

Station Analysis View

11336580 MORRISON C NR SACRAMENTO
CA

Responsible Office
U.S. Geological Survey
Sacramento - Field Office
8550 23rd Avenue
Sacramento, CA, 95826
(916) 381-0207

Most recent revision: 11/17/2008

Revised by: cdnagel

LOCATION.--Lat 38°29'55", long 121°27'06" referenced to North American Datum of 1927, in SW 1/4 SE 1/4 sec.32, T.8 N., R.5 E., Sacramento County, CA, Hydrologic Unit 18020109, on right bank, 750 ft upstream from Florin Road, 1.6 mi upstream from Elder Creek, and 3.8 mi south of State Capitol Building in Sacramento.

EQUIPMENT.--Design Analysis H-500 datalogger is connected to a Handar 436A/B incremental encoder powered by a 12-volt gel cell battery attached to a regulator and solar panel. Sacramento County shares the encoder's output for their Flood Alert System. A Design Analysis Signal radio (SE-100) was installed 04/22/04, that transmits 15-minute stage data every 4 hours via satellite into our database making it part of the U.S.G.S. "real time" network. DCP ID for this site is DD39A764.

HYDROLOGIC CONDITIONS.--Morrison Creek drains a 53.4 mi² area in Sacramento County. The drainage basin is of low relief and the stream gradient is very small. Elevation of the basin ranges from about 7.60 ft to about 145 ft above mean sea level.

Flood peaks are caused by general frontal storms and occasional thunderstorms. Flood rises are sharp and of short duration. Average winter temperature is 50°F, average summer temperature is 70° F. Average annual precipitation is 18 inches per year and is composed entirely of rain.

Runoff characteristics of the basin have changed from those of a primarily rural area to those of an urban area. Low flow is sustained by residential and industrial wastewater.

Accessibility is good at all times. There is no ice effect.

GAGE HEIGHT RECORD.--Primary record is DCP data that is collected on the Design Analysis H-500 data logger and transmitted on the Design Anlysis SE-100 radio. EDL values are used to overwrite DCP values, when necessary, in the HYDRA program in ADAPS. Record is complete for the 2008 Water Year.

GAGE HEIGHT CORRECTIONS.--Levels last run on 10/25/05. No gage-height corrections were needed for the 2008 Water Year. See ADAPS table below for exact dates and inputs (or lack, thereof):

1 U.S. DEPARTMENT OF THE INTERIOR - U.S. GEOLOGICAL SURVEY - WATER RESOURCES

COUNTY 067 STATION NUMBER 11336580 MORRISON C NR SACRAMENTO CA SOURCE AGENCY USGS STATE 06

DATUM LATITUDE 382955 LONGITUDE 1212706 NAD27 DRAINAGE AREA 53.4 CONTRIBUTING DRAINAGE AREA

Date Processed: 2008-08-08 14:02 By btyost

Correction set #1			Gage Height Corrections			CORRECTION CURVES	
						2008 Water Year	
						DD 2, Gage height (ft)	
STARTS	AGE	ENDS			INPUT	CORR.	
PRV: 2006/10/03 09:30:00 PDT	A	2006/10/03 09:31:00 PDT			0.00	0.00	
INS/OS OBS. EQUAL.							
1 2007/10/02 00:01:00 PDT	R	2007/10/02 00:02:00 PDT			0.00	0.00	
Can't do this on 10-1 due to locked period.							

NXT: None

RATING.--The low water control is a tapered restriction in the concrete cunette approximately 10 feet below the gage. Usually, concrete is covered with algae, sand or moss and cleaning during the summer months is essential to lessen negative shifting. For the past few years, erosion of the right bank adjacent to the concrete control has resulted in water bypassing the apron on the right side at lower stages. Therefore positive shifting, as defined by measurements, can occur. Highwater control is channel. At times there may be backwater from Beach Lake, located 5.7 miles downstream from the gage.

Rating 24, started on Oct. 1, 2005 @ 0000, was developed to better define the high end, where the first "highwater measurement" made in several years, CMM 516, defined a positive trend, reflecting cleared brush higher in the channel and the lack of backwater from Beach Lake. Rating 24 is based on CMM 516 and is the same as Rating 23 below 2.00 ft.

Rating 24 was used throughout the entire 2008 Water Year with shifting. Eight (8) discharge measurements (Nos. 531-538) have been made during the water year and were used for this analysis along with measurement 530, which was made in the previous water year and measurement 539 made in the 2009 water year. Measured flow has ranged from 4.07 cfs to 219 cfs. The range in computed discharge is 1.8 cfs to 1530 cfs.

