

ATTACHMENT 1

Oral SDWA Testimony by Alex Hildebrand for presentation at the 1/16/07 Workshop of SWRCB re South Delta Salinity

My testimony is intended to provide an overview of where salts come from, where they go, why the concentration of salts causes salinity problems and how salinity can be managed.

Please interrupt me whenever you have questions.

The first three slides are merely introductory. One shows the existing salinity standards in the South Delta.

There are two primary sources of salt load in the San Joaquin watershed. First, there is a substantial indigenous salt load per Slide 4. That is the salt load that derives primarily from the weathering of soils that reduces rocks to gravel to coarse soils to silt. The chemical composition of this salt varies between soils that derive from granite on the east side of the valley and soils that derive from marine shales on the west side. These indigenous salts are released to the river system and flushed to the ocean primarily during high flows. Those high flows dilute the indigenous salt load to low, non-damaging salinity as it is conveyed to the Bay and ocean. Since these indigenous salts are not a problem, they do not need to be regulated except when they are mobilized by irrigating unleached lands during low river flows.

The second major source of salt load is salt that is imported into the San Joaquin watershed and South Delta by CVP and SWP operations. Referring to Slide 5, tidal flows bring salty Bay water into the western Delta. CVP and SWP export operations then draw Sacramento water from the north Delta to the South Delta by reducing water levels and depths in the South Delta. This flow across the Delta entrains some of the salty Bay water that is in the western Delta as a result of tidal flows. That entrained Bay salt is greatly diluted by Sacramento water. However, about half a million to a million tons of this entrained salt is then delivered each year to the CVP's west side service area per Slides 6 and 7. It is delivered either directly via the Delta Mendota Canal (DMC), or indirectly via the San Luis Dam where CVP and SWP export waters are commingled with their salt loads.

After the Delta Mendota Canal went into operation the salinity at Vernalis increased, as shown on Slides 8 and 9. The reason for this is that DMC water is delivered to westside farm lands (including the "exchange contractors") and to wetlands. Most of this water is then consumed by crop and wetland plants in the CVP service area as shown on Slide 10. The root systems of plants take up water and evaporate it through the plants' leaves. This consumption of water is a necessity of plant growth. However, the osmotic root systems reject the salt that is in the consumed water. The rejected salt is thereby substantially concentrated and then flushed from the root zone with a small "leach fraction" of water which is excess to the water consumed by the plants. This concentrated salt then either accumulates in the soils and ground waters, below the root zone or it flows to the river. The flow to the river is primarily via the drainage water pumped from the "tile" drains, and by subsurface accretions that flow into the river, and by

intermittent drainage of water from wetlands. Roughly forty million tons of this imported salt has so far accumulated in the soils and groundwaters below the crop roots. However, hundreds of thousands of tons of this salt also flow into the river in most years. This is by far the major source of salt load in the San Joaquin River and South Delta, particularly in summer months. Waste discharges from growing cities also add salt load to the river at salinities above the salinity of their source waters. This exacerbates the problem, but it is not a large portion of the total load.

The availability of low salinity water to dilute the imported salt load that drainage water brings into the river and South Delta has been substantially decreased. This is primarily due to CVP exports south from Friant Dam, and to increased exports of Tuolumne River water to the Bay Area, and to a managed reduction of summer flows in the river when the inflow of drainage salt is greatest. This is done in order to shift the time of flow to increase spring flows for fish. The reduction is also due to increased consumptive use of water to grow food crops for the growing population. The FERC flows required from the Merced and Tuolumne Rivers only assure a very low San Joaquin flow during dry summers. The June 1980 technical report by USBR and SDWA determined the decrease in Vernalis flow that occurs due to operations of the CVP. Slide 11 shows the reduction in Vernalis flow that is caused by the CVP in various types of water years.

The human population in California is about three-and-a-half times what it was in 1950 when the CVP went into operation in the San Joaquin watershed. This increased population needs three-and-a-half times as much food as well as fiber to make clothes. Meeting that need consumes a lot of water. Furthermore, the rest of the nation relies on California for a large portion of the nation's fruits, nuts, and vegetables. Agricultural Code 411, which is shown in Slide 12 stipulates that neither the State nor the nation should be allowed to become dependent on a net importation of food. Farmers have until now had enough water to respond to that need. But this has substantially increased the consumptive use of water and decreased the inflow to the Delta. Much of the salt that was in the consumed water still flows to the Delta.

Slides 13 and 14 introduce the subject of salinity versus crop yields. In prior proceedings we have presented information showing significant crop damage resulting from the use of water above the 0.7 EC standard as well as testimony estimating the economic impact to the area as a whole resulting from incremental increases in salinity.

An increase in the permitted salinity in South Delta channels has been advocated in previous proceedings by parties who believe that they would benefit by decreasing the protection of South Delta crops. They have not demonstrated that they would actually benefit from their proposed increase in salinity. These parties have asserted that South Delta farmers would not be adversely impacted by irrigating with channel water having salinities higher than the 0.7/1.0 EC standard. As explained in prior proceedings this contention is erroneously based on an invalid rehash of old crop salinity sensitivity data without regard to limitations of that data as applied to South Delta crops and soils. These limitations were explained in expert testimony by the U.S. Salinity Laboratory, the U.C. Extension Service and others. Dr. Glenn Hoffman of the U. S. Salinity Lab testified and I quote, "the basic root zone salinity tolerance data on which the tables are based are difficult to relate to field conditions. They were based on large part on tests using

weekly irrigation and 50% leach fractions on highly permeable soils. There was no pretense of coping with such factors as variations in salinity tolerance at different stages of growth, cultural soil compaction, commercially necessary departures from 'as needed' irrigation, variations in leach fraction with time during the crop season, root aeration problems which occur when soaking for high leach, soil variations within fields, or soil damage by precipitation."

Slide 15. The parties wanting to increase salinity have ignored the fact that the salinity sensitivity of crops varies during different stages of plant growth. They have only addressed established plants. Seedlings are typically more salt sensitive than established plants. Terry Prichard's testimony will address this.

Slide 16. Proponents of increased irrigation water salinity have assumed that soil salinity will be diluted by rainfall. This is only true of "effective" rainfall. Terry Prichard will explain this. Beans and other crops do not germinate until the days are long enough and the soil temperature is high enough. By that time, most or all of the rain moisture has evaporated from the shallow soils around the seeds.

Slide 17. Proponents of increased salinity have also assumed that "leach fractions" of 25% or more are commercially feasible for South Delta crops on South Delta soils. Extensive prior testimony established that a large portion of South Delta soils have very low permeability (slow percolative capacity). This high "leach fraction" therefore often can not be achieved in commercial practice. This is particularly the case with alfalfa. The result is that, although alfalfa can tolerate higher soil moisture salinity than beans, the irrigation water salinity that can provide full crop yield is about the same for alfalfa as it is for beans, carrots, onions, and berries.

Consequently a 0.7/1.0 EC salinity is only marginally adequate for important crops grown on South Delta soils.

Let's next discuss damage resulting from periods when salinities are above the salinity standard as would be permitted by SDIP.

The operation of CVP and SWP export pumps draws down water levels and depths throughout the South Delta in order to induce a north to south flow across the Delta. This reduction is shown on Slides 18 and 19. This reduction in level and depth is more at high tide than at low tide because of the way Clifton Court is operated. The tidal excursion is therefore also reduced. Slide 20 shows the most recent example of a southern Delta channel being almost dry while exports were high. Temporary barriers have been used to largely correct this depth problem in the short term. However, the temporary barriers do not now control salinity.

Slide 21 illustrates the flow and salinity distribution with temporary barriers. As you can see, there is a very small net flow over the Middle River (as well as the Old River) barrier which indicates the large null zone behind it. The same is true of Old River. To correct this problem in the future, the SDIP proposes to install tidal barriers that capture high tide waters for diversion during low tides. However, the high tide water captured by the barriers would often be insufficient, particularly during neap tides, to supply irrigation needs. A substantial flow of

water is therefore required into the head of Old River from the San Joaquin channel to maintain adequate water depth. In summer months during periods of above normal temperature this required inflow is forecast by DWR to be about 700 cfs during periods of neap tides that occur twice in each lunar month.

Slides 22 and 23 introduce problems with the SDIP. Slide 24 shows how the SDIP proposes to operate at lower water levels than exist with the temporary barriers [discuss problems]. Slide 25 shows a possible operating scenario under the SDIP.

In 2004 the flow at Vernalis was about 1,000 cfs during the summer. We asked DWR to furnish an analysis of how the SDIP would have operated during the summer of 2004. They furnished this slide. I want to explain the problems with that operation [discuss OR null zones, salinity rise from Vernalis, OR head depth, flow at Brandt Bridge, operation at depth cusp].

There are means by which the 0.7/1.0 EC standard can be met throughout the South Delta at all times except during extreme drought. Proponents of increased salinity have asserted in past proceedings that compliance with the 0.7/1.0 EC standard may not be possible, and would require an unreasonable release of stored project water. It is obvious to anyone who understands Delta hydraulics that releases from Folsom can not control salinity in South Delta channels. Yet DWR has analyzed that ineffective option while continuing to refuse to analyze effective options that SDWA has proposed for a long time. The effective options include the following, per Slide 26.

First, install fish friendly, low lift pumps at one or more of the tidal barriers, per Slide 27. These would be the type of pump that fish agencies have installed at Banta Carbona and in the Sacramento Valley. These pumps would supply on an as needed basis most of the flow and volume deficit which the barriers can not capture. They would thereby assure that adequate water depth is maintained at all times. They would also assure that unidirectional flow is maintained in each channel reach to avoid periods of stagnation and loss of salinity and DO control. Furthermore, they would bring in export quality water. That water is better than the salinity standard, and hence would permit some concentration of the salt in the inflow water as it flows toward the exit in each reach. This recirculation of water within the South Delta involves no water cost to any party, and requires only a modest power cost. This measure would also reduce the DMC recirculation required to comply with the Brandt Bridge standard. A modified version of this option could reduce salinity violations even with temporary barriers.

Second, recirculate water from the DMC to the river and back to the Delta, as shown on Slide 28. During summer months (July through September) there appears to be no unacceptable net fishery impact when water is recirculated by delivering Delta water to the San Joaquin River via the DMC and the Newman Wasteway, and then back down the river to the Delta. This recirculation was demonstrated in August of 2004 at a time when Vernalis flow was about 1000 cfs. That 1000 cfs flow was only marginally adequate to maintain water depth from Vernalis to the head of Old River, and the salinity at Brandt Bridge could then not meet the standard with 0.7 EC at Vernalis. 250 cfs was released through the Newman Wasteway while New Melones releases were kept constant. This flow increased the water depth at Vernalis by about half a foot

and lowered salinity by about 0.1 EC. When there is 0.6 EC at Vernalis, it comes close to providing 0.7 EC at Brandt Bridge providing the inflow to the head of Old River is sufficiently reduced by low head pumps at the tidal barriers so that an adequate downstream flow continues past Brandt Bridge. This option could be implemented now. It does not have to wait for new barriers. It could achieve compliance with the Brandt Bride standard.

If it is desirable for upstream reasons, DMC water could be circulated via the Mendota Pool, per Slide 29. Thirty years ago John Garamendi and I requested and then witnessed a modest circulation via the Westley Wasteway to augment Vernalis flow. This option is shown on Slide 30.

From mid-May to July 1 the above type of DMC recirculation might be detrimental to fisheries. At those times the increase needed in Vernalis flow and quality can be obtained by using borrowed water which is replaced later. For example, water can be borrowed from San Luis Dam in June and replaced in July and August. Or it can be borrowed from deliveries being made to subsurface or surface storage south of the Delta during June and replaced in July and August. It may also be possible to provide spring fish flows in ways that do not reduce Vernalis flows from mid-May to July 1. During a low flow year the Department of Fish and Game arranged this type of recirculation to convey Merced salmon smolts to the Delta.

These and perhaps other measures can be combined in ways that are optimum for each situation. It is not clear that any substantial releases of stored water are necessary to comply with the 0.7/1.0 EC salinity standard. If a somewhat higher salinity was permitted, essentially the same measures would still be needed. Nothing would be gained by raising the standards.

Summary

Prior to operation of the CVP and SWP there was no salinity problem in the South Delta except briefly during extreme drought. Natural processes release a substantial salt load into the river system, but these native salts enter the system during high flows. They are therefore flushed through the South Delta toward the Bay with ample dilution and low salinity.

Operations of the CVP and SWP cause a large importation of salt into the San Joaquin watershed that was not previously there. This imported salt is greatly concentrated by consumptive use of water in the CVP Service Area. Part of it then drains to the river via drainage from farm lands and wetlands. This imported salt thereby creates the South Delta salinity problem. Farmers in the South Delta add very little salt.

River flows that can dilute this imported salt have been reduced by exports from the watershed, by shifts in time of river flow away from the periods of largest drainage inflow, and by increases in consumptive use of water to grow the food that is needed by population growth.

Even when dilution water from New Melones is provided to comply with the Vernalis salinity standard, the imported salt load is still there. Farm crops in the South Delta necessarily consume water and reconcentrate that salt load, just as CVP water users concentrate the salt in water from the DMC. The salinity therefore again rises as the Vernalis flow goes downstream.

Determining the channel water salinities that can provide irrigation water that is adequate to provide full crop yields in the South Delta is a very complicated process, as shown by the testimony which led to the 0.7/1.0 EC standard. The permeability of many South Delta soils is very low. High "leach fractions" are not feasible. The salt sensitivity of seedlings is greater than the sensitivity of established plants, and it is difficult to control soil moisture salinity in the shallow root zone of young plants. There has been no change in the science involved in salinity versus crop yields. We see no reason to expect that a change in EC standard would result from a repetition of the thorough analysis that took place at the time the standards were established. We do believe that the implementation of the standards should avoid large fluctuations in salinity during a lunar month, and that there should be monitoring that better represents the location of maximum salinity within each channel reach during each mode of in-channel flows caused by barrier operations and recirculation via the DMC or with low head pumps.

I have explained why we have a salinity problem and how it can be cured. I look forward to your questions.

ATTACHMENT 2

11/1/2008

Measures Which Can Meet All Regulatory Requirements in South Delta Channels By Alex Hildebrand, Engineer for South Delta Water Agency

Introduction

Recent discussions have been held among engineers in the Department of Water Resources, (DWR), the U.S. Bureau of Reclamation (USBR), and the South Delta Water Agency (SDWA). These discussions served to clarify and define methods, most of which have been previously proposed, by which DWR and USBR can comply with salinity, dissolved oxygen (DO), and water level requirements in South Delta channels while using temporary barriers and current methods of export. Those regulatory requirements apply throughout the portions of the San Joaquin channel, Middle River, Grantline Canal, Old River and other channels that are within the SDWA. Upstream diverters would not be impacted. The measures meet in-channel water requirements. They are not designed to benefit any individual diverter.

Cause of the Degradation of Channel Waters

Sixty-five years ago, prior to the CVP, there was always low salinity in South Delta channels, and tidal water levels in those channels were not depressed by the drawdown of CVP and SWP pumps. The SWRCB, therefore, made compliance with South Delta salinity standards a permit condition for exports by CVP and SWP.

The tides bring Bay salt into the western Delta. Some of this salt is entrained in the north to south flow of Sacramento water toward the pumps. One half million to one million tons per year of this entrained salt is in water conveyed by the DMC to the westside CVP service area in the San Joaquin watershed. Crop plants and wetlands plants in the service area consume most of the water and reject the salt. Drainage waters from the service area therefore put several hundred thousand tons of this imported salt into the river in most years. This salt is diluted at Vernalis by releases from New Melones. However, the salt is not removed. It, therefore, is reconcentrated as it flows into South Delta channels. No significant amount of salt is added by local diverters, but South Delta crops can not consume water as a necessity of crop growth without reconcentrating the imported salt that is in the consumed water but is rejected by crop plant roots and flows back to the channels in return flow waters.

Unless and until this imported salt load is kept out of the river, there must be enough dilution water in each channel to meet the salinity standard, and enough flow to avoid local concentrations of salt. The flow can be provided by measures to recirculate water. The dilution to control salinity can be provided by recirculating water of sufficient quality and input location to avoid channel reaches with increased salinity.

In order to meet those requirements there must be a net unidirectional flow through each channel to prevent stagnant reaches where the salt contained in flows entering each channel can accumulate and where DO is depleted. This must be done while complying with established minimum water level needs. It must also be accomplished during neap tides and during periods of above normal temperature when local diversions exceed monthly averages.

The following measures can collectively meet those requirements:

1) Recirculation of water must be provided from the DMC into the San Joaquin River through the Newman or Westley Wasteway and back past Vernalis into the South Delta. It is currently assumed that the resulting minimum flow at Vernalis must be maintained at about 1000 cfs, but this flow requirement can be adjusted by the degree to which downstream measures are provided to distribute that flow among downstream channels in proportion to local diversions in each channel and by the total magnitude of local diversion at different times of the year.

The potential for salinity compliance is not limited to summer months. However, the group of engineers has focused on the period of July 1 through September 15. That period involves the largest local diversions and the least potential for conflict with fishery concerns.

Also, the needed minor alterations to temporary barriers are not affected significantly by a typical range of summer Vernalis flows. The modeling is, therefore, being based on the actual Vernalis flows that occurred in 2008 including recirculation flows.

During recirculation, releases from New Melones must be maintained at the rate that would be required in the absence of recirculation. (During 2004 and 2007 the Vernalis flow absent recirculation did not drop below about 750, but in August and September of 2008 it has been down to a little over 600 cfs)

2) When item (1) is being provided, the salinity standards at Brandt Bridge are expected to be met. The flow at that location will some times be a reverse flow. However, it now appears that consequent intermittent stagnation during periods of reversal will not cause salinity violations. High tidal flows and the large volume of water in that channel serve to dampen the effect of brief periods of stagnation. In years after 2009 a method should be provided to control the flow split at the head of Old River.

The engineering group has so far focused on the recently typical situations where recirculation has been needed to maintain an adequate minimum Vernalis flow. Under those conditions, the flow split at the head of Old River appears to be about as desired. However, it may not be optimum, and over a wider range of Vernalis flows we will need some sort of adjustable weir, or deflector to more efficiently control that split. We do not assume that this measure would be accomplished in 2009. However, a determination of how best to do this should be authorized so that it can be considered for 2010.

3) Salinity and DO control in Old River between Doughty Cut and the barrier can be provided by shifting some of the water flowing into Grantline Canal to flow instead into Old

River. A small shift is now provided by opening and closing flap gates at the Old River barrier. However, this shift is limited by the need to avoid a loss of water level in Old River. Further, if this method is vigorously pursued it may require increased pumping into Tom Paine Slough. Modeling has shown that with 1000 cfs flow at Vernalis, there is more than enough downstream flow through Grantline Canal, but an insufficient flow into Old River. There needs to be an engineered increase in height of the Grantline barrier so that the flow split between the channels is in proportion to the local diversions in those channels. This is not expected to require a large increase in height.

(4) In Middle River, stagnation can be avoided and salinity standards met, and water level needs maintained by creating a net upstream flow from the barrier to Old River. This can be done by an engineered combination of adding culverts in the barrier, raising the barrier, and, if necessary or desirable, pumping to increase water capture at the barrier. This will also decrease the Vernalis flow requirement by supplying local diversions in Middle River with water from the central Delta.

The water elevation in Old River at the head of Middle River will be affected by measures one through three above, which in turn affects the needed magnitude of this measure. Upstream flow could also be facilitated in future years by doing the dredging in Middle River that is contemplated in the SDIP. Any significant flow of Middle River water into Old River would have the further benefit of contributing to salinity control in Old River and minimizing the flow needed at Vernalis.

5) Diverters from Tom Paine Slough and elsewhere are diverting water which contains the salt load that entered the channel system at Vernalis. This salt is then concentrated by crops and drains into Paradise Cut. Diverters in the tidal portion of Paradise Cut also concentrate the incoming salt in their return flows. There is very little circulation in Paradise Cut, but tidal flows draw salt into Old River as the salinity in Paradise Cut rises. This problem can be corrected by pumping some of the San Joaquin flow over the Paradise Cut weir. Some of the Vernalis flow which now flows to the head of Old River will then instead be conveyed to Old River by flowing through Paradise Cut. This is part of the need to control circulation to avoid local reaches with high salinity. The size of this pump is still being considered, but is expected to be within the range that is now done into Tom Paine Slough.

6) Operation of the above measures requires that salinity be monitored in channel reaches that would be the most likely to experience stagnation, particularly in Old River. Modeling can determine these most probable locations and monitoring at those locations can then be established.

Almost all of the above measures have been discussed in prior years in less detail and can be implemented next year, and thereafter providing the necessary engineering and other permitting and preplanning is done and so that the measures are implemented before the barriers are installed in 2009.

PRELIMINARY RESULTS, SUBJECT TO REVISIONS

**South Delta Alternatives Analysis Study
Using DSM2 Simulations**

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South Delta Alternatives Analysis Study Using DSM2 Simulations

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South Delta Alternatives Analysis Study Using DSM2 Simulations

Approach:

1. Develop a baseline run using July 1- August 31, 2008 historical data.
2. Refine the baseline by comparing with observed data (stage and flow) and by modifying south delta barrier characteristics if necessary.
3. Formulate alternative scenarios with elevation changes among barriers, with increased number of culverts in the barriers, etc.; and simulate these scenarios and evaluate results.
4. Formulate alternative scenarios with various levels of pumping from San Joaquin River to Paradise Cut assuming elevated initial EC levels in Paradise Cut; simulate these scenarios and evaluate results.

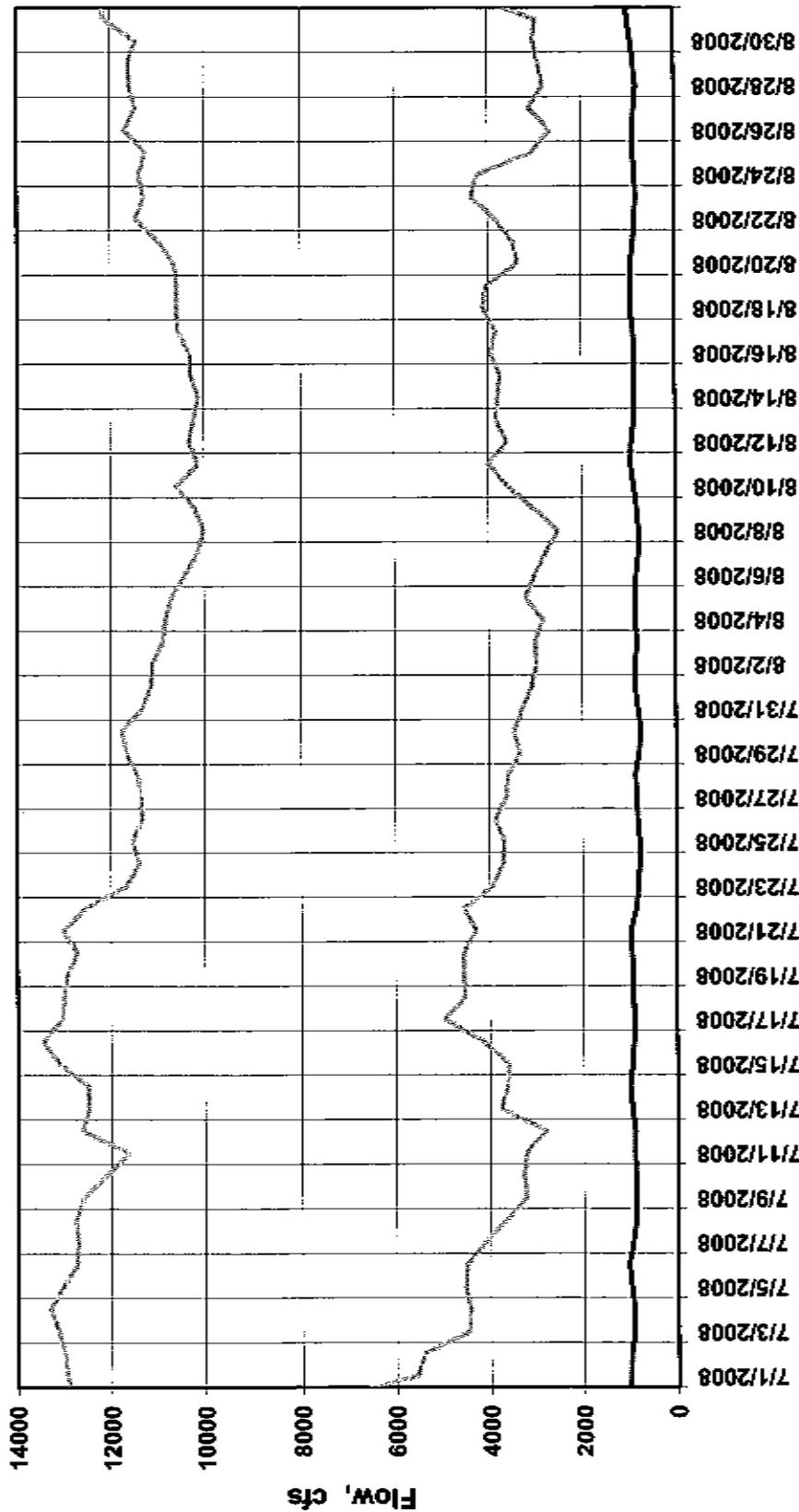
**SUMMARY OF
GATES OPERATIONS,
FLOWS & EXPORTS**

Summary of Gates Operations, Flows, and Exports

(July 1, 2008 – August 31, 2008)

1. **Clifton Court Forebay Gates** were operating on a Priority 2 schedule from the beginning to the end of the period.
2. **Delta Cross Channel Gates** remained open from the beginning to the end of the period.
3. All three **agricultural barriers** were in place and were operating as follows
 - **MR Flapgates:**
 - 7/1/08 – 8/31/08: All six MR flapgates untied (operating tidally).
 - **ORT Flapgates:**
 - 7/1/08 - 7/8/08: All nine ORT flapgates tied open.
 - 7/9/08 - 8/3/08: Six of nine ORT flapgates untied (operating tidally) and three tied open.
 - 8/4/08 - 8/5/08: Three of nine ORT flapgates untied (operating tidally) and six tied open.
 - 8/6/08 - 8/13/08: Six of nine ORT flapgates untied (operating tidally) and three tied open.
 - 8/14/08 - 8/31/08: Three of nine ORT flapgates untied (operating tidally) and six tied open.
 - **GLC Flapgates:**
 - 7/1/08 - 7/28/08: All six GLC flapgates tied open.
 - 7/29/08 - 8/31/08: All six GLC flapgates untied (operating tidally).
4. Suisun Marsh salinity control flashboards were removed and the boatlock was closed. The Suisun Marsh salinity control gates were open from the beginning to the end of the period.
5. San Joaquin River flow at Vernalis varied between 750 cfs and 1,050 cfs over the period.
6. Sacramento River flow at Freeport varied between 10,000 cfs and 13,500 cfs over the period.
7. Clifton Court Forebay intake varied between 1,100 cfs and 3,200 cfs over the period.
8. Jones pumping varied between 2,500 cfs and 4,400 cfs over the period.

