	Average
5	135,190	158,969	431,226	137,272	215,664
4	32,072	45,251	83,590	59,332	55,062
3	14,127	34,695	72,454	36,160	39,359
2	9,380	19,838	29,280	27,312	21,452
1	2,202	5,367	8,595	7,819	5,996

A quantitative comparison is made using a sediment budget where the incoming sediment to a reach (from upstream) is compared to the outgoing sediment from a reach (assumed to equal the load of that reach). The sediment balance is the difference between the incoming upstream load and the outgoing load from reach (i) to reach (i-1).

A positive reach sediment balance implies aggradation is possible for that reach, and a negative sediment balance implies degradation is likely. The assumed upstream boundary condition is that Reach 5 is capacity limited and therefore neither aggradation nor degradation is likely. The assumption of capacity-limited sediment transport rate for the upstream boundary condition was made for two reasons. First, no combination of bed load and suspended load data during storm events exist. This is necessary to estimate the bed material transport rate in a supply-limited scenario. Second, the most conservative estimate of sediment delivery to the system is a potential overestimate of sediment delivery such that it would provide an upper limit to the amount of sediment to consider in terms of determining the need for settling basins. These mass balance calculations continue in the downstream direction. The sediment budget was calculated for the range of sediment loads resulting from the various equations used to produce a range of potential erosion or deposition. Table 2-8 presents the mass balance calculations for the San Jacinto River, showing that aggradation is likely between Lake Park Drive and Bridge Street for the channel improvement designs from Webb and Tetra Tech.

Table 2-8. Sediment Balance calculations in tons/year by Reach (+Aggradation, -Degradation)

Reach	Ackers and White	Yang	Laursen	Engelund and Hansen	Average
5	0	0	0	0	0
4	103,118	113,718	347,635	77,939	160,602
3	17,946	10,557	11,136	23,172	15,703
2	4,747	14,857	43,175	8,848	17,907
1	7,179	14,471	20,684	19,493	15,457

The size and quantity of material delivered to the outlet of Reach 1 is of interest. One possible option for offsetting the costs of building the project is to make the exit material available for commercial purposes. Figure 2-18 presents the bed material delivered to the exit of Reach 1 (at Bridge Street) by phi-class size for the four transport equations used as well as an average by size.

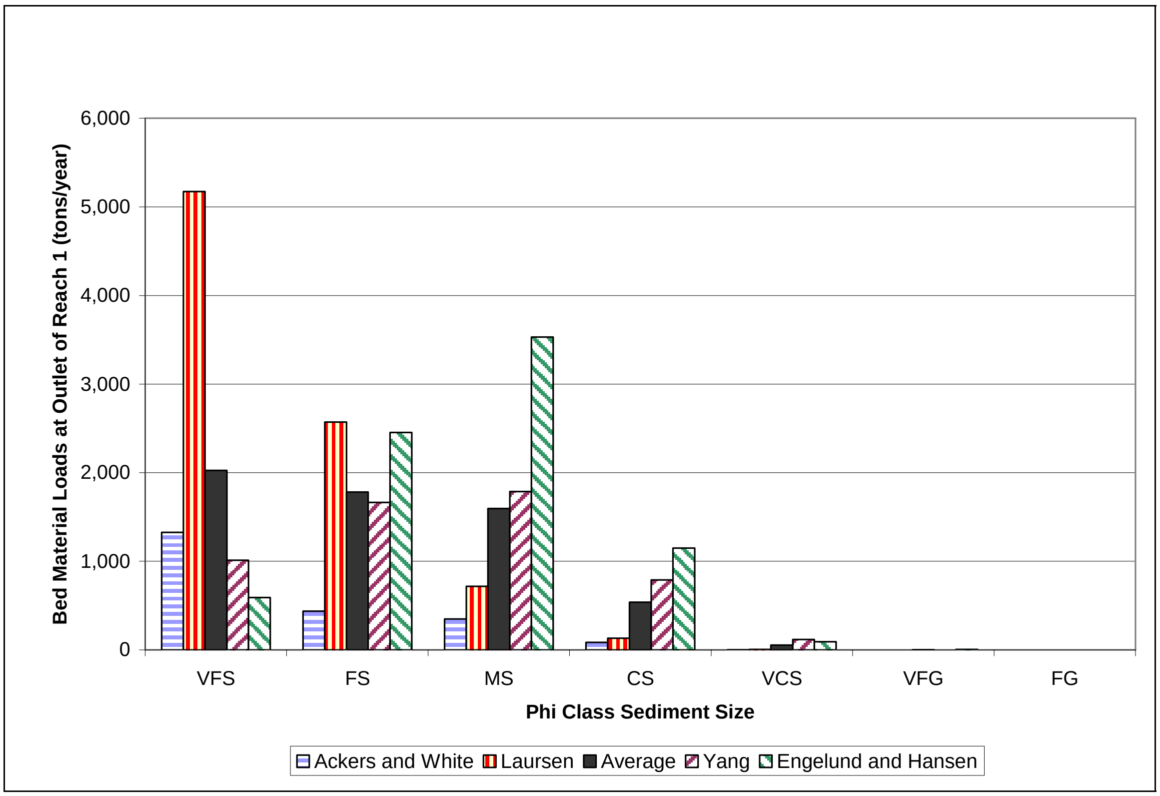

Figure 2-18. Bed Material Delivered to Exit of Reach 1 by Size Class (see Table 2-1 for Phi Class Definitions).

2.4.2 SRH-1D

SRH-1D is a one dimensional model which calculates the hydraulics in a similar manner to HEC-RAS. The difference between SRH-1D and HEC-RAS is that HEC-RAS is a fixed bed model whereas SRH-1D is a mobile bed model, meaning that input sediment parameters are used to estimate bed adjustments at each cross section and at each time step. In contrast to the sediment budget model, the SRH-1D model uses all of the input cross sections, not reach averaged hydraulics. Also, a chronological flow record is used for SRH-1D as opposed to flow duration bins. The flow record used is the instantaneous transform of the synthesized data for USGS Gage 11070150 as described in Section 2.2.2 which was treated as a series of steady-state flows. Computational time was maximized by neglecting zero flow records. Recall that 97% of the instantaneous transformation of the synthesized gage record was zero values. The 87 years of synthesized data was truncated to approximately 3.2 years by neglecting the zero value flows.

Mobile bed models are sensitive to cross section spacing and to computational time steps which dictates how frequently the bed of each cross section is updated. Model stability was achieved by using a time step of 2.4 minutes. The downstream boundary condition used in SRH-1D was still a normal depth control as discussed in Section 2.3.2. The weir drop structure elevations were fixed to reflect Tetra Tech's hard-point drop design. Sediment gradation information was applied to the cross sections in the same way as in the sediment budget program, and the same transport equations were used as in the sediment budget program. The assumed upstream boundary condition is that Reach 5 is capacity-limited for the reasons presented in Section 2.4.1.1

2.4.2.1 Results

The SRH-1D model shows a similar trend as the sediment budget results. That is, aggradation is predicted for all of the reaches. Figure 2-19 presents the minimum bed elevation profile for the initial conditions and as a result of the four transport equations used.

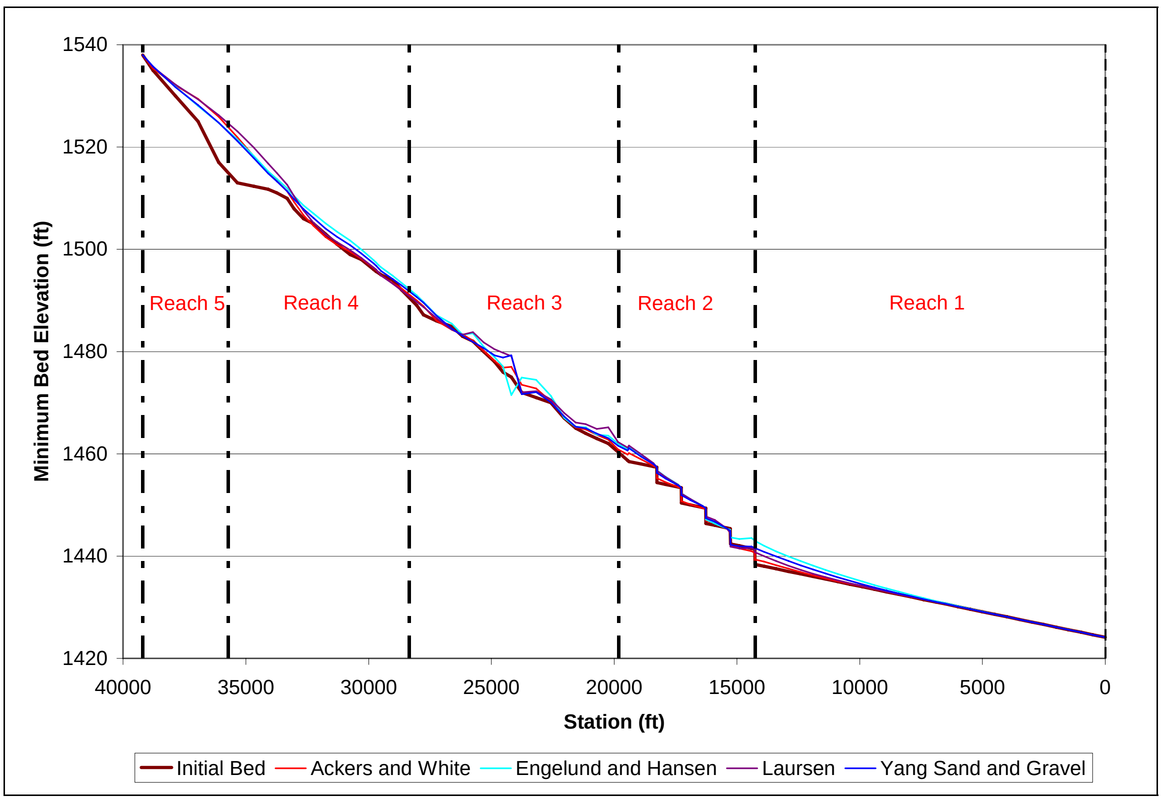

Figure 2-19. Resulting Bed Profiles from Four Transport Equations, Compared to Initial Bed Elevation.

There is one cross section (~station 25,000 ft) which degrades under the Engelund-Hansen transport equation. The other equations predict aggradation at this cross section, but in a discontinuous behavior. Analysis of this cross section shows that it has the highest width to depth ratio across the 20 representative flows for Reach 3 as well as a low product of in-channel flow and friction slope relative to the next upstream cross section. This may correlate to a flow contraction which changes the continuity of sediment transport through these cross sections. On the whole, however, the resulting bed aggradation agrees with the results of the sediment budget program.

This program also estimates the bed material sediment leaving the downstream cross section; both cumulative and broken down by size class. The resulting sediment volumes leaving the downstream cross section are cumulative over the entire simulation period. Recall that the sediment budget program used representative flows from the flow duration bins which can be thought of as an average or representative flow year. SRH-1D uses the entire flow hydrograph and then the cumulative volume over time can be divided by the length of the flow record to come up with an averaged annual sediment delivery at the downstream cross section. These values are compared to the sediment loads for Reach 1 from the sediment budget program and presented in Table 2-9. Note that the values presented in Table 2-9 do not represent what one should expect on a yearly basis, but simply is the total sediment delivery volume divided by the number of years of the flow record.

Table 2-9. Bed Material Sediment Loads (tons/year) Exiting Downstream End of Reach 1

Methodology	Ackers and White	Yang	Laursen	Engelund and Hansen	Average
Sediment Budget Loads	2,202	5,367	8,595	7,819	5,996
SRH-1D Loads	464	2,209	853	3,541	1,767

As can be seen in Table 2-9, there is a twofold to an order of magnitude difference in downstream delivery rates between the two models. Again, the SRH-1D loads presented on a yearly basis were derived by dividing the cumulative delivery volume from the model outputs by the length of the modeled duration. Order-of-magnitude differences are not uncommon in sediment transport simulations where calibration to physical data is not available. Figure 2-20 presents the cumulative sediment loads exiting the downstream cross section from SRH-1D by phi class.

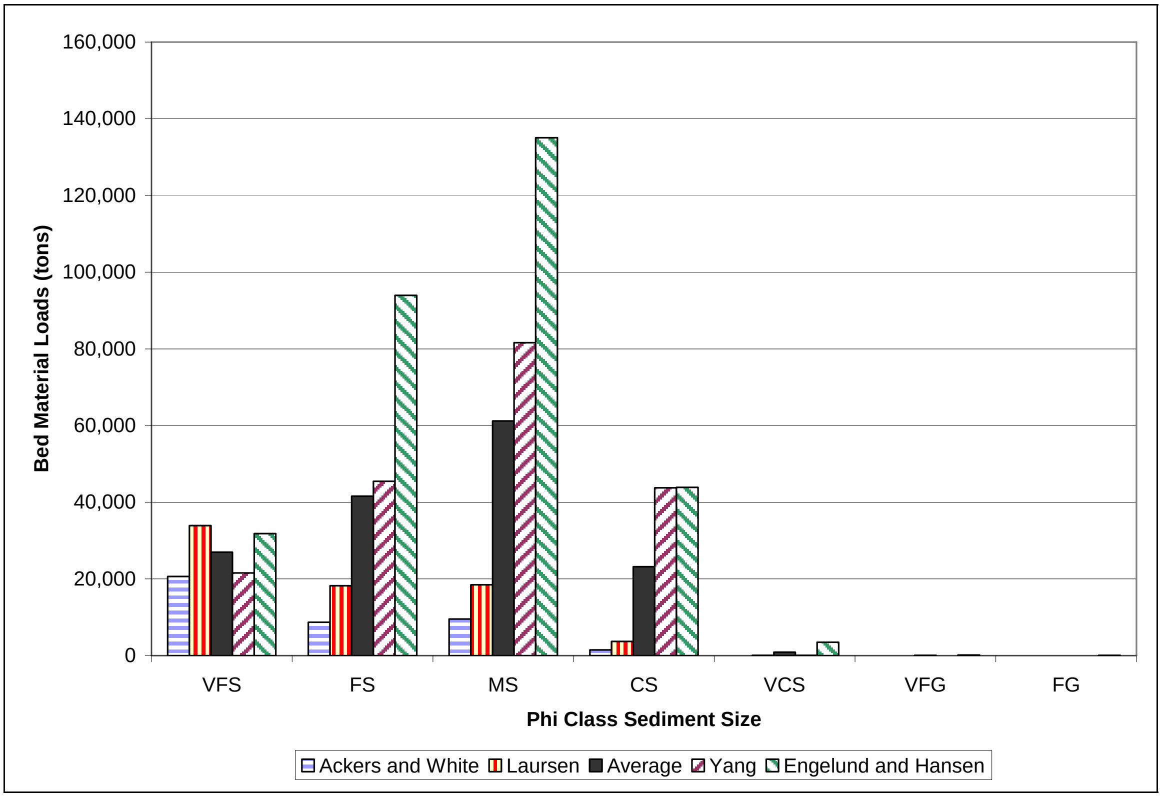

Figure 2-20. Bed Material Sediment Delivery Loads (tons) at Downstream-most Cross-section by Phi Class for 87-year Model Duration (see Table 2-1 for Phi Class Definitions).

3 Conclusions

Sediment transport using two methods for 87 years of simulated duration were performed on the San Jacinto River from near Lake Park Drive to Bridge Street. The model results incorporate present sediment, historical hydrologic, and future geometric conditions. The changes in sediment volumes by reach, in tons per year, as an average of the 4 transport formulae used are presented in Table 3-1.

Table 3-1. Volume Change By Reach as an Average of Four Transport Formulae

Reach	Average Volume Change (tons/year)
5	0
4	160,602
3	15,703
2	17,907
1	15,457

Combining the results from the sediment budget model and the SRH-1D model helps understand the dynamics of the system. Comparing Table 2-8 and Figure 2-19, it can be seen that the high rates of aggradation for Reach 4 are focused on filling the concave profile of the bed that makes up Reach 5 and the first 1/3rd or so of Reach 4. A different assumption regarding the upstream boundary condition for sediment supply may change this result by varying degrees, but the implication that the river would attempt to reach a stable slope still holds true. The assumption of capacity-limited sediment transport rate for the upstream boundary condition was made for two reasons as noted in Section 2.4.1.1. For the length of river downstream of the concave portion of Reach 4 (83 of 93 modeled cross sections) the conservative estimate of a capacity-limited upstream boundary condition yields on average about 1.2 foot of aggradation from the Engelund-Hansen calculations and less than 1 foot for the other three equations. The geometric data, as supplied by Tetra Tech, was developed from the 1992 digital terrain model (DTM) data with 4-ft contour intervals. This data has a vertical accuracy of ½ of a contour interval, or two feet (per comm. Jim Morrell, RCFC). Therefore 1 foot of aggradation may not be statistically significant. However, aggradation of some degree is likely in the San Jacinto River if the proposed channel modifications are implemented.

The channel widening upstream of Sanderson Avenue does not improve channel conveyance of sediment but may increase temporary in-channel storage of sediment. Channel conveyance of water is probably increased but was not considered in this study as it was outside the scope. The channel design downstream of Sanderson Avenue has a flatter slope than the slope of the channel upstream of Sanderson. The river will seek a stable bed slope, and assuming the sediment conditions remain similar after channel construction, the bed slope may be achieved through aggradation as is suggested in Figure 2-19. Once achieved, a higher volume of sediment may be transported through Reach 1 and be deposited at the outlet of Reach 1 (Bridge Street). With aggradation occurring during the simulations, there is still approximately 6,000 tons per year on average of bed-material sediment exiting the downstream of Reach 1 (Bridge Street). Additional sediment, consisting of wash-load material, will also be traveling down the river and exiting at Bridge Street, but this wash load is not bed material load and was not modeled during the simulations. Without physical samples to compare model results, the results from the 4 transport equations were averaged to come up with an estimate of average annual sediment delivery by phi-size class as presented in Table 3-2.

Table 3-2. Average Annual Bed Material Sediment Load Delivered to Bridge Street (tons/year)

Phi Class Size	VFS	FS	MS	CS	VCS	VFG	FG	MG	CG	Sum
Average Bed Material Load (tons/year)	2,026	1,781	1,595	538	54	1	0	0	0	5,996

Because an 87-year simulation was performed does not imply that it will take 87 years for the conditions in Figure 2-19 to be reached. The channel is likely to aggrade over time under the proposed geometric conditions to achieve a stable bed slope. This may lead to a decrease in channel conveyance area and an increase in the likelihood of levee overtopping.

Further information may prove useful for decision making by local councils and managers. The pertinent findings from these model simulations, along with suggested further studies are outlined below.