No backwater at the higher stages happened during the 2008 water year. During this same period, there were no highwater measurements made. The last "highwater" measurement made (above 3.76 ft), CMM 516, upon which Rating 24's upper end is based, reflects a cleaner channel at the lower-high stage of the channel than in the past. For this reason, Rating 24 is used direct at 5.54 ft (ght of CMM 516) and above.

ADVM 531 shows negative shifting at the beginning of the water year which is due to growth in the channel. ADVM's 532 and 534 show positive shifting which is due to bypass flow around the control. CMM 533, made at a higher stage, is directly on Rating 24. ADVM's 535-537 show negative shifting as these measurements were made in the spring and summer months when algae and vegetational growth are the dominating influence on streamflow regimen.

ADVM 538 showed a minor positive shift which was due to annual vegetation eradication by personnel from Sacramento County on July 9, 2008. This steam cleaning caused positive shifting to occur through July and August. Vegetation appears to grow back between ADVM's 538 and 539 as 539 shows negative shifting once again.

DISCHARGE RECORD.--Shifting was employed for the entire Oct. 1, 2007 to July 8, 2008

period. Record was computed using the previous shift, V1 from the beginning of the year to October 10 when a substantial rise in flow occurred. Shift V7, from the 2007 water year prorates to V1 from August 13, 2007 to October 2, 2007. By this proration, V1 takes full effect before the 2008 water year begins. This proration is a measurement to measurement proration.

V1 is -0.06 at 0.10, -0.06 at 0.57 and 0.00 at 5.54. When stage begins to rise on October 10 (at 0130 hrs.), V1 prorates to a new positive shift, V2. This scheme assumes that this peak scours and clears out the vegetation in the channel and creates positive shifting off of Rating 0024.

V2 takes full effect on the October 10 peak which occurs at 0445 hours at a recorded peak stage of 3.35 ft. (Max DPI is 3.36 ft.) V2 is 0.04 at 0.10, 0.04 at 0.42 and returns to a 0 at the peak stage of 3.35. This shift is based on ADVN 532 showing an optimum shift of +0.04. V2 continues up to the January 4 peak which will most likely be the peak of the year. As that peak recedes, V2 prorates to Rating 24 from 1-4 to the time of CMM 533 at 0815 hrs on 1-5. While this is set up as a shift, it is computing discharge directly from Rating 24. It is entered at 0.00 at 0.51 ft and 0.00 at 2.81 ft.

This scheme assumes some fill occurring upon the recession of the peak which removes positive shifting and returns computed discharge to Rating 24.

Record was computed directly from Rating 24 on 1-5 as shown by CMM 533. Through January and February, there were a number of peaks that collectively scoured the channel. So shifting prorates from Rating 24 to shift V3 from January to the beginning of March when streamflow decreases back to a low flow condition. V3 is based on ADVN 534 and the top point is based on CMM 533.

Specifically, discharge is computed directly from Rating 24 on 1-5 at the beginning time of CMM 533 and prorates to V3 on March 3 at 1100 hrs. This is when the stage drops to 0.51 ft. It is assumed that no scouring is happening after this point since flow is too low to cause scouring. V3 is +0.09 at 0.51 ft. returning to 0 at 2.81 ft.

The +0.09 shift from ADVN 534 continues through to April 11 to a point when it appears that stage rises due to someone placing "debris" on the control. It appeared that someone piled some concrete chunks and a metal beam on the control so they could place a chair on the control and sit in the water and enjoy the day. It was a warm weekend (90 degrees plus) and the hydrograph jumps from 0.38 ft. at 0945 hrs to 0.61 ft. at 1945 hrs.

Part of this jump was used to create a shift proration. The +0.09 shift continues to 4-11 at 1230 hrs where the stage is 0.46 feet. This shift prorates to a -0.06 shift at 1945 hrs to where the stage reaches 0.61 feet.

This shifting continues to the time of the site visit on 04-14 when the measurement is made and the debris is cleared. When the debris is cleared, the shifting changes from -0.06 to +0.06 from 1145 hrs to 1245 hrs. Stages and shifts are based on ADVN 535 with a Ght of 0.66 ft. and an optimum shift of -0.06.

The +0.06 shift continues to May 5 when the hydrograph shows a quick jump from 1645 hrs to 1830 hrs. It is noted on the May 27 visit that concrete chunks were found on the control. Once they were removed, stage changed by -0.08 feet.