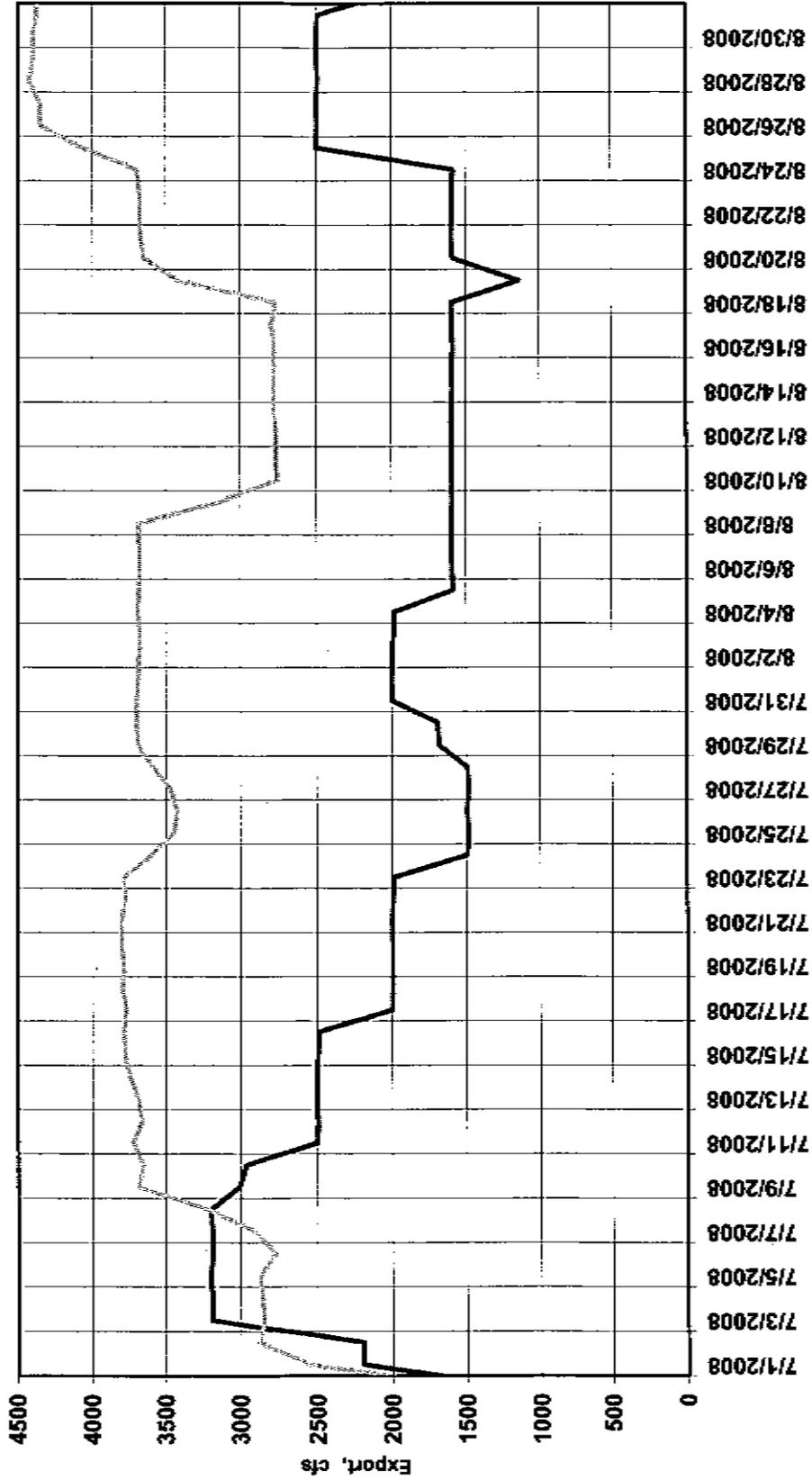
Historical Daily Sacramento R. Flow, San Joaquin R. Flow, and Delta Outflow



Simulation Period 07/01/08 thru 08/31/08

Legend: SAC (solid line), SJR (dashed line), Delta Outflow (dotted line)

Historical Daily SWP and CVP Exports

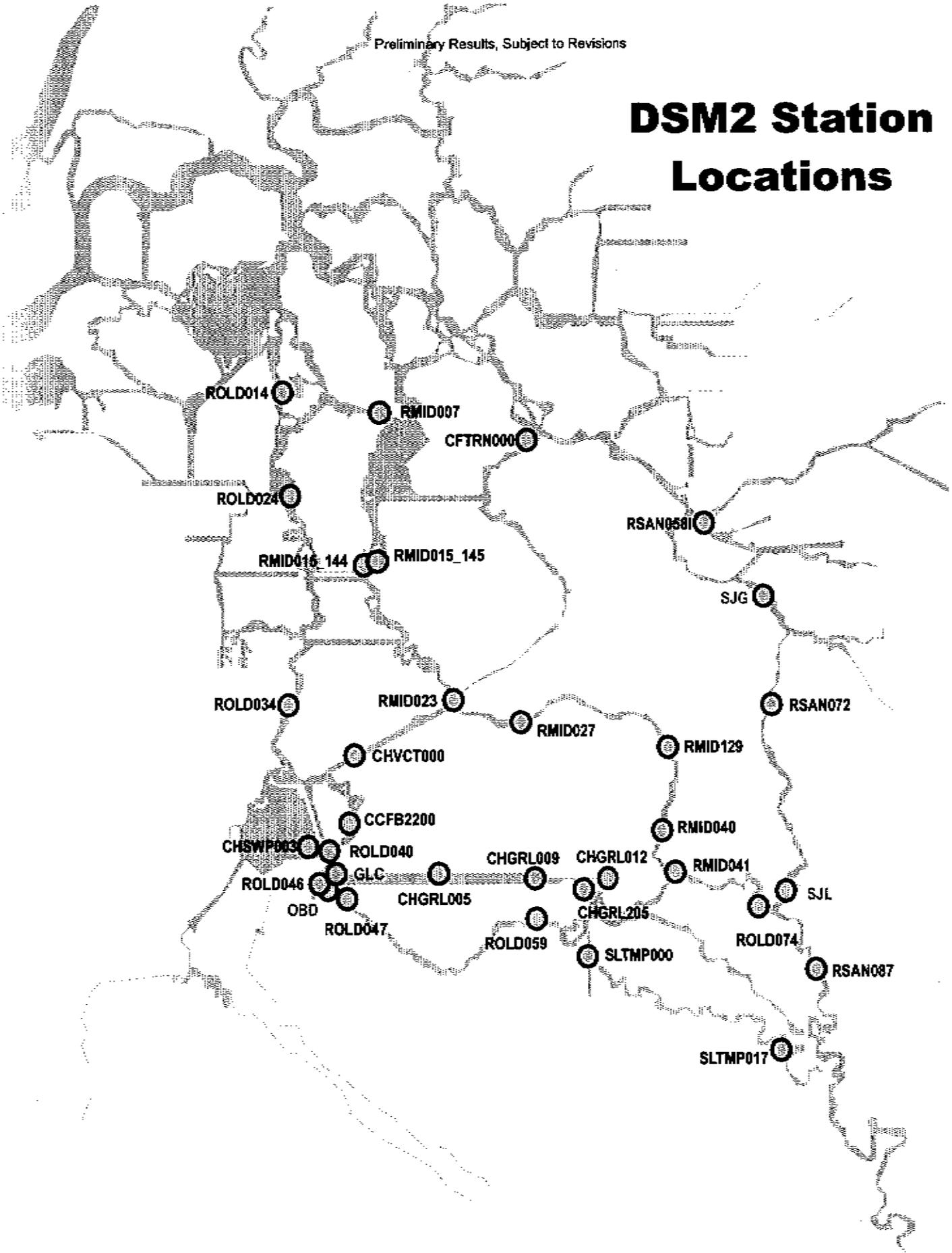


Simulation Period 07/01/08 thru 08/31/08

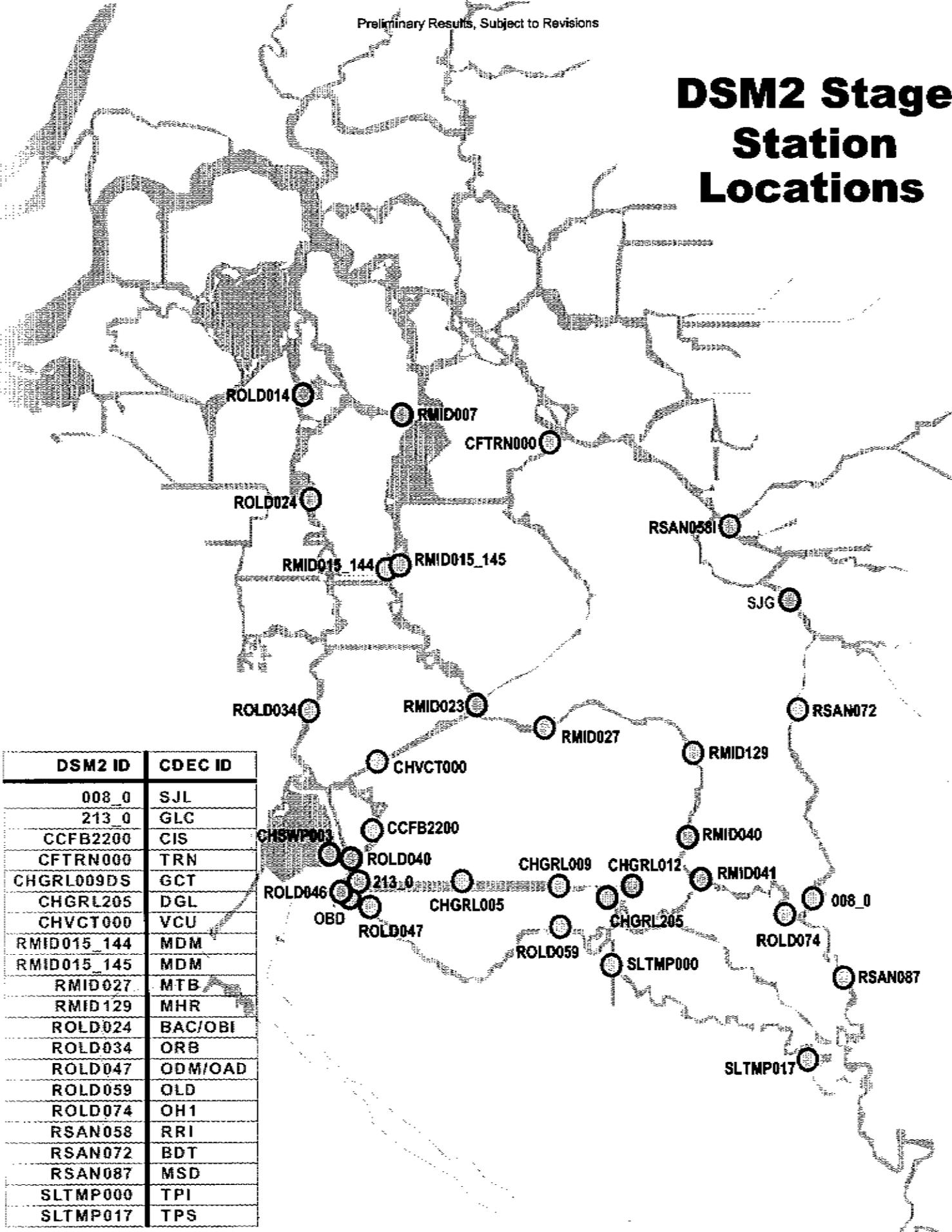
— SWP CVP

DSM2 LOCATIONS MAPS & TABLE

DSM2 Station Locations

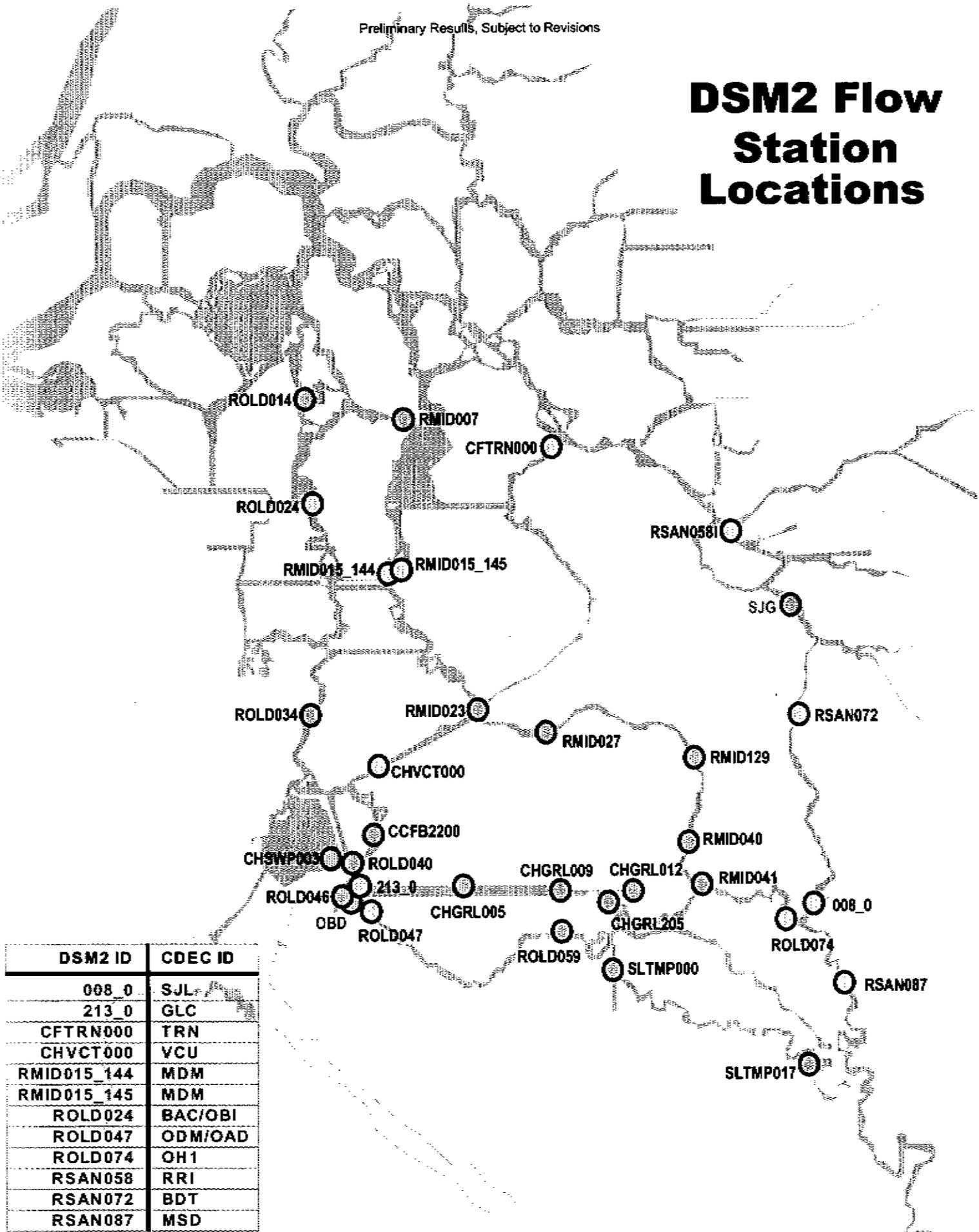


DSM2 Stage Station Locations



DSM2 ID	CDEC ID
008_0	SJL
213_0	GLC
CCFB2200	CIS
CFTRN000	TRN
CHGRL009DS	GCT
CHGRL205	DGL
CHVCT000	VCU
RMID015_144	MDM
RMID015_145	MDM
RMID027	MTB
RMID129	MHR
ROLD024	BAC/OBI
ROLD034	ORB
ROLD047	ODM/OAD
ROLD059	OLD
ROLD074	OH1
RSAN058	RRI
RSAN072	BDT
RSAN087	MSD
SLTMP000	TPI
SLTMP017	TPS

DSM2 Flow Station Locations



DSM2 ID	CDEC ID
008_0	SJL
213_0	GLC
CFTRN000	TRN
CHVCT000	VCU
RMID015_144	MDM
RMID015_145	MDM
ROLD024	BAC/OBI
ROLD047	ODM/OAD
ROLD074	OH1
RSAN058	RRI
RSAN072	BDT
RSAN087	MSD

DSM2 LOCATIONS FOR SOUTH DELTA ALTERNATIVES ANALYSIS

Sl. No	DSM2 ID	DSM2 Channel (Length)	DSM2 Node	Data Definition	CDEC Name	Stage	(CDEC Sensor /Time /Time Resol.	Flow	(CDEC Sensor /Time /Time Resol.	EC	(CDEC Sensor /Time /Time Resol.	Comments
MIDDLE RIVER												
1	RMID007	Channel 248 (685)		Middle R.								
2	RMID015_144	Channel 144 (838)		Middle R. near Middle R.	USGS/MDM	Yes	(1) 15M	Yes	(20/41) 15M/1D	No	N/A	Calc = 144 minus 145
3	RMID015_145	Channel 145 (214)		Middle R. near Middle R.	USGS/MDM	Yes	(1) 15M	Yes	(20/41) 15M/1D	No	N/A	Calc = 144 minus 145
4	CHVC000	Channel 229 (0)	Node 190	Victoria Canal near Byron	V/C	Yes	(1) 15M	Yes	(20) 15M	Yes	(100) 15M	Need mean daily flow and daily EC.
5	RMID023	Channel 135 (719)		Middle R. @ Borden Highway, VIC=Victoria Island.	V/C	No	N/A	No	N/A	Yes	(5) 15M/1H/1D	
6	134_length	Channel 134 (length)		Middle R. Barrier (downstream)	N/A							
7	RMID027	Channel 133 (3641)		Middle R. @ Tracy Blvd.	MTB	Yes	(1) 15M	No	N/A	Yes	(100) 15M/1H/1D	
8	133_0	Channel 133 (0)		Middle R. Barrier (upstream)	N/A							
9	RMID129	Channel 128 (3000)		Middle R. @ Howard Road Bridge	MHR	Yes	(1) 15M	No	N/A	Yes	(100) 15M	Need daily EC.
10	RMID040	Channel 126 (3951)		Middle R. @ Mowery Bridge	N/A							
11	RMID041	Channel 125 (1700)		Middle R. @ Old R. (Middle R. East of Union Island)	UNI	No	N/A	No	N/A	Yes	(5) 15M/1H/1D	
OLD RIVER												
12	ROLD014	Channel 118 (0)		Old R. @ Holland Cut	HLL	No	N/A	No	N/A	Yes	(5) 15M/1H/1D	
13	ROLD024	Channel 106 (2718)		Old R. @ Bacon Island (near CCC)	USGS/BAC	Yes	(1) 15M	Yes	USGS	Yes	(100) 15M/1H/1D	EC doesn't have flow data
14	ROLD024	Channel 106 (2718)		Old R. @ Bacon Island (near CCC)	USGS/OBI	Yes	(1) 15M	Yes	(20/41) 15M/1D	Yes	(100) 15M	Need daily EC.
15	ROLD034	Channel 90 (3021)		Old R. near Byron	ORB	Yes	(1) 15M	No	N/A	No	N/A	
16	CCFB2200	Channel 218 (2200)		West of Union Island (Old R. @ Coney Island)	CIS	Yes	(1) 15M	No	N/A	No	N/A	No data although CDEC has sensors for EC.
17	CHSWP003	Channel 82 (length)		Clifton Court Forebay (Gates)	CLC	No	N/A	No	N/A	Yes	(100) 15M/1D	
18	ROLD040	Channel 82 (2809)		Old R. @ Clifton Court Ferry	N/A							
19	80_length	Channel 80 (length)		Old R. Barrier (downstream)	N/A							
20	ROLD048	Channel 80 (1431)		Old R.	N/A							
21	ROLD047 ??	Channel 79 (2766) ??		Old R. near DMC below Dam	OSD	Yes	(1) 15M	No	N/A	Yes	(100) 15M	Need daily EC.
22	ROLD047 ??	Channel 79 (2766) ??		Old R. near DMC	ODM	Yes	(1) 15M	Yes	(20) 15M	No	N/A	Need mean daily flow.
23	ROLD047 ??	Channel 79 (2766) ??		Old R. near DMC above Dam	OAD	Yes	(1) 15M	No	N/A	Yes	(100) 15M	Need daily EC.
24	79_0	Channel 79 (0)		Old R. Barrier (upstream)	N/A							
25	ROLD059	Channel 71 (3116)		Old R. @ Tracy Road	OLD	Yes	(1) 15M	No	N/A	Yes	(100) 15M/1D	
26	ROLD074	Channel 54 (735)		Old R. @ Head	OH1	Yes	(1) 15M	Yes	(20/41) 15M/1D	No	N/A	

DSM2 LOCATIONS FOR SOUTH DELTA ALTERNATIVES ANALYSIS

SI. No	DSM2 ID	DSM2 Channel (Length)	DSM2 Node	Data Definition	GDEC Name	Stage	(GDEC Sensor) /Time /Time Resol.	Flow	(GDEC Sensor) /Time /Time Resol.	EC	(GDEC Sensor) /Time /Time Resol.	Comments
TOM PAINÉ SLOUGH												
27	SLTMP000	Channel 194 (1946)		Tom Paine Slough Intake (above intake structure???)	TPI	Yes	(1) 15M	No	N/A	No	N/A	
28	SLTMP017	Channel 185 (0)		Tom Paine Slough (above the mouth???)	TPS	Yes	(1) 15M	No	N/A	No	N/A	
PARADISE CUT												
29	61_length	Channel 61 (length)		Old R. downstream of Paradise Cut Channel 61 Downstream	N/A							
30	61_0	Channel 61 (0)		Old R. downstream of Paradise Cut Channel 61 Upstream	N/A							
31	199_0	Channel 199 (0)		Paradise Cut Channel 199 Upstream	N/A							
32	196_length	Channel 198 (length)		Paradise Cut Channel 198 Downstream	N/A							
33	198_0	Channel 198 (0)		Paradise Cut Channel 198 Upstream	N/A							
34	197_0	Channel 197 (0)		Paradise Cut Channel 197 Upstream	N/A							
35	196_0	Channel 196 (0)		Paradise Cut Channel 196 Upstream	N/A							
36	195_0	Channel 195 (0)		Paradise Cut Channel 195 Upstream	N/A							
GRANTLINE CANAL												
37	213_0	Channel 213 (0)		Downstream end of Grantline Canal	GLC	Yes	(1) 15M	Yes	(20) 15M	Yes	(100) 15M	Need mean daily flow and daily EC.
38	CHGR005	Channel 211 (1585)		Grantline Canal (West Position)	N/A							OR IS IT Channel 210 (Length)???
39	207_length	Channel 207 (length)		Grantline Canal Barrier (downstream)	N/A							
40	CHGR009DS	Channel 207 (36)		Grantline Canal downstream of Barrier (East Position). GCT=GLC at Tacey Rd Bridge	GCT	Yes	(1) 15M	No	N/A	Yes	(100) 15M	Need daily EC.
41	206_0	Channel 206 (0)		Grantline Canal Barrier (upstream)	N/A							
42	CHGR012	Channel 204 (1672)		Head of Grantline Canal	N/A							
43	CHGR0205	Channel 205 (3000)		Doughty Cut above Grantline Canal	DGL	Yes	(1) 15M	No	N/A	Yes	(100) 15M/1D	
SAN JOAQUIN RIVER												
44	CFTRN000	Channel 172 (727)		Turner Cut near hall (downstream of 172)	TRN	Yes	(1) 15M	Yes	(20) 15M	Yes	(100) 15M	Need mean daily flow and daily EC.
45	RSAN058	Channel 20 (2520)		San Joaquin R. @ Stockton Ship Channel/Bough & Ready Island	RR1	Yes	(1) 15M	Yes	(20) 15M	Yes	(100) 15M/1D	Need mean daily flow.
46	RSAN072	Channel 10 (9400)		San Joaquin R. @ Brandt Bridge	BDT	Yes	(1) 15M	Yes	(20) 15M	Yes	(100) 15M/1D	Need mean daily flow.
47	8_0	Channel 8 (0)		San Joaquin R. below Head of Old R. near Lathrop	SJL	Yes	(1) 15M	Yes	(20/41) 15M/1D	Yes	(100) 15M	Need daily EC.
48	RSAN087	Channel 6 (3930)		San Joaquin R. @ Mossdale	MSD	Yes	(1) 15M	Yes	(20) 15M	Yes	(100) 15M/1D	Need mean daily flow.

SUMMARY OF RESULTS

South Delta Alternatives Analysis Study Using DSM2 Simulations

Summary of Results from Analysis:

A. Simulation of Historical Water Level and Flow Conditions

DSM2 is able to reasonably accurately simulate historical water level and water flow conditions in the Delta for the period July 1 through August 31.

B. Impacts of Changes in Barrier Operations (Scenarios F, G, H, and I)

Scenario	Change in Barrier Operations	Impacts of Barrier Operations on Period Average Flow (CFS) as Compared to		
		Old River at Tracy	Middle River	Grant Line Canal
F	ORT Elv -0.5'; GLC Elv +0.5'	+25	+ 10	-90
H	"F" + MR Elv +0.5 & npipes 8	+30	-15	-85
G	ORT Elv -1.0'; GLC Elv +1.0'	+80	+ 5	-150
I	"G" + MR Elv +1.0 & npipes 10	+95	-50	-140

C. Impacts of Pumping from San Joaquin River to Paradise Cut

1. The decrease in flow (10 to 20 cfs) in San Joaquin River due to pumping into Paradise Cut results in a similar decrease in flow at Old River at Head, as well as in channels of Old River upstream of Old River-Paradise Cut junction.
2. Downstream of Paradise Cut, the flow in Old River is about the same for the various alternative levels of pumping from San Joaquin River to Paradise Cut. This happens because due to pumping, there is a decrease in flow from San Joaquin River and there is a similar increase in flow from Paradise Cut.
3. The initial elevated EC values (3,000 mmhos/cm) in the channels of Paradise Cut decrease to 500-600 mmhos/cm within two weeks or so for all the alternatives
4. There appears to be little or no significant impact on EC levels in the channels of Paradise Cut under the different alternatives for the period of analysis.
5. There also appears to be no impact on EC levels in Old River channels as a result of pumping from San Joaquin River to Paradise Cut under the different alternatives for the period of analysis.
6. It appears that further analysis needs to be conducted with continuous sources of EC into Paradise Cut and for an extended period of simulation to more completely evaluate the impacts of pumping from San Joaquin River to Paradise Cut.