Major findings of this report include:

- Excluding the upper 1.2 miles of simulated river, an average of 1 ft of aggradation can be expected in the river channel under approximately three years of flow, similar to the three years of flow experienced during the 87-year duration period.
- An average of approximately 6000 tons of bed material sediment can be expected to be delivered to Bridge Street during years of flow, with 90% of that sediment being very fine sand, fine sand, and medium sand (10% course sand and larger).

Suggested further studies to be performed for the benefit of decision-makers and stakeholders include, but are not limited to:

- Run simulations with varying assumed upstream sediment boundary conditions (as a percentage of transport capacity), and perhaps develop a relationship between aggradation/degradation and/or sediment delivery to Bridge Street as a function of the assumed upstream boundary condition.
- Reflecting the ephemeral nature of the San Jacinto River, run individual simulations representing wet, moderate, and dry hydrologic years.
- The existing path of flow downstream of the 2005 breach location can not be accurately represented with a one-dimensional model. Upstream of the breach, a pre-project simulation could be run in order to quantify the sedimentation effects of the levee setbacks.
- Estimate changes in flow conveyance between the start of simulation and end of simulation to determine the effect of channel aggradation or degradation on flood-flow capacities.

References

[(1)]California Regional Water Quality Control Board. 2004. Santa Ana Region. Resolution No. R8-2004-0037: Resolution Amending the Water Quality Control Plan for Santa Ana River Basin to Incorporate Nutrient Total Maximum Daily Loads (TMDLs) for Lake Elsinore and Canyon Lake.

[(2)] ASTM Standard D2487-06. Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System). ASTM International, West Conshohocken, PA, www.astm.org.

[(3)] Tetra Tech, Inc. 2007. San Jacinto Gap Feasibility Study

[(4)] Huang, Victor and Greimann, Blair. 2007. User's Manual for SRH-1D. http://www.usbr.gov/pmts/sediment/model/srh1d/index.html.

AppendixA: Instantaneous Transform of USGS Mean Daily Flow Records and Flow Duration Bins

Using mean daily flow values to compute a sediment transport rate would under predict total loads due to the non-linear relationship between sediment transport and discharge. A transformation to an instantaneous time series while preserving volume provides an improved estimate. Figure A-1 shows the parameters involved.

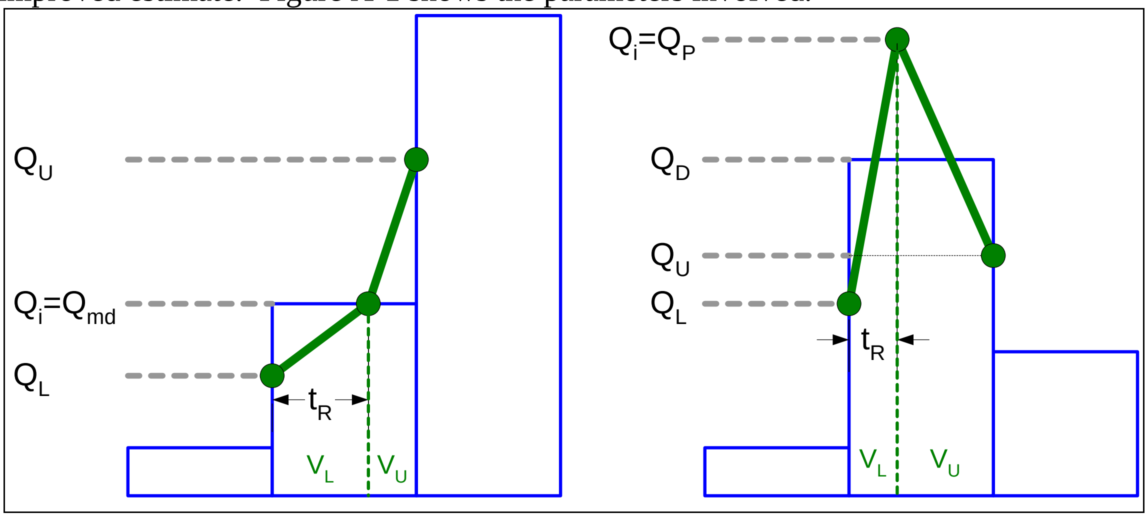

Figure A-1 Instantaneous Discharge versus Mean Daily Value for Rising or Falling Limbs

The instantaneous discharge at the upper, U, and lower, L, bounds of the mean daily flow record are computed by averaging with the adjacent mean daily flow records. The total daily volume equals the mean daily flow rate, Q_{md}, times the duration of one day. Splitting the day into two periods results in a volume of water passing during the first period, V_L, and a volume passing during the second period, V_U. A conservation of volume equation, Equation 1, provides a relationship between the time ratio (t_R), intermediate instantaneous discharge (Q_i), and the instantaneous discharges at the upper and lower boundary of the mean daily flow period (Q_L and Q_U), Equation 2.

$$V_D = V_L + V_U$$ **Equation 1**

$$Q_{md} \cdot (t_U - t_L) = \frac{1}{2}(Q_L + Q_i) \cdot (t_U - t_L) \cdot (t_R) + \frac{1}{2}(Q_U + Q_i) \cdot (t_U - t_L) \cdot (1 - t_R)$$

$$t_R = \frac{2 \cdot Q_{md} - Q_U - Q_i}{Q_L - Q_U}$$ **Equation 2**

Where,

V_D = volume of water computed from the mean daily flow;

V_L = volume of water in the first time period;

V_U = volume of water in the second period;

Q_{md} = mean daily discharge;

t_U = time at the upper boundary;

t_L = time at the lower boundary;

Q_L = instantaneous discharge computed at the start of the day;

Q_i = intermediate instantaneous discharge;

Q_U = instantaneous discharge computed at the end of the day;

Q_P = peak discharge;

t_R = time ratio between the time of day for flows less than the instantaneous discharge versus the total time.

For rising and falling limbs, the instantaneous discharge, Q_i, equals the mean daily flow. For a peak or a trough, the intermediate discharge must be estimated. If no suitable method is available for estimating the intermediate flow, Equation 3 solves the conservation of volume equations for discharge given a time ratio.

$$Q_i = 2 \cdot Q_{md} + t_R \cdot (Q_U - Q_L) - Q_U$$ **Equation 3**

The non-linear nature of sediment transport will amplify discrepancies when computing loads from flow rates. For two adjacent bins (days) with the same flow rate, there is no method for conserving volume while adjusting the instantaneous point on the upper and lower bounds. Under those conditions, the instantaneous points at the upper and lower bounds equals the mean daily flow and creates a discontinuity in the estimated instantaneous flow record.

Flow duration values were developed for each unique upper bound, lower bound, and instantaneous discharge value. The non-exceedance probability equals the amount of time equal to or below each discharge divided by the total period of record plus one day. The additional day accounts for uncertainty in the empirical plotting position from using daily flow records.

The continuous empirical flow duration pattern was divided into 18 bins based on a sediment transport potential weighted volume of water. For an equivalent volume of water, lower flows transport less sediment than higher flows. A power relationship expressing sediment transport as a function of discharge can provide a rough approximation of relative transport rates. Bins were determined by first exponentially weighting each discharge and multiplying by the time to obtain a total weighted volume,

$$\sum V_w = \sum \left(Q^b\right) \cdot t$$ **Equation 4**

Where,

V_w = exponentially weighted volume;

Q = discharge;

b = assumed sediment rating curve exponent; and

t = duration of flow at discharge Q.

The sum of the weighted volumes was then divided by the number of desired bins to determine the amount of weighted volume in each bin,

$$V_{w,n} = \frac{\sum V_w}{n}$$ **Equation 5**

Where,

$V_{w,n}$ = weighted volume in each bin;

i = bin; and

n = number of bins.

The sediment rating exponent varies from site to size. A conservative value (under predicts the non-linear sediment transport behavior) of 1.5 was assumed for all gages for the purpose of dividing the flow duration curve into bins.
The representative flow for each weighted bin was also determined according to the sediment transport weighting method. Equation 6 computes the representative flow for each bin by dividing the exponentially weighted volume by duration of the volume to result in a flow rate. The flow rate is weighted according to the same sediment transport exponent.

$$Q_{r,i} = \left(\frac{V_{w,n}}{2 \cdot (t_{i+1} - t_i)} \right)^{1/b}$$ **Equation 6**

Where,

$Q_{r,i}$ = representative flow rate for bin i;

$V_{w,n}$ = weighted volume in each bin;

t = non-exceedance time (plotting position); and

b = assumed sediment rating curve exponent.

Weighting the representative flow for each bin better captures the sediment transport potential of each bin. However, the representative flow and the duration no longer results in the same annual volume of water as the gage record. Bins conserve annual volumes of sediment, not volumes of water.

AppendixB: HEC-RAS final model geometry.

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4480.09 1534 4505.97 1534 4592.18 1533 4869.78 1532 4989.39 1531
5027.02 1531 5046.33 1531 5057.77 1531 5064.73 1532 5066.79 1533
5068.63 1534 5070.76 1535 5073.78 1536 5089.74 1536 5092.46 1535
5094.12 1534 5095.91 1533 5098.31 1532 5100.72 1531 5124.06 1530
5183.43 1529 5265.57 1528 5288.7 1528 5312.26 1529 5351.5 1530
5399.65 1530 5509.5 1529 5512.01 1528 5515.35 1527 5519.34 1526
5526.17 1526 5587.29 1527 5595.35 1527 5673.96 1526 5675.65 1526
5690.72 1527 5701.29 1527 5733.85 1527 5847.32 1527 5860.66 1527
5871.83 1527 5880.57 1526 6037 1525 6101.24 1525 6129.46 1525
6177.85 1525 6220.04 1526 6229.87 1527 6236.9 1528 6242.89 1529
6248.38 1530 6259.47 1531 6281.21 1532 6334.05 1533 6342.58 1534
6345.97 1535 6348.78 1536 6351.13 1537 6353.73 1538 6356.04 1539
6357.97 1540 6359.56 1541 6361.08 1542 6363.05 1543 6372.44 1544

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 6429.69    1540 6438.13    1540 6450.63    1540
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Exp/Cntr=0.3,0.1

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 2528.04  1530.7 2637.89  1530.7 2769.71  1530.7 3065.22  1530.7 3192.56  1530.7
 3267.05  1530.7 3323.68  1530.7 3490.04  1530.7 4004.26    1531 4072.95    1530
 4125.37    1529 4135.74    1528 4143.67    1527 4156.62    1526 4173.65    1525
 4188.37    1524 4239.45    1524  4294.1    1524 4309.03    1523 4330.16    1522
 4356.92    1521 4397.86    1520 4461.67    1520 4473.75    1520 4512.47    1520
 4522.08    1520 4579.94    1519 4595.43    1519 4601.44    1520  4608.5    1521
 4612.67    1522  4615.4    1523 4650.69    1524 4690.02    1525 4708.67    1526
 4743.88    1527  4745.5    1528  4747.3    1529 4749.62    1530 4751.55    1531
 4753.73    1532 4757.62    1533 4772.98    1533 4774.86    1532 4776.52    1531
 4777.93    1530 4779.33    1529 4780.43    1528 4781.49    1527 4782.53    1526
 4837.71    1525 4896.54    1525 5055.62    1525 5069.84    1524 5075.05    1523
 5078.87    1522    5143    1521  5200.8    1521 5202.93    1521 5211.38    1521
 5216.09    1520 5221.48    1519 5228.09    1518 5238.41    1517 5392.05    1517
 5415.44    1518 5417.92    1518 5478.12    1518 5505.77    1518 5517.51    1517
 5588.54    1517 5591.18    1518 5594.02    1519 5597.91    1520 5605.31    1521
  5607.2    1522 5617.29    1522 5619.75    1522 5621.35    1522 5694.55    1522
 5704.75    1523 5712.08    1524 5714.16    1525 5715.89    1526 5717.68    1527
 5719.21    1528 5720.69    1529 5722.41    1530 5723.92    1531 5725.56    1532
 5727.05    1533 5728.44    1534  5729.2    1535 5730.63    1536 5733.82    1537
  5736.5    1538 5738.29    1539 5740.21    1540 5741.33    1541 5750.13    1542
 5752.02    1543 5754.68    1544 5755.99    1545 5757.58    1546 5759.68    1547
 5762.39    1548 5765.04    1549 5767.14    1550 5768.94    1551 5770.06    1552
 5771.28    1553 5772.73    1554 5774.56    1555
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  474.73  1530.7  593.52  1530.7 1763.33  1530.7 2377.39  1526.7 2647.95  1526.7
 2862.98  1526.7 2929.95  1526.7 3503.61  1526.7 3620.32  1526.7 3682.79  1526.7
 3721.71    1524 3735.47    1523 3750.92    1522 3765.08    1521 3808.42    1521
 3845.06    1522 3885.38    1523 4086.88    1524 4101.06    1524 4111.78    1523
 4120.79    1522 4127.79    1521 4142.58    1520 4188.33    1519 4195.56    1518
 4202.98    1517 4223.01    1516 4238.17    1515 4324.65    1515 4333.51    1516
  4404.7    1516 4419.97    1515 4437.95    1515 4459.96    1516 4475.35    1517
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 4592.84    1523 4595.09    1524 4597.01    1525 4598.93    1526 4600.64    1527
 4602.33    1528 4603.89    1529  4605.5    1530 4621.64    1530 4623.33    1529
  4625.1    1528 4627.23    1527  4629.4    1526 4632.39    1525 4636.65    1524
 4647.02    1523 4659.12    1522 4670.52    1521 4673.56    1520  4675.3    1519
 4677.58    1518  4699.5    1518 4723.96    1518 4793.49    1518 4801.89    1518
 4855.01    1517 4864.58    1516 4869.79    1515 4879.07    1514 4904.41    1513
 5138.99    1513 5160.69    1514 5163.22    1515 5165.06    1516 5172.06    1516
  5173.7    1515 5207.23    1515 5211.25    1516 5215.34    1517 5237.65    1517
 5258.86    1517 5260.23    1518 5262.99    1519 5265.68    1520 5267.84    1521
  5272.2    1522 5274.91    1523 5275.85    1524 5277.27    1525 5277.85    1526
 5278.75    1527    5283    1527 5305.36    1527 5307.31    1528 5313.54    1529
 5317.58    1530 5319.75    1531 5322.03    1532 5324.33    1533 5326.99    1534
 5329.21    1535 5331.57    1536  5333.9    1537 5335.84    1538 5337.53    1539
 5339.87    1540 5342.23    1541 5344.23    1542 5346.53    1543 5349.07    1544
  5351.3    1545 5353.69    1546 5355.81    1547 5358.07    1548 5360.39    1549
 5361.81    1550    5363    1551  5364.2    1552 5365.29    1553 5366.53    1554
 5384.25    1555 5386.16    1556 5388.43    1557 5391.27    1558 5394.17    1559
 5399.02    1560 5401.99    1561 5404.16    1562  5406.4    1563 5408.64    1564
 5410.77    1565 5412.97    1566  5414.7    1567 5415.87    1568 5417.18    1569
 5420.26    1570 5458.39    1570 5469.07    1569 5473.05    1568 5475.34    1567
 5477.62    1566 5480.96    1565 5486.94    1565 5517.36    1566 5522.14    1567
 5525.25    1568 5527.78    1569 5530.01    1570 5532.93    1571 5541.18    1572
 5541.98    1573 5542.62    1574 5546.01    1575 5547.09    1576 5582.21    1577
 5632.18    1578 5645.52    1578
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 3496.96  1522.7 3745.84  1522.7 3811.68  1522.7 3863.45  1522.7 3977.75    1523
 4001.14    1522 4024.84    1521 4049.73    1520 4064.59    1520 4080.61    1521
 4083.72    1521 4086.27    1520 4091.29    1519 4105.91    1519 4108.99    1519
 4112.46    1518  4118.6    1517 4126.64    1516 4135.58    1515 4141.96    1514
 4150.58    1513 4171.18    1512 4183.89 1512.33 4187.85 1512.33 4197.21 1512.33
 4207.55 1512.33 4216.57 1512.33 4224.82 1512.33 4234.82 1512.33 4242.06 1512.33
 4246.47 1512.33 4250.62    1513 4257.26    1514 4274.71    1515 4300.61    1516
 4312.47    1516 4321.77    1515 4324.22    1514 4329.61    1513 4344.62 1512.33
 4371.36 1512.33 4385.09    1513 4401.36    1513 4425.53    1512 4433.51    1512
 4442.66    1512 4505.89 1512.33 4511.23 1512.33 4524.31 1512.33 4562.11 1512.33
 4603.54 1512.33 4613.12 1512.33  4618.7 1512.33 4623.71    1513  4627.1    1514
 4630.43    1515 4632.91    1516 4635.48    1517 4638.67    1518  4689.8    1519
  4695.3    1520 4697.48    1521 4713.47    1521 4721.62    1521 4737.31    1522
    4741    1523 4743.86    1524 4746.33    1525 4748.27    1526 4756.27    1526
 4761.66    1526 4771.38    1526 4779.65    1525 4781.45    1524 4782.98    1523
 4784.81    1522 4786.45    1521 4788.68    1520 4790.41    1519 4792.79    1518
 4794.98    1517 4797.83    1516 4823.92    1515 4876.86    1515 4935.39    1515
 4952.59    1515 4957.06    1515 4958.88    1515 4976.28    1515 4983.41    1515
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5240.93 1514 5243.68 1515 5246.43 1516 5248.79 1517 5250.72 1518
5252.53 1519 5254.25 1520 5256.13 1521 5257.94 1522 5259.69 1523
5261.29 1524 5263.11 1525 5265.25 1526 5266.73 1527 5268.84 1528
5273.09 1528 5385.48 1527 5405.53 1527 5426.3 1528 5429.27 1529
5431.01 1530 5432.6 1531 5434.76 1532 5436.89 1533 5439.43 1534
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5470.26 1540 5473.57 1541 5476.95 1542 5478.95 1543 5480.67 1544
5482.51 1545 5484.16 1546 5485.94 1547 5487.61 1548 5489.7 1549
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5561.67 1552 5579.5 1552 5582.2 1553 5584.04 1554 5585.77 1555
5586.94 1556 5588.44 1557 5589.68 1558 5590.9 1559 5592.11 1560
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5607.33 1576 5608.46 1577 5609.2 1578 5610.64 1579 5613.47 1580
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5632.2 1586 5639.88 1584 5644.11 1583 5646.1 1582 5647.77 1581
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1149.68 1526.7 1168.64 1526.7 1218.45 1526.7 1262.72 1526.7 1322.44 1526.7
1358.27 1526.7 1376.57 1526.7 1540.67 1526.7 1582.14 1526.7 1945.27 1526.7
2073.81 1526.7 2797.59 1526.7 3625.92 1522.7 3693.77 1522.7 3709.13 1522.7
4213.76 1522.7 4290.97 1522.7 4433.42 1522.7 4570.14 1522.7 4689.16 1522.7
5288.41 1523 5311.02 1523 5321.31 1523 5338.05 1522 5367.05 1522
5397.47 1522 5400.72 1521 5403.59 1520 5407.33 1519 5446.52 1519
5454.68 1520 5457.88 1521 5460.13 1522 5462.35 1523 5464.28 1524
5466.03 1525 5471.86 1525 5473.73 1524 5475.74 1523 5477.25 1522
5479.76 1521 5482.16 1520 5484.65 1519 5486.96 1518 5495.43 1517
5521.26 1517 5557.13 1518 5566.39 1518 5577.55 1517 5587.87 1517
5606.06 1517 5620.18 1516 5714.53 1515 5764.39 1515 5776.15 1515
5789.18 1514 5815.65 1513 5818.95 1512 5840.41 1512 5843.42 1513
5844.89 1514 5847.22 1515 5848.72 1516 5884.41 1516 5888.6 1516
5898.76 1517 5905.59 1518 5911.36 1519 5920.18 1519 5922.8 1518
5957.12 1518 5966.13 1519 5969.2 1520 5971.36 1521 5973.74 1522
5976.59 1523 5979.98 1523 5993.71 1523 6010.42 1524 6028.11 1524
6031.12 1523 6033.06 1522 6035 1521 6036.45 1520 6038.09 1519
6039.23 1518 6040.47 1517 6041.91 1516 6043.29 1515 6045.67 1514
6051.22 1513 6149.08 1512 6155.02 1511.67 6165.87 1511.67 6198.22 1511.67
6217.64 1511.67 6223.29 1512 6281.27 1512 6327.88 1512 6344.11 1512
6349.86 1512 6395.94 1513 6406.52 1514 6409.57 1515 6411.94 1516
6413.72 1517 6415.86 1518 6418.22 1519 6448.94 1520 6500.43 1521