ADVN 536 indicates a -0.06 shift with debris on the control. So somewhere between the 4-14 and 5-27 visit, the concrete chunks were deposited and the hydrograph for this period shows that

the jump on May 5 was probably when the chunks were deposited. After the debris was removed, the shift changes from -0.06 to +0.02.

This +0.02 shift prorates from May 27 to a -0.09 shift on the next site visit on July 8. ADVM 537, made on July 8 showed a -0.09 shift with no debris on the control. This change in shifting can be attributed to growth and fill in the channel as the spring progresses into summer. Essentially, this is a measurement to measurement shift.

On July 9, 2008, personnel from Sacramento County did routine annual channel cleaning and vegetation eradication work which created positive shifting from July 9 through August 18 and was verified by ADVM 538 showing a minor (+0.02) positive shift. This +0.02 shift then prorates to a negative (-0.08) shift from August 18 to October 1, 2008. (2009 Water Year) ADVM 539, made on October 1 shows negative shifting had returned.

See ADAPS table below for exact dates and inputs:

Rating STGQ #0024				SHIFT CURVES 2008 Water Year DD 1, Discharge (cfs)				
INPUT	SHIFT	STARTS	AGE	ENDS	INPUT	SHIFT	INPUT	SHIFT
5.54	0.00	2007/08/13 12:30:00 PDT	A		0.10	-0.04	0.56	-0.04
		V7 Based on ADVM 530. MM to MM shift.						
5.54	0.00	2007/10/02 12:15:00 PDT	A		0.10	-0.06	0.57	-0.06
		V1 -Based on ADVM 531. MM to MM shift.						
5.54	0.00	2007/10/10 01:30:00 PDT	A		0.10	-0.06	0.57	-0.06
		V1 continues to beginning of rise.						
3.35	0.00	2007/10/10 04:45:00 PDT	A		0.10	0.04	0.42	0.04
		Scour on rise creates V2, based on peak and ADVM 532.						
3.35	0.00	2008/01/04 14:30:00 PST	A		0.10	0.04	0.42	0.04
		V2 continues to 1-4 peak.						
		2008/01/05 08:15:00 PST	A		0.51	0.00	2.81	0.00
		Rating Direct. Prorates from pk. to CMM 533 on 1-5.						
		2008/03/03 04:00:00 PST	R		0.51	0.09	2.81	0.00
		V3, based on ADVM 534. Assumes scour from Jan. to Mar.						
		2008/04/11 12:30:00 PDT	R		0.51	0.09	2.81	0.00
		V3 continues to this point.						
		2008/04/11 19:30:00 PDT	R		0.61	-0.06	2.81	0.00
		V4, new shift based on debris on control.						
		2008/04/14 11:45:00 PDT	R		0.66	-0.06	2.81	0.00
		V5, shift based on ADVM 535.						
		2008/04/14 12:45:00 PDT	R		0.54	0.06	2.81	0.00
		V6, After debris is cleared.						
		2008/05/05 16:45:00 PDT	R		0.54	0.06	2.81	0.00
		V6 continues to this point.						
		2008/05/05 18:30:00 PDT	R		0.64	-0.06	2.81	0.00
		V7, Debris is placed on control.						
		2008/05/27 13:00:00 PDT	R		0.64	-0.06	2.81	0.00
		V7 continues, based on ADVM 536.						
		2008/05/27 13:30:00 PDT	R		0.52	0.02	2.81	0.00
		V8, After debris is cleared.						

15	2008/07/08 10:15:00 PDT	L	0.61	-0.09	2.81	0.00
	V9, based on ADVM 537.					
16	2008/07/09 09:00:00 PDT	W	0.61	-0.09	2.81	0.00
	Shift continues to this point.					
17	2008/07/09 20:00:00 PDT	W	0.59	0.02	2.81	0.00
	then prorates to this after steam cleaning.					
18	2008/08/18 09:15:00 PDT	W	0.59	0.02	2.81	0.00
	Site Visit. Shift based on ADVM 538					
NXT:	2008/10/01 12:00:00 PDT	W	0.64	-0.08	2.81	0.00
	Site Visit. Based on ADVM 539					

REMARKS (SANAL).--Records fair. To date, there have been no periods of backwater, at higher stages, from Beach Lake. Hydrographic comparison with Laguna Creek nr Elk Grove (11336585) is good for storm peaks only and fair at other times and poor in the summer months when there are too many external influences changing low flow at both of these stations. This is a Sacramento County Cooperative station, and is part of the County's Flood Alert System.

Worked by: Brian Yost

Date: 10/28/2008

Checked by: Clint Nagel

Date: 11/16/2008

Reviewed by: Clint Nagel

Date: 11/16/2008