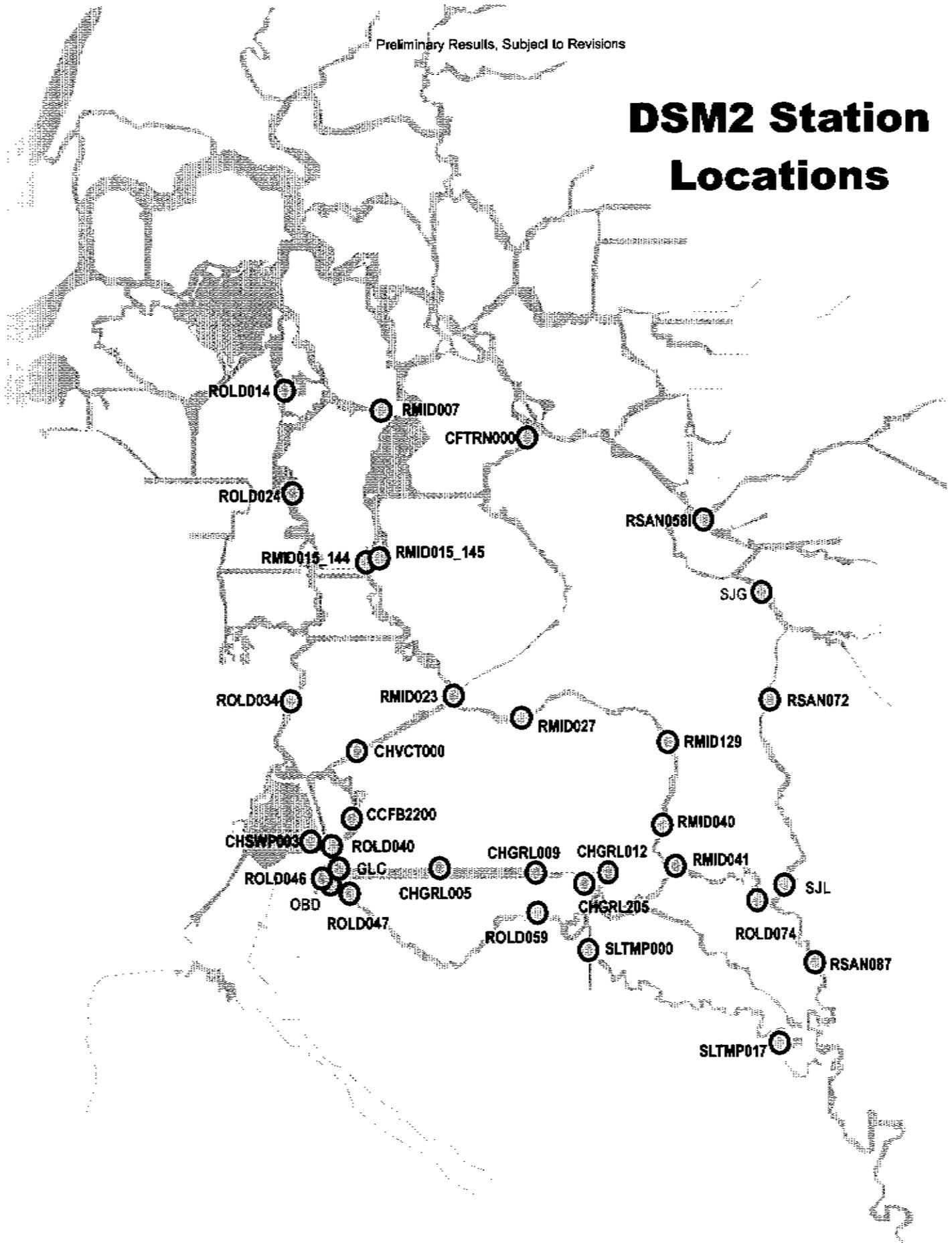
**COMPARISON OF RESULTS
UNDER BASELINE AND
ALTERNATIVE BARRIER
OPERATIONS**

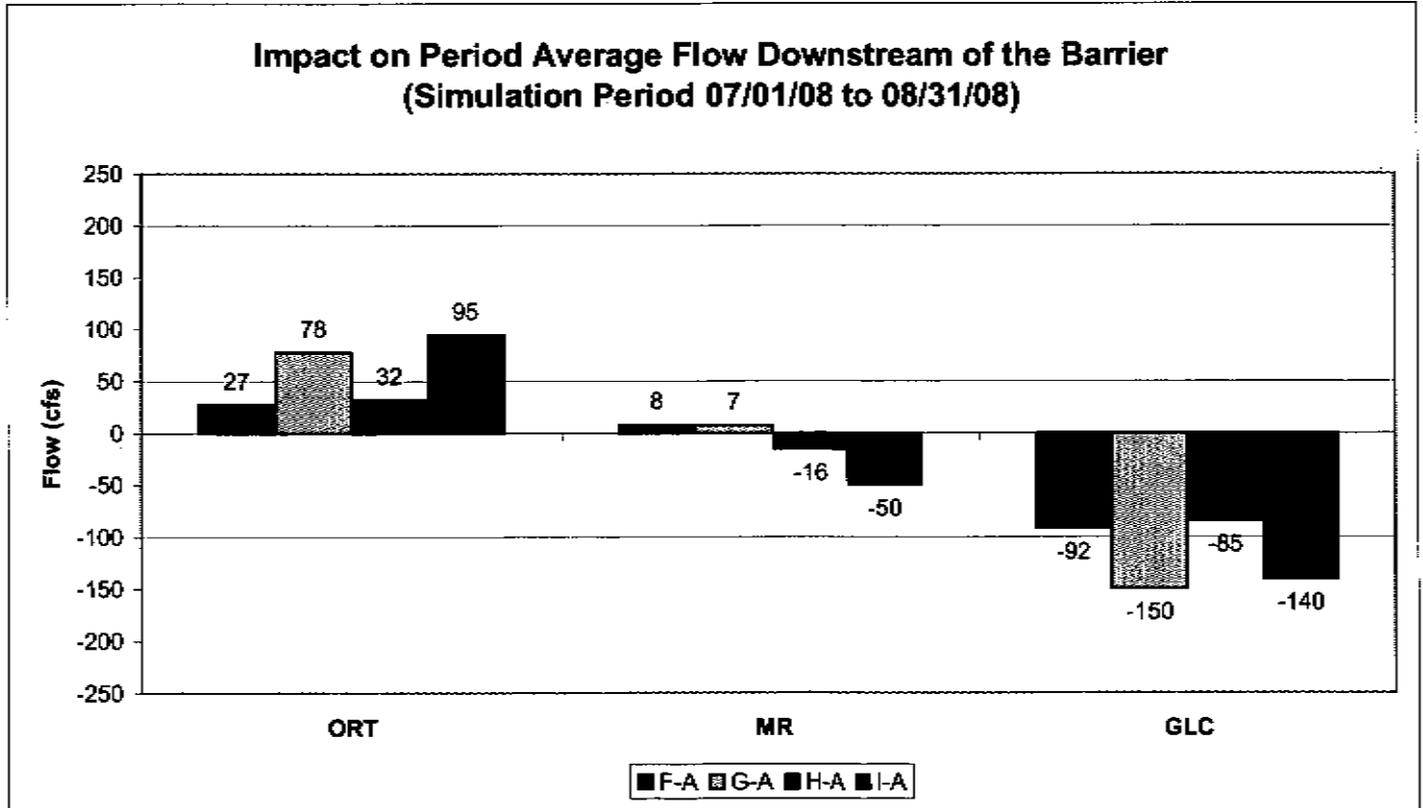
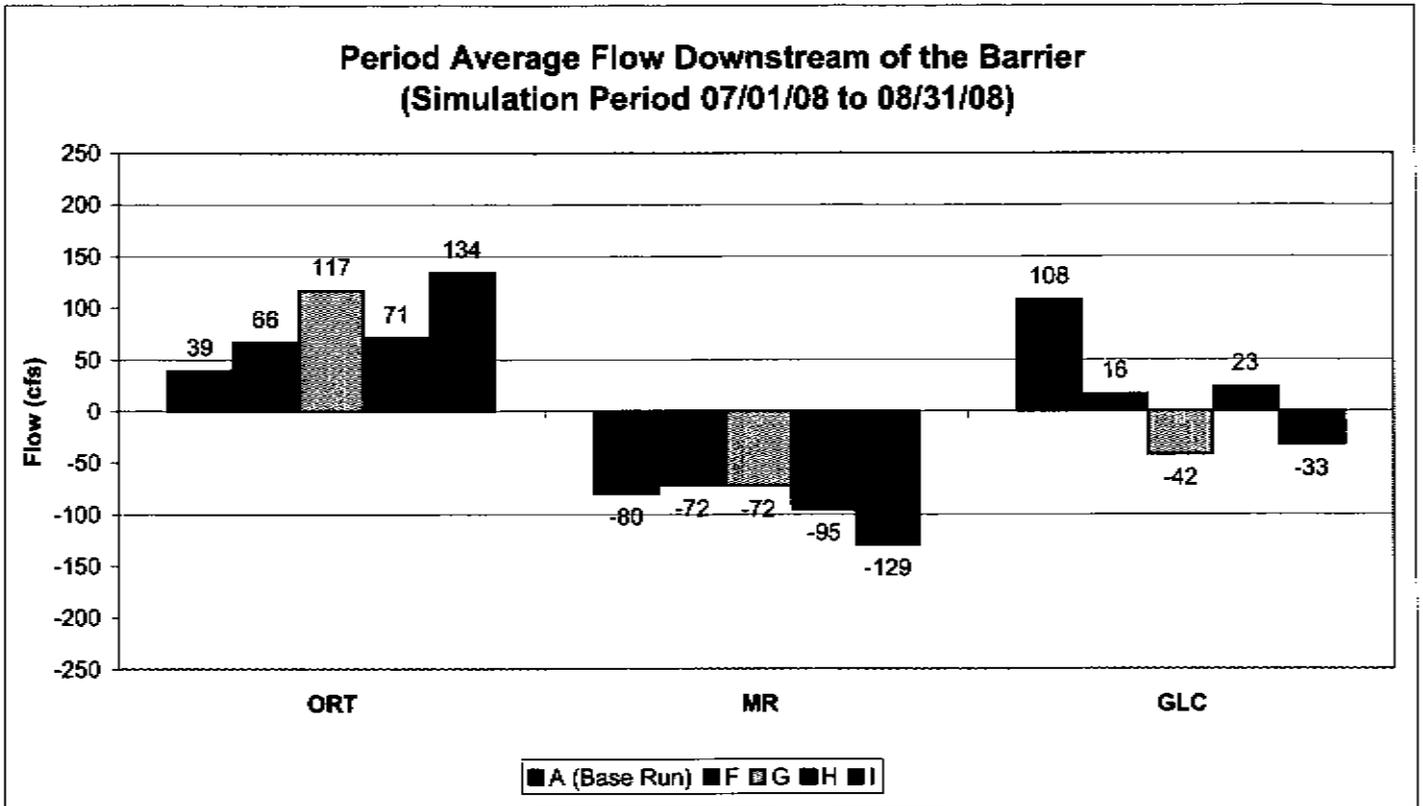
South Delta Alternatives Analysis Study Using DSM2 Simulations

South Delta Barrier Operations Alternatives Analyzed:

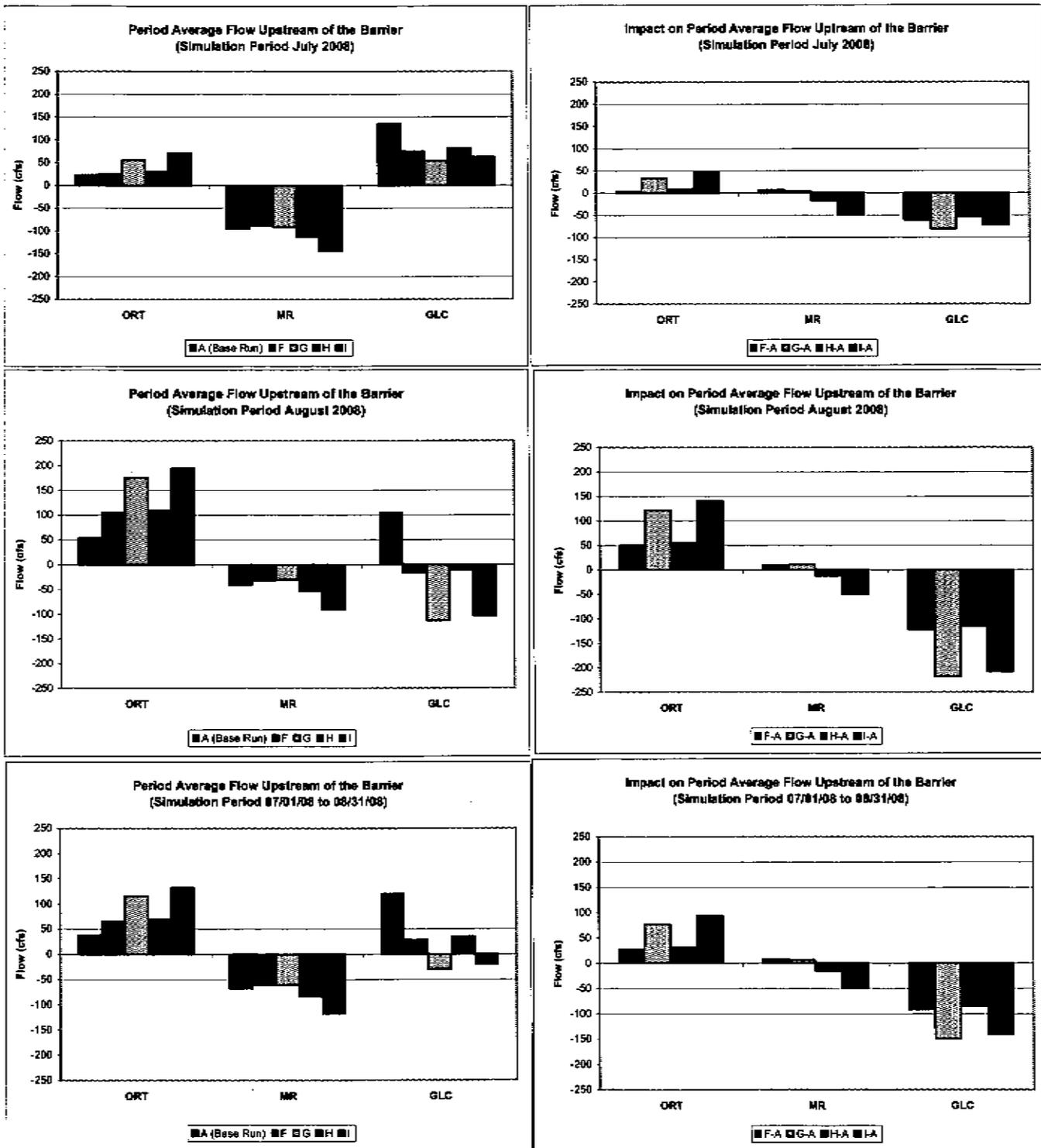
1. **Scenario A:** Baseline run based on historical data.
2. **Scenario B:** Increase Middle River (MR) barrier elevation by 0.5 feet.
3. **Scenario C:** Increase Middle River (MR) barrier elevation by 1.0 feet.
4. **Scenario D:** Increase the number of culverts in Middle River (MR) barrier from 6 to 8.
5. **Scenario E:** Increase the number of culverts in Middle River (MR) barrier from 6 to 10.
6. **Scenario F:** Decrease Old River at Tracy (ORT) barrier elevation by 0.5 feet and increase Grantline Canal (GLC) barrier elevation by 0.5 feet.
7. **Scenario G:** Decrease Old River at Tracy (ORT) barrier elevation by 1.0 feet and increase Grantline Canal (GLC) barrier elevation by 1.0 feet.
8. **Scenario H:** Scenario B plus Scenario D plus Scenario F.
9. **Scenario I:** Scenario C plus Scenario E plus Scenario G.

DSM2 Station Locations

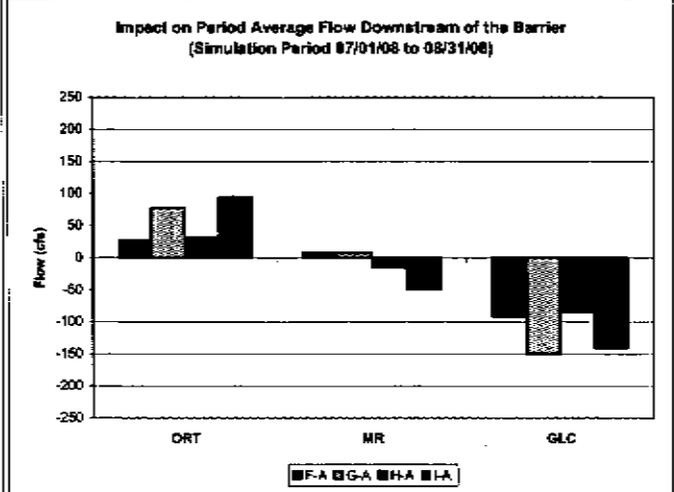
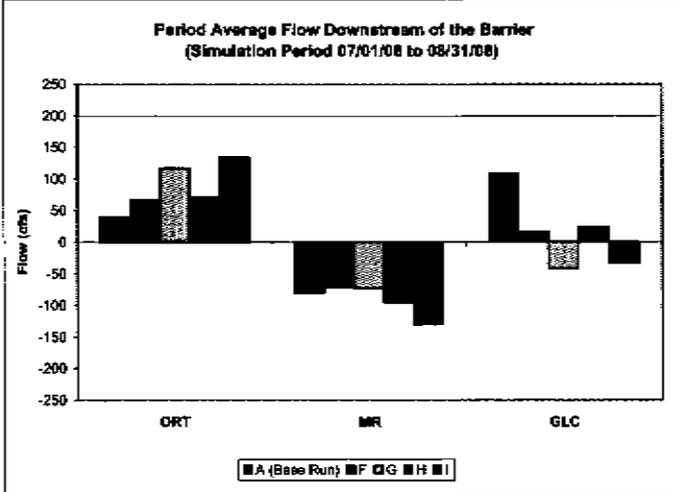
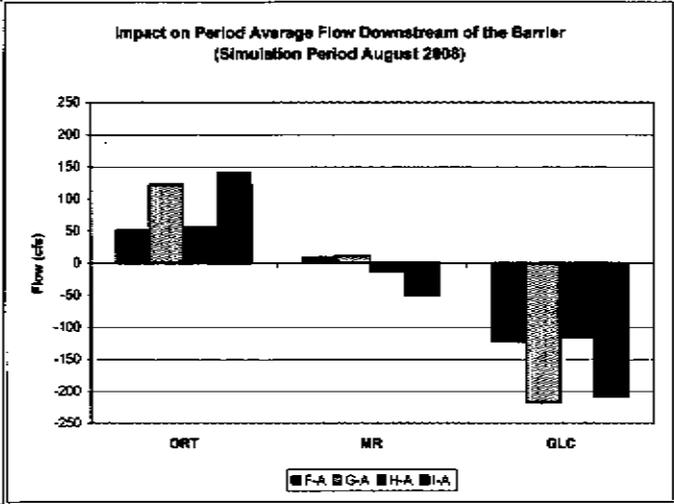
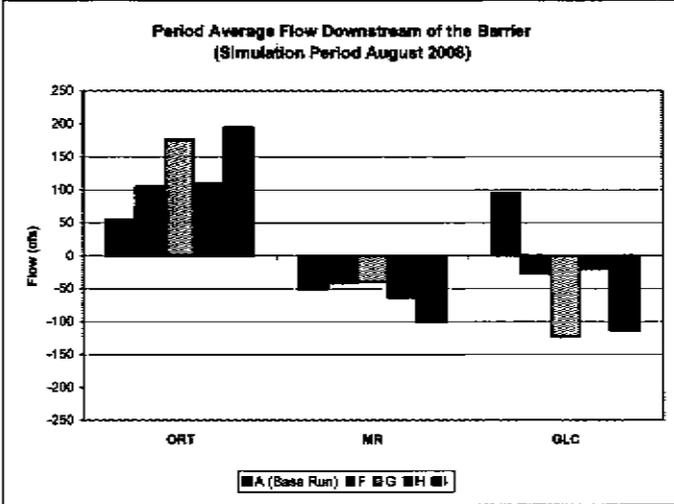
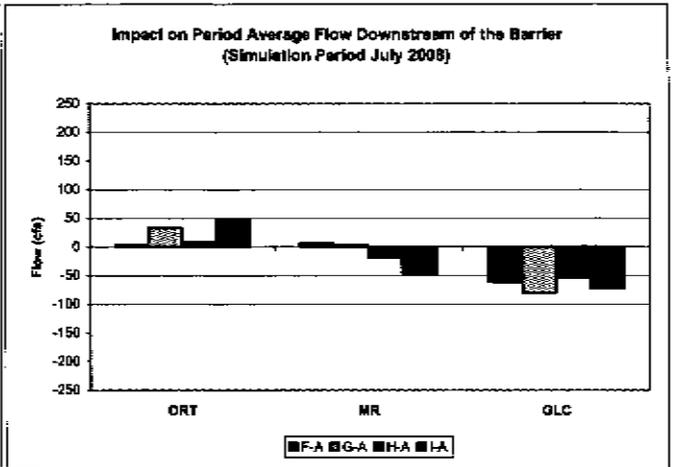
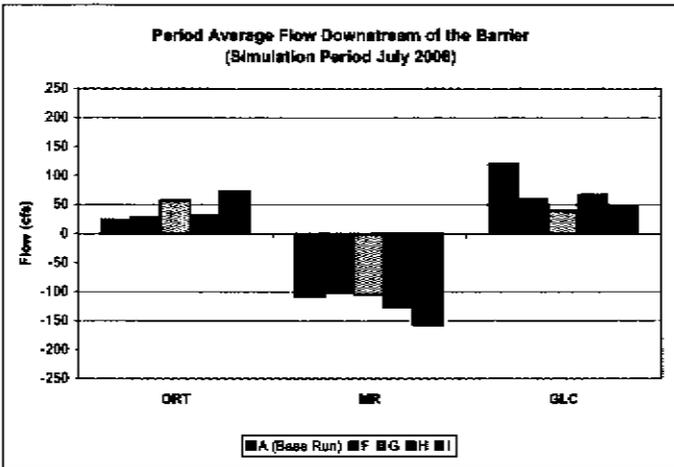




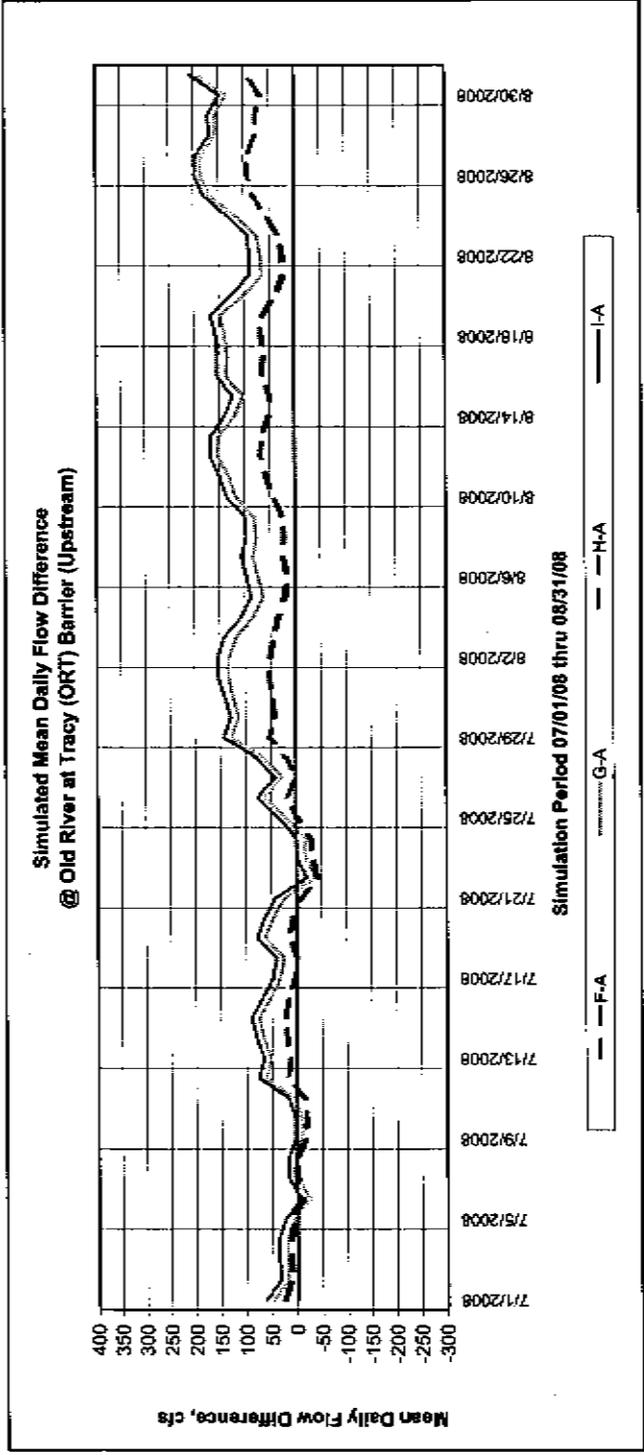
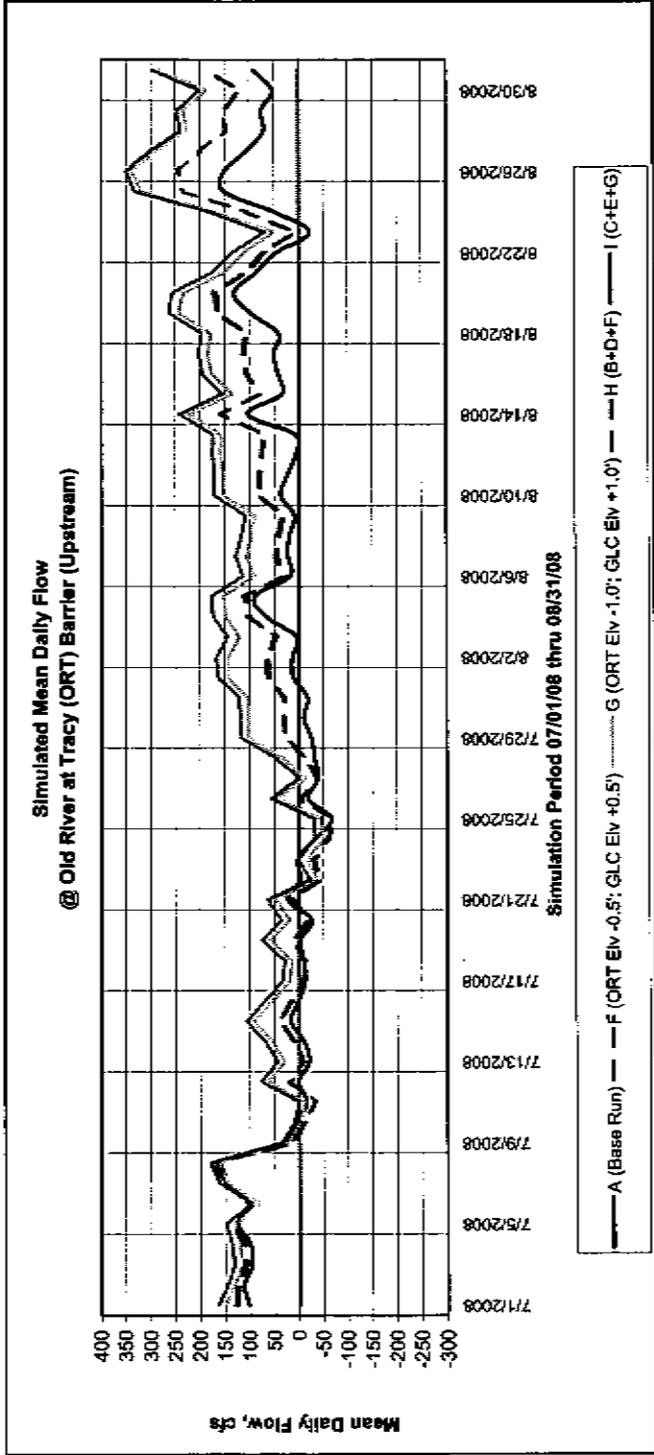
B = (MR Elv +0.5') F = (ORT Elv -0.5'; GLC Elv +0.5')	C = (MR Elv +1.0') G = (ORT Elv -1.0'; GLC Elv +1.0')	D = (MR Npipes 8) H = (B+D+F)	E = (MR Npipes 10) I = (C+E+G)
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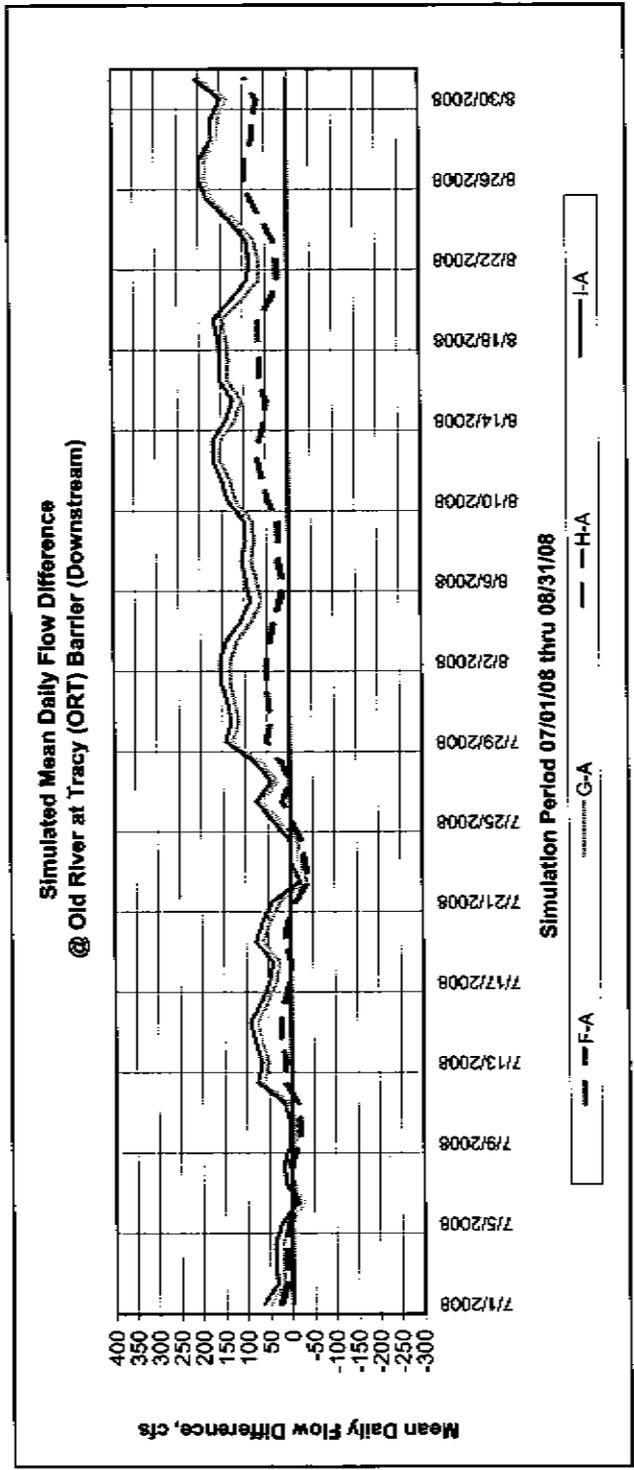
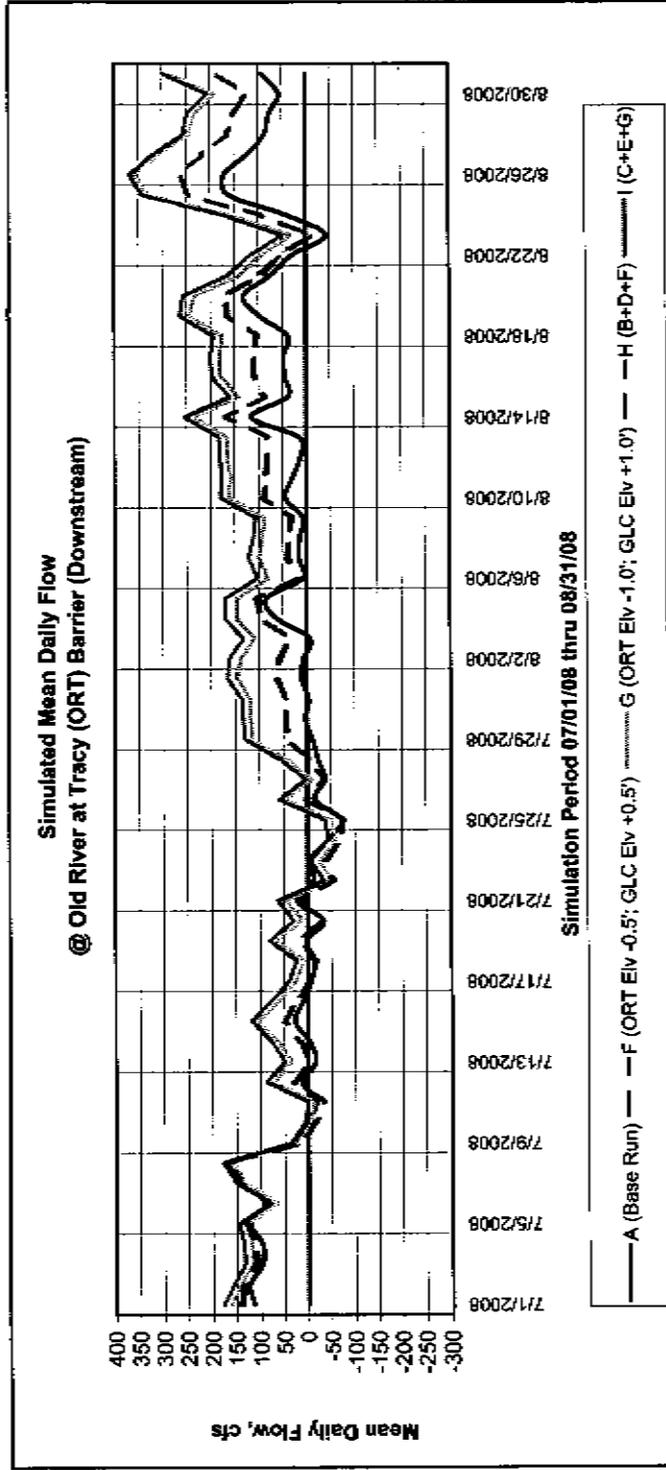