6533.11 1522 6544.74 1523 6557.31 1524 6568.46 1525 6578.66 1526
6586.85 1527 6596.43 1528 6604.98 1529 6611.6 1530 6617.08 1531
6621.67 1532 6626.26 1533 6633.58 1534 6662.07 1534 6715.22 1533
6727.64 1533 6733.11 1534 6735.6 1535 6737.18 1536 6739.07 1537
6740.1 1538 6741.4 1539 6742.65 1540 6744.1 1541 6745.59 1542
6746.97 1543 6748.98 1544 6750.43 1545 6752.91 1546 6754.74 1547
6756.98 1548 6759.02 1549 6761.38 1549 6763 1548 6765.94 1547
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3728.62 1522.7 3759.21 1522.7 5316.21 1520 5325.75 1519 5332.11 1518
5346.34 1518 5359.03 1519 5370.14 1520 5399.26 1521 5448.77 1521
5460.83 1520 5495.27 1520 5502.56 1521 5516.14 1522 5528.45 1523
5541.71 1524 5548.88 1525 5553.18 1526 5556.78 1527 5563.5 1527
5565.52 1526 5567.07 1525 5568.59 1524 5570.34 1523 5572.31 1522
5574.23 1521 5576.85 1520 5598.01 1520 5610.14 1521 5613.2 1522
5635.27 1523 5688.8 1523 5699.75 1522 5701.6 1521 5703.36 1520
5705.66 1519 5712.14 1518 5724.96 1517 5755.33 1516 5778.71 1516
5782.33 1517 5786.14 1518 5806.24 1518 5813.03 1517 5819.34 1516
5825.69 1515 5828.25 1514 5830.5 1513 5832.24 1512 5834.9 1511
5852.07 1511 5870.62 1512 5884.01 1512 5886.44 1511 5888.87 1510
5891.23 1509 5894.16 1508 5897.6 1507 5904.21 1506 5911.46 1505
5928.86 1505 5933.98 1506 5938.82 1507 5951.25 1508 6000.52 1508
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6229.77 1521 6231.89 1520 6233.87 1519 6235.97 1518 6237.77 1517
6239.68 1516 6241.58 1515 6243.25 1514 6245.71 1513 6248.76 1512
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6757.54 1518 6776.41 1519 6780.03 1520 6782.01 1521 6784.23 1522
6786.29 1523 6788.34 1524 6791.39 1525 6804.77 1526 6810.69 1526
6813.04 1525 6815.62 1524 6818.8 1523 6824.5 1523 6827.39 1524
6829.54 1525 6831.53 1526 6833.21 1527 6839.42 1528 6853.47 1529
6875.22 1529 6887.17 1529 6890.51 1529 6891.9 1528 6894.69 1527
6897.2 1526 6898.54 1526 6902.92 1527 6906.33 1528 6909.39 1529
6912.33 1530 6915.29 1531 6918.13 1532 6920.61 1533 6941.69 1534
6954.42 1535 6972.76 1536 6986.22 1537 6997.58 1538 7014.92 1539
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 2727.89  1522.7 2963.07  1526.7 2977.99  1526.7 3689.11  1522.7 3707.35  1522.7
 3763.83  1522.7 4349.08  1518.7 4476.74  1518.7  4971.9  1518.7 5054.28  1518.7
 5168.42  1518.7 5202.88  1518.7    5896    1518 5932.54    1517 5960.22    1516
 5990.92    1515 6033.45    1515 6047.96    1515 6054.44    1514 6061.67    1513
 6071.27    1512 6082.88    1511 6089.06    1510 6096.09    1509 6101.78    1508
    6108    1507 6112.63    1506 6116.62    1505 6277.11    1505 6280.98    1506
 6285.41    1507 6289.59    1508 6293.18    1509 6296.39    1510 6299.49    1511
 6303.34    1512 6307.65    1513 6312.52    1514 6316.61    1515 6321.84    1516
 6337.77    1517 6344.43    1518 6349.68    1519 6354.82    1520    6367    1520
 6370.56    1519 6383.49    1518 6423.84    1517 6439.04    1516 6465.43    1514
 6547.58    1513 6563.24    1512 6566.49    1511 6568.85    1510 6571.05    1509
 6572.95    1508 6575.48    1507 6578.88    1506 6581.87    1505 6587.42    1504
 6602.92    1503 6627.88    1502 6656.06    1502 6673.56    1503 6695.32    1504
 6724.37    1504  6775.9    1504 6779.06    1505 6781.67    1506 6783.54    1507
 6785.28    1508 6786.78    1509 6788.56    1510 6790.14    1511 6796.06    1512
 6798.28    1512 6817.99    1512 6823.35    1513 6827.42    1514 6832.05    1515
 6849.17    1516 6871.74    1517 6878.26    1518 6883.28    1519 6890.62    1520
  6899.2    1521 6926.89    1521 6928.52    1520 6929.81    1519 6931.11    1518
 6932.39    1517 6933.99    1516 6935.37    1515 6936.52    1514 6938.14    1513
 6938.99    1512 6940.02    1511 6975.95    1510 7008.06    1510 7013.24    1510
 7273.93    1510 7364.04    1511 7366.71    1512 7368.98    1513 7371.02    1514
  7373.5    1515 7376.06    1516 7378.89    1517 7383.06    1518 7392.92    1519
 7412.28    1520 7444.48    1521 7461.07    1522  7480.3    1523 7498.94    1524
  7510.3    1525 7515.67    1526 7519.46    1527 7523.06    1528 7526.21    1529
 7528.79    1530 7530.93    1531 7538.03    1532  7546.3    1533 7556.94    1534
 7602.85    1535
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Levee=-1,6345.61,1528.48,0,,,,
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 5858.36 6345.61 1517.96 6470.25 6923.51 1509.95
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Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,53      ,368.55,373.15,382.35
Node Last Edited Time=Nov/04/2003 11:55:00
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  996.17  1522.7 1004.75  1522.7 1009.41  1522.7 1010.77  1522.7  1068.1  1522.7
 1069.52  1522.7 1096.64  1522.7 1415.06  1526.7  1437.3  1526.7 1671.56  1522.7
 1694.57  1522.7 1859.14  1522.7  2068.8  1522.7 2549.87  1522.7 2637.51  1522.7
 3499.34  1522.7 3511.56  1522.7 3564.25  1522.7 4262.37  1518.7 4475.74  1518.7
  4845.7  1518.7 4934.75  1518.7 5041.71  1518.7 5161.98  1518.7 5341.92  1518.7
 5390.29  1518.7 5529.16  1518.7 5544.38  1518.7 5618.31  1518.7 5652.21  1518.7
 5704.36  1518.7 5899.11    1517 5970.11    1517 5984.78    1517 5999.98    1517
 6009.83    1517 6027.28    1516 6038.83    1515 6044.23    1514 6050.14    1513
 6056.04    1512 6093.46    1512 6100.77    1512 6105.77    1511 6109.07    1510
 6112.58    1509 6116.49    1508 6120.71    1507 6123.95    1506 6128.06    1505
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6272.57 1505 6276.54 1506 6280.44 1507 6284.16 1508 6287.8 1509
6291.11 1510 6295.6 1511 6307.49 1512 6315.15 1513 6320.13 1514
6324.7 1515 6328.09 1516 6332.99 1517 6336.07 1518 6356.61 1518
6364 1517 6370.66 1516 6377.15 1515 6383.74 1514 6438.1 1514
6444.68 1515 6478.1 1515 6483.96 1514 6488.78 1513 6493.87 1512
6564.23 1511 6568.08 1510 6570.53 1509 6573.63 1508 6575.83 1507
6577.89 1506 6579.86 1505 6581.76 1504 6584.87 1503 6588.5 1502
6606.71 1502 6609.39 1503 6612.06 1504 6616.72 1505 6625.87 1505
6628.59 1504 6631.06 1503 6633.12 1502 6635.74 1501 6639.11 1500
6645.11 1499 6656.87 1498 6703.1 1498 6715.64 1499 6739.22 1500
6751.13 1501 6759.13 1502 6774.59 1503 6780.1 1504 6789.8 1505
6800.41 1506 6806.84 1507 6811.59 1508 6814.4 1509 6816.9 1510
6820 1511 6822.77 1512 6825.56 1513 6829.04 1514 6888.24 1515
6891.84 1516 6895.06 1517 6899.27 1518 6908.25 1519 6922.93 1520
6950.09 1520 6952.73 1519 6954.23 1518 6955.71 1517 6957.35 1516
6959.19 1515 6960.8 1514 6962.75 1513 6963.84 1512 6965.09 1511
6966.48 1510 6968.99 1509 6987.26 1509 6994.01 1509 7269.41 1508
7278.9 1508 7311.37 1508 7317.12 1508 7324.29 1509 7327.37 1510
7330.39 1511 7332.77 1512 7334.44 1513 7335.76 1514 7337.13 1515
7338.44 1516 7339.72 1517 7341.1 1518 7342.53 1519 7344.69 1520
7363.68 1521 7381.66 1522 7392.59 1523 7413.25 1524 7431.16 1525
7445.1 1526 7456.74 1527 7467.35 1528 7478.35 1529 7482.63 1530
7485.34 1531 7487.99 1532 7492.55 1533 7501.86 1534 7507.94 1535
7512.32 1536 7516.6 1537 7523.59 1538 7528.45 1538 7556.32 1537
7577.14 1537 7583.49 1538 7588.92 1539 7593.22 1540 7596.56 1541
7599.47 1542 7602.64 1543 7607.4 1544 7633.75 1544 7680.96 1543
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Node Last Edited Time=Nov/04/2003 11:41:39
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1058.63 1522.7 1067.97 1522.7 1069.59 1522.7 1112.37 1522.7 1112.4 1522.7
1615.51 1522.7 2566.64 1522.7 2939.35 1522.7 4044.44 1518.7 4063.84 1518.7
4137.93 1518.7 4174.89 1518.7 4222.69 1518.7 4341.11 1518.7 4447.4 1518.7
4541.37 1518.7 4641.07 1518.7 4809.78 1518.7 4897.22 1518.7 5308.52 1518.7
5384.98 1518.7 5849.21 1516 5894.23 1515 5943.27 1515 5970.98 1516
6066.81 1516 6075.02 1515 6090.28 1514 6108.33 1513 6118.38 1512
6123.73 1511 6128.19 1510 6131.47 1509 6133.54 1508 6135.82 1507
6138.34 1506 6140.82 1505 6190.85 1505 6357.6 1505 6361.75 1506
6365.41 1507 6369.38 1508 6372.72 1509 6381.28 1510 6392.27 1511
6395.46 1512 6407.5 1513 6417.8 1514 6424.26 1515 6431.33 1516
6450.71 1516 6462.05 1515 6478.57 1514 6496.47 1513 6518.55 1512
6591.33 1511 6597.49 1510 6618.13 1509 6634.03 1508 6641.36 1507
6648.88 1506 6652.56 1505 6654.99 1504 6661.28 1503 6679.69 1502
6683.95 1501 6689.31 1500 6693.77 1499 6702.37 1498 6717.4 1498
6726.96 1499 6743.71 1500 6773.39 1501 6784.25 1502 6791.76 1503
6812.84 1504 6818.36 1505 6822.28 1506 6826.85 1507 6830.49 1508
6833.86 1509 6836.06 1510 6838.69 1511 6841.91 1512 6845.78 1513

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 6859.97    1513 6894.67    1513 6898.93    1514 6902.48    1515 6906.29    1516
  6910.5    1517 6917.17    1518 6959.51    1518 6962.31    1517 6965.55    1516
 6968.79    1515 6971.87    1514 6975.09    1513 6978.34    1512 6980.64    1511
 6981.62    1510 6982.86    1509 6984.05    1508 7003.38    1507 7019.58    1507
 7169.84    1507 7187.24    1506 7189.53    1506 7311.45    1507 7314.77    1508
 7318.15    1509 7320.94    1510 7323.62    1511 7326.12    1512  7328.7    1513
 7331.76    1514 7335.09    1515 7361.62    1516 7384.88    1517 7396.07    1517
 7425.63    1517 7434.67    1518 7442.01    1519 7449.75    1520 7463.25    1521
 7475.86    1522 7487.95    1523 7500.62    1524 7510.43    1525 7519.74    1526
 7526.73    1527 7533.08    1528  7541.7    1529  7546.7    1530 7551.03    1531
 7554.54    1532 7558.07    1533 7567.68    1534 7584.69    1534 7598.43    1533
 7608.91    1532 7609.74    1532 7613.24    1533 7618.01    1534 7621.81    1535
 7625.16    1536 7628.36    1537 7631.46    1538 7635.13    1539 7639.04    1540
 7644.11    1541 7659.63    1542 7664.14    1542  7666.4    1541 7668.79    1540
 7671.71    1539  7676.1    1538 7715.32    1538 7769.79    1539 7833.23    1540
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Bank Sta=6959.51,7384.88
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,51      ,493.74,496.98,487.08
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  3298.7  1518.7  3371.9  1518.7  3380.7  1518.7 3660.69  1518.7 3668.95  1518.7
 5437.11    1516 5552.08    1515 5784.01    1514  5793.2    1513 5796.07    1512
  5798.3    1511 5800.74    1510 5803.38    1509 5807.52    1508 5811.68    1507
 5813.17    1507 5817.07    1508 5819.06    1509 5820.48    1510  5822.3    1511
 5824.12    1512 5825.54    1513 5826.69    1514 5828.41    1515 5917.99    1515
 5957.19    1514 5978.39    1513 5986.99    1512 6000.48    1511 6035.04    1511
    6039    1511 6069.02    1511 6079.24    1511 6107.12    1511 6118.72    1510
 6169.36    1509 6200.64    1509 6213.56    1510 6227.33    1510 6243.28    1509
 6282.28    1508 6288.91    1508 6292.33    1508 6302.27    1507 6306.61    1506
 6310.56    1505 6315.56    1504 6324.34    1503 6331.11    1503 6339.37    1503
 6465.44    1503 6477.82    1504 6481.25    1505 6483.84    1506 6486.38    1507
 6488.83    1508 6491.55    1509 6494.47    1510 6498.63    1511 6510.13    1512
 6515.65    1513 6519.29    1514 6522.77    1515 6526.54    1516 6531.65    1517
 6562.29    1518 6567.84    1518 6570.13    1517 6572.88    1516 6575.02    1515
 6577.37    1514 6579.99    1513 6582.74    1512 6585.88    1511 6589.24    1510
 6594.55    1509 6603.46    1508 6607.59    1507 6611.98    1506  6727.4    1505
  6747.7    1505  6761.7    1505 6774.91    1505 6780.11    1505 6894.05    1505
 6906.54    1505 6919.33    1505 6965.45    1505 6974.91    1506 6989.28    1507
 7001.88    1508 7006.42    1509 7010.34    1510 7013.87    1511 7033.53    1512
 7044.27    1512 7059.51    1511 7063.29    1510 7067.19    1509 7072.83    1508
 7102.72    1508 7123.96    1509 7138.73    1510 7146.26    1511  7154.6    1512
 7164.31    1513 7193.37    1514 7206.11    1515 7215.35    1516 7222.13    1517
 7228.41    1518 7234.05    1519 7243.93    1519 7246.59    1519 7269.89    1519
 7288.59    1518 7293.06    1518 7300.31    1519 7307.76    1520 7313.58    1521
 7320.95    1522 7336.91    1523 7342.04    1524 7346.15    1525 7350.71    1526
 7354.78    1527 7363.65    1528 7382.81    1529  7391.3    1530
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Levee=-1,6039.66,1519.09,0,,,,
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Bank Sta=6567.84,7033.53
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,50      ,458.4,461.28,485.46
Node Last Edited Time=Nov/04/2003 11:38:53
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  416.71    1518  422.22    1518   433.9    1518  467.61    1518  809.24    1518
  966.79    1517 1074.06    1517 1116.04    1518 1130.67    1518 1179.64    1518
 1186.33    1518    1202    1518 1216.45    1518 1217.36    1518 1243.12    1518
 1280.95    1517 1553.76    1520 1559.18    1520 1567.61    1520 1855.73  1518.7
 2228.08  1518.7 2448.31  1518.7 2515.27  1518.7 2639.69  1518.7  3035.9  1514.7
 3117.46  1514.7  3605.9  1514.7 3642.75  1514.7 3721.55  1514.7 4005.82  1514.7
 4120.42  1514.7 4232.03  1514.7 4291.48  1514.7 4383.38  1514.7 4493.13  1514.7
 4571.35  1514.7 4708.04  1514.7 4774.45  1514.7  5091.1    1507 5211.17    1507
 5329.32    1507 5357.49    1506 5466.53    1506 5486.61    1506 5531.14    1505
  5556.1    1506 5607.66    1507  5613.2    1508 5618.32    1509 5624.18    1509
 5627.51    1508 5630.04    1507 5632.77    1506 5635.14    1505  5670.2    1504
 5672.09    1503 5678.37    1502 5690.26    1501 5696.18    1500 5700.57    1499
 5704.76    1498 5723.03    1497 5734.73    1497 5740.99    1498 5745.56    1499
 5748.73    1500 5751.86    1501 5754.69    1502 5757.61    1503 5781.54    1503
 5798.89    1502 5814.55    1502 5818.77    1503 5821.67    1504 5825.05    1505
 5829.24    1506 5832.95    1507  5837.1    1508 5863.06    1508 5878.51    1508
  5914.8    1508 5926.35    1507  5931.9    1506 5937.42    1505 5942.27    1504
 5948.08    1503 5979.29    1503 6043.89    1504  6117.1    1505 6125.31    1506
 6130.47    1507 6135.22    1508 6140.55    1509 6145.16    1510 6150.76    1511
 6155.07    1512 6161.05    1513 6166.52    1514 6197.59    1514 6201.06    1513
 6203.66    1512 6204.97    1511 6206.64    1510 6207.18    1509 6208.59    1508
 6209.25    1506 6209.34    1507 6210.92    1505 6213.11    1504    6220    1504
 6302.91    1503  6306.1    1503 6344.96    1503  6353.1    1503 6378.41    1503
 6407.58    1503  6444.4    1503 6538.12    1503 6548.36    1504 6571.99    1504
 6587.82    1504 6594.16    1505 6600.19    1506 6624.81    1506 6635.98    1506
  6652.9    1506 6663.33    1506 6682.67    1506 6739.91    1506 6743.98    1507
 6746.84    1508 6750.28    1509 6755.16    1510 6760.32    1511 6766.86    1512
 6797.68    1512 6837.42    1512 6867.33    1512 6872.65    1511 6877.18    1510
 6887.35    1509 6897.07    1509 6942.55    1510 6972.58    1511 7004.17    1511
    7034    1513    7044    1514
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Levee=-1,5677.05,1513.76,0,,,,
#Block Obstruct= 1 ,-1
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Bank Sta=6197.59,6766.86
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,49      ,516.06,536.16,535.62
Node Last Edited Time=Dec/18/2007 15:59:15
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 1711.53    1515 1840.94    1515 2704.64    1516 2952.39  1514.7 3019.51  1514.7
 3432.88  1514.7 3572.27  1514.7  3617.2  1514.7 3767.59  1514.7 4250.77  1514.7
 4487.62    1508 4528.81    1509  4551.4    1509 4700.39    1508 4820.44    1507
 5045.02    1506 5067.75    1506 5076.71    1506 5089.76    1506 5108.77    1507
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5220.63 1507 5230.26 1507 5237.37 1507 5258.84 1506 5571.23 1505
5640.02 1506 5671.37 1506 5678.21 1506 5689.71 1506 5733 1506
5735.28 1506 5790 1506 5795.63 1506 5809.1 1505 5815.79 1504
5821.41 1503 5827.41 1502 5839.96 1502 5845.48 1503 5849.58 1504
5854.87 1505 5861.98 1506 5884.7 1506 5913.97 1505 5925.4 1504
5941.66 1503 6044.45 1503 6050.48 1504 6055.25 1505 6061.37 1506
6069.98 1507 6100.87 1507 6224.58 1507 6300.28 1501.06 6386.89 1501
6428.18 1501 6428.24 1501 6438.89 1501 6461.06 1501 6465.56 1501
6628.42 1502 6642.26 1502 6655.65 1502 6656.33 1502 6662.87 1502
6664.94 1503 6666.69 1504 6667.98 1505 6669.08 1506 6670.24 1507
6671.39 1508 6672.81 1509 6674.61 1510 6684.01 1510 6688.14 1509
6695.45 1508 6782.07 1507 6830.81 1506 6851.31 1506 6869.76 1506
6888.02 1506 6902.47 1506 6924.37 1506 7064.06 1507 7184 1510
7194 1511 7200 1512
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Permanent Ineff=
F F
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Exp/Cntr=0.5,0.3