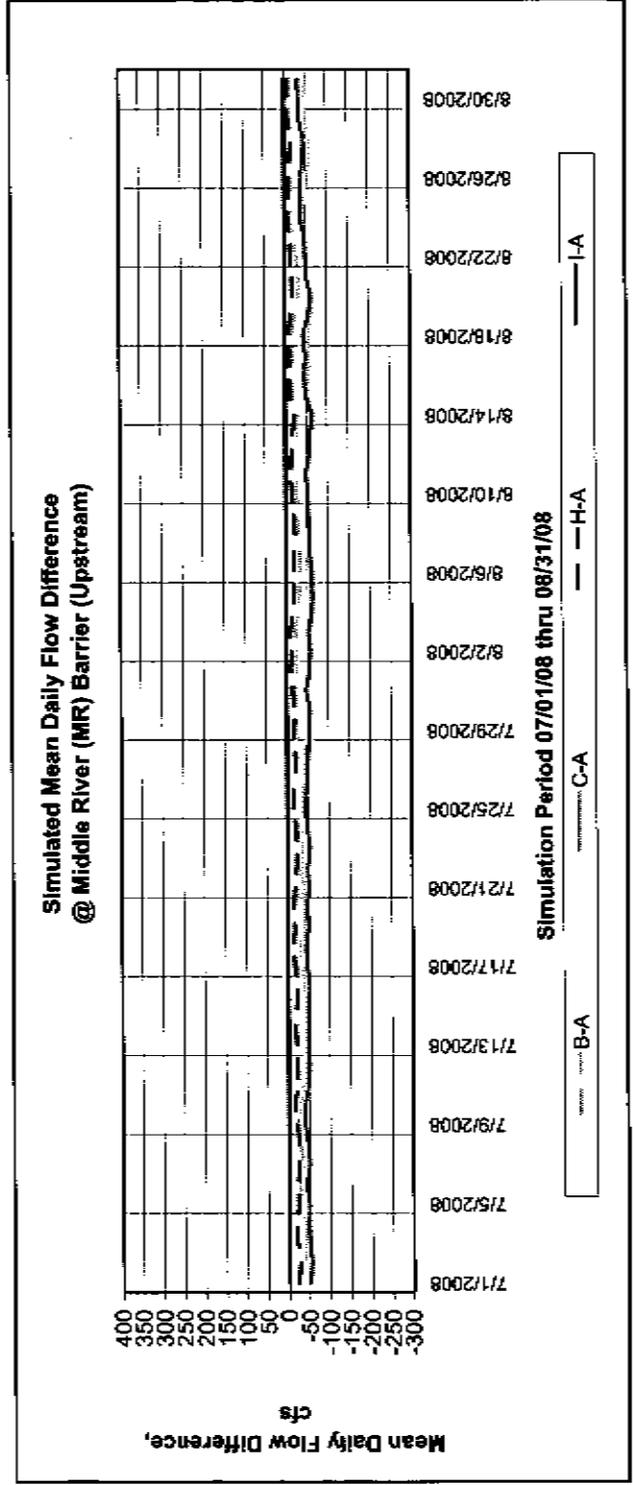
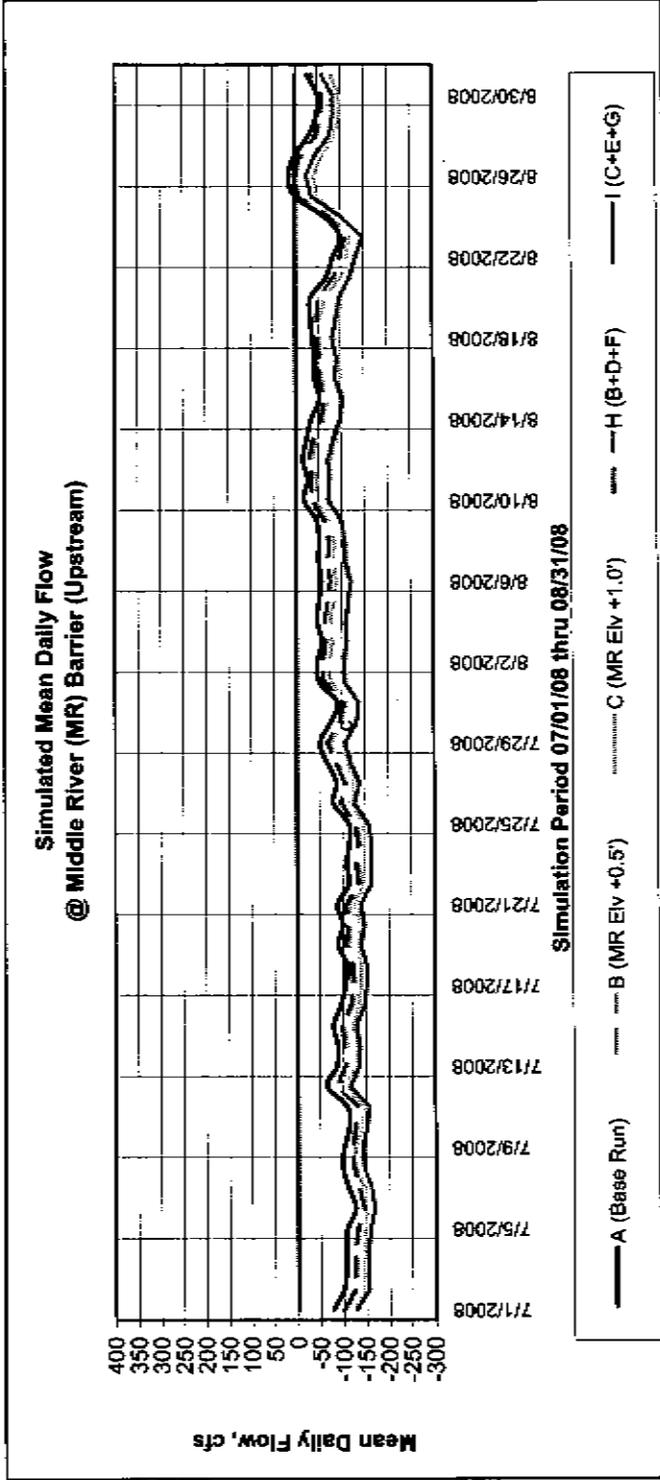
B = (MR Elev +0.5)	C = (MR Elev +1.0)	D = (MR Npipes 8)	E = (MR Npipes 10)
F = (ORT Elev -0.5; GLC Elev +0.5)	G = (ORT Elev -1.0; GLC Elev +1.0)	H = (B+D+F)	I = (C+E+G)

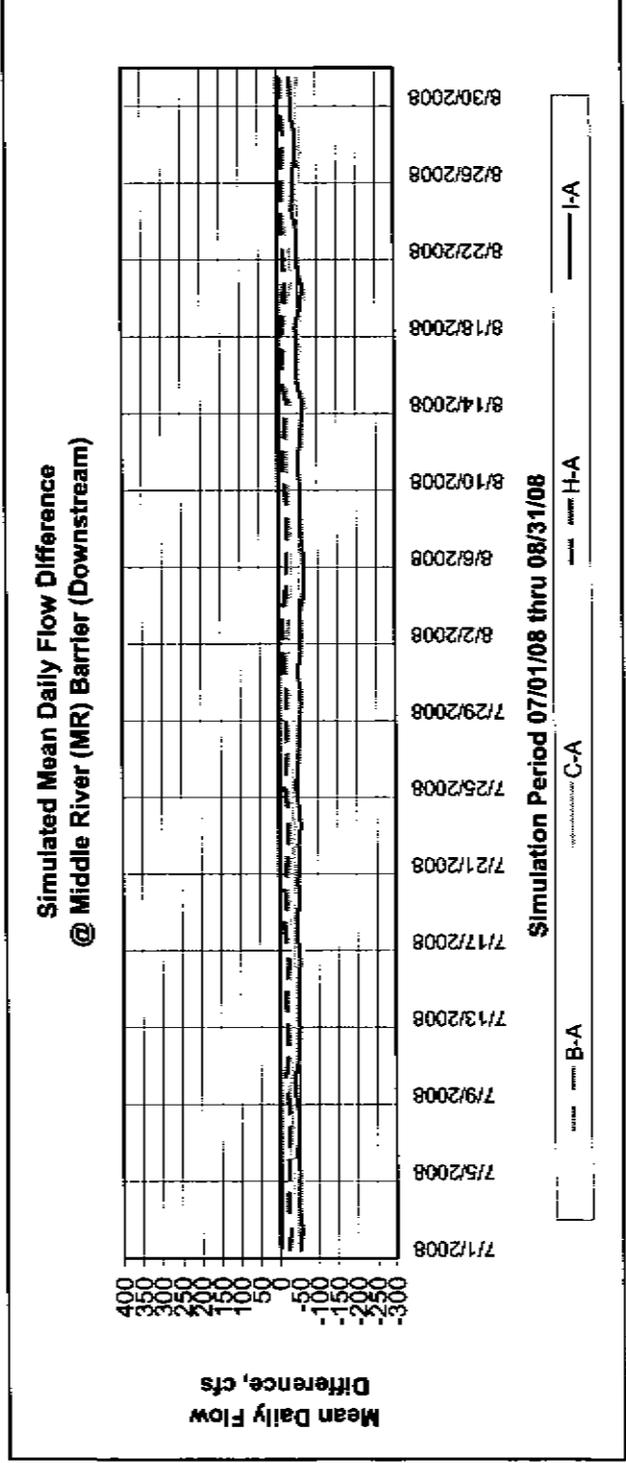
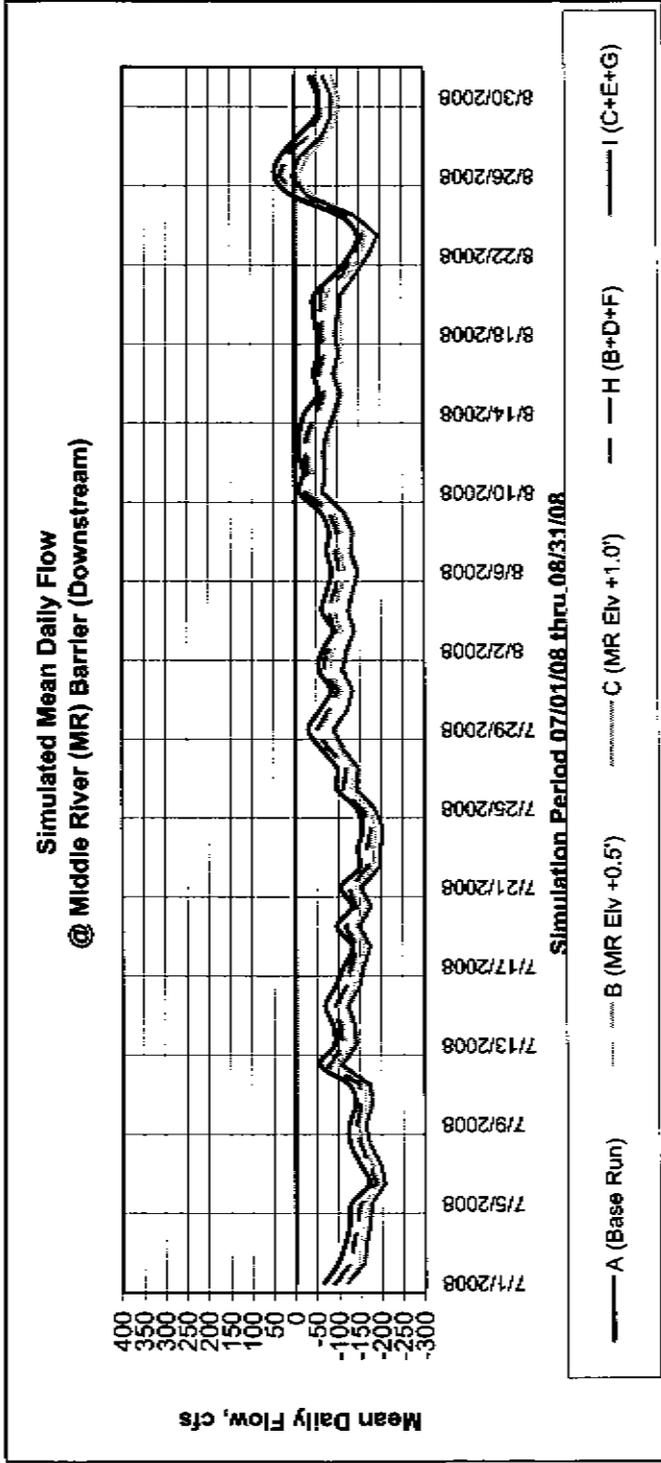


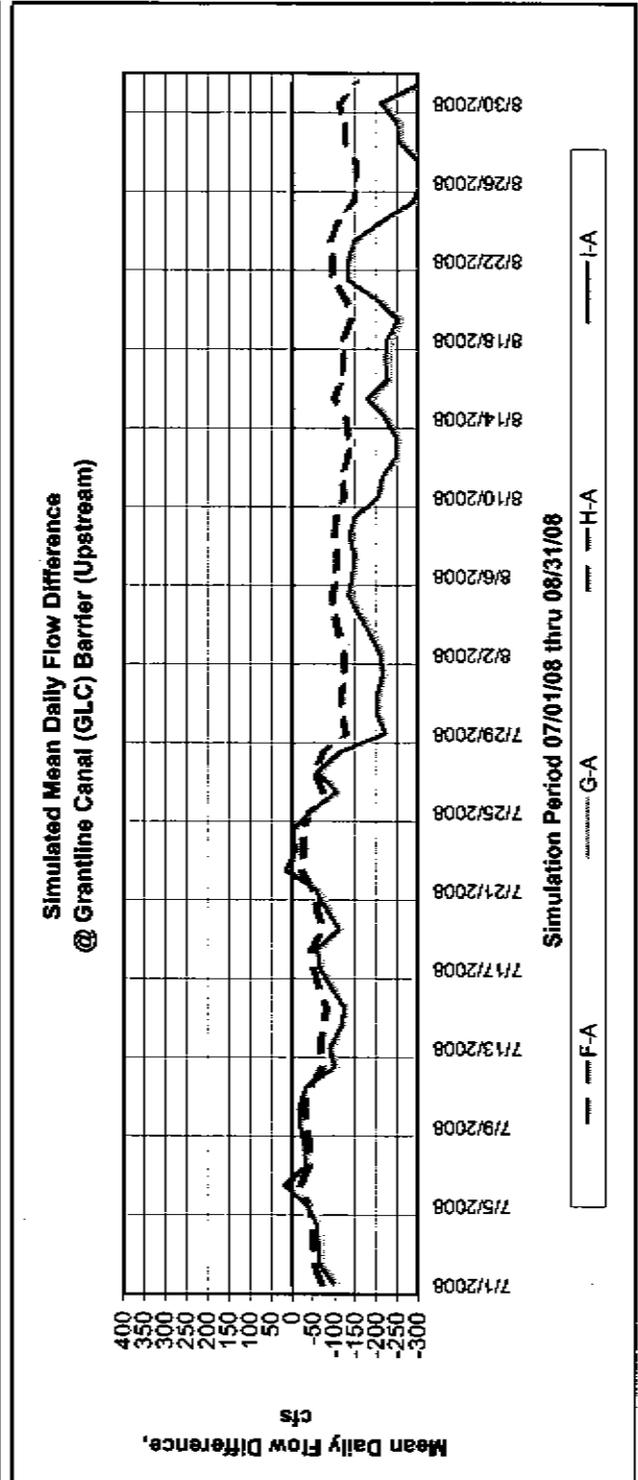
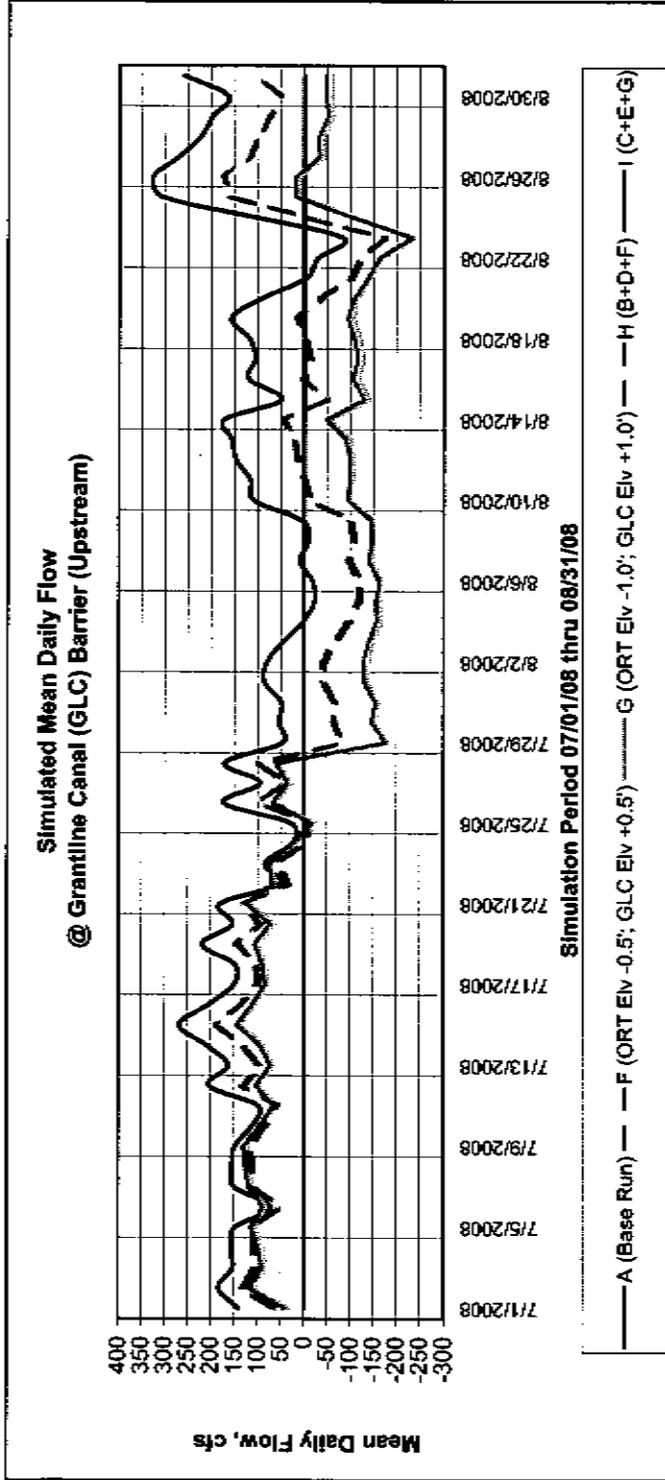
B = (MR Elev +0.5')	C = (MR Elev +1.0')	D = (MR Pipes 8)	E = (MR Pipes 10)
F = (ORT Elev -0.5'; GLC Elev +0.5')	G = (ORT Elev -1.0'; GLC Elev +1.0')	H = (B+D+F)	I = (C+E+G)