Type RM Length L Ch R = 1 ,48 ,461.64,452.76,478.8
Node Last Edited Time=Jan/03/2008 14:23:45
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1103.87 1515 1200.98 1514 1203.17 1514 1214.13 1514 1224.74 1514
1237.78 1514 1245.64 1514 1262.1 1514 1263.04 1514 1277.69 1514
1320.6 1514 1369.07 1514 1487.24 1514 1940.61 1515 1946.29 1515
1967.35 1515 2145.77 1515 2152.77 1515 2154.83 1515 2167.31 1515
2181.21 1516 2215.47 1516 2284.64 1516 2323.16 1516 2620.33 1515
2785.88 1514 3110.67 1513 3391.55 1512 3415.1 1512 3421.52 1512
3489.5 1511 3582.96 1510 3602.5 1509 3639.26 1509 3722.37 1510
3856.89 1510 4072.74 1509 4078.01 1509 4095.33 1510 4103.66 1511
4117.3 1511 4125.01 1510 4153.01 1510 4171 1510 4179.43 1509
4200.26 1509 4213.16 1509 4235.61 1509 4288.76 1510 4297.74 1511
4304.16 1511 4339.28 1509 4437.24 1508 4463.98 1507 4504.77 1506
4507.46 1506 4514.71 1506 4550.36 1506 4582.19 1506 4802.1 1506
4842.18 1506 4905.99 1506 5175.97 1506 5188.82 1505 5223.65 1505
5257.17 1504 5267.02 1504 5300.76 1504 5314.87 1504 5324.56 1504
5353.75 1504 5357.28 1504 5565.39 1503 5603.33 1503 5648.22 1503
5700.06 1503 5745 1503 5745.04 1503 5899.21 1504 5904 1504
5913.07 1504 5920.69 1503 5952.14 1502 5967.25 1501 5991.93 1501
6007.03 1502 6015.85 1503 6029.17 1504 6149.04 1506 6159.9 1507
6169.39 1508 6213.01 1508 6213.31 1508 6221.64 1507 6229.87 1506
6232.29 1499.09 6397.72 1499 6430.51 1499 6463.02 1499 6471.81 1499
6491.93 1499 6499.43 1499 6666.94 1499 6675.3 1499 6685.98 1500
6690.08 1501 6692.53 1502 6694.19 1503 6695.53 1504 6697.36 1505
6698.66 1506 6699.34 1507 6700.47 1508 6701.87 1509 6707.21 1509
6712.85 1508 6715.37 1507 6717.55 1506 6720.16 1505 6723.57 1504
6731.9 1503 6736.56 1503 6870.53 1504 7020.6 1505 7048.17 1505

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 7064.47    1505 7077.96    1506  7080.6    1507 7082.96    1508 7084.24    1509
  7085.8    1510    7088    1511
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         5903.68 1513.01
Permanent Ineff=
       F       F
#Block Obstruct= 1 ,-1
 5263.46 6045.33    1504
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Exp/Cntr=0.5,0.3

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Node Last Edited Time=Jan/03/2008 14:24:09
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  616.13  1514.7  867.45  1514.7  913.27  1514.7 1228.55    1513  1241.2    1513
 1249.57    1513 1263.13    1513 1268.37    1513 1285.58    1513 1310.68    1513
 1409.16    1513 1425.75    1513 1542.12    1512 1588.92    1512 1699.59    1512
  1705.2    1512 1709.79    1512 1714.25    1512 1781.62    1513 1787.14    1513
 1825.64    1513 1828.27    1513 1951.88    1513  2022.8    1513 2037.52    1513
 2148.82    1513 2402.84    1512 2413.05    1511 2420.76    1510 2462.31    1509
 2532.46    1509 2543.26    1510 2549.12    1511 2562.43    1512  2640.8    1512
 2648.12    1512 2735.44    1512 2739.07    1512 2883.42    1513 2903.02    1514
 2945.96    1515 2995.77    1514 2998.84    1513 3001.01    1512 3003.21    1511
 3112.99    1510 3116.66    1510 3120.81    1510 3188.65    1510 3189.58    1510
 3409.22    1509 3517.98    1509 3522.94    1509 3791.33    1508 3855.45    1508
 3860.07    1508 4269.09    1507 4277.03    1507 4283.79    1507 4415.75    1506
 4424.24    1506 4427.42    1506  4505.8    1505 4513.28    1505 4525.21    1505
 4567.23    1505 4575.96    1505 4766.61    1505 4768.26    1505 4949.53    1504
 4961.08    1504 4998.65    1504 5031.07    1504 5040.75    1504 5236.98    1503
 5239.49    1503 5401.75    1503 5428.23    1502 5478.56    1502 5495.61    1502
 5577.36    1502 5583.89    1503 5591.25    1504 5599.69    1505 5606.48    1506
 5618.23    1507 5622.54    1507 5638.66    1506 5651.15    1505 5661.83    1504
 5671.48    1503 5682.66    1502 5709.99    1502 5847.03    1502    5849    1502
    6136    1502 6141.64 1502.11 6322.95 1498.08 6509.92 1498.05 6610.92    1498
 6643.51    1498  6663.9    1498 6868.83    1498 6870.81    1499 6873.14    1500
 6874.83    1501 6876.99    1502 6879.01    1503 6881.14    1504 6883.19    1505
 6885.66    1506 6887.93    1507 6891.04    1508 6912.43    1508 6914.63    1507
 6917.51    1506 6921.55    1505    6932    1505 6945.34    1505 7075.78    1505
    7087    1506 7090.84    1507 7093.38    1508 7094.97    1509 7096.19    1510
 7097.66    1511 7114.59    1512 7128.53    1512 7143.07    1511 7159.13    1511
 7180.59    1511 7183.97    1511 7200.39    1512 7208.23    1513 7215.29    1514
 7221.86    1515
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         6135.98 1512.29
Permanent Ineff=
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Bank Sta=6141.64,6891.04
Exp/Cntr=0.5,0.3
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Node Last Edited Time=Jan/03/2008 14:24:26
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1737.06 1514.7 1850.41 1514.7 1908.43 1514.7 2464.96 1510.7 2645.92 1510.7
2757.46 1510.7 3405.64 1510 3415.82 1509 3548.02 1509 3571.68 1509
3626.25 1509 3642.42 1509 3699.28 1509 3704.01 1509 3724.4 1509
3729.25 1509 3962.13 1509 3998.84 1510 4009.55 1510 4016.02 1509
4125.33 1508 4125.89 1508 4150.74 1508 4154.1 1508 4167.64 1508
4169.2 1508 4174.57 1508 4218.5 1508 4228.63 1508 4243.69 1508
4264.4 1508 4485.23 1507 4625.1 1506 4652.07 1506 4655.86 1506
4818.29 1505 4821.78 1505 5113.26 1504 5123.68 1504 5126.39 1504
5145.02 1504 5148.47 1504 5356.77 1504 5489.62 1504 5495.4 1504
5498.12 1504 5546.45 1504 5546.76 1504 5642.59 1503 5716.88 1502
5731.54 1502 5739.65 1502 5743.46 1502 5750.37 1502 5756.77 1502
5776.49 1502 6057.21 1501 6070.42 1501 6161.4 1501 6207.01 1501
6215.62 1501 6468.56 1500 6506.84 1500 6526.07 1500 6577.17 1500
6592.21 1500 6743.63 1499 6757.21 1498 6769.53 1497 6811.78 1497
6818.76 1498 6869.38 1498 6881.17 1497 6975.51 1496 7117 1496
7117.56 1496 7119.56 1496 7130.06 1496 7164.6 1495 7203.72 1495
7209.56 1496 7216.92 1497 7223.9 1498 7230.74 1499 7237.14 1500
7242.57 1501 7247.35 1502 7251.83 1503 7256.42 1504 7261.47 1505
7266.9 1506 7271.29 1507 7284.04 1508 7312.44 1509 7359.45 1510
7412.17 1511 7413.39 1511 7416.63 1510 7417.31 1509 7419.19 1508
7420.28 1504 7420.9 1507 7421.28 1503 7422 1503 7423.84 1503
7424.01 1506 7425.12 1504 7425.87 1504 7426.06 1505 7432.43 1503
7485.84 1496.1 7783.53 1496 8064.64 1496 8066.3 1497 8067.93 1498
8070.24 1499 8072.23 1500 8073.86 1501 8075.11 1502 8076.44 1503
8077.66 1504 8078.88 1505 8080.51 1506 8082.41 1507 8087.58 1508
8158.59 1509 8177.67 1510 8188.92 1511 8201.21 1512 8207.36 1513
8213.67 1514 8240.76 1515 8260.8 1516 8280.44 1517 8327.64 1518
8333.68 1519 8337.84 1520 8342.47 1521 8347.66 1522 8365.34 1523
8372.15 1524 8379.88 1525 8387.75 1526 8396.15 1527 8402.85 1528
8410.77 1529 8414.29 1530 8418.42 1531 8423.87 1532 8429.33 1533
8434.35 1534 8438.34 1535 8460.45 1540
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Permanent Ineff=
F F
#Block Obstruct= 1 ,-1
6657.22 7315.86 1496.27
Bank Sta=7412.17,8087.58
Exp/Cntr=0.5,0.3

Type RM Length L Ch R = 1 ,45.6666*,101.68,99.48,95.35
Node Last Edited Time=Jan/03/2008 14:24:38
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1636.99 1513.86 1778.75 1513.74 1894.82 1513.63 1954.23 1513.58 2189.15 1512.27
2524.12 1510.16 2709.43 1509.86 2823.64 1509.67 3011.33 1509.23 3117.46 1509.16
3191.05 1509.11 3228.71 1509.08 3273.23 1509.05 3417.77 1508.95 3445.45 1508.93
3487.38 1508.87 3497.8 1508.2 3633.18 1508.1 3657.41 1508.09 3713.28 1508.05
3729.84 1508.03 3788.07 1507.99 3792.91 1507.99 3813.79 1507.98 3818.76 1507.97

```
 4057.23 1507.81 4094.82 1508.45 4105.78 1508.44 4112.41 1507.77 4224.34 1507.02
 4224.92 1507.02 4250.36    1507  4253.8    1507 4267.67 1506.99 4269.27 1506.99
 4274.77 1506.99 4319.75 1506.96 4330.12 1506.95 4345.54 1506.94 4366.75 1506.92
 4592.88  1506.1 4736.11 1505.33 4763.73 1505.31 4767.61 1505.31 4933.94 1504.53
 4937.51 1504.53 5235.98 1503.65 5246.66 1503.64 5249.43 1503.64 5268.51 1503.63
 5272.04 1503.62 5355.37 1503.57 5485.34 1503.42 5621.38 1503.26  5627.3 1503.25
 5630.08 1503.25 5679.57 1503.19 5679.89 1503.19 5778.02 1502.41 5854.09 1501.66
  5869.1 1501.64 5877.41 1501.63 5881.31 1501.63 5888.39 1501.62 5894.94 1501.61
 5915.13 1501.59 6138.71 1500.81 6202.59 1500.41 6216.12 1500.35 6221.44 1500.33
 6309.28 1500.18 6355.99  1500.1  6364.8 1500.08 6413.37 1499.88 6455.61 1499.77
 6571.73 1499.47 6597.44  1499.4    6608 1499.37 6616.71 1499.35 6623.81 1499.33
 6627.75 1499.33 6663.01 1499.33  6682.7 1499.33 6735.03 1499.33 6750.43 1499.33
 6758.64  1499.3  6765.6 1499.27 6879.21 1498.78 6903.63 1499.34 6905.49 1499.33
 6919.21 1498.68 6919.39 1498.66 6932.01 1497.66 6944.13 1497.33 6962.32    1497
 6975.27 1496.98 6982.42 1497.64 7034.25 1497.56 7046.33 1496.87 7142.93 1496.06
 7181.47    1496 7279.32 1495.67 7287.541495.663 7290.44 1495.66 7301.19 1495.65
 7336.56 1494.96 7376.62 1494.93  7382.6 1495.59 7390.14 1496.25 7397.28 1496.91
 7404.29 1497.57 7410.84 1498.24  7416.4  1498.9  7421.3 1499.56 7425.88 1500.22
 7430.58 1500.89 7435.75 1501.55 7441.31 1502.21 7445.81 1502.88 7458.87 1503.53
 7487.95 1504.18 7536.09 1504.81 7590.07 1505.44 7591.32 1505.44 7594.64 1504.77
 7595.34  1504.1 7597.26 1503.43 7598.38 1500.76 7599.01 1502.76  7599.4  1500.1
 7602.02 1500.09  7602.2 1502.09 7603.33 1500.76  7604.1 1500.76  7604.3 1501.43
 7610.82 1500.09  7667.8 1499.38 7683.11 1499.37  7698.3  1495.7  7961.9 1495.67
 8230.62 1495.67  8232.8 1496.37 8234.94 1497.08 8237.97 1497.79 8240.59 1498.51
 8242.73 1499.21 8244.37 1499.91 8246.12  1500.6 8247.72  1501.3 8249.32 1501.99
 8249.81 1502.15 8251.46    1503 8252.72 1503.67 8253.96 1504.32 8253.99 1504.34
 8255.64 1504.83 8256.66 1505.27 8258.47 1505.78 8260.75 1506.33 8270.79 1506.77
 8275.53 1507.15  8296.9 1507.69 8309.18 1508.15  8312.9 1508.52 8316.25 1508.88
  8319.7 1509.25 8322.75 1509.62 8325.29 1509.97  8327.3 1510.33 8327.93 1510.43
  8329.4 1510.72 8331.37 1511.13 8333.44 1511.54 8336.21 1511.97 8338.33 1512.38
 8341.37 1512.83 8345.99    1513 8356.63 1513.67 8368.26 1514.33 8374.08    1515
 8380.05 1515.67 8381.95 1515.72 8390.36  1515.6 8399.84 1515.51 8405.68 1515.48
 8410.44  1515.5 8420.19 1515.51 8424.64  1515.5 8428.97 1515.49 8439.83 1515.54
 8443.22 1515.67 8454.97 1515.84 8484.79 1516.62 8487.88 1516.79 8493.41 1517.65
  8493.6 1517.68 8497.53 1518.64 8497.93 1518.73 8501.92 1519.67 8501.93 1519.67
 8505.48 1520.48 8506.83 1520.82 8508.36 1521.06 8511.49 1521.52 8523.55 1522.18
    8530 1522.94 8534.16 1523.38 8537.31 1523.69 8544.76 1524.42 8552.71 1525.15
 8559.04 1525.87 8566.54  1526.6 8569.87 1527.29 8573.78 1527.99 8575.23 1528.19
 8578.93 1528.74  8584.1 1529.52 8588.85 1530.29 8591.05 1530.72 8592.62 1531.04
 8603.22 1533.02 8613.54    1535
#Mann= 3 ,-1 , 0
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Levee=-1,7287.54,1518.37,0,,,,
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Permanent Ineff=
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Bank Sta=7590.07,8260.75
Exp/Cntr=0.5,0.3

Type RM Length L Ch R = 3 ,45.5    ,,,
BEGIN DESCRIPTION:
```