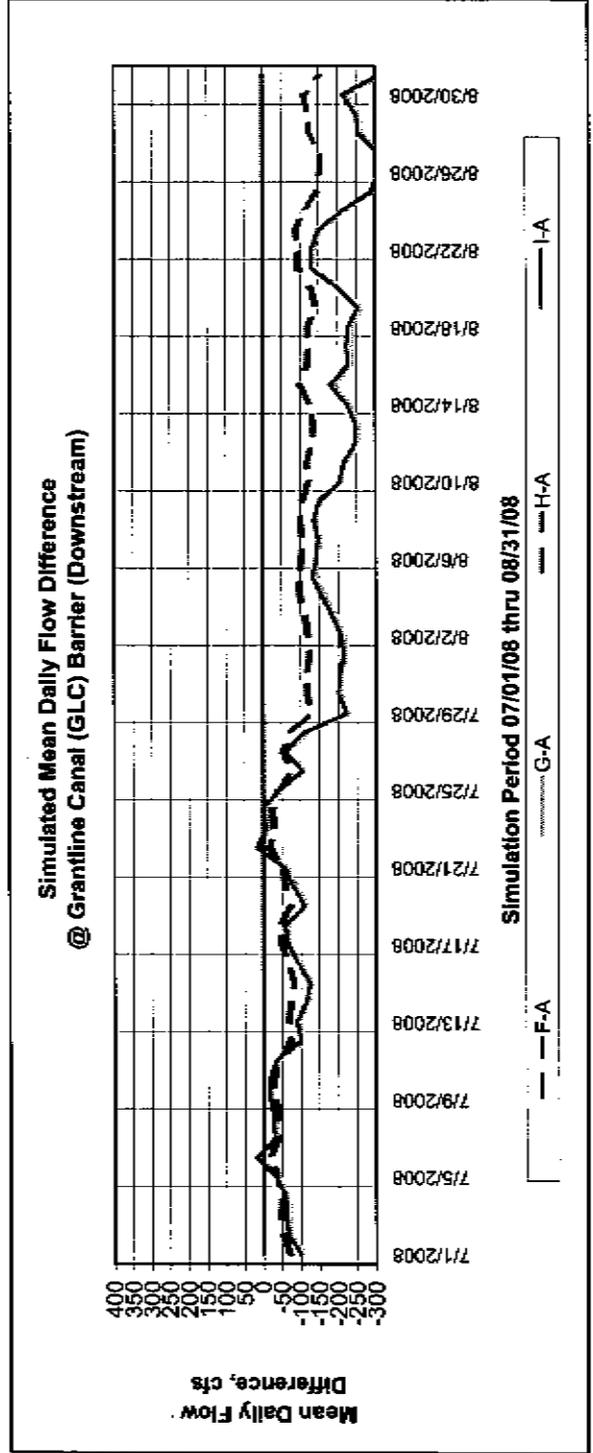
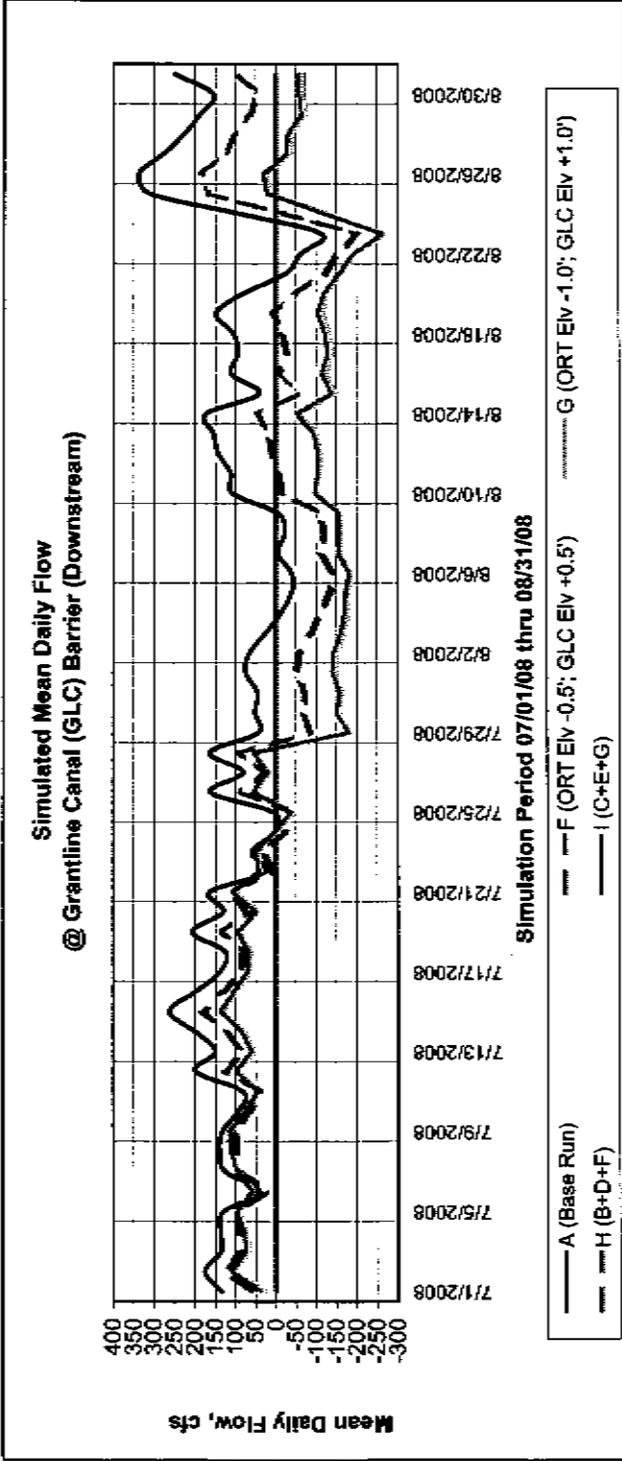




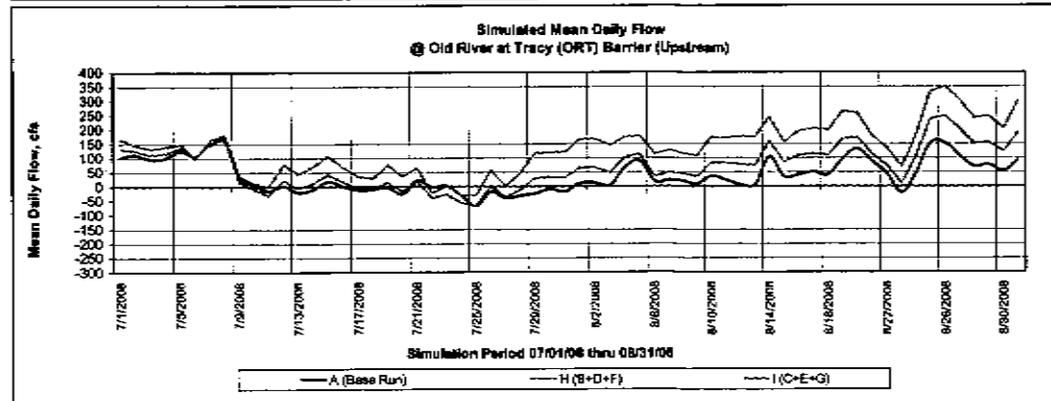
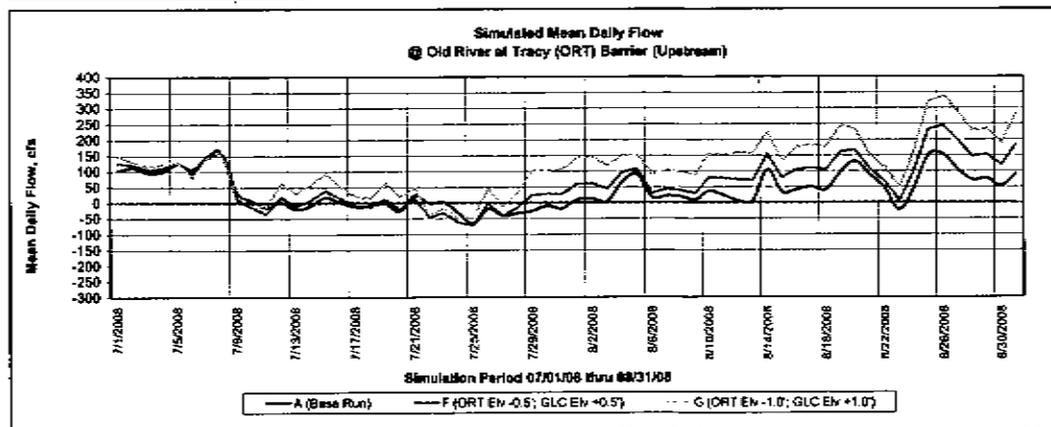
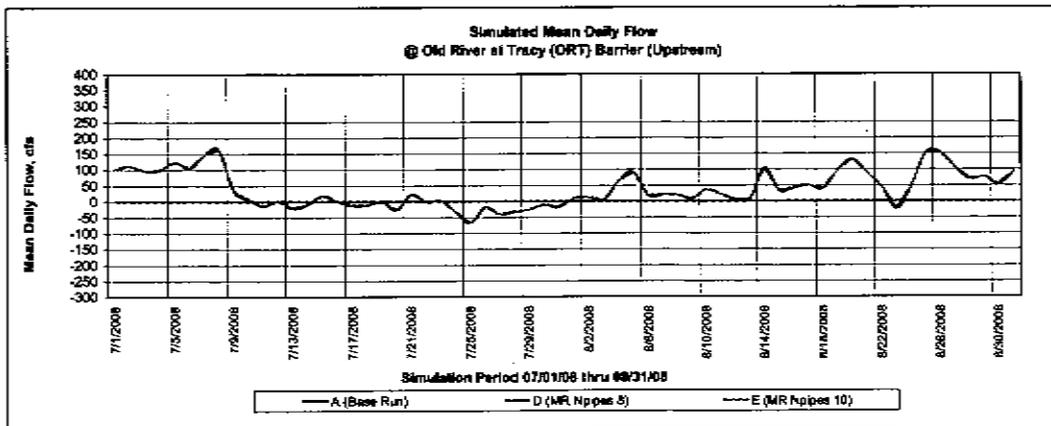
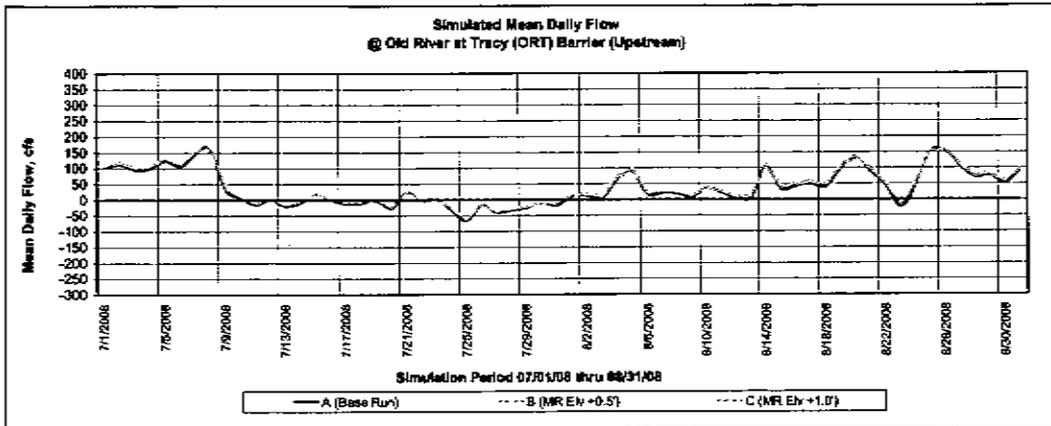




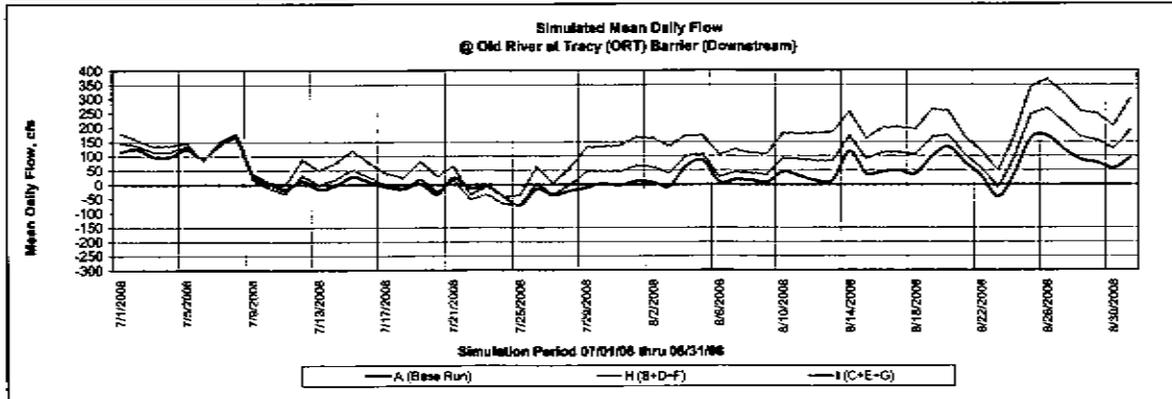
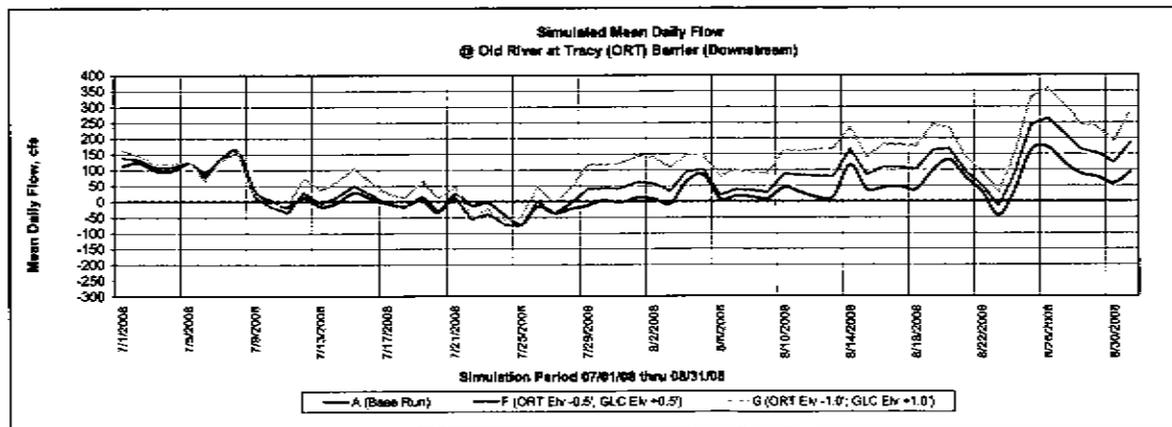
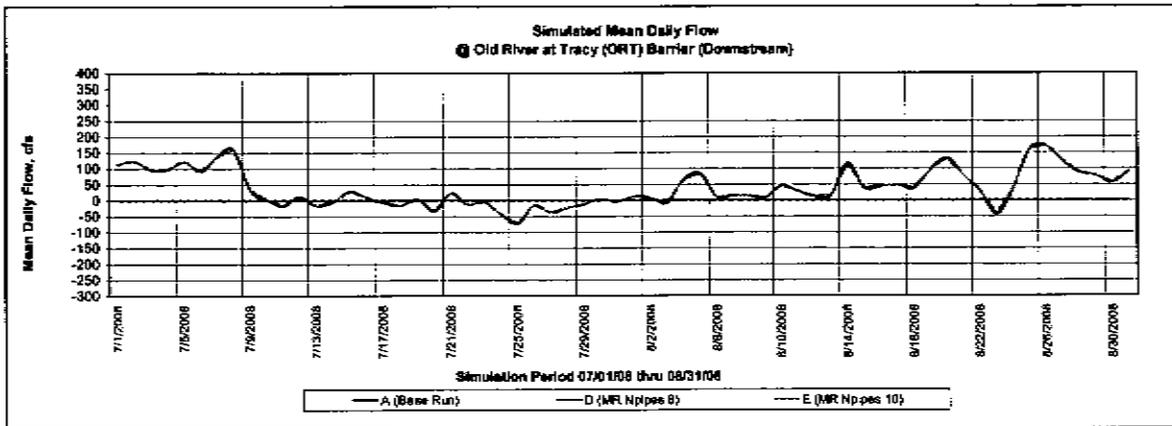
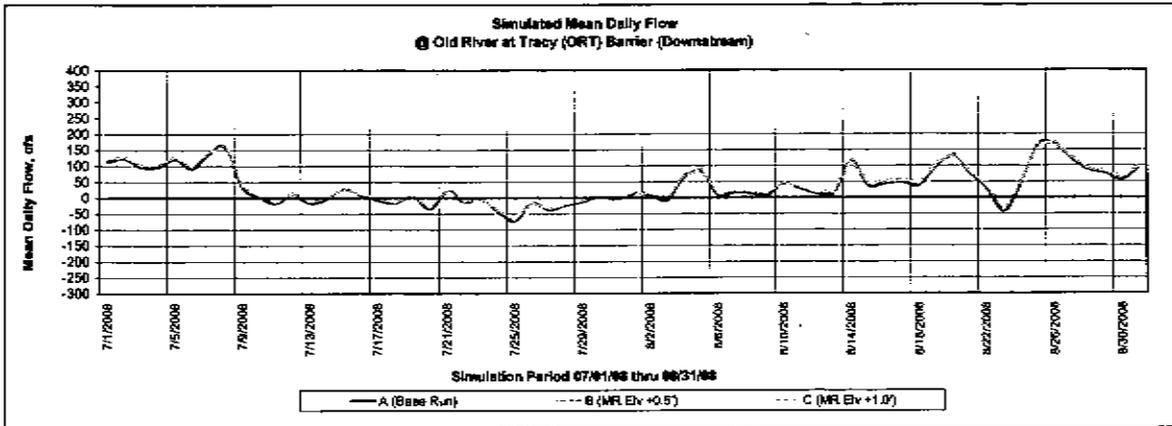




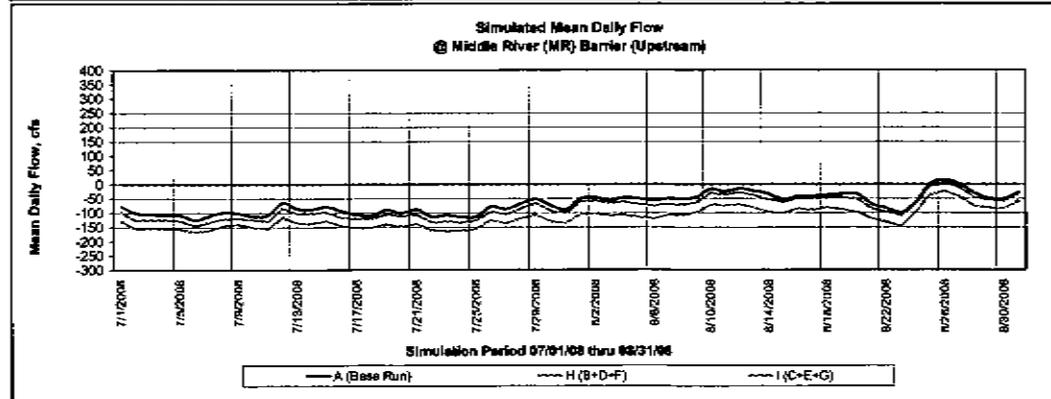
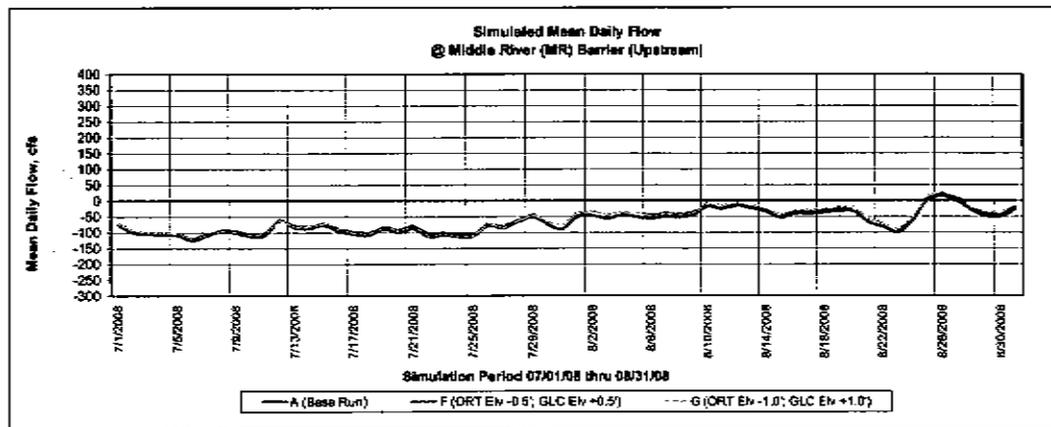
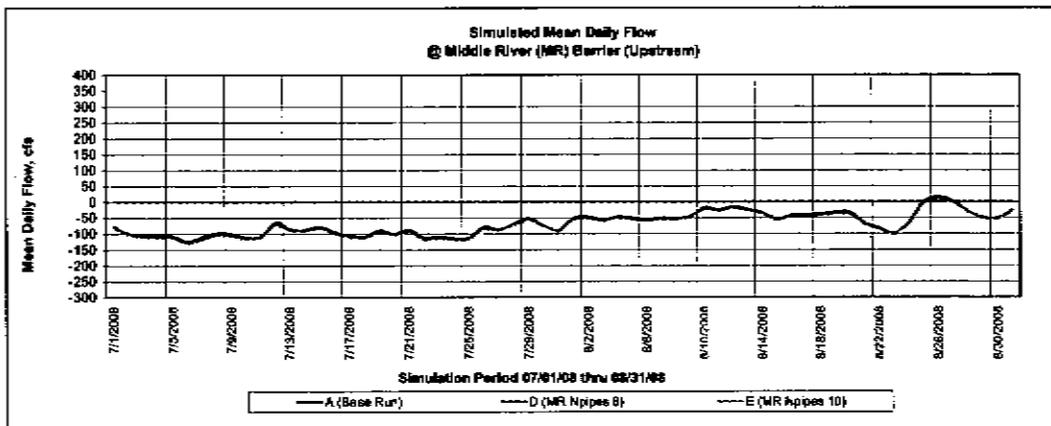
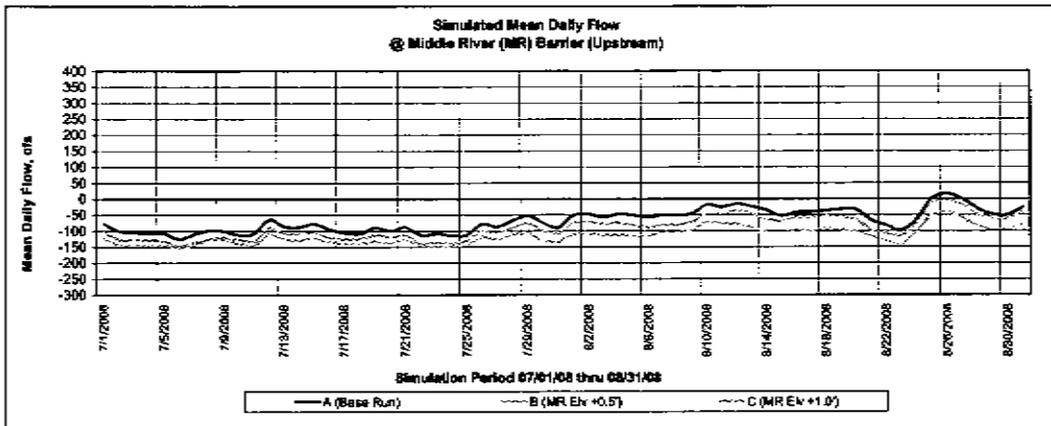
Preliminary Results, Subject to Revisions



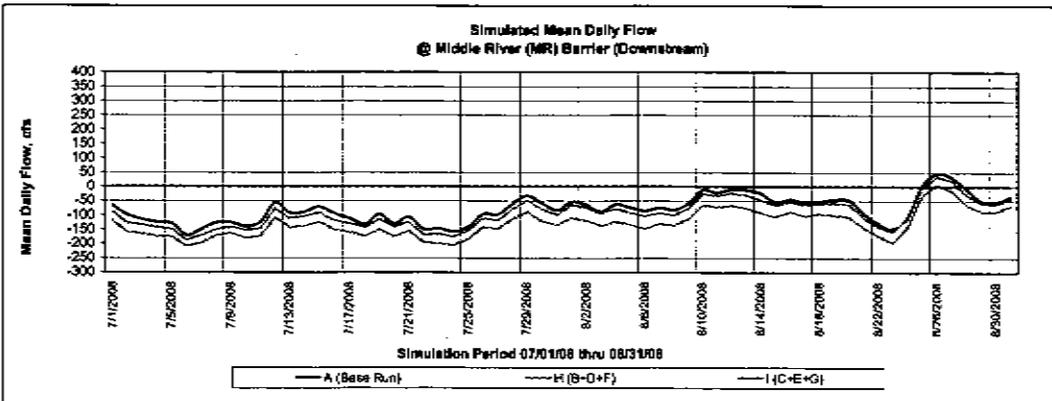
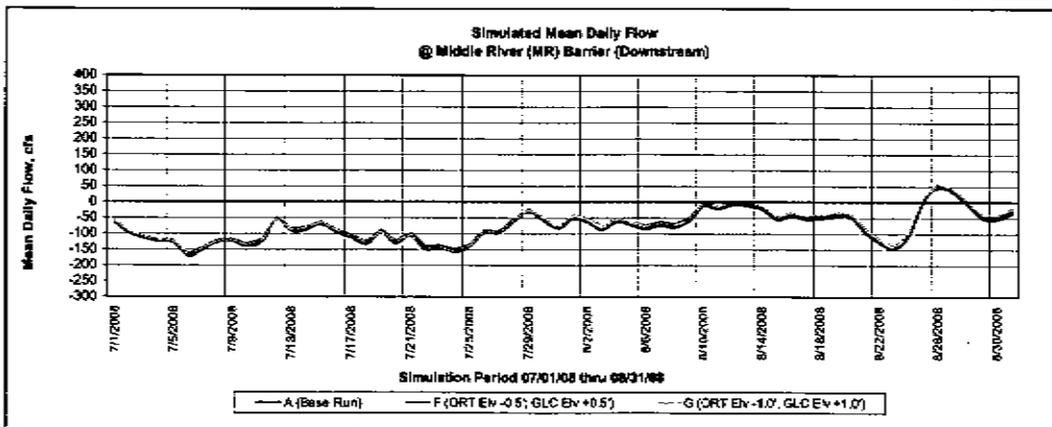
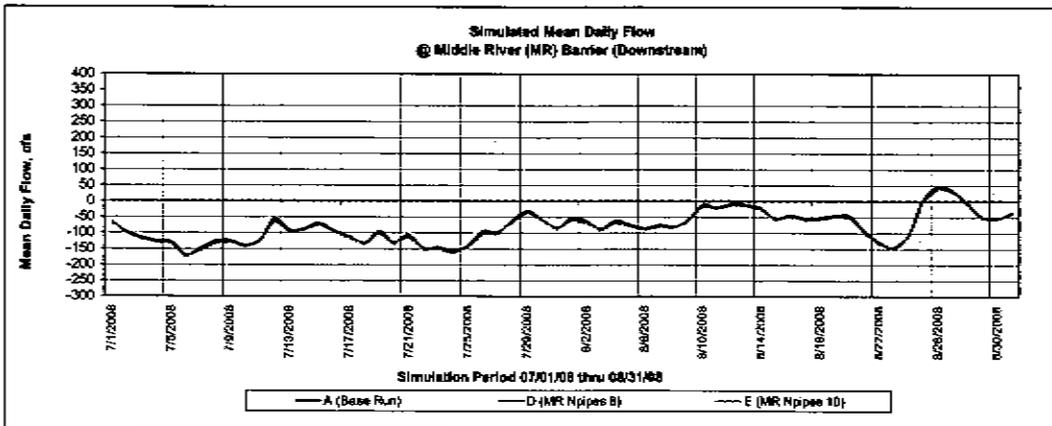
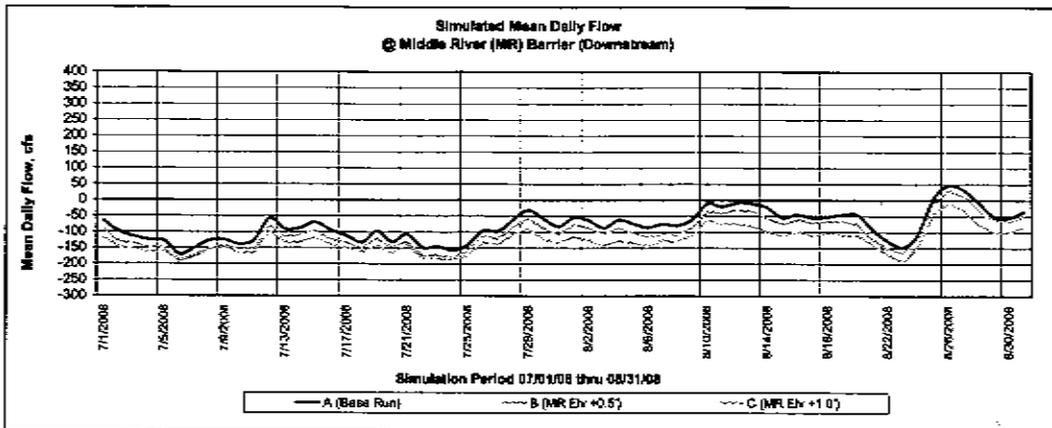
Preliminary Results, Subject to Revisions



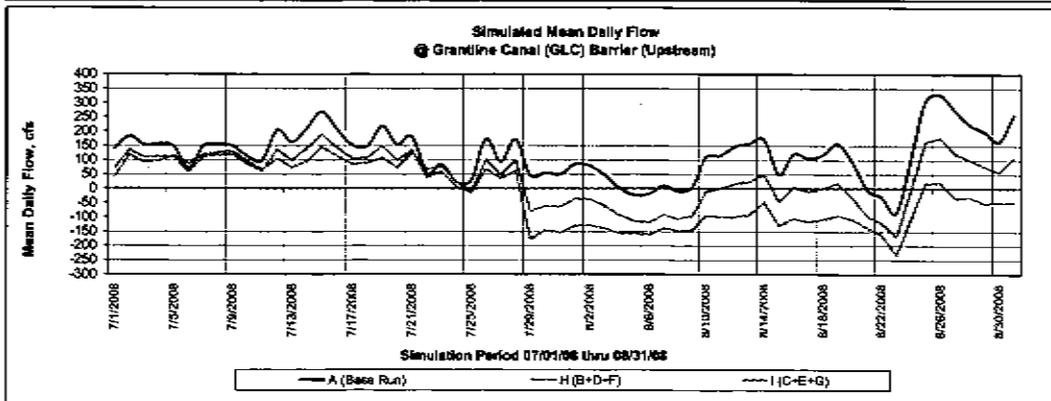
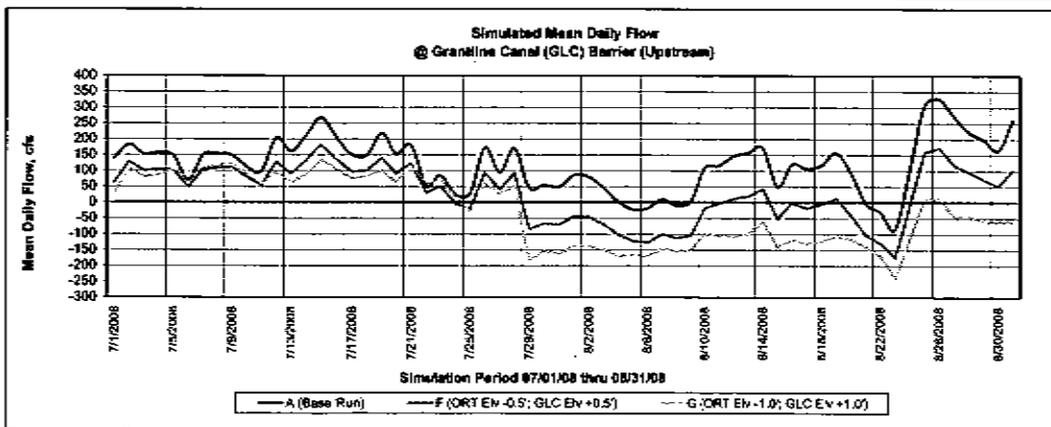
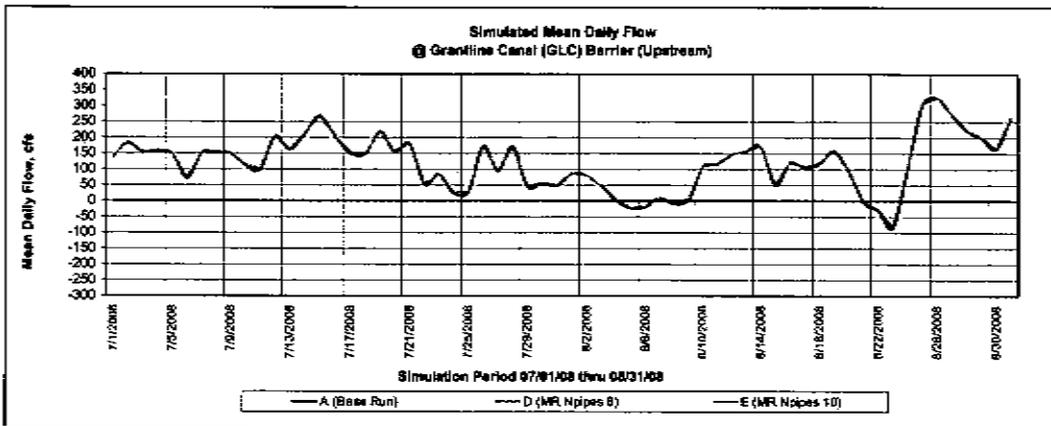
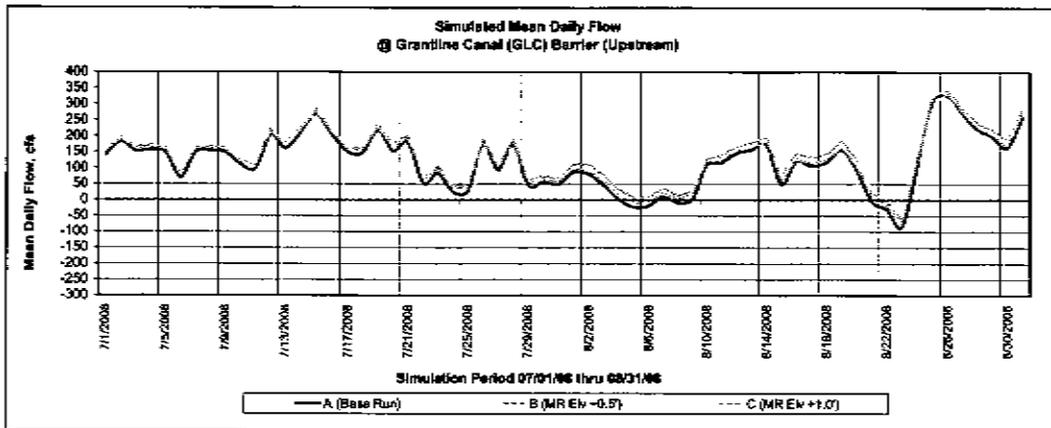
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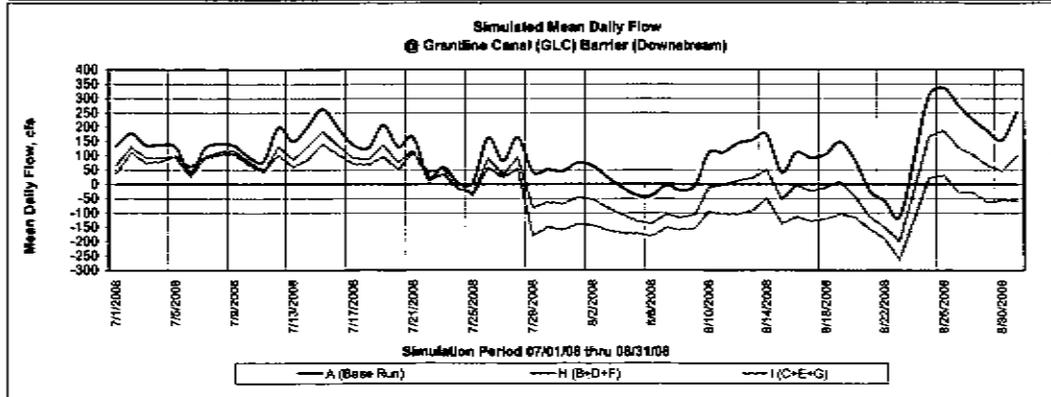
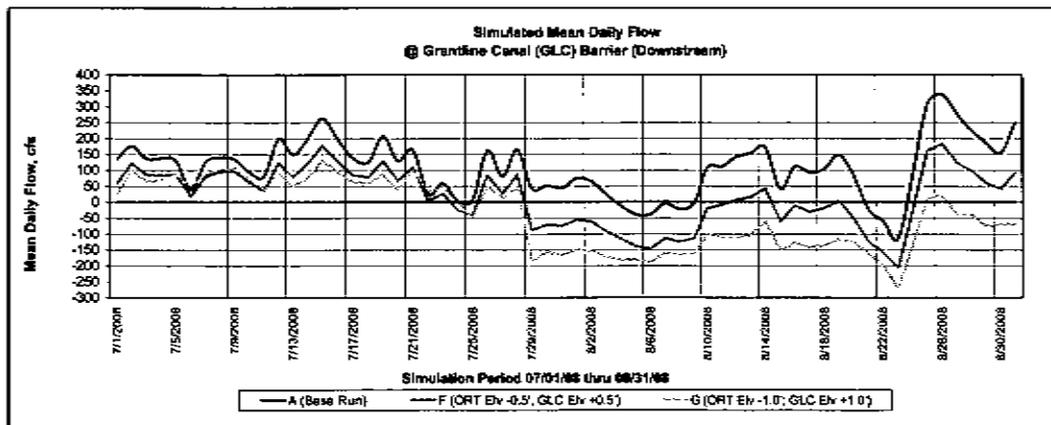
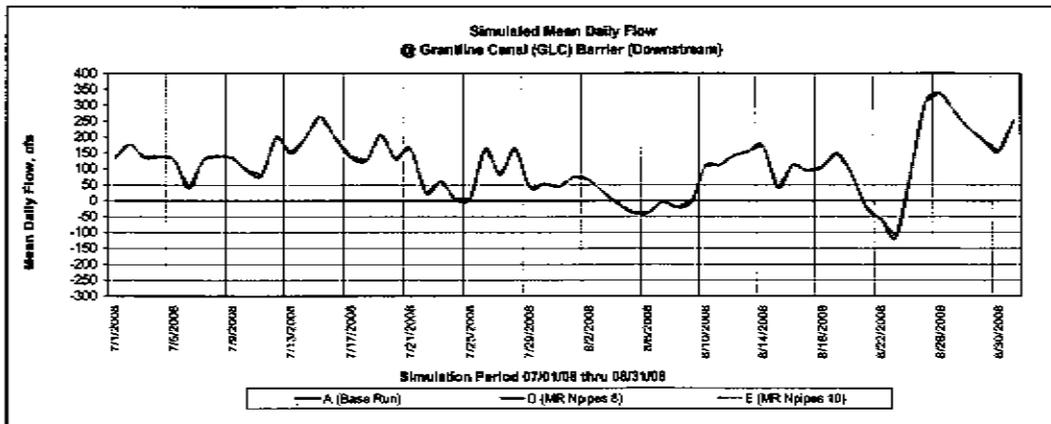
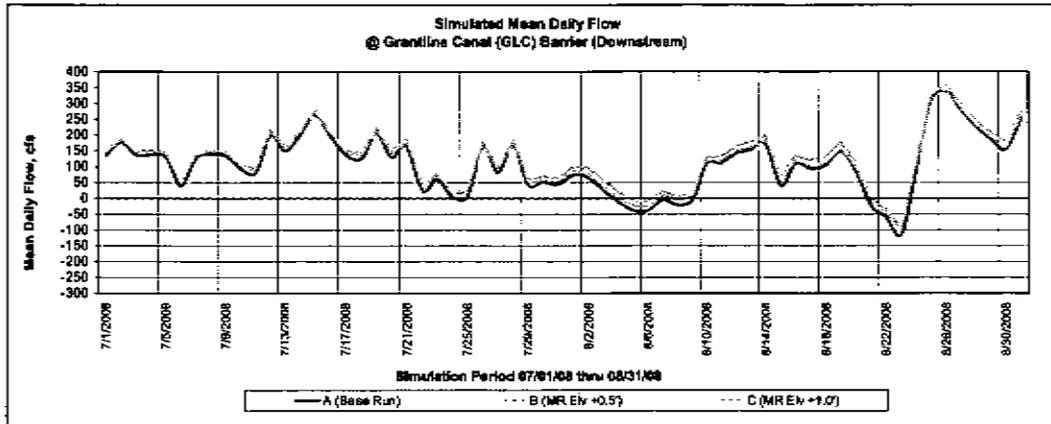
Preliminary Results, Subject to Revisions



Preliminary Results, Subject to Revisions



Preliminary Results, Subject to Revisions



**COMPARISON OF RESULTS
UNDER BASELINE AND
ALTERNATIVE LEVELS OF
PUMPING FOR SJ RIVER TO
PARADISE CUT**

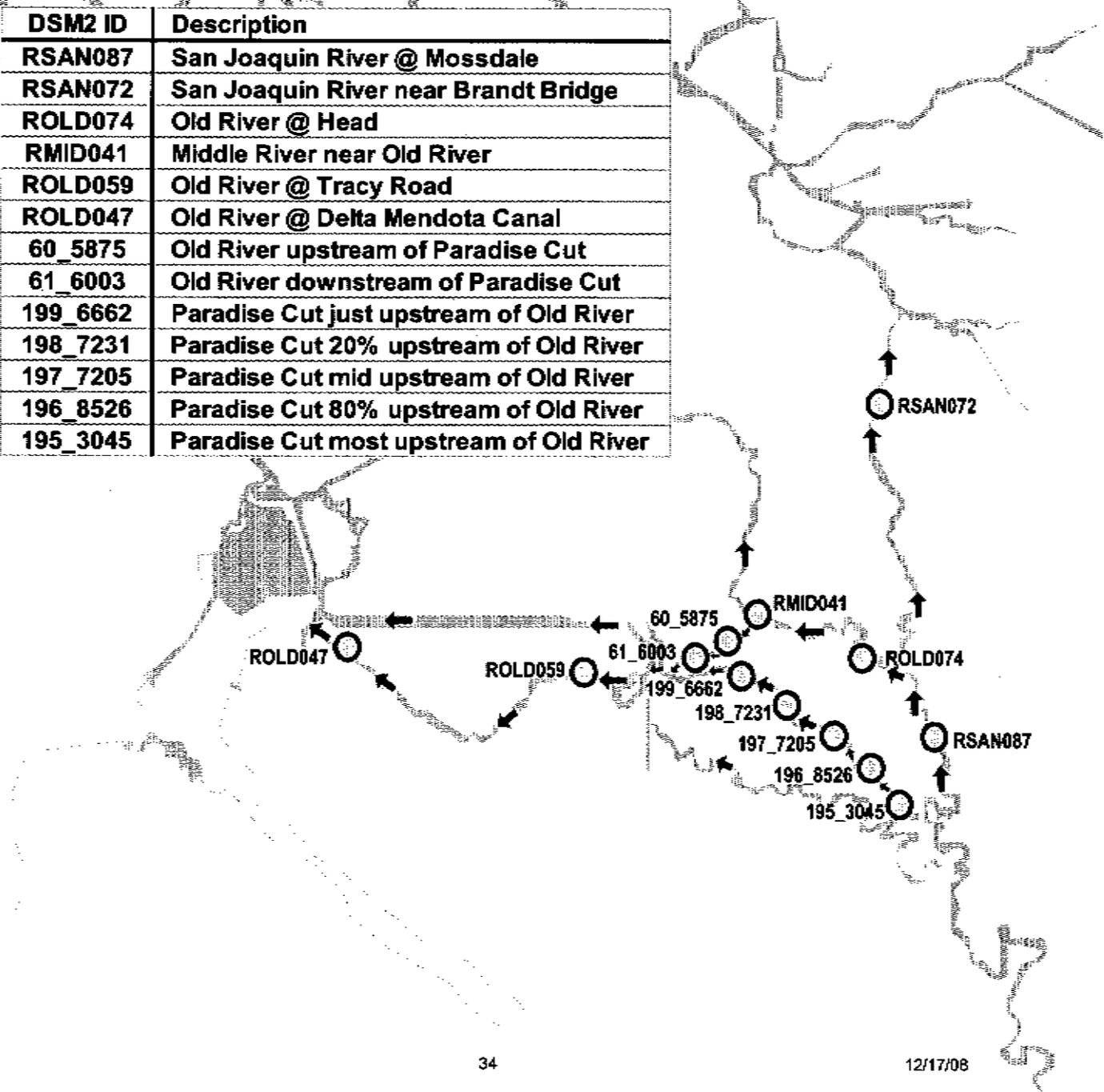
South Delta Alternatives Analysis Study Using DSM2 Simulations

Paradise Cut Alternatives Analyzed:

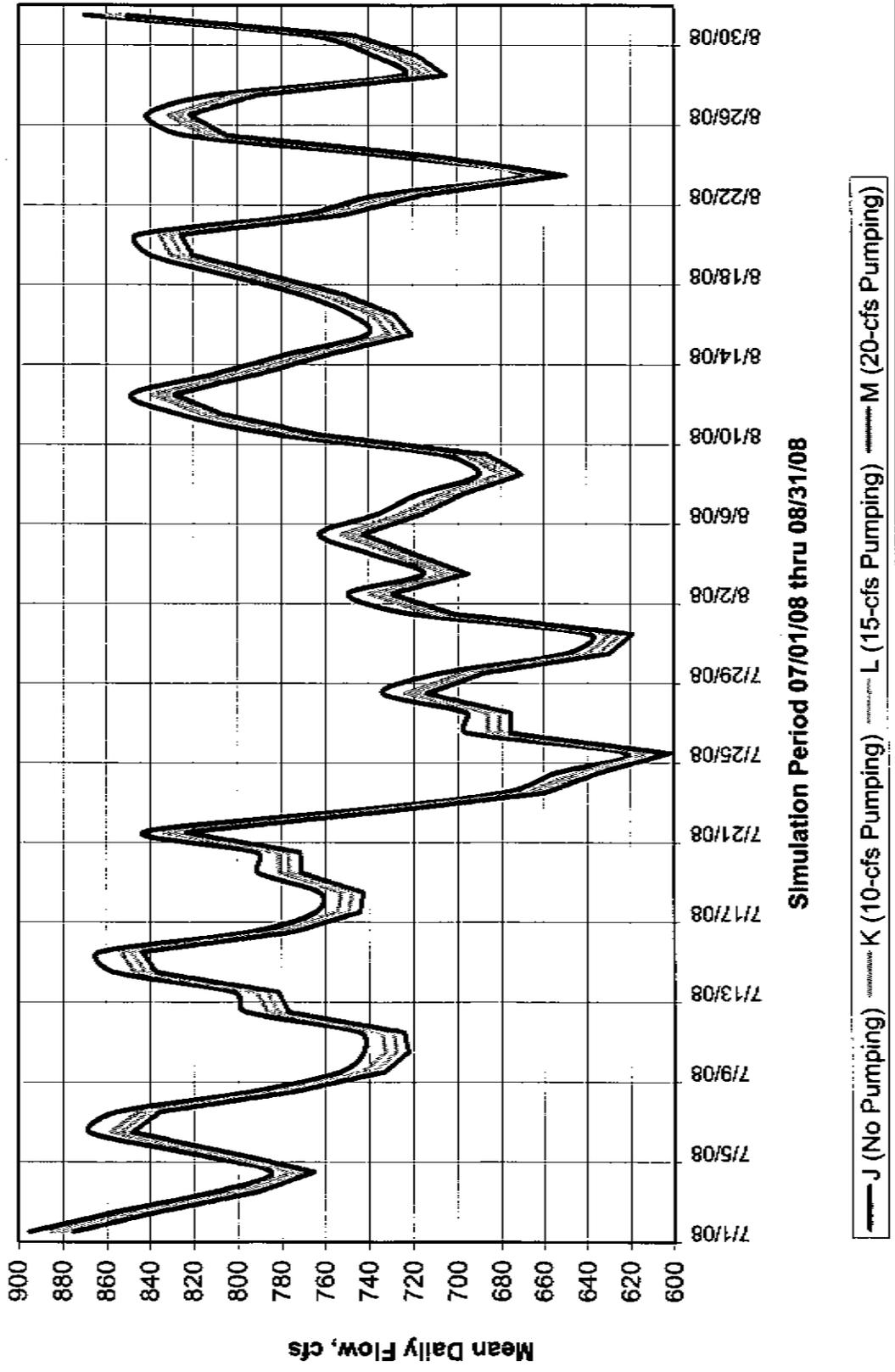
1. Scenario J: Baseline run based on historical data. No pumping from San Joaquin River to Paradise Cut.
2. Scenario K: 10 cfs pumping from San Joaquin River to Paradise Cut.
2. Scenario L: 15 cfs pumping from San Joaquin River to Paradise Cut.
2. Scenario M: 20 cfs pumping from San Joaquin River to Paradise Cut.

DSM2 Station Locations

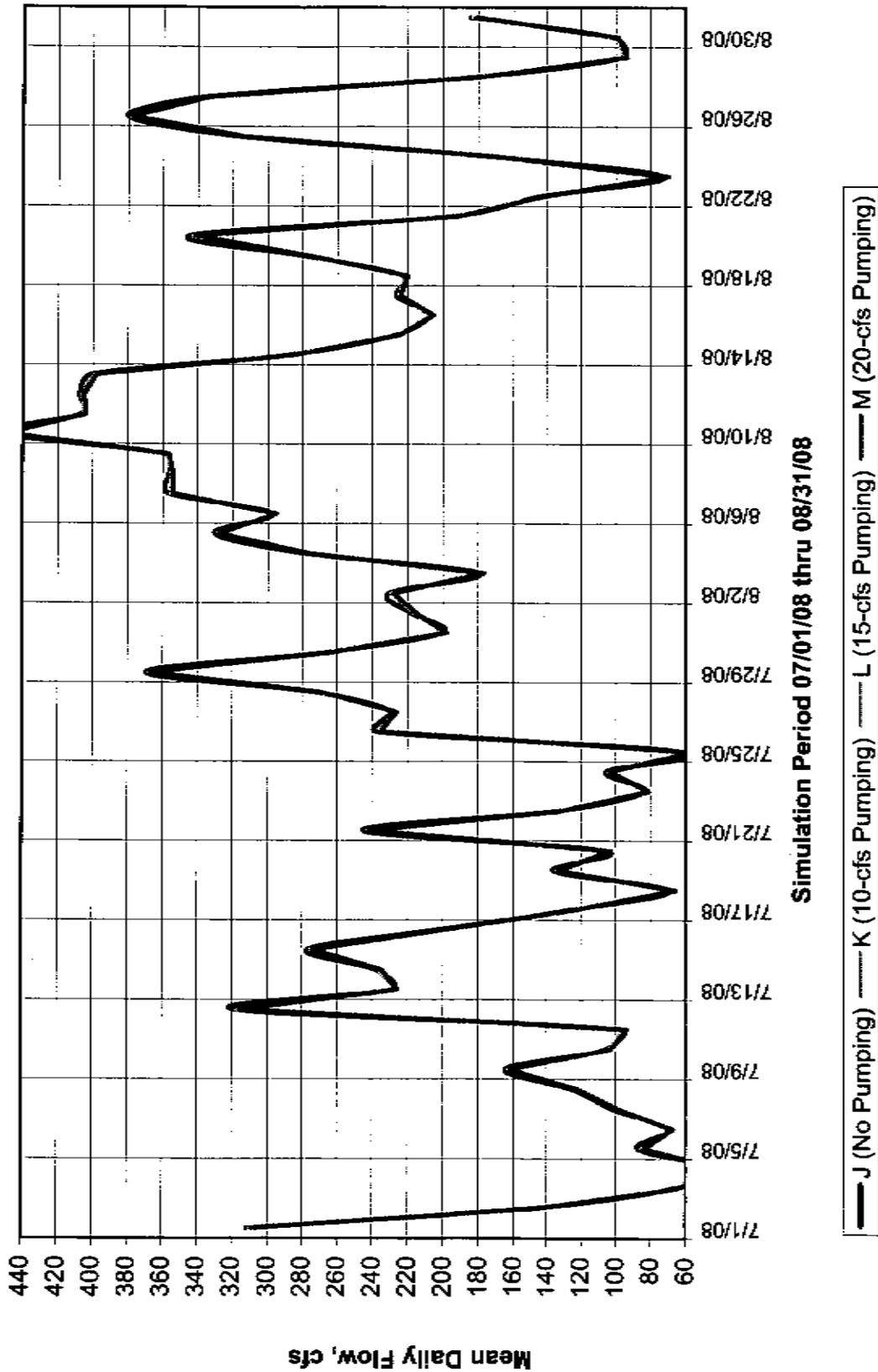
DSM2 ID	Description
RSAN087	San Joaquin River @ Mossdale
RSAN072	San Joaquin River near Brandt Bridge
ROLD074	Old River @ Head
RMID041	Middle River near Old River
ROLD059	Old River @ Tracy Road
ROLD047	Old River @ Delta Mendota Canal
60_5875	Old River upstream of Paradise Cut
61_6003	Old River downstream of Paradise Cut
199_6662	Paradise Cut just upstream of Old River
198_7231	Paradise Cut 20% upstream of Old River
197_7205	Paradise Cut mid upstream of Old River
196_8526	Paradise Cut 80% upstream of Old River
195_3045	Paradise Cut most upstream of Old River



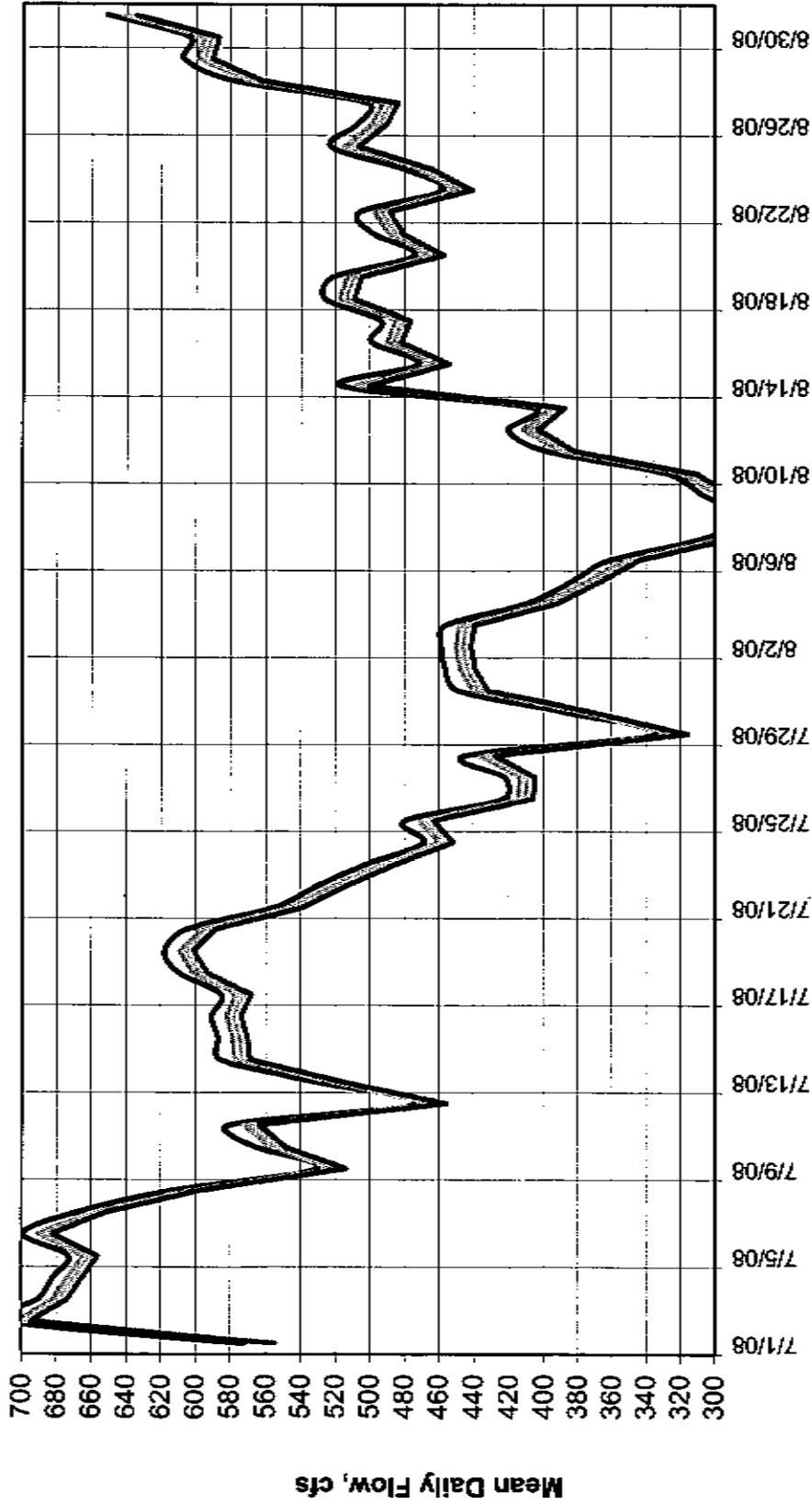
Simulated Mean Daily Flow @ San Joaquin River @ Mossdale