State Street Bridge - THis has adjusted geometry to make up for the 40 degree skew that exists with the bridge. The bridge plans say that they are in vnad 1929 and the elevation of the topo has been adjusted for vnad 85 This is conservative but, the water does not come close to the top of the bridge so is ok.

```
END DESCRIPTION:
Node Last Edited Time=Oct/02/2003 16:56:49
Bridge Culvert--1,0,-1,-1, 0
Deck Dist Width WeirC Skew NumUp NumDn MinLoCord MaxHiCord MaxSubmerge Is_Ogee
20,75,2.6,0, 6, 6, 1516, , 0.95, 0, 0,0,,
   4000    7687    7687    8292    8292    9000
   1510  1513.3  1513.3 1518.63 1518.63    1520
   1490    1490  1510.3 1515.63    1490    1490
   4000    7853    7853    8458    8458    9000
   1510  1513.3  1513.3 1518.63 1518.63    1520
   1490    1490  1510.3 1515.63    1490    1520
Pier Skew, UpSta & Num, DnSta & Num=  ,7713.4, 2 ,7879.4, 2 , 0 , 0 , 0 ,,
      3       3
 1494.86    1518
      3       3
 1494.86    1518
Pier Skew, UpSta & Num, DnSta & Num=  ,7749.02, 2 ,7915.02, 2 , 0 , 0 , 0 ,,
      3       3
 1494.86    1518
      3       3
 1494.86    1518
Pier Skew, UpSta & Num, DnSta & Num=  ,7784.64, 2 ,7950.64, 2 , 0 , 0 , 0 ,,
      3       3
 1494.86    1518
      3       3
 1494.86    1518
Pier Skew, UpSta & Num, DnSta & Num=  ,7820.26, 2 ,7986.26, 2 , 0 , 0 , 0 ,,
      3       3
 1494.86    1518
      3       3
 1494.86    1518
Pier Skew, UpSta & Num, DnSta & Num=  ,7855.88, 2 ,8021.88, 2 , 0 , 0 , 0 ,,
      3       3
 1494.86    1518
      3       3
 1494.86    1518
Pier Skew, UpSta & Num, DnSta & Num=  ,7891.5, 2 ,8057.5, 2 , 0 , 0 , 0 ,,
      3       3
 1494.86    1518
      3       3
 1494.86    1518
Pier Skew, UpSta & Num, DnSta & Num=  ,7927.121, 2 ,8093.121, 2 , 0 , 0 , 0 ,,
      3       3
 1494.86    1518
      3       3
 1494.86    1518
Pier Skew, UpSta & Num, DnSta & Num=  ,7962.741, 2 ,8128.741, 2 , 0 , 0 , 0 ,,
      3       3
 1494.86    1518
      3       3
 1494.86    1518
Pier Skew, UpSta & Num, DnSta & Num=  ,7998.361, 2 ,8164.361, 2 , 0 , 0 , 0 ,,
      3       3
 1494.86    1518
      3       3
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1494.86   1518
Pier Skew, UpSta & Num, DnSta & Num= ,8033.981, 2 ,8199.98, 2 , 0 , 0 , 0 ,,
3   3
1494.86   1518
3   3
1494.86   1518
Pier Skew, UpSta & Num, DnSta & Num= ,8069.601, 2 ,8235.601, 2 , 0 , 0 , 0 ,,
3   3
1494.86   1518
3   3
1494.86   1518
Pier Skew, UpSta & Num, DnSta & Num= ,8105.221, 2 ,8271.221, 2 , 0 , 0 , 0 ,,
3   3
1494.86   1518
3   3
1494.86   1518
Pier Skew, UpSta & Num, DnSta & Num= ,8140.841, 2 ,8306.841, 2 , 0 , 0 , 0 ,,
3   3
1494.86   1518
3   3
1494.86   1518
Pier Skew, UpSta & Num, DnSta & Num= ,8176.461, 2 ,8342.461, 2 , 0 , 0 , 0 ,,
3   3
1494.86   1518
3   3
1494.86   1518
Pier Skew, UpSta & Num, DnSta & Num= ,8212.081, 2 ,8378.081, 2 , 0 , 0 , 0 ,,
3   3
1494.86   1518
3   3
1494.86   1518
Pier Skew, UpSta & Num, DnSta & Num= ,8247.701, 2 ,8413.701, 2 , 0 , 0 , 0 ,,
3   3
1494.86   1518
3   3
1494.86   1518
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3   3
1494.86   1518
3   3
1494.86   1518
Pier Skew, UpSta & Num, DnSta & Num= ,8318.941, 2 ,8484.941, 2 , 0 , 0 , 0 ,,
3   3
1494.86   1518
3   3
1494.86   1518
BR Coef=-1 , 1 , 0 ,, 0 ,,,0.8,-1,1.5,0,
WSPro=,,,, 1 ,,,, 0 ,,,, 0 ,,,,-1 ,-1 ,-1 , 0 , 0 , 0 , 0 , 0
BC Design=,, 0 ,, 0 ,,18,7713.4,7879.4,35.62,3

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Node Last Edited Time=Jan/03/2008 14:24:53
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0 1518.7 723.15 1515.23 1197.52 1513.87 1270.61 1513.74 1561.13 1513.23
1675.36 1513.03 1820.44 1512.77 1939.23 1512.56 2000.04 1512.46 2240.46 1511.48
2583.28 1509.61 2772.93 1509.01 2889.83 1508.64 3081.91 1507.97 3190.53 1507.93

3265.85 1507.9 3304.38 1507.89 3349.95 1507.88 3497.88 1507.82 3526.2 1507.81
3569.12 1507.74 3579.79 1507.39 3718.33 1507.2 3743.13 1507.17 3800.32 1507.09
3817.27 1507.07 3876.86 1506.99 3881.81 1506.98 3903.18 1506.95 3908.26 1506.95
4152.32 1506.61 4190.79 1506.89 4202.02 1506.88 4208.8 1506.54 4323.36 1506.05
4323.94 1506.05 4349.99 1506.01 4353.51 1506 4367.7 1505.99 4369.33 1505.98
4374.96 1505.98 4421 1505.91 4431.62 1505.9 4447.4 1505.88 4469.1 1505.85
4700.53 1505.2 4847.12 1504.66 4875.38 1504.63 4879.35 1504.62 5049.58 1504.06
5053.24 1504.05 5358.71 1503.3 5369.63 1503.29 5372.47 1503.28 5391.99 1503.25
5395.61 1503.25 5480.9 1503.13 5613.91 1502.83 5753.14 1502.52 5759.19 1502.51
5762.04 1502.5 5812.69 1502.39 5813.02 1502.39 5913.45 1501.83 5991.31 1501.32
6006.67 1501.29 6015.17 1501.27 6019.16 1501.26 6026.4 1501.24 6033.11 1501.23
6053.78 1501.18 6282.6 1500.41 6347.97 1499.82 6361.82 1499.71 6367.27 1499.67
6457.16 1499.36 6504.96 1499.2 6513.99 1499.17 6563.69 1498.94 6606.92 1498.88
6725.77 1498.73 6752.07 1498.7 6762.89 1498.69 6771.79 1498.68 6779.07 1498.67
6783.09 1498.67 6819.19 1498.67 6839.34 1498.67 6892.89 1498.67 6908.65 1498.67
6917.06 1498.65 6924.17 1498.63 7040.45 1498.39 7065.45 1499.67 7067.34 1499.67
7081.38 1499.34 7081.57 1499.32 7094.49 1498.32 7106.89 1497.67 7125.51 1497
7138.76 1496.96 7146.08 1497.27 7199.13 1497.11 7211.48 1496.74 7281.81496.299
7310.35 1496.12 7349.8 1496 7449.94 1495.33 7461.32 1495.32 7472.32 1495.3
7508.52 1494.92 7549.52 1494.86 7555.64 1495.18 7563.35 1495.5 7570.67 1495.83
7577.83 1496.15 7584.54 1496.47 7590.23 1496.8 7595.24 1497.12 7599.94 1497.45
7604.75 1497.78 7610.04 1498.1 7615.73 1498.43 7620.33 1498.75 7633.69 1499.07
7663.46 1499.36 7712.72 1499.62 7767.97 1499.87 7769.25 1499.87 7772.65 1499.53
7773.36 1499.2 7775.33 1498.86 7776.47 1497.53 7777.12 1498.53 7777.52 1497.19
7780.2 1497.19 7780.38 1498.19 7781.55 1497.52 7782.33 1497.52 7782.53 1497.85
7789.21 1497.18 7847.53 1496.76 7863.2 1496.73 7882.44 1495.34 8140.26 1495.33
8396.6 1495.33 8399.3 1495.74 8401.95 1496.15 8405.71 1496.59 8408.95 1497.01
8411.6 1497.42 8413.63 1497.81 8415.79 1498.2 8417.78 1498.59 8419.76 1498.98
8420.37 1499.08 8422.41 1500 8422.43 1500 8423.97 1500.83 8425.5 1501.65
8425.54 1501.67 8427.59 1502.42 8428.85 1503.13 8431.1 1503.89 8433.91 1504.67
8443.39 1505.38 8447.85 1506.07 8468.01 1506.85 8479.59 1507.57 8483.1 1508.26
8486.26 1508.94 8489.51 1509.63 8492.39 1510.31 8494.79 1510.99 8496.68 1511.66
8497.28 1511.87 8498.66 1512.36 8500.52 1513.06 8502.47 1513.77 8505.09 1514.49
8507.08 1515.19 8509.95 1515.91 8514.3 1516 8524.34 1516.33 8535.31 1516.67
8540.8 1517 8546.43 1517.33 8548.22 1517.36 8556.15 1516.8 8565.1 1516.26
8570.6 1515.97 8575.09 1515.75 8584.29 1515.26 8588.48 1515 8592.57 1514.74
8602.8 1514.27 8606.01 1514.33 8617.08 1514.42 8645.21 1515.31 8648.13 1515.57
8653.34 1516.32 8653.52 1516.36 8657.23 1517.28 8657.6 1517.36 8661.36 1518.33
8661.38 1518.33 8664.72 1519.24 8665.99 1519.64 8667.44 1520.03 8670.39 1520.76
8681.77 1521.35 8687.84 1521.88 8691.77 1522.19 8694.74 1522.38 8701.76 1522.84
8709.26 1523.3 8715.24 1523.74 8722.31 1524.19 8725.45 1524.58 8729.13 1524.98
8730.51 1525.09 8734 1525.49 8738.87 1526.04 8743.35 1526.57 8745.43 1526.86
8746.91 1527.09 8756.9 1528.51 8766.64 1530
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0 .035 0 7847.53 .1 0 8140.26 .035 0
Levee=-1,7281.8,1513.84,0,,,,
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Permanent Ineff=
F F
Bank Sta=7767.97,8433.91
Exp/Cntr=0.5,0.3

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Node Last Edited Time=Jan/03/2008 14:22:10
#Sta/Elev= 81

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 3340.64  1506.7 3380.06  1506.7 3426.67  1506.7 3577.99  1506.7 3606.96  1506.7
 5606.42  1502.7 6426.48    1500 6513.09    1499 6714.01    1498 6758.23    1498
  6879.8    1498 6906.71    1498 6917.77    1498 6926.88    1498 6938.44    1498
 7075.47    1498 7082.75    1498 7201.69    1498 7227.26    1500 7243.56    1500
 7269.65    1498  7288.7    1497 7518.12    1496 7620.56    1495    7655    1495
 7655.81    1495    7996    1495 8091.45    1494 8247.11    1494 8253.26    1495
 8318.63    1495 8562.58    1495 8590.93    1496 8593.38    1497 8595.22    1498
  8597.1    1499 8599.54    1500 8601.04    1501 8603.72    1502 8607.08    1503
 8615.98    1504 8620.18    1505 8639.12    1506    8650    1507  8653.3    1508
 8656.27    1509 8659.32    1510 8662.03    1511 8664.28    1512 8666.06    1513
 8667.92    1514 8669.67    1515  8671.5    1516 8673.96    1517 8675.83    1518
 8678.53    1519 8714.49    1519 8721.94    1518 8730.35    1517 8739.74    1516
 8748.38    1515 8756.16    1514 8765.78    1513  8779.2    1513 8805.63    1514
 8813.27    1515 8817.27    1516 8820.82    1517 8823.96    1518 8826.52    1519
 8829.29    1520 8849.38    1521 8885.78    1522  8899.8    1523 8910.58    1524
 8919.73    1525
#Mann= 3 ,-1 , 0
     0    .035       0    7655      .1       0    7996    .035       0
Levee=-1,7655.81,1509.01,0,,,,
#XS Ineff= 2 , 0
       7995.75 1505.43
Permanent Ineff=
     F       F
#Block Obstruct= 1 ,-1
  7379.6 8321.53 1495.07
Bank Sta=7655.81,8607.08
Exp/Cntr=0.5,0.3

Type RM Length L Ch R = 1 ,44      ,355.75,366.2,370.95
Node Last Edited Time=Jan/03/2008 14:21:41
#Sta/Elev= 56
     0  1514.7  633.36  1510.7 2208.04  1506.7 2613.27  1506.7 2780.09  1506.7
 3349.69  1502.7 3373.88  1502.7 3527.22  1502.7 3709.01  1502.7 3723.84  1502.7
 4350.72  1498.7  4518.9  1498.7 4553.92  1498.7 4685.46  1498.7 4877.47  1498.7
 6037.17  1498.7 6235.44  1498.7 6522.02    1496 6597.81    1496 6611.03    1496
 6620.94    1495 6632.46    1495 6832.86    1496 6846.14    1497 6871.16    1497
 6885.66    1496 6904.75    1495  7111.5    1494 7236.27    1493 7306.02    1492
    7344    1492 7344.191491.997 7400.83    1491 7416.94    1491 7567.79    1492
 7665.17    1493 7707.64    1494    7734    1494 7974.04    1495 8027.45    1494
 8048.67    1494 8172.14    1494 8402.72    1494 8404.33    1495  8405.6    1496
 8408.26    1497 8413.07    1498 8417.63    1499 8422.99    1500 8427.78    1501
 8434.29    1502 8450.54    1502 8452.78    1501 8479.99    1500 8500.03    1500
 8504.04    1500
#Mann= 3 ,-1 , 0
     0    .035       0    7344      .1       0    7734    .035       0
Levee=-1,7344.19,1506.94,-1,8441.93,1505.94,,
#XS Ineff= 2 , 0
       7733.71 1504.93
Permanent Ineff=
     F       F
#Block Obstruct= 1 ,-1
 6798.87    8017 1493.71
Bank Sta=7344.19,8450.54
Exp/Cntr=0.5,0.3
```

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Type RM Length L Ch R = 1 ,43      ,611.87,612.5,637.28
Node Last Edited Time=Jan/03/2008 14:21:31
#Sta/Elev= 66
       0  1510.7  800.21  1506.7 2339.59  1502.7 2491.78  1502.7 2522.83  1502.7
 2753.23  1502.7 3195.47  1502.7 3447.33  1502.7 3512.68  1502.7 3679.63  1502.7
 4424.15  1498.7  6744.9    1494 6824.76    1493  6914.6    1492 6964.17    1491
  7017.6    1490  7292.9    1490    7344    1490 7344.191490.012 7359.96    1491
 7407.02    1492 7532.25    1493 7558.84    1493 7573.02    1493    7649    1493
 7850.82    1493 7895.96    1493 7946.45    1493 8003.69    1492 8054.21    1492
 8061.07    1492 8110.98    1492 8215.01    1492 8240.41    1492  8346.2    1492
  8453.7    1492  8461.3    1493 8465.37    1494 8468.86    1495 8471.09    1496
 8473.48    1497 8475.99    1498 8478.46    1499 8481.46    1500 8484.43    1501
  8487.9    1502 8493.73    1503    8511    1503 8513.26    1502 8514.14    1501
 8515.09    1500 8515.98    1499 8549.71    1499 8550.63    1500 8551.55    1501
 8552.48    1502 8559.18    1502 8560.48    1501 8561.77    1500 8564.15    1499
 8582.49    1498 8588.07    1497  8612.3    1497 8702.24    1497 8715.98    1496
 8736.81    1495
#Mann= 3 ,-1 , 0
       0    .035       0    7344      .1       0    7649    .035       0
Levee=-1,7344.19,1505.45,-1,8512.75,1503.35,,
#XS Ineff= 2 , 0
         7648.73 1500.41
Permanent Ineff=
       F       F
#Block Obstruct= 2 ,-1
 6536.83 7485.84 1491.93  6784.7 7492.92  1492.1
Bank Sta=7344.19,8511
Exp/Cntr=0.5,0.3

Type RM Length L Ch R = 1 ,42      ,282.56,271.44,264.44
Node Last Edited Time=Jan/03/2008 14:21:19
#Sta/Elev= 63
       0  1506.7  353.74  1506.7  354.03  1506.7  354.67  1506.7  383.54  1506.7
  384.45  1506.7 1149.22  1502.7 1540.04  1502.7 1625.56  1502.7 2039.98  1502.7
 2051.32  1502.7 2143.15  1502.7 2167.55  1502.7 3500.06  1498.7 3515.26  1498.7
 3852.51  1498.7 4675.32  1494.7 4715.93  1494.7 4876.47  1494.7 5106.91  1494.7
 5130.45  1494.7 5492.12  1494.7  5527.2  1494.7 6537.79    1491 6563.39    1490
 6599.48    1489 6779.21    1488 6874.24    1488 6879.05    1488    7174    1488
 7174.22    1488 7174.42    1488 7299.94    1488 7317.57    1488    7386    1488
 7402.09    1488 7483.62    1488 7513.11    1488 7590.58    1489 7780.41    1490
 7885.99    1490 7928.36    1490 7982.69    1490 8035.42    1490 8038.24 1489.03
 8362.63    1489 8409.03    1489  8413.3    1490  8415.4    1491 8417.06    1492
 8419.05    1493 8421.02    1494 8422.77    1495 8424.35    1496 8426.81    1497
 8451.78    1497 8458.44    1496 8464.56    1495 8472.94    1494 8491.82    1493
 8578.54    1493 8654.71    1494 8689.88    1494
#Mann= 3 ,-1 , 0
       0    .035       0    7174      .1       0    7386    .035       0
Levee=-1,7174.22,1501.54,-1,8449.01,1497.31,,
#XS Ineff= 2 , 0
         7386.69 1498.95
Permanent Ineff=
       F       F
#Block Obstruct= 2 ,-1
 6211.05 7634.56 1488.62 6501.42 7825.78 1489.06
Bank Sta=7174.22,8426.81
Exp/Cntr=0.5,0.3
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Type RM Length L Ch R = 1 ,41 ,532.8,530.16,533.76
Node Last Edited Time=Jan/03/2008 14:20:53
#Sta/Elev= 77
0 1502.7 2084.15 1498.7 2485.08 1498.7 2565.84 1498.7 3735.02 1494.7
3834.31 1494.7 4102.85 1494.7 6535.51 1492 6574.72 1492 6609.38 1492
6816.4 1491 7017.2 1490 7144.35 1489 7145.891488.985 7249.19 1488
7408.06 1488 7422.42 1488 7436.3 1488 7449.11 1488 7497.47 1487
7716.16 1486 7859.97 1485 7899.91 1485 7925.79 1486 7946.06 1487
7953.82 1487 7955.72 1486 7957.83 1485 7967.69 1485 7969.45 1486
7970.93 1487 7972.56 1488 7976.18 1489 7977.03 1489 8015.97 1489
8019.61 1490 8022.27 1491 8024.3 1492 8026.31 1493 8028.4 1494
8030.3 1495 8032.42 1496 8034.39 1497 8036.36 1498 8068.96 1498
8075.55 1497 8084.5 1496 8095.17 1495 8098.49 1494 8101.17 1493
8103.45 1492 8106.02 1491 8107.85 1490 8111.25 1489 8169 1489
8374.72 1488 8390.78 1488 8392.16 1489 8393.28 1490 8394.78 1491
8396 1492 8398.31 1493 8399.9 1494 8401.56 1495 8403.72 1496
8415.36 1497 8428.86 1497 8439.84 1496 8448.7 1495 8466.33 1495
8479.34 1495 8491.09 1494 8501.7 1493 8513.22 1492 8534.01 1491
8578.53 1491 8714.29 1492
#Mann= 3 ,-1 , 0
0 .035 0 7969.45 .1 0 8169 .035 0
Levee=-1,7145.89,1502.33,-1,8427.76,1497.13,,
#XS Ineff= 2 , 0
7294.62 1495.93
Permanent Ineff=
F F
#Block Obstruct= 1 ,-1
7273.37 8045.33 1487.19
Bank Sta=7145.89,8415.36
Exp/Cntr=0.5,0.3