Simulated Mean Daily Flow @ San Joaquin River @ Brandt Bridge

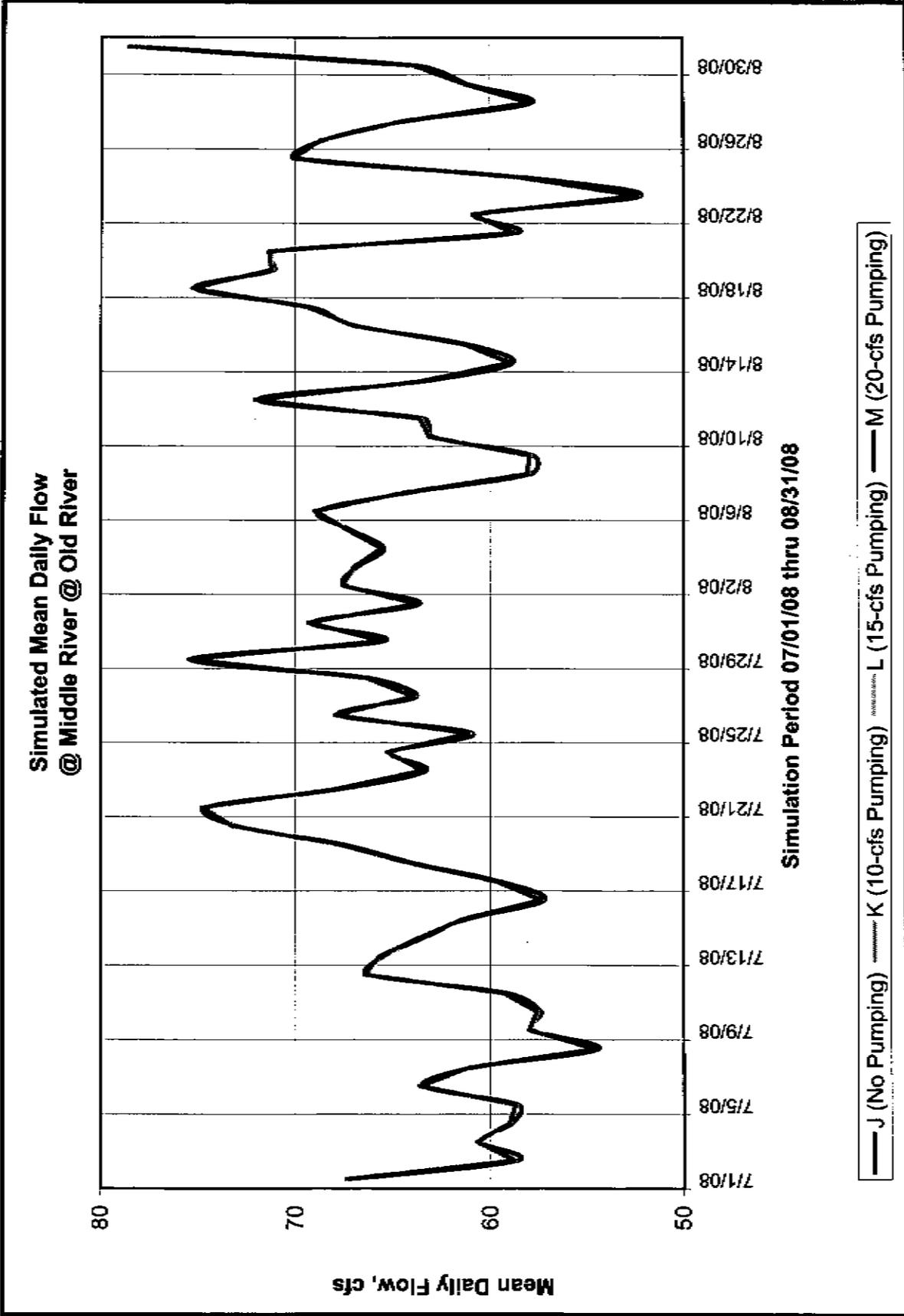


Simulated Mean Daily Flow @ Old River at Head

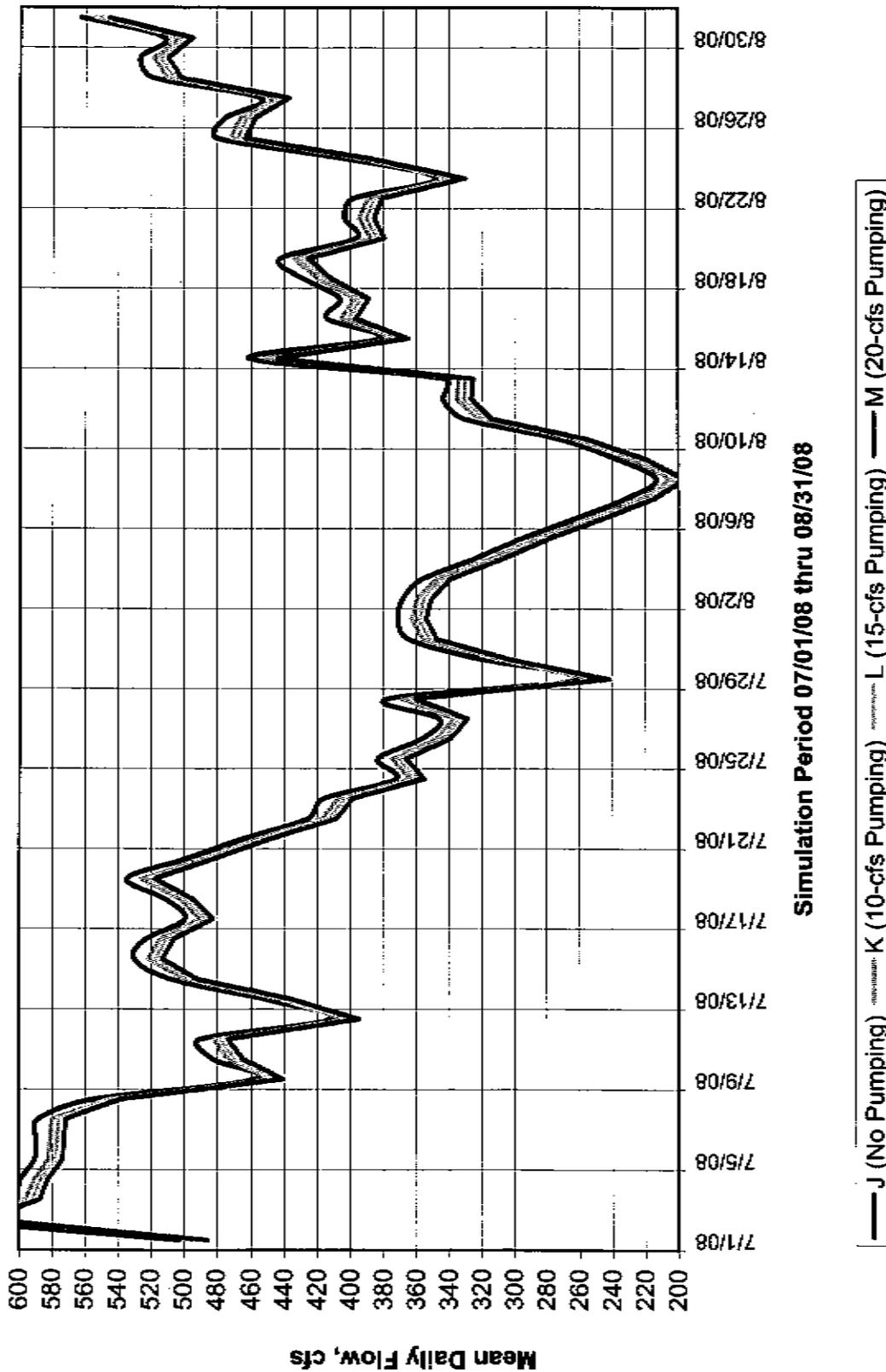


Simulation Period 07/01/08 thru 08/31/08

— J (No Pumping) — K (10-cfs Pumping) — L (15-cfs Pumping) — M (20-cfs Pumping)



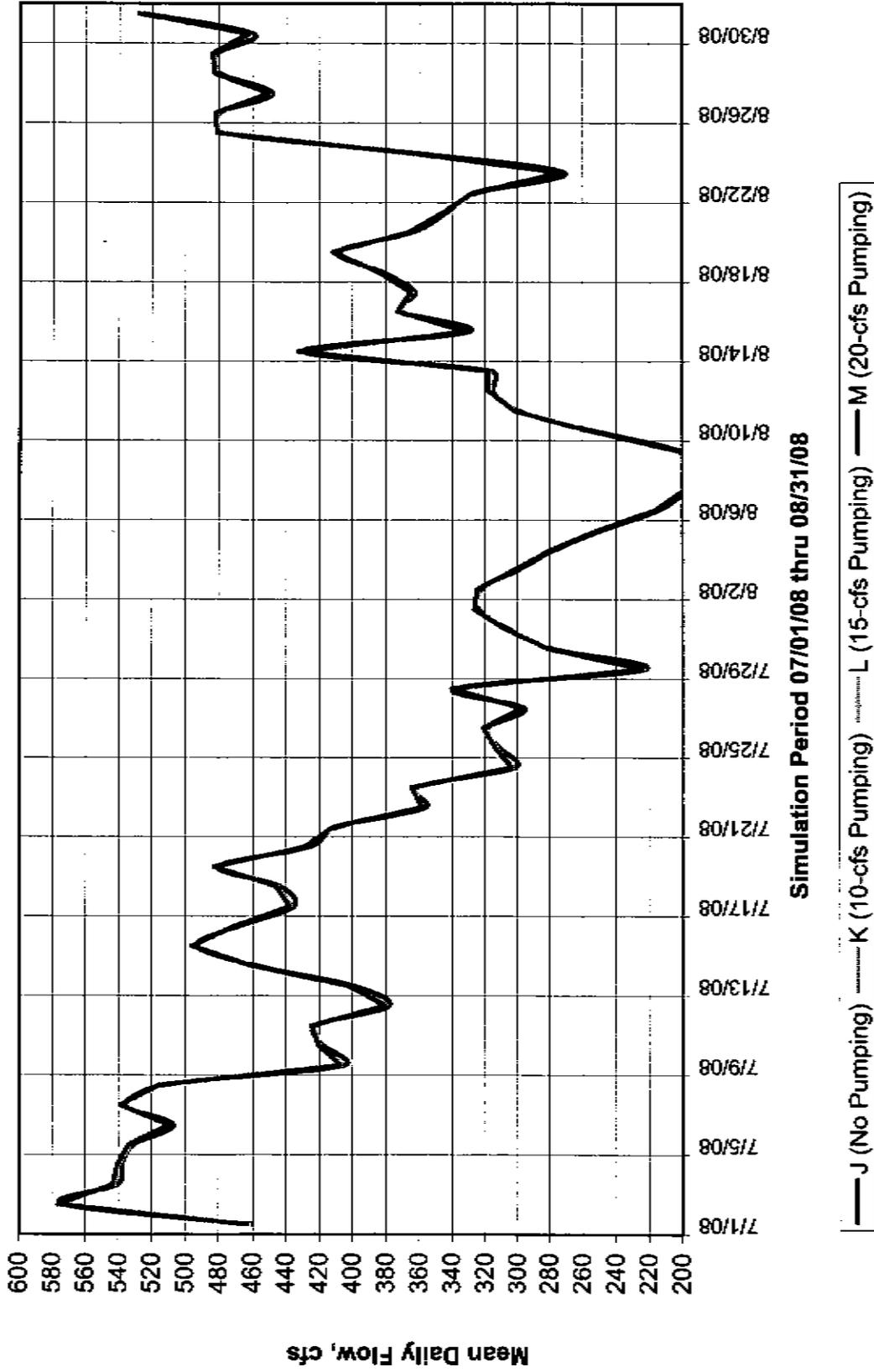
Simulated Mean Daily Flow @ Old River Channel 60



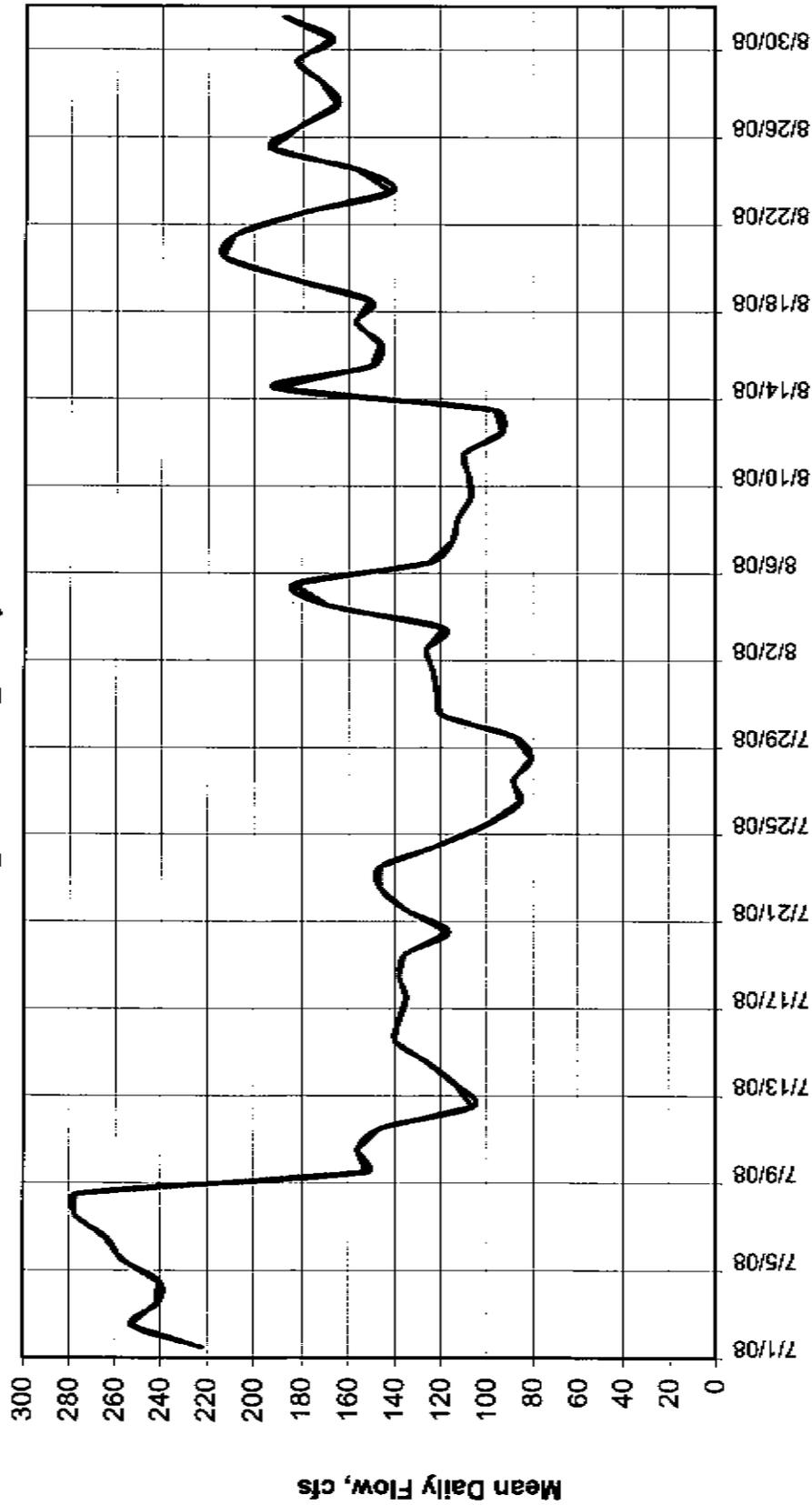
Simulation Period 07/01/08 thru 08/31/08

— J (No Pumping) — K (10-cfs Pumping) — L (15-cfs Pumping) — M (20-cfs Pumping)

Simulated Mean Daily Flow @ Old River Downstream of Paradise Cut



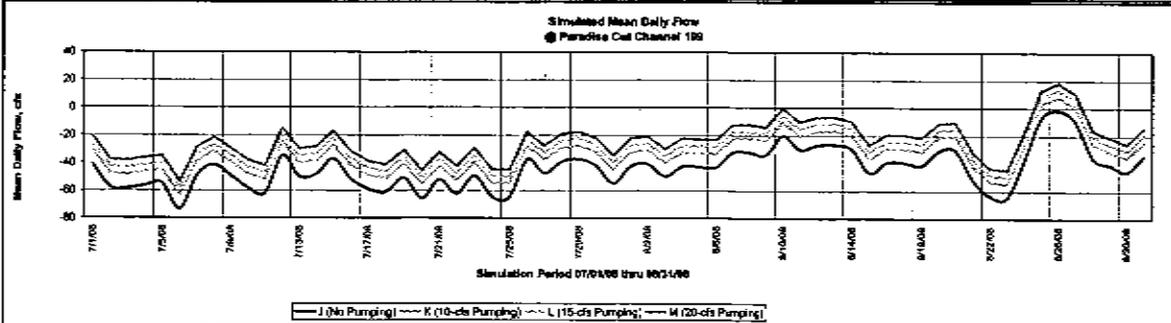
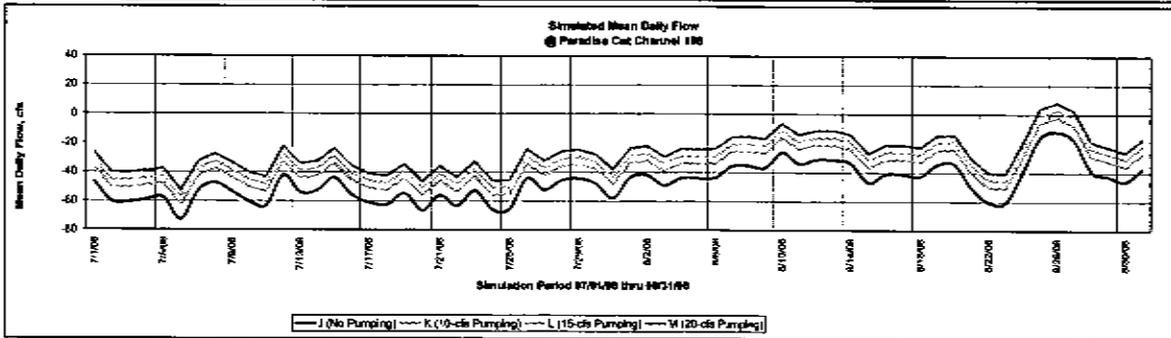
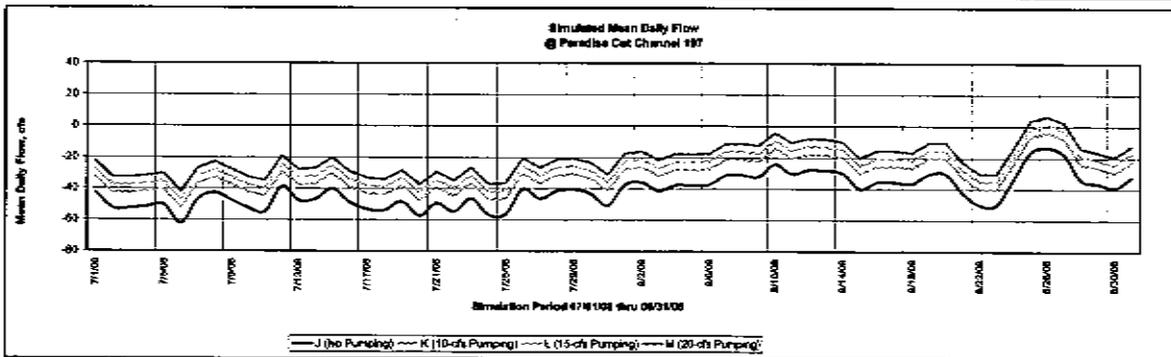
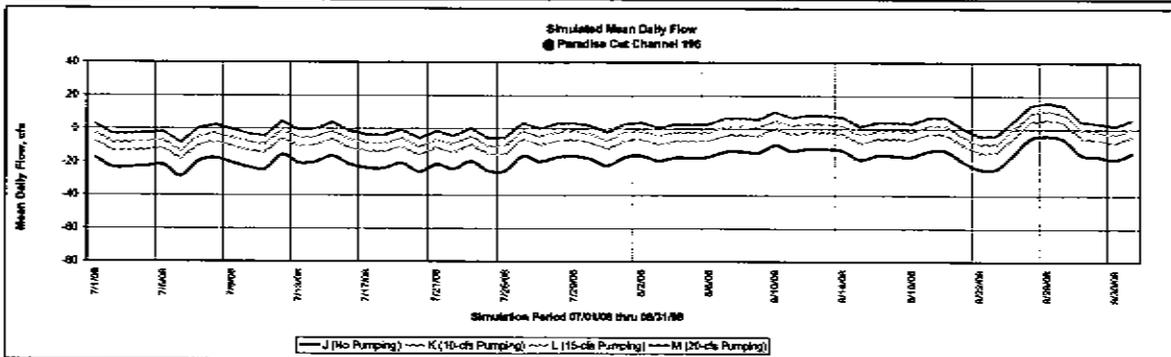
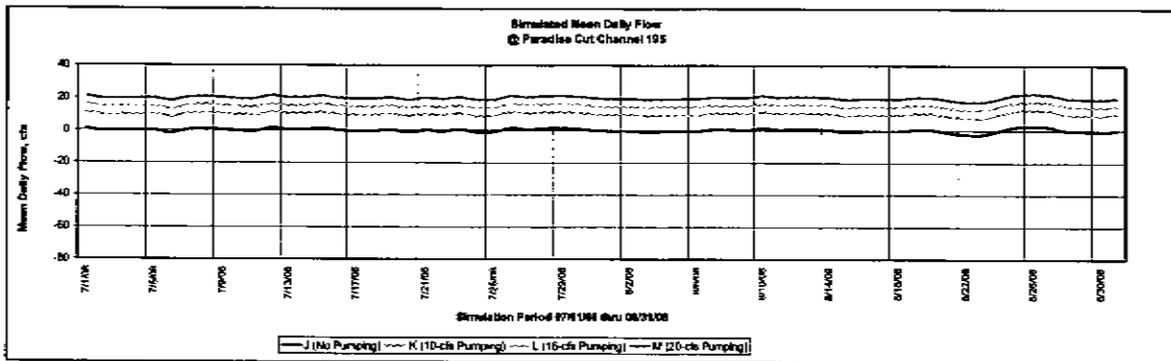
Simulated Mean Daily Flow @ Old River @ Tracy Road