Type RM Length L Ch R = 1 ,40 ,622.93,630.84,618.87
Node Last Edited Time=Jan/03/2008 14:20:35
#Sta/Elev= 82
0 1502.7 495.83 1498.7 791.3 1498.7 835.76 1498.7 2631.5 1494.7
3007.3 1494.7 3112.07 1494.7 3186.4 1494.7 3212.66 1494.7 3311.77 1494.7
3351.16 1494.7 4346.21 1490.7 4365.47 1490.7 6003.46 1490.7 6200.93 1490.7
6557.31 1490.7 6597.16 1490.7 6620.88 1490.7 7128.63 1490 7293.7 1489
7358.56 1488 7379.04 1488 7459.75 1488 7464.591487.875 7498.41 1487
7658.94 1486 7723.71 1485 7815.55 1484 7916.12 1484 7921.53 1484
7962.83 1484 7983.55 1484 7996.29 1484 8007.63 1484 8024.84 1484
8026.48 1485 8028.15 1486 8030.23 1487 8032.99 1488 8037.4 1488
8051.32 1488 8059.06 1488 8172.37 1488 8178.73 1489 8183.4 1490
8279 1490 8318.7 1491 8323.6 1492 8327.57 1493 8330.93 1494
8333.95 1495 8336.74 1496 8339.46 1497 8379.17 1497 8382.22 1496
8385.71 1495 8389.43 1494 8391.85 1493 8394.13 1492 8396.23 1491
8398.31 1490 8400.42 1489 8402.65 1488 8479 1488 8549.69 1487
8696.7 1486 8701.28 1486 8702.5 1487 8703.64 1488 8704.64 1489
8705.83 1490 8707.4 1491 8708.98 1492 8710.99 1493 8712.85 1494
8719.27 1495 8721.85 1495 8734.03 1494 8738.34 1493 8743.19 1492
8807.22 1491 8813.81 1490
#Mann= 3 ,-1 , 0
0 .035 0 8279 .1 0 8479 .035 0
Levee=-1,7464.59,1497.78,-1,8732.29,1495.36,,
#Block Obstruct= 1 ,-1

7145.89 8144.48 1487.02
Bank Sta=7464.59,8721.85
Exp/Cntr=0.5,0.3

Type RM Length L Ch R = 1 ,39 ,448.6,437.35,445.8
Node Last Edited Time=Jan/03/2008 14:20:09
#Sta/Elev= 75
0 1498.7 560.44 1494.7 707.04 1494.7 766.6 1494.7 2619.47 1490.7
5585.53 1482.7 5827.02 1482.7 5862.79 1482.7 6652.74 1486 6670.62 1486
6735.4 1486 6753.9 1486 6788.48 1486 7015.04 1486 7050.98 1485
7072.99 1484 7089.03 1483 7096.81 1482 7104.21 1481 7177.09 1481
7294.62 1481 7295.6 1481 7595.08 1481 7598.09 1482 7599.99 1483
7602.12 1484 7603.97 1485 7606.79 1486 7623.84 1486 7631.79 1486
7639.63 1487 7640.89 1487 7644.88 1486 7787.69 1486 8139 1486
8186.07 1487 8199.23 1488 8201.4 1489 8203 1490 8204.74 1491
8206.66 1492 8208.58 1493 8211.4 1494 8239.37 1494 8248.75 1493
8251.48 1492 8253.98 1491 8257.18 1490 8260.99 1489 8265.76 1488
8272.59 1487 8281.11 1486 8289.98 1485 8339 1485 8569.06 1485
8570.63 1486 8572.05 1487 8573.82 1488 8575.51 1489 8577.14 1490
8578.78 1491 8580.86 1492 8600.31 1492 8604.38 1491 8608.86 1490
8613.64 1489 8619.94 1488 8680.95 1488 8685.53 1489 8689.62 1490
8693.07 1491 8697.22 1492 8758.42 1492 8766.36 1491 8793.98 1490
#Mann= 3 ,-1 , 0
0 .035 0 8139 .1 0 8339 .035 0
Levee=-1,7294.62,1495.17,-1,8590.65,1492.31,,
#Block Obstruct= 2 ,-1
4015.58 6203.97 1483.89 6791.78 7719.55 1484.88
Bank Sta=7294.62,8580.86
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,38 ,416.45,417.55,406.4
Node Last Edited Time=Jan/03/2008 14:19:57
#Sta/Elev= 68
0 1494.7 321.55 1494.7 730 1494.7 1188.26 1494.7 1206.2 1494.7
1875.73 1490.7 3038.06 1482.7 3105.14 1482.7 3253.24 1478.7 3324.05 1478.7
3358.86 1482.7 6019.87 1482.7 7035.74 1482.7 7338.79 1481 7853.07 1481
7859.28 1482 7861.191482.652 7862.21 1483 7864.18 1484 7866.54 1485
7873.16 1485 7876.65 1484 7948.5 1484 8203.74 1484 8331.53 1484
8518.49 1484 8628 1484 8674.48 1484 8687.06 1486 8689.09 1487
8690.77 1488 8692.36 1489 8693.95 1490 8695.35 1491 8697.27 1492
8727.62 1492 8728.7 1491 8730.72 1490 8731.77 1489 8733.06 1488
8734.31 1487 8735.28 1486 8736.34 1485 8737.41 1484 8828 1484
8835.91 1483 8925.23 1483 8961.23 1483 9005.71 1483 9040.15 1483
9045.78 1483 9047.8 1484 9048.99 1485 9050.37 1486 9051.67 1487
9053.43 1488 9055.12 1489 9057.16 1490 9072.44 1491 9077.7 1491
9084.77 1490 9089.18 1489 9094.01 1488 9101.6 1487 9130.8 1486
9225.89 1485 9244.76 1485 9350.96 1485
#Mann= 3 ,-1 , 0
0 .035 0 8628 .1 0 8828 .035 0
Levee=-1,7861.19,1491.75,-1,9079.32,1491.4,,
#Block Obstruct= 2 ,-1
2053.82 3378.19 1482.62 6423.51 8024.08 1482.66
Bank Sta=7861.19,9077.7
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,37 ,441.8,437.3,436

Node Last Edited Time=Jan/03/2008 14:19:47
#Sta/Elev= 69
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      0  1494.7 2104.29  1490.7 2126.36  1490.7 2302.09  1490.7 2629.39  1482.7
 2641.41  1482.7 2769.22  1482.7  3438.5  1482.7 3525.82  1482.7 3711.96  1482.7
 5966.62  1482.7 6044.84  1482.7  6267.9  1482.7 6342.55  1482.7 7018.22  1478.7
 7505.17  1478.7 7565.37  1478.7 7574.61  1478.7 7648.31  1478.7 7861.06    1480
 8063.99    1481 8173.02    1482 8219.02    1483  8223.1    1484 8226.02    1484
 8230.43    1483 8235.56    1482 8392.35    1482 8930.98    1482    9197    1482
 9221.74    1482 9245.36    1483 9248.55    1484 9251.28    1485 9253.48    1486
 9255.51    1487 9257.24    1488  9258.8    1489 9259.89    1490 9296.82    1490
  9301.7    1489 9305.45    1488 9307.87    1487 9309.27    1486  9310.3    1485
 9311.45    1484  9312.5    1483 9313.48    1482    9397    1482 9608.43    1482
 9610.82    1483 9612.37    1484 9614.36    1485 9616.02    1486 9617.53    1487
 9619.02    1488 9643.79    1488 9648.65    1487 9653.21    1486 9657.72    1485
 9663.36    1484 9670.23    1483 9698.23    1483 9711.12    1484 9719.18    1485
 9776.52    1485    9782    1484 9817.02    1484 9841.11    1484
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#Mann= 3 ,-1 , 0
```
      0    .035       0    9197      .1       0    9397    .035       0
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Levee=-1,8392.35,1490.57,-1,9645.89,1488.25,,
#Block Obstruct= 1 ,-1
 5743.63 8186.97 1481.96
Bank Sta=8392.35,9619.02
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,36   ,448.6,447.3,450.75
Node Last Edited Time=Jan/03/2008 14:19:35
#Sta/Elev= 73
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      0  1494.7   63.24  1490.7  115.03  1490.7  510.53  1490.7 1283.43  1490.7
 1319.85  1490.7 2251.94  1482.7 3175.74  1482.7 3264.27  1482.7 3275.99  1482.7
 3319.75  1482.7  3432.1  1482.7 3708.46  1478.7 4041.01  1478.7 4088.27  1478.7
  4436.1  1478.7 4552.32  1478.7  4579.5  1478.7 5042.56  1478.7 5062.99  1478.7
 5237.95  1478.7 5304.48  1478.7  6291.8  1478.7 7717.45    1479 7723.24    1479
 7734.83    1479 7767.44    1480  7785.9    1481 7811.87    1481 7815.45    1480
 7883.71    1479 8103.14    1479 8165.721479.301 8311.12    1480 8361.41    1480
 8572.77    1480    8960    1480 9008.51    1481 9027.59    1482 9040.01    1483
 9042.44    1484 9044.69    1485 9047.14    1486  9049.5    1487 9051.71    1488
 9056.09    1489 9059.59    1489 9090.44    1488 9096.81    1487 9099.94    1486
 9102.71    1485 9105.08    1484 9106.71    1483 9108.05    1482 9109.32    1481
 9111.64    1480    9160    1480 9307.95    1480 9403.88    1481 9405.74    1482
 9406.78    1483 9408.36    1484 9409.99    1485 9411.64    1486 9413.41    1487
    9427    1487 9439.56    1486 9446.95    1485 9467.69    1484 9479.14    1484
 9487.73    1484 9500.31    1484 9502.07    1485
```
#Mann= 3 ,-1 , 0
```
      0    .035       0    8960      .1       0 9059.59     .05       0
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Levee=-1,8165.72,1487.71,-1,9440.51,1487.2,,
Bank Sta=8165.72,9427
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,35   ,349,346,341.64
Node Last Edited Time=Jan/03/2008 14:14:03
#Sta/Elev= 73
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      0  1494.7   22.67  1490.7 1093.68  1482.7 1100.59  1482.7 1117.96  1482.7
  1584.4  1482.7 1884.36  1482.7 1959.16  1482.7 2532.89  1482.7 2954.48  1478.7
 3144.39  1478.7  3603.9  1478.7 5261.66  1478.7 5302.54  1478.7 5552.59  1478.7
 5592.73  1478.7  6771.2  1474.7 6812.21  1474.7 6863.93  1474.7 6899.91  1474.7
 7475.55    1478 7486.02    1478 7490.45    1477 7801.36    1477 8042.391477.778
```

8111.16 1478 8195.59 1478 8227.65 1478 8341.14 1478 8484.51 1478
8832.42 1478 8867 1478 8883.3 1478 8898.83 1478 8911.79 1478
8917.26 1479 8920.63 1480 8923.89 1481 8926.63 1482 8929.09 1483
8931.2 1484 8933.2 1485 8935.2 1486 8937.14 1487 8939.27 1488
8966.99 1488 8978.59 1487 8989.54 1486 8992.03 1485 8993.7 1484
8995.11 1483 8996.66 1482 8998.33 1481 9000.12 1480 9002.49 1479
9067 1478 9086.68 1478 9152.15 1478 9164.42 1478 9281.75 1478
9290 1479 9291.27 1480 9292.7 1481 9294.4 1482 9295.55 1483
9296.44 1484 9297.74 1485 9317.63 1485 9318.89 1484 9320.19 1483
9322.22 1482 9323.94 1481 9394.01 1479
#Mann= 3 ,-1 , 0
0 .035 0 8867 .1 0 9067 .035 0
Levee=-1,8042.39,1486.8,-1,9320.11,1485.36,,
Bank Sta=8042.39,9297.74
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,34 ,340.44,334.84,338.96
Node Last Edited Time=Jan/03/2008 14:13:31
#Sta/Elev= 79
0 1482.7 165.2 1482.7 255.89 1482.7 1649.67 1482.7 2956.96 1478.7
3125.05 1478.7 3171.02 1478.7 3640.1 1478.7 3680.54 1478.7 3923.26 1474.7
4089.06 1474.7 4231.95 1474.7 4418.26 1474.7 4430.27 1474.7 4611.01 1474.7
4642.51 1474.7 4742.62 1474.7 4815.05 1474.7 4815.54 1474.7 5256.77 1474.7
5839.72 1474.7 6229.32 1474.7 6290.56 1474.7 6630.6 1474.7 6756.21 1474.7
7331.07 1474.7 7406.3 1474.7 7448.95 1474.7 7490.07 1475 7912.48 1476
7969.86 1476 7974.84 1476 8116.15 1476 8187.28 1476 8203.23 1476
8369.49 1476 8373.64 1476 8539.65 1476 8729.4 1476 8927 1476
8952.96 1477 8956.53 1478 8967.13 1478 8975.26 1478 8977.69 1479
8979.78 1480 8981.85 1481 8983.06 1482 8985.45 1483 8986.61 1484
8989.17 1485 8991.57 1486 9027.12 1486 9038.37 1485 9049.08 1484
9050.29 1483 9051.57 1482 9052.65 1481 9053.44 1480 9054.74 1479
9056.12 1478 9060.59 1477 9109.21 1477 9127 1477 9133.47 1477
9338.99 1477 9341.28 1478 9342.7 1479 9344.27 1480 9345.58 1481
9346.87 1482 9348.49 1483 9350.72 1484 9369.19 1484 9372.21 1483
9374.49 1482 9376.65 1481 9379.43 1480 9448.51 1479
#Mann= 3 ,-1 , 0
0 .035 0 8927 .1 0 9127 .035 0
Levee=-1,8116.15,1484.03,-1,9362.61,1484.16,,
Bank Sta=8116.15,9350.72
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Node Last Edited Time=Jan/03/2008 14:13:01
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0 1482.7 11.6 1482.7 847.75 1482.7 1330.21 1482.7 1603.62 1482.7
2626.44 1478.7 2680.83 1478.7 2707.05 1478.7 3641.15 1474.7 3645.69 1474.7
3812.16 1474.7 3849.14 1474.7 3901.57 1474.7 4215.84 1474.7 4486.53 1474.7
4670.92 1474.7 4744.46 1474.7 4759.54 1474.7 4777.4 1474.7 4785.02 1474.7
4802.14 1474.7 4811.23 1474.7 5458.16 1474.7 5528.56 1474.7 8254.87 1474
8259.15 1474 8266.08 1474 8689.81474.399 9327.74 1475 9461 1475
9508.04 1476 9533.23 1477 9537.86 1478 9541.17 1479 9544.3 1480
9546.75 1481 9548.76 1482 9550.83 1483 9552.25 1484 9554.55 1485
9560.83 1485 9602.37 1484 9605.41 1483 9611.02 1482 9611.82 1481
9612.82 1480 9613.32 1479 9614.35 1478 9615.69 1477 9649.13 1476
9661 1476 9901.25 1476 9905.88 1477 9906.87 1478 9907.92 1479
9909.36 1480 9910.72 1481 9912.13 1482 9914.11 1483 9931.01 1483

9933.48   1482 9935.4   1481 9936.97   1480 9938.58   1479 9944.01   1478
9954.51   1477 9959.31   1477 9994.85   1477
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Node Last Edited Time=Jan/03/2008 14:12:39
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3384.3 1474.7 4858.99 1470.7 5453.17 1470.7 5501.84 1470.7 5698.8 1470.7
5787.29 1474.7 5821.74 1474.7 5915.39 1470.7 7222.21 1470.7 7253.48 1470.7
7609.13 1470.7 7687.85 1470.7 7950.06 1470.7 8479.48   1472 8725.13   1472
8750.23   1472 8787.54   1472 8905.01   1472 8964.21   1472 9166.91   1473
9305.35   1474 9534.35   1475 9593.44   1475   9631   1475 9651.04   1475
9656.21   1476 9668.89   1477 9671.36   1478 9673.81   1479 9676.05   1480
9678.63   1481 9681.61   1482 9731.38   1482 9733.24   1481 9734.95   1480
9736.34   1479 9737.71   1478 9738.9   1477 9740.59   1476 9765.05   1475
9806.31   1475   9831   1475 9857.83   1475 9974.95   1474 9997.59   1474
10010.73   147410030.74   147410035.22   147510036.36   147610037.89   1477
10039.15   147810040.74   1479 10042.3   148010043.73   148110046.26   1482
10060.88   1482 10064.4   148110067.29   148010069.91   1479 10074.3   1478
10082.06   147710156.66   1476
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1672.23 1478.7 2285.01 1474.7 2415.64 1474.7 2570.26 1474.7 2576.04 1474.7
2698.46 1474.7 2746.25 1474.7 2747.01 1474.7 2764.26 1474.7 2768.2 1474.7
2794.24 1474.7 3695.33 1470.7 3847.39 1470.7 4354.46 1470.7 4407.35 1470.7
4428.62 1470.7 5602.08 1470.7 5653.38 1470.7 5938.91 1470.7 6026.49 1470.7
8748.48   1470 8754.65   1470 8794.44   1470 8798.81   1470 8809.55   1470
8881.021470.216 9139.93   1471 9325.99   1472 9611.31   1472   9683   1472
9714.03   1472 9716.09   1473 9718.28   1474 9719.83   1475 9721.46   1476
9723.15   1477 9724.58   1478 9727.74   1479 9783.44   1479 9785.82   1478
9787.25   1477 9788.94   1476 9791.34   1475 9794.75   1474 9801.66   1473
9883   1473 9966.33   147210007.76   147210049.06   147210111.52   1472
10116.6   147310118.49   147410119.76   147510121.46   147610123.04   1477
10125.06   147810126.87   147910148.68   147910152.65   147810156.75   1477
10161.17   147610166.72   147510191.56   147510208.97   147510251.64   1475
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Node Last Edited Time=Jan/03/2008 14:11:53