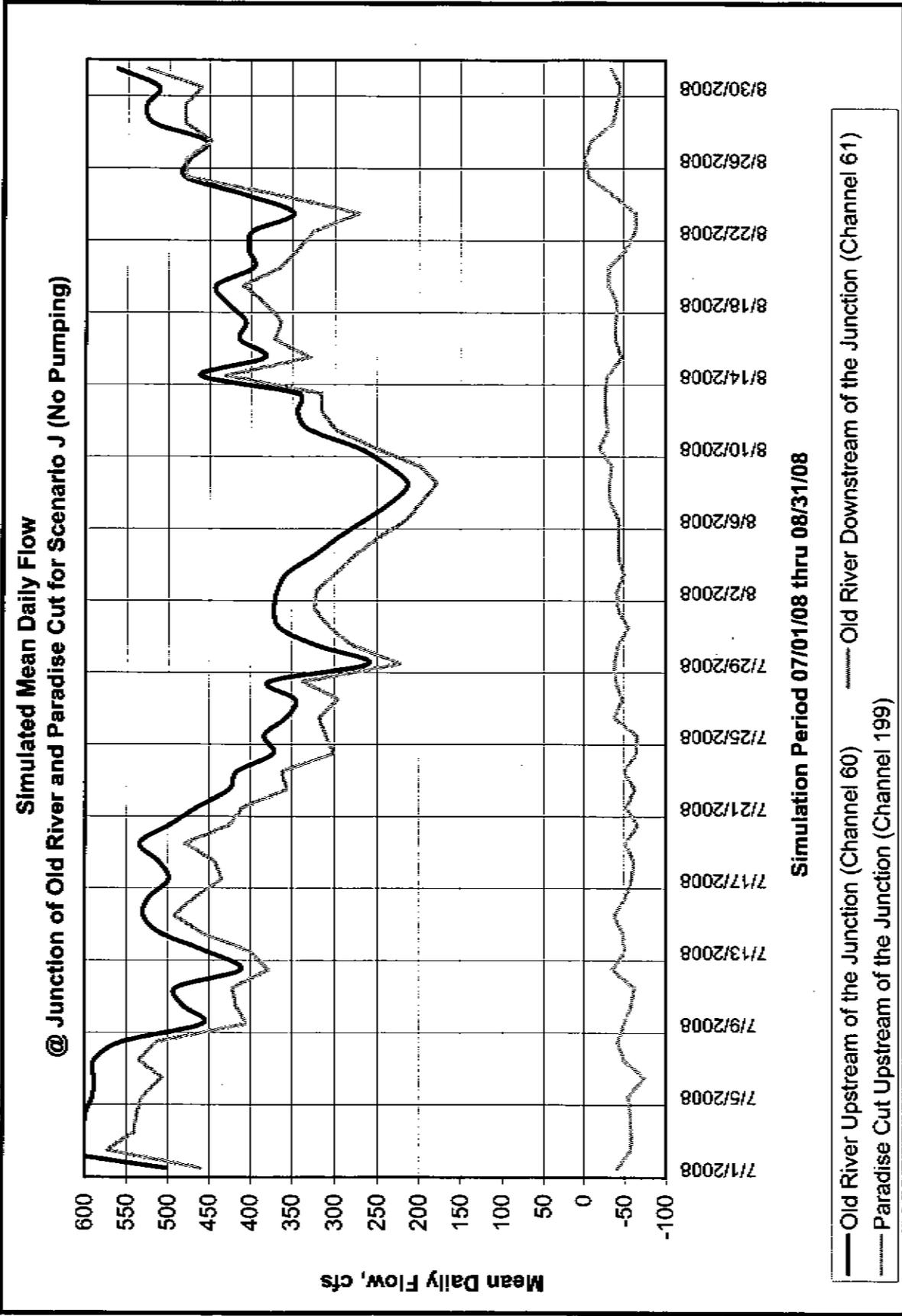


Simulation Period 07/01/08 thru 08/31/08

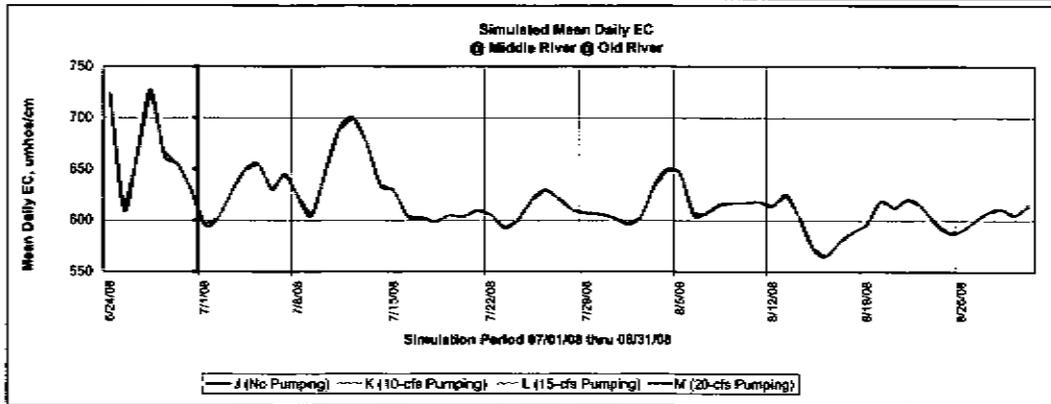
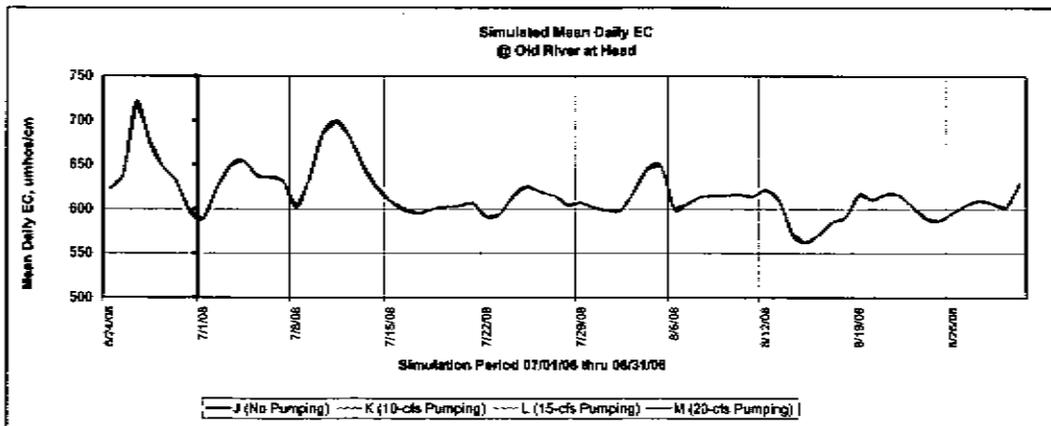
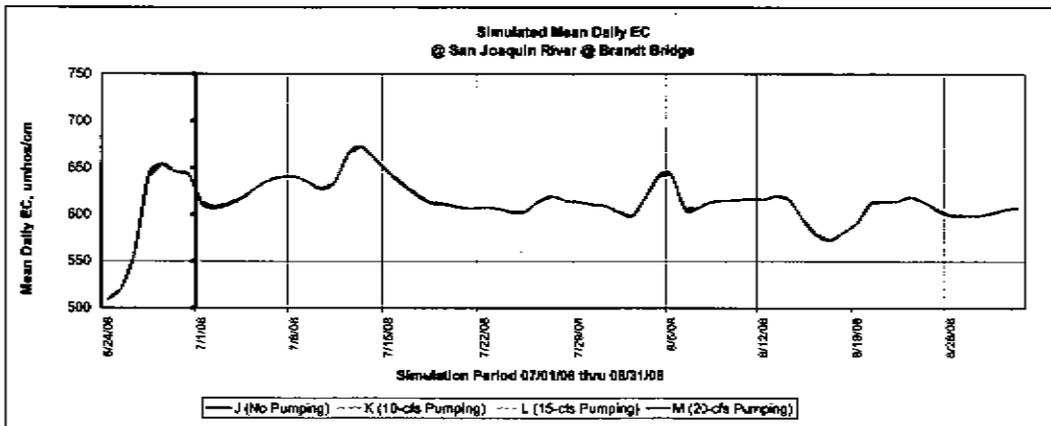
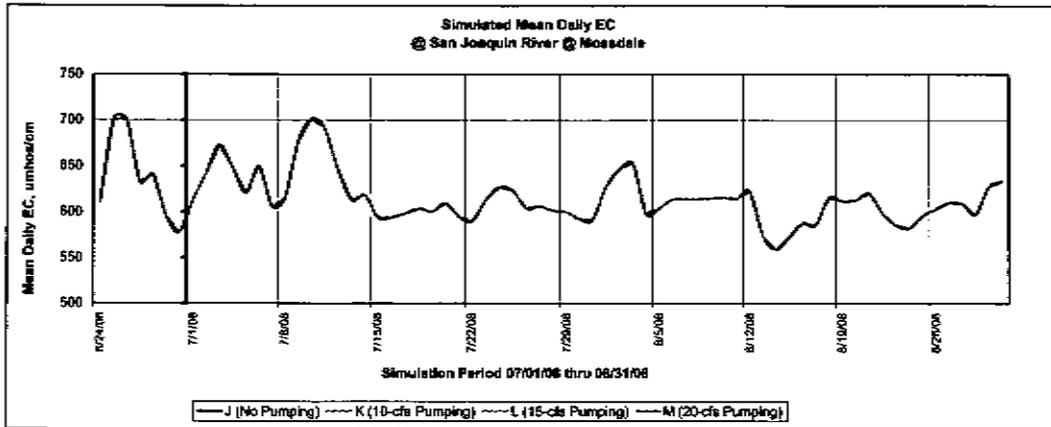
— J (No Pumping) - - - - - K (10-cfs Pumping) - - - - - L (15-cfs Pumping) — M (20-cfs Pumping)

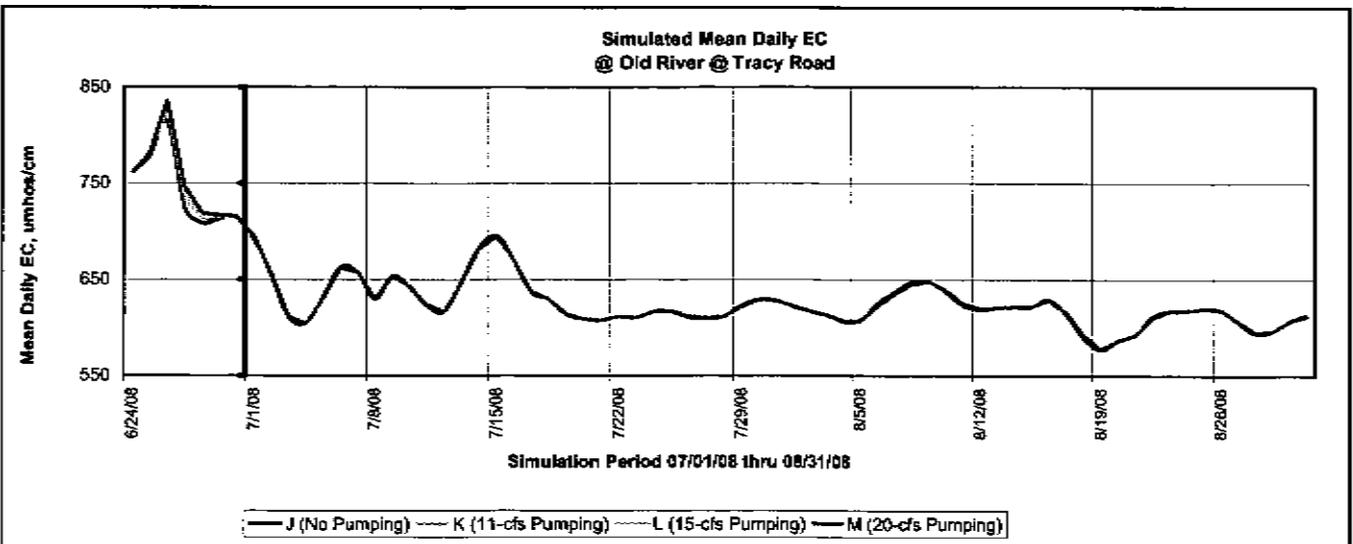
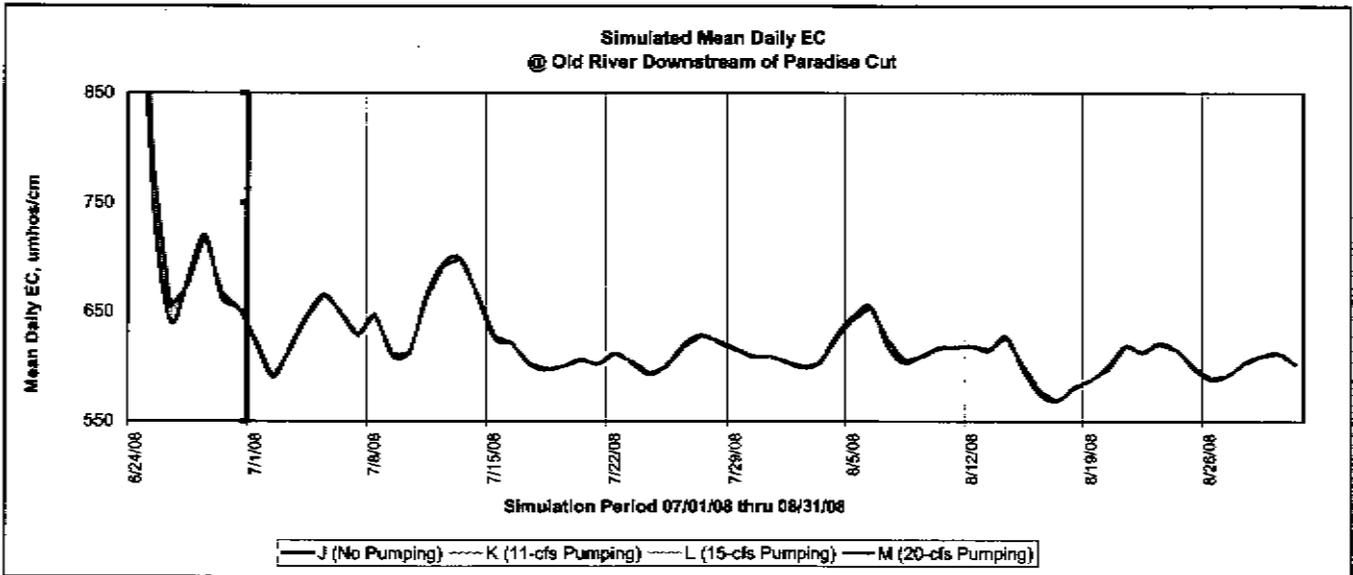
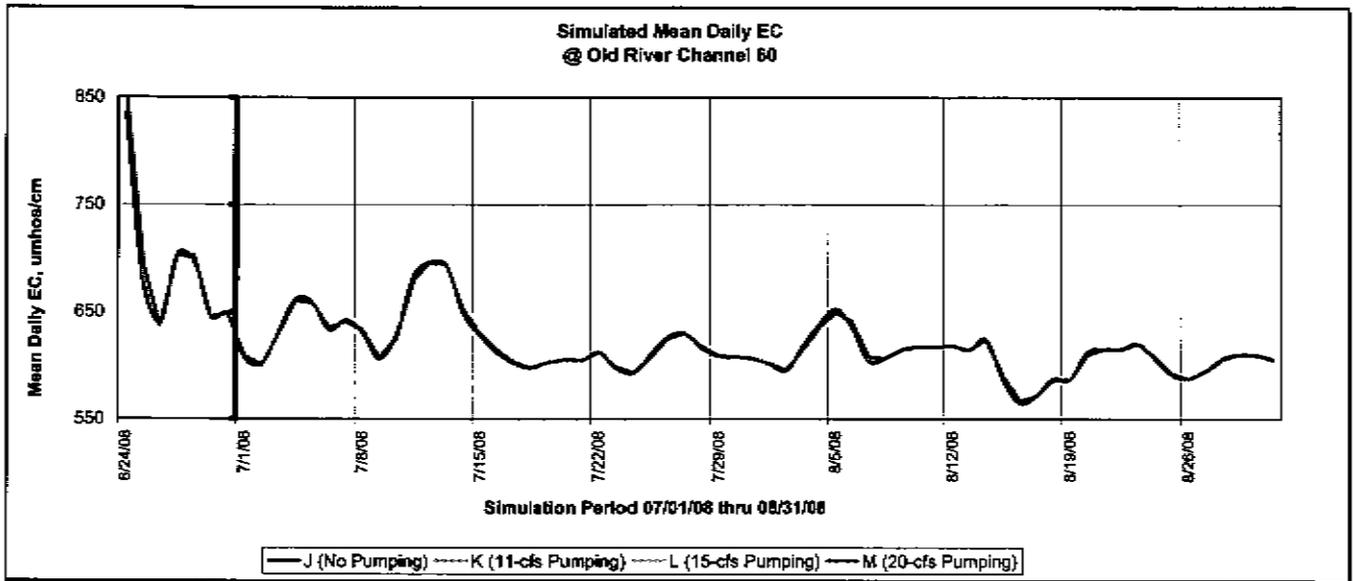
Preliminary Results, Subject to Revisions



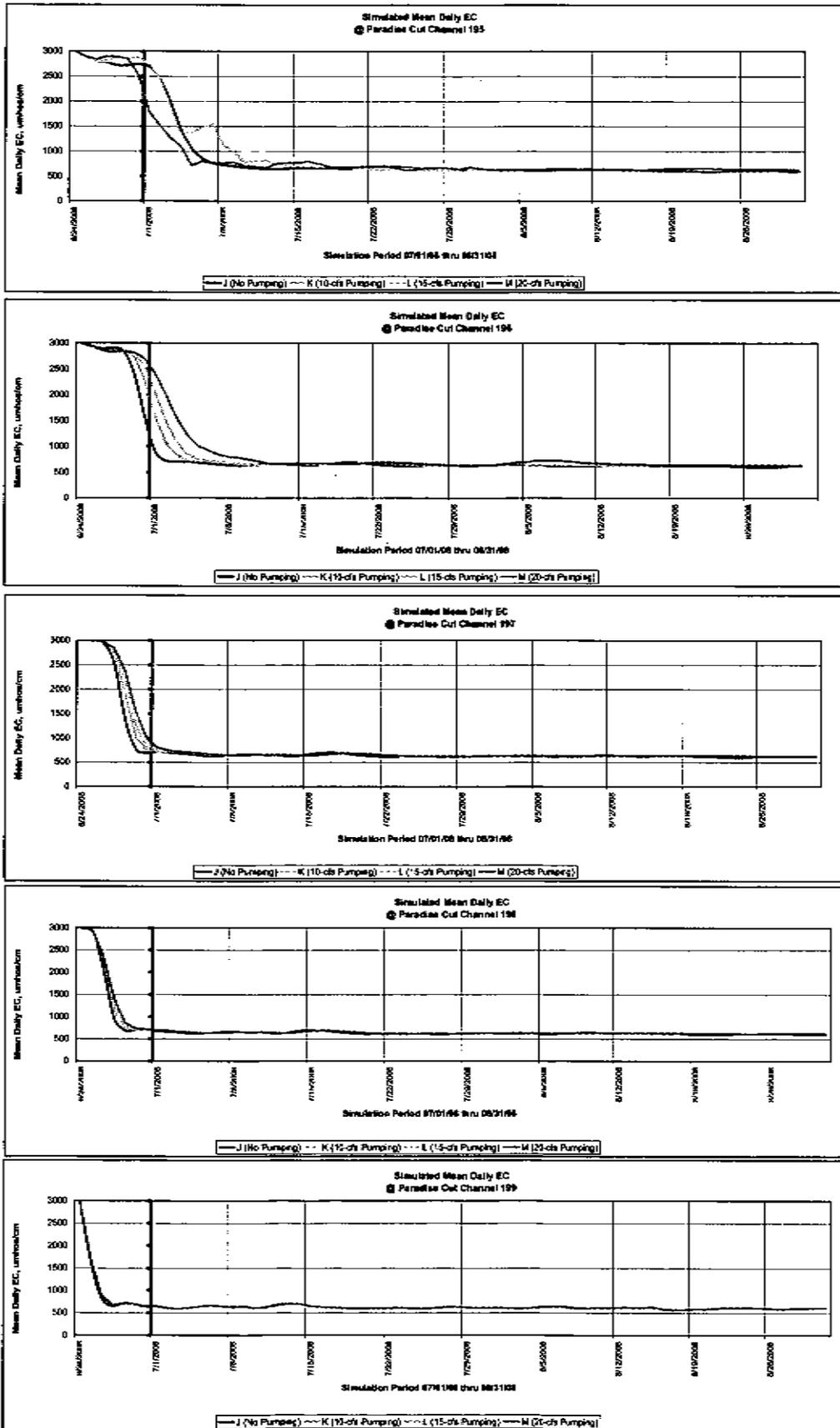


Preliminary Results, Subject to Revisions

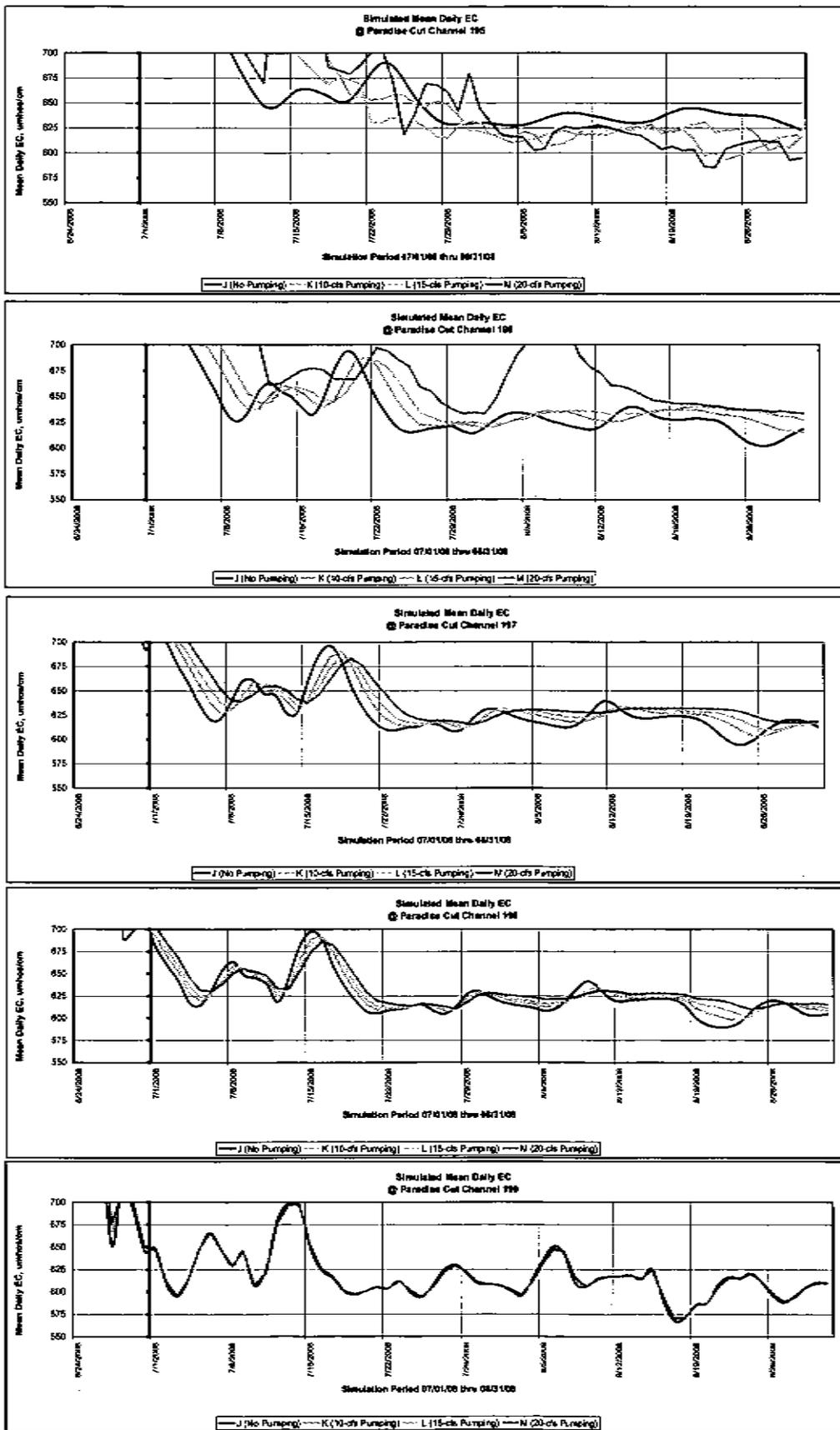




Preliminary Results, Subject to Revisions

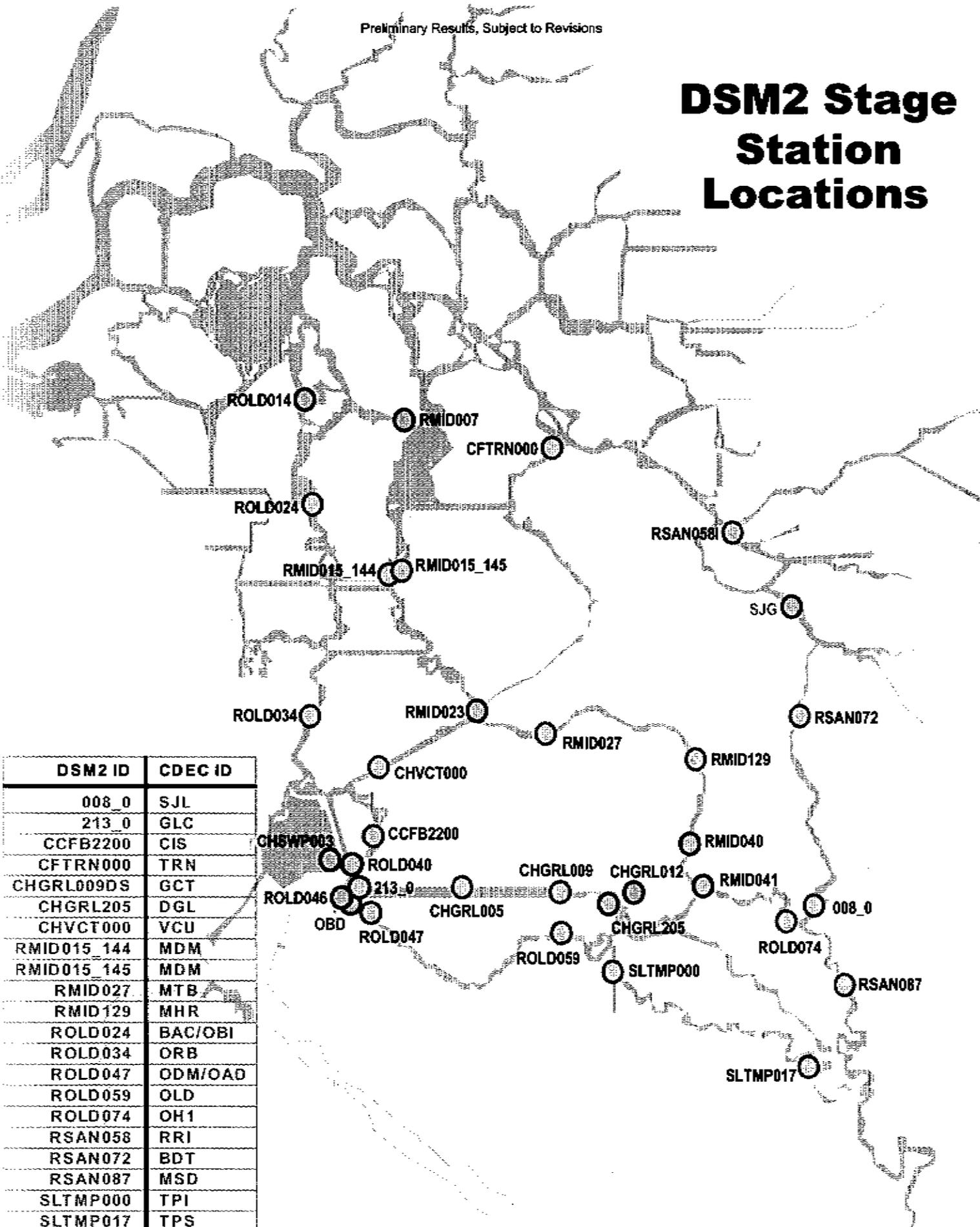


Preliminary Results, Subject to Revisions



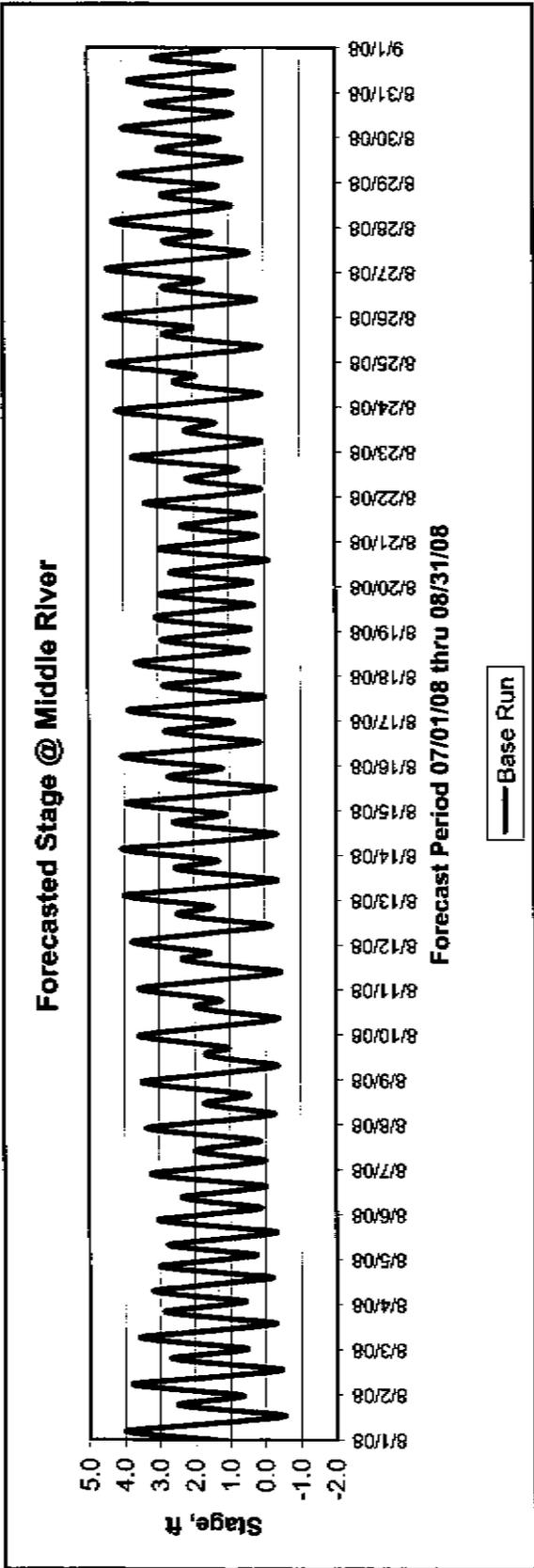