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 3255.49  1470.7 3260.97  1470.7 3294.89  1466.7 3326.47  1466.7 3772.67  1470.7
 4179.26  1470.7 6039.18  1466.7 6128.87  1466.7 7379.02  1466.7 8016.21  1466.7
 8761.27    1468 8957.12    1469  8991.51469.111 9267.64    1470    9785    1470
 9859.74    1471 9865.41    1472 9867.71    1473 9869.75    1474 9871.63    1475
 9873.28    1476 9875.35    1477 9877.53    1478 9884.85    1478 9913.91    1477
 9916.74    1476 9919.54    1475 9923.28    1474 9924.68    1473 9926.58    1472
  9928.3    1471 9933.17    1470    9985    147010212.25    147010213.95    1471
10215.87    1472 10217.6    147310219.85    147410222.17    1475 10224.5    1476
10226.67    147710228.66    147810230.43    147910237.95    148010246.16    1480
10250.74    147910253.96    147810256.35    1477 10258.5    147610260.93    1475
10263.26    147410275.42    147310292.08    147210301.59    1471 10414.3    1471
10441.74    1471
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Type RM Length L Ch R = 1 ,29      ,474.3,474.18,489.18
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  592.77  1478.7  987.87  1478.7 2174.64  1474.7  2759.1  1470.7 2931.16  1466.7
 2978.14  1462.7 2995.24  1462.7 3101.09  1466.7 3575.37  1466.7 3691.58  1466.7
 3705.04  1466.7 3768.28  1466.7 3782.51  1466.7 5305.73  1466.7 5542.13  1466.7
 6254.75  1462.7 6254.92  1462.7 6255.12  1462.7 6259.73  1462.7 6288.35  1466.7
 6388.66  1466.7 6762.46  1466.7 6951.35  1466.7  7099.9  1466.7 7102.42  1466.7
 7151.87  1466.7  7152.5  1466.7 8344.44  1466.7 8619.63    1467  9025.51467.816
 9116.95    1468 9321.31    1469 9668.08    1469 9747.51    1469    9797    1469
 9825.46    1469 9841.97    1468 9844.25    1468 9848.14    1469 9864.53    1470
 9868.59    1471 9871.68    1472 9874.65    1473 9877.35    1474 9879.88    1475
 9882.65    1476  9885.8    1477 9897.33    1477 9924.23    1476 9926.38    1475
 9928.28    1474 9931.63    1473 9933.53    1472 9935.16    1471 9936.68    1470
 9937.92    1469 9940.01    1468    9997    146810108.11    146710215.65    1467
10216.85    146810218.39    146910220.12    147010221.83    147110223.74    1472
10225.72    147310228.24    147410230.25    147510232.47    147610234.92    1477
10256.34    147710258.48    147610260.58    147510266.53    147410353.42    1473
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Exp/Cntr=0.3,0.1

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 2835.44  1470.7 2966.83  1470.7 3005.01  1470.7 3050.31  1470.7 3084.49  1466.7
  3125.3  1462.7 3155.94  1462.7 5283.77  1466.7 5355.44  1466.7  6077.2  1462.7
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6087.82 1462.7 6106.29 1462.7 6112.45 1462.7 6436.52 1462.7 6467.7 1462.7
6468 1462.7 6495.83 1466.7 6552.58 1466.7 7024.67 1466.7 7025.3 1466.7
7077.45 1466.7 7078.8 1466.7 8658.84 1466 8774.49 1466 8949.52 1466
8977.6 1466.7 9118.981466.814 9347.97 1467 9886.38 1467 9889.56 1466
9892.58 1465 9897 1465 9916.81 1465 9921.53 1466 9924.89 1467
9929.72 1468 9932.75 1469 9937.08 1470 9941.33 1471 9946.69 1472
9951.32 1473 9954.95 1474 9996.79 1474 9998.94 147310000.53 1472
10002.16 147110003.51 147010004.87 146910006.52 146810008.37 1467
10012.61 1466 10097 146610301.44 1466 10304.9 146710306.63 1468
10308.65 146910311.19 147010313.77 147110316.27 147210318.99 1473
10320.62 147410322.39 147510323.82 147610338.32 147610345.79 1475
10349.35 147410353.57 147310372.04 147210377.36 147110414.94 1470
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4676.24 1462.7 4920.21 1462.7 4925.32 1462.7 4932.37 1462.7 5477.87 1462.7
5872.31 1462.7 5911.55 1462.7 6358.58 1462.7 6411.81 1462.7 6456.23 1462.7
6481.63 1466.7 6540.51 1466.7 6811.05 1462.7 6815.48 1462.7 6970.04 1462.7
6981.74 1462.7 7330.79 1462.7 7416.13 1462.7 9042.491464.997 9044.91 1465
9046.9 1465 9219.15 1465 9780 1465 9827.54 1465 9837.28 1465
9842.28 1466 9857.55 1467 9861.06 1468 9864.41 1469 9867.82 1470
9871.75 1471 9874.04 1472 9875.87 1473 9877.82 1474 9880.43 1475
9895.26 1475 9917.57 1474 9918.36 1473 9919.92 1472 9921.34 1471
9922.99 1470 9924.53 1469 9926.47 1468 9928.43 1467 9929.97 1466
9931.63 1465 9980 1464.510161.15 146410211.67 1464 10216.9 1465
10219.33 146610221.66 146710224.24 146810226.18 146910228.07 1470
10230.11 147110232.35 147210234.64 147310236.79 147410238.74 1475
10240.69 147610242.88 147710244.99 147810247.52 147910261.88 1480
10335.11 147910336.32 147810337.81 147710339.75 147610341.17 1475
10343.24 147410345.89 147310348.47 147210351.48 147110409.72 1470
10424.96 1470
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Node Last Edited Time=Jan/03/2008 14:06:30
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0 1474.7 758.79 1474.7 786.88 1474.7 837.78 1474.7 2020.7 1470.7
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3969.62 1462.7 4010.68 1462.7 4069.62 1462.7 4069.63 1462.7 4180.57 1462.7
4523.95 1462.7 4724.97 1462.7 4781.54 1462.7 4812.99 1462.7 4861.93 1462.7
6219.63 1462.7 6529.37 1462.7 6602.41 1462.7 6692.06 1462.7 6802.23 1462.7
6855.61 1462.7 7937.91 1462.7 8869.24 1463 9137.78 1463 9169.971463.069
9601.4 1464 9884 1464 9924.31 1464 9930.81 1464 9936.71 1465

9952.43   1466 9959.56   1467 9963.74   1468 9967.22   1469 9970.43   1470
9973.03   1471 9975.62   1472 9978.27   1473 9980.86   1474 9984.21   1475
10016.37   147410018.63   147310020.97   147210023.23   147110025.53   1470
10027.45   146910029.32   146810031.21   146710033.28   146610035.11   1465
10037.13   1464   10084   146410222.89   146310315.83   146310319.07   1464
10321.29   146510323.66   146610325.98   146710327.97   146810329.95   1469
10331.93   147010333.84   147110335.87   147210337.91   147310339.84   1474
10341.71   147510343.16   147610344.59   147710346.13   147810352.41   1479
10374.4   147910378.93   147810380.24   147710381.63   147610383.35   1475
10384.9   1474 10386.9   147310388.27   147210573.54   147210632.75   1472
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Exp/Cntr=0.3,0.1

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Node Last Edited Time=Jan/03/2008 14:05:49
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6219.83 1462.7 6277.52 1462.7 6456.56 1462.7 6551.11 1462.7 6827.21 1462.7
6906.52 1462.7 6957.15 1462.7 6976.38 1462.7 8788.89 1462.7 8954.28 1462.7
9407.93 1462.27 9692.68   1462 9936.58   1463 10122.8   146310140.23   1463
10198.36   1464   10202   146410241.34   146410255.94   146410259.18   1465
10261.8   146610263.83   146710265.28   146810266.99   146910268.67   1470
10270.31   1471 10301.6   147110303.37   147010305.59   146910307.68   1468
10309.81   146710312.21   146610315.32   146510319.44   146410325.55   1463
10393.53   1462   10402   146210420.28   146210471.59   146210594.72   1462
10596.54   146310599.04   146410600.99   146510602.86   146610604.67   1467
10606.55   146810608.26   146910609.98   147010611.88   147110614.67   1472
10667.05   147210805.71   147210933.86   147310986.91   147311091.75   1473
11311.89   1474
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3079.22 1465.49 3179.4 1465.07 3493.29 1464.13 3539.17 1463.99 3596.25 1463.82
3597.11 1463.82 3622.21 1463.74 3622.79 1463.74 3971.9 1462.7 4397.11 1462.7
4428.39 1462.7 4528.66 1462.7 4616.23 1461.85 4666.12 1461.37 4720.51 1461.37
4811.01 1461.37 4827.24 1461.37 4838.42 1461.37 6169.37 1461.37 6226.59 1461.37
6249.79 1461.37 6281.48 1461.37 6352.03 1461.37 6404.18 1461.37 6413.92 1461.37
6436.05 1461.37 6497.96 1461.37 6771.82 1461.37 6850.49 1461.37 6900.71 1461.37
6919.78 1461.37 6954.21 1461.37 7012.99 1461.37 7194.82 1461.37 8717.59 1461.16
8881.64 1461.14 8923.03 1461.11 8926.82 1461.44 8952.5 1461.42 8956.9 1461.09
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10115.62 1462.1810117.15   146210119.91 1461.67 10123.1 1461.3310143.64 1461.33
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10178.46 1465.3110178.55 1465.3510180.27 1466.2410180.56 1466.38   10182 1467.27
10182.39 1467.49 10183.7 1468.2810183.94 1468.4310185.36 1469.2310185.98 1469.59
10186.99 1470.2110187.57 1470.3310189.56 1470.6710218.03 1470.6710219.42 1469.89
10221.17  1469.110222.44 1468.4810222.81  1468.310224.48  1467.510226.37 1466.68
 10226.6 1466.6110228.82  1465.810230.29 1465.3610232.06 1464.8910235.41  1464.2
10236.87 1463.9210241.18 1463.6110249.38 1463.1810254.04 1462.7910257.36 1462.41
10261.41 1462.0310265.15 1461.6510268.58 1461.2710272.84 1460.8810290.34 1460.33
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10493.52 1461.7610494.42 1462.1610495.49 1462.6810497.36 1463.2710497.76 1463.42
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10531.38    147110537.78    147110540.19 1470.6710542.22 1470.3310543.97    1470
10546.23 1469.67 10550.4 1469.3310563.46    146910598.81 1468.6710603.15 1468.56
10612.34 1468.3310658.16    146810693.51 1468.3310721.19 1468.3310730.44 1468.33
10819.75  1468.610840.34 1468.7410882.36 1469.2111019.93 1469.6211102.79 1469.59
11179.26 1469.5711206.98 1469.5711259.14 1469.5711266.56 1469.5911610.43 1471.57
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Bank Sta=9305.95,10521.33
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 3 ,24.5    ,,,
Node Last Edited Time=Oct/03/2003 09:20:54
Bridge Culvert--1,0,-1,-1, 0
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    6000    9321    9321   10521   10521   11500
    1460  1474.3  1474.3    1484    1484    1484
    1450    1450  1471.3    1481    1450    1450
    6000    9228    9228   10428   10428   11500
    1460  1474.3  1474.3    1484    1484    1484
    1450    1450  1471.3    1481    1450    1450
Pier Skew, UpSta & Num, DnSta & Num=  ,9426.7, 2 ,9333.7, 2 , 0 , 0 , 0 ,,
       3       3
 1458.67    1481
       3       3
 1458.67    1481
Pier Skew, UpSta & Num, DnSta & Num=  ,9570.95, 2 ,9477.95, 2 , 0 , 0 , 0 ,,
       3       3
 1458.67    1481
       3       3
 1458.67    1481
Pier Skew, UpSta & Num, DnSta & Num=  ,9715.2, 2 ,9622.2, 2 , 0 , 0 , 0 ,,
       3       3
 1458.67    1481
       3       3
 1458.67    1481
Pier Skew, UpSta & Num, DnSta & Num=  ,9859.45, 2 ,9766.45, 2 , 0 , 0 , 0 ,,
       3       3
 1458.67    1481
       3       3
 1458.67    1481
Pier Skew, UpSta & Num, DnSta & Num=  ,10003.7, 2 ,9910.7, 2 , 0 , 0 , 0 ,,
```

3 3
1458.67 1481
3 3
1458.67 1481
Pier Skew, UpSta & Num, DnSta & Num= ,10147.95, 2 ,10054.95, 2 , 0 , 0 , 0 ,,
3 3
1458.67 1481
3 3
1458.67 1481
Pier Skew, UpSta & Num, DnSta & Num= ,10292.2, 2 ,10199.2, 2 , 0 , 0 , 0 ,,
3 3
1458.67 1481
3 3
1458.67 1481
Pier Skew, UpSta & Num, DnSta & Num= ,10436.45, 2 ,10343.45, 2 , 0 , 0 , 0 ,,
3 3
1458.67 1481
3 3
1458.67 1481
BR Coef=-1 , 0 , 0 ,, 0 ,,,0.8,-1,,0,
WSPro=,,,, 1 ,,,, 0 ,,,, 0 ,,,,-1 ,-1 ,-1 , 0 , 0 , 0 , 0 , 0
BC Design=,, 0 ,, 0 ,,8,9426.7,9333.7,144.25,3

Type RM Length L Ch R = 1 ,24.3333*,50,50,50
Node Last Edited Time=Jan/03/2008 14:05:05
#Sta/Elev= 160
0 1476.03 .94 1476.03 15.37 1476.03 101.86 1475.79 840.93 1472.36
958.17 1471.89 984.1 1471.86 1030.08 1471.81 1969.47 1468.24 2048.11 1467.94
3054.03 1464.27 3153.39 1463.88 3464.72 1463.41 3510.23 1463.35 3566.83 1463.26
3567.69 1463.26 3592.59 1463.22 3593.16 1463.22 3939.42 1462.7 4361.14 1462.7
4392.17 1462.7 4491.62 1462.7 4578.48 1461 4627.95 1460.03 4681.9 1460.03
4771.66 1460.03 4787.76 1460.03 4798.84 1460.03 6118.91 1460.03 6175.67 1460.03
6198.68 1460.03 6230.11 1460.03 6300.07 1460.03 6351.8 1460.03 6361.46 1460.03
6383.41 1460.03 6444.82 1460.03 6716.44 1460.03 6794.46 1460.03 6844.27 1460.03
6863.19 1460.03 6897.33 1460.03 6955.63 1460.03 7135.98 1460.03 8646.29 1459.62
8808.99 1459.58 8850.05 1459.55 8853.81 1460.22 8879.28 1460.21 8883.64 1459.54
9089.61 1459.48 9246.461459.554 9535.41 1459.69 9775.36 1460.22 9921.38 1460.33
9958.55 1460.73 9975.7 1460.91 9984.49 1461.0510007.89 1461.1910031.61 1460.66
10032.89 1460.36 10034.4 146010037.14 1459.3310040.31 1458.6710060.67 1458.67
10062.49 1459.3310063.87 146010065.13 1460.6710068.36 1461.3310075.17 1461.68
10081.61 146210089.54 1462.5810090.77 1462.810092.72 1463.5510093.15 1463.72
10095.21 1464.66 10095.3 1464.7 10097 1465.62 10097.3 1465.7610098.72 1466.54
10099.11 1466.7410100.41 1467.5610100.64 1467.7110102.06 1468.4610102.67 1468.79
10103.67 1469.4210104.24 1469.6710106.22 1470.3310134.45 1470.3310135.47 1469.79
10136.74 1469.1910137.67 1468.7410137.94 1468.6110139.16 1468.0110140.53 1467.37
10140.7 1467.310142.32 1466.610143.39 1466.1810144.68 1465.7710147.12 1465.1
10148.18 1464.8310151.33 1464.31 10157.3 1463.5910160.69 1462.8910163.12 1462.21
10166.06 1461.5110168.79 1460.8210171.29 1460.14 10174.4 1459.4410187.14 1458.67
10213.68 1458.6710264.58 1458.6710386.74 1458.6710388.67 1459.5 10390 1460.29
10390.5 1460.5310391.71 1461.0810393.15 1461.8410395.67 1462.5510396.22 1462.71
10399.71 1463.2310403.57 1463.8210406.37 1464.2510407.32 1464.5310409.54 1465.19
10411.2 1465.8110411.89 1466.06 10413.9 1466.9210414.74 1467.1910416.88 1467.87
10418.3 1468.2410420.87 1468.8810422.23 1469.3310423.61 1469.75 10428 1470
10441.65 147010450.36 147010453.63 1469.33 10456.4 1468.6710458.77 1468
10461.85 1467.3310467.53 1466.6710485.29 146610533.35 1465.3310539.26 1465.12
10551.75 1464.6710614.05 146410662.12 1464.6710699.77 1464.6710712.34 1464.67

```
10833.79 1465.2110861.78 1465.3710918.93  1466.1   11106 1466.2411218.68 1466.18
11322.66 1466.1311360.36 1466.1311431.28 1466.1311441.37 1466.1911908.98 1469.13
#Mann= 3 , 0 , 0
       0    .035       0 9246.46      .1       0   10428    .035       0
Levee=-1,9246.46,1470.03,-1,10444.76,1470.66,,
Bank Sta=9246.46,10428
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,24      ,500,500,500
BEGIN DESCRIPTION:
TT31500
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0  1458.5      18 1470.62      38 1470.62      56  1458.5     556  1458.5
    1056  1458.5    1074 1470.62    1094 1470.62    1112  1458.5
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1470.62,-1,1074,1470.62,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,23      ,500,500,500
BEGIN DESCRIPTION:
TT31000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0    1458      18 1468.62      38 1468.62      56    1458     556    1458
    1056    1458    1074 1468.62    1094 1468.62    1112    1458
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1468.62,-1,1074,1468.62,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,22      ,118,118,118
BEGIN DESCRIPTION:
TT30500
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 13:24:52
#Sta/Elev= 9
       0  1457.5      18 1466.62      38 1466.62      56  1457.5     556  1457.5
    1056  1457.5    1074 1466.62    1094 1466.62    1112  1457.5
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1466.62,-1,1074,1466.62,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,21.75   ,22,22,22
BEGIN DESCRIPTION:
TT30369US
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 12:12:59
#Sta/Elev= 9
```

```
      01457.369      181466.096      381466.096      561457.369     5561457.369
   10561457.369    10741466.096    10941466.096    11121457.369
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1466.096,-1,1074,1466.096,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 5 ,21.74   ,,,
BEGIN DESCRIPTION:
1st Drop
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 12:07:42
IW Pilot Flow=0
#Inline Weir SE= 2
     56 1457.37    1056 1457.37
IW Dist,WD,Coef,Skew,MaxSub,Min_El,Is_Ogee,SpillHt,DesHd
0,20,2.6,0,0.95,, 0 ,,,0,0,

Type RM Length L Ch R = 1 ,21.72   ,360,360,360
BEGIN DESCRIPTION:
TT30360
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0 1454.36      18 1466.06      38 1466.06      56 1454.36     556 1454.36
   1056 1454.36    1074 1466.06    1094 1466.06    1112 1454.36
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1466.06,-1,1074,1466.06,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,21      ,500,500,500
BEGIN DESCRIPTION:
TT30000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0    1454      18 1464.62      38 1464.62      56    1454     556    1454
   1056    1454    1074 1464.62    1094 1464.62    1112    1454
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1464.62,-1,1074,1464.62,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,20      ,118,118,118
BEGIN DESCRIPTION:
TT29500
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 13:24:41
#Sta/Elev= 9
      0  1453.5      18 1462.62      38 1462.62      56  1453.5     556  1453.5
   1056  1453.5    1074 1462.62    1094 1462.62    1112  1453.5
#Mann= 3 , 0 , 0
```

```
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1462.62,-1,1074,1462.62,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,19.75   ,22,22,22
BEGIN DESCRIPTION:
TT29369
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 12:16:26
#Sta/Elev= 9
      01453.369      181462.096      381462.096      561453.369     5561453.369
   10561453.369    10741462.096    10941462.096    11121453.369
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1462.096,-1,1074,1462.096,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 5 ,19.74   ,,,
BEGIN DESCRIPTION:
2nd Drop
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 12:22:02
IW Pilot Flow=0
#Inline Weir SE= 2
     56 1453.37    1056 1453.37
IW Dist,WD,Coef,Skew,MaxSub,Min_El,Is_Ogee,SpillHt,DesHd
0,20,2.6,0,0.95,, 0 ,,,0,0,

Type RM Length L Ch R = 1 ,19.72   ,360,360,360
BEGIN DESCRIPTION:
TT29360
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0 1450.36      18 1462.06      38 1462.06      56 1450.36     556 1450.36
   1056 1450.36    1074 1462.06    1094 1462.06    1112 1450.36
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1462.06,-1,1074,1462.06,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,19      ,500,500,500
BEGIN DESCRIPTION:
TT29000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0    1450      18 1460.62      38 1460.62      56    1450     556    1450
   1056    1450    1074 1460.62    1094 1460.62    1112    1450
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1460.62,-1,1074,1460.62,,
Bank Sta=38,1074
```

```
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,18      ,118,118,118
BEGIN DESCRIPTION:
TT28500
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 13:24:24
#Sta/Elev= 9
       0  1449.5      18 1458.62      38 1458.62      56  1449.5     556  1449.5
    1056  1449.5    1074 1458.62    1094 1458.62    1112  1449.5
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1458.62,-1,1074,1458.62,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,17.75   ,22,22,22
BEGIN DESCRIPTION:
TT28369
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 12:17:30
#Sta/Elev= 9
       01449.369      181458.096      381458.096      561449.369     5561449.369
    10561449.369    10741458.096    10941458.096    11121449.369
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1458.096,-1,1074,1458.096,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 5 ,17.74   ,,,
BEGIN DESCRIPTION:
3rd drop
END DESCRIPTION:
Node Last Edited Time=Jan/03/2008 13:17:54
IW Pilot Flow=0
#Inline Weir SE= 2
      56 1449.37    1056 1449.37
IW Dist,WD,Coef,Skew,MaxSub,Min_El,Is_Ogee,SpillHt,DesHd
0,20,2.6,0,0.95,, 0 ,,,0,0,

Type RM Length L Ch R = 1 ,17.72   ,360,360,360
BEGIN DESCRIPTION:
TT28360
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0 1446.36      18 1458.06      38 1458.06      56 1446.36     556 1446.36
    1056 1446.36    1074 1458.06    1094 1458.06    1112 1446.36
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1458.06,-1,1074,1458.06,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,17      ,500,500,500
```

```
BEGIN DESCRIPTION:
TT28000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0    1446      18 1456.62      38 1456.62      56    1446     556    1446
   1056    1446    1074 1456.62    1094 1456.62    1112    1446
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1456.62,-1,1074,1456.62,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,16      ,118,118,118
BEGIN DESCRIPTION:
TT27500
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 13:24:13
#Sta/Elev= 9
      0  1445.5      18 1454.62      38 1454.62      56  1445.5     556  1445.5
   1056  1445.5    1074 1454.62    1094 1454.62    1112  1445.5
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1454.62,-1,1074,1454.62,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,15.75   ,22,22,22
BEGIN DESCRIPTION:
TT27369
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 12:18:30
#Sta/Elev= 9
      01445.369      181454.096      381454.096      561445.369     5561445.369
   10561445.369    10741454.096    10941454.096    11121445.369
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1454.096,-1,1074,1454.096,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 5 ,15.74   ,,,
BEGIN DESCRIPTION:
4th Drop
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 12:22:32
IW Pilot Flow=0
#Inline Weir SE= 2
     56 1445.37    1056 1445.37
IW Dist,WD,Coef,Skew,MaxSub,Min_El,Is_Ogee,SpillHt,DesHd
0,20,2.6,0,0.95,, 0 ,,,0,0,

Type RM Length L Ch R = 1 ,15.72   ,360,360,360
BEGIN DESCRIPTION:
TT27360
END DESCRIPTION:
```

Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
0 1442.36 18 1454.06 38 1454.06 56 1442.36 556 1442.36
1056 1442.36 1074 1454.06 1094 1454.06 1112 1442.36
#Mann= 3 , 0 , 0
0 .035 0 38 .046 0 1074 .035 0
Levee=-1,38,1454.06,-1,1074,1454.06,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,15 ,500,500,500
BEGIN DESCRIPTION:
TT27000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
0 1442 18 1452.62 38 1452.62 56 1442 556 1442
1056 1442 1074 1452.62 1094 1452.62 1112 1442
#Mann= 3 , 0 , 0
0 .035 0 38 .046 0 1074 .035 0
Levee=-1,38,1452.62,-1,1074,1452.62,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,14 ,118,118,118
BEGIN DESCRIPTION:
TT26500
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 13:23:38
#Sta/Elev= 9
0 1441.5 18 1450.62 38 1450.62 56 1441.5 556 1441.5
1056 1441.5 1074 1450.62 1094 1450.62 1112 1441.5
#Mann= 3 , 0 , 0
0 .035 0 38 .046 0 1074 .035 0
Levee=-1,38,1450.62,-1,1074,1450.62,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,13.75 ,22,22,22
BEGIN DESCRIPTION:
TT26369
END DESCRIPTION:
Node Last Edited Time=Dec/31/2007 12:19:07
#Sta/Elev= 9
01441.369 181450.096 381450.096 561441.369 5561441.369
10561441.369 10741450.096 10941450.096 11121441.369
#Mann= 3 , 0 , 0
0 .035 0 38 .046 0 1074 .035 0
Levee=-1,38,1450.096,-1,1074,1450.096,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 5 ,13.74 ,,,
BEGIN DESCRIPTION:
5th Drop
END DESCRIPTION:

```
Node Last Edited Time=Jan/03/2008 13:18:05
IW Pilot Flow=0
#Inline Weir SE= 2
     56 1441.37    1056 1441.37
IW Dist,WD,Coef,Skew,MaxSub,Min_El,Is_Ogee,SpillHt,DesHd
0,20,2.6,0,0.95,, 0 ,,,0,0,

Type RM Length L Ch R = 1 ,13.72   ,360,360,360
BEGIN DESCRIPTION:
TT26360
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0 1438.36      181450.104      381450.104      56 1438.36     556 1438.36
   1056 1438.36    10741450.104    10941450.104    1112 1438.36
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1450.104,-1,1074,1450.104,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,13      ,500,500,500
BEGIN DESCRIPTION:
TT26000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0    1438      18  1449.6      38  1449.6      56    1438     556    1438
   1056    1438    1074  1449.6    1094  1449.6    1112    1438
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1449.6,-1,1074,1449.6,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,12      ,500,500,500
BEGIN DESCRIPTION:
TT25500
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0  1437.5      18  1448.9      38  1448.9      56  1437.5     556  1437.5
   1056  1437.5    1074  1448.9    1094  1448.9    1112  1437.5
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1448.9,-1,1074,1448.9,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,11      ,500,500,500
BEGIN DESCRIPTION:
TT25000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0    1437      18  1448.2      38  1448.2      56    1437     556    1437
```

```
   1056    1437    1074  1448.2    1094  1448.2    1112    1437
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1448.2,-1,1074,1448.2,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,10      ,500,500,500
BEGIN DESCRIPTION:
TT24500
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0  1436.5      18  1447.5      38  1447.5      56  1436.5     556  1436.5
    1056  1436.5    1074  1447.5    1094  1447.5    1112  1436.5
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1447.5,-1,1074,1447.5,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,9       ,500,500,500
BEGIN DESCRIPTION:
TT24000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0    1436      18  1446.8      38  1446.8      56    1436     556    1436
    1056    1436    1074  1446.8    1094  1446.8    1112    1436
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1446.8,-1,1074,1446.8,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,8       ,500,500,500
BEGIN DESCRIPTION:
TT23500
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0  1435.5      18  1446.1      38  1446.1      56  1435.5     556  1435.5
    1056  1435.5    1074  1446.1    1094  1446.1    1112  1435.5
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1446.1,-1,1074,1446.1,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,7       ,500,500,500
BEGIN DESCRIPTION:
TT23000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0    1435      18  1445.4      38  1445.4      56    1435     556    1435
```

```
   1056    1435    1074  1445.4    1094  1445.4    1112    1435
#Mann= 3 , 0 , 0
     0    .035      0     38    .046      0    1074    .035      0
Levee=-1,38,1445.4,-1,1074,1445.4,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,6      ,500,500,500
BEGIN DESCRIPTION:
TT22500
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
     0  1434.5      18  1444.7      38  1444.7      56  1434.5     556  1434.5
   1056  1434.5    1074  1444.7    1094  1444.7    1112  1434.5
#Mann= 3 , 0 , 0
     0    .035      0     38    .046      0    1074    .035      0
Levee=-1,38,1444.7,-1,1074,1444.7,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,5      ,500,500,500
BEGIN DESCRIPTION:
TT22000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
     0    1434      18    1444      38    1444      56    1434     556    1434
   1056    1434    1074    1444    1094    1444    1112    1434
#Mann= 3 , 0 , 0
     0    .035      0     38    .046      0    1074    .035      0
Levee=-1,38,1444,-1,1074,1444,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,4      ,500,500,500
BEGIN DESCRIPTION:
TT21500
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
     0  1433.5      18  1443.3      38  1443.3      56  1433.5     556  1433.5
   1056  1433.5    1074  1443.3    1094  1443.3    1112  1433.5
#Mann= 3 , 0 , 0
     0    .035      0     38    .046      0    1074    .035      0
Levee=-1,38,1443.3,-1,1074,1443.3,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,3      ,500,500,500
BEGIN DESCRIPTION:
TT21000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
     0    1433      18  1442.6      38  1442.6      56    1433     556    1433
```

```
   1056    1433    1074  1442.6    1094  1442.6    1112    1433
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1442.6,-1,1074,1442.6,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,2       ,500,500,500
BEGIN DESCRIPTION:
TT20500
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0  1432.5      18  1441.9      38  1441.9      56  1432.5     556  1432.5
   1056  1432.5    1074  1441.9    1094  1441.9    1112  1432.5
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1441.9,-1,1074,1441.9,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,1       ,500,500,500
BEGIN DESCRIPTION:
TT20000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0    1432      18  1441.2      38  1441.2      56    1432     556    1432
   1056    1432    1074  1441.2    1094  1441.2    1112    1432
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1441.2,-1,1074,1441.2,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,0       ,500,500,500
BEGIN DESCRIPTION:
TT19500
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0  1431.5      18  1440.5      38  1440.5      56  1431.5     556  1431.5
   1056  1431.5    1074  1440.5    1094  1440.5    1112  1431.5
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1440.5,-1,1074,1440.5,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-1      ,400,400,400
BEGIN DESCRIPTION:
TT19000
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0    1431      18  1439.8      38  1439.8      56    1431     556    1431
```

1056 1431 1074 1439.8 1094 1439.8 1112 1431
#Mann= 3 , 0 , 0
0 .035 0 38 .046 0 1074 .035 0
Levee=-1,38,1439.8,-1,1074,1439.8,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-2 ,500,500,500
BEGIN DESCRIPTION:
TT18600
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
0 1430.6 18 1439.3 38 1439.3 56 1430.6 556 1430.6
1056 1430.6 1074 1439.3 1094 1439.3 1112 1430.6
#Mann= 3 , 0 , 0
0 .035 0 38 .046 0 1074 .035 0
Levee=-1,38,1439.3,-1,1074,1439.3,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-3 ,500,500,500
BEGIN DESCRIPTION:
TT18100
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
0 1430.1 18 1438.8 38 1438.8 56 1430.1 556 1430.1
1056 1430.1 1074 1438.8 1094 1438.8 1112 1430.1
#Mann= 3 , 0 , 0
0 .035 0 38 .046 0 1074 .035 0
Levee=-1,38,1438.8,-1,1074,1438.8,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-4 ,500,500,500
BEGIN DESCRIPTION:
TT17600
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
0 1429.6 18 1438.3 38 1438.3 56 1429.6 556 1429.6
1056 1429.6 1074 1438.3 1094 1438.3 1112 1429.6
#Mann= 3 , 0 , 0
0 .035 0 38 .046 0 1074 .035 0
Levee=-1,38,1438.3,-1,1074,1438.3,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-5 ,500,500,500
BEGIN DESCRIPTION:
TT17100
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
0 1429.1 18 1437.8 38 1437.8 56 1429.1 556 1429.1

```
   1056  1429.1    1074  1437.8    1094  1437.8    1112  1429.1
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1437.8,-1,1074,1437.8,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-6      ,500,500,500
BEGIN DESCRIPTION:
TT16600
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0  1428.6      18  1437.3      38  1437.3      56  1428.6     556  1428.6
   1056  1428.6    1074  1437.3    1094  1437.3    1112  1428.6
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1437.3,-1,1074,1437.3,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-7      ,500,500,500
BEGIN DESCRIPTION:
TT16100
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0  1428.1      18  1436.8      38  1436.8      56  1428.1     556  1428.1
   1056  1428.1    1074  1436.8    1094  1436.8    1112  1428.1
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1436.8,-1,1074,1436.8,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-8      ,500,500,500
BEGIN DESCRIPTION:
TT15600
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0  1427.6      18  1436.3      38  1436.3      56  1427.6     556  1427.6
   1056  1427.6    1074  1436.3    1094  1436.3    1112  1427.6
#Mann= 3 , 0 , 0
       0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1436.3,-1,1074,1436.3,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-9      ,500,500,500
BEGIN DESCRIPTION:
TT15100
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
       0  1427.1      18  1435.8      38  1435.8      56  1427.1     556  1427.1
```

```
   1056  1427.1    1074  1435.8    1094  1435.8    1112  1427.1
#Mann= 3 , 0 , 0
      0    .035      0      38    .046      0    1074    .035      0
Levee=-1,38,1435.8,-1,1074,1435.8,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-10     ,500,500,500
BEGIN DESCRIPTION:
TT14600
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0  1426.6      18  1435.3      38  1435.3      56  1426.6     556  1426.6
   1056  1426.6    1074  1435.3    1094  1435.3    1112  1426.6
#Mann= 3 , 0 , 0
      0    .035      0      38    .046      0    1074    .035      0
Levee=-1,38,1435.3,-1,1074,1435.3,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-11     ,500,500,500
BEGIN DESCRIPTION:
TT14100
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0  1426.1      18  1434.8      38  1434.8      56  1426.1     556  1426.1
   1056  1426.1    1074  1434.8    1094  1434.8    1112  1426.1
#Mann= 3 , 0 , 0
      0    .035      0      38    .046      0    1074    .035      0
Levee=-1,38,1434.8,-1,1074,1434.8,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-12     ,500,500,500
BEGIN DESCRIPTION:
TT13600
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0  1425.6      18  1434.3      38  1434.3      56  1425.6     556  1425.6
   1056  1425.6    1074  1434.3    1094  1434.3    1112  1425.6
#Mann= 3 , 0 , 0
      0    .035      0      38    .046      0    1074    .035      0
Levee=-1,38,1434.3,-1,1074,1434.3,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-13     ,500,500,500
BEGIN DESCRIPTION:
TT13100
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0  1425.1      18  1433.8      38  1433.8      56  1425.1     556  1425.1
```

```
   1056  1425.1    1074  1433.8    1094  1433.8    1112  1425.1
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1433.8,-1,1074,1433.8,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-14     ,500,500,500
BEGIN DESCRIPTION:
TT12600
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0  1424.6      18  1433.3      38  1433.3      56  1424.6     556  1424.6
   1056  1424.6    1074  1433.3    1094  1433.3    1112  1424.6
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1433.3,-1,1074,1433.3,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1

Type RM Length L Ch R = 1 ,-15     ,,,
BEGIN DESCRIPTION:
TT12100
END DESCRIPTION:
Node Last Edited Time=Dec/17/2007 13:24:31
#Sta/Elev= 9
      0  1424.1      18  1432.8      38  1432.8      56  1424.1     556  1424.1
   1056  1424.1    1074  1432.8    1094  1432.8    1112  1424.1
#Mann= 3 , 0 , 0
      0    .035       0      38    .046       0    1074    .035       0
Levee=-1,38,1432.8,-1,1074,1432.8,,
Bank Sta=38,1074
Exp/Cntr=0.3,0.1
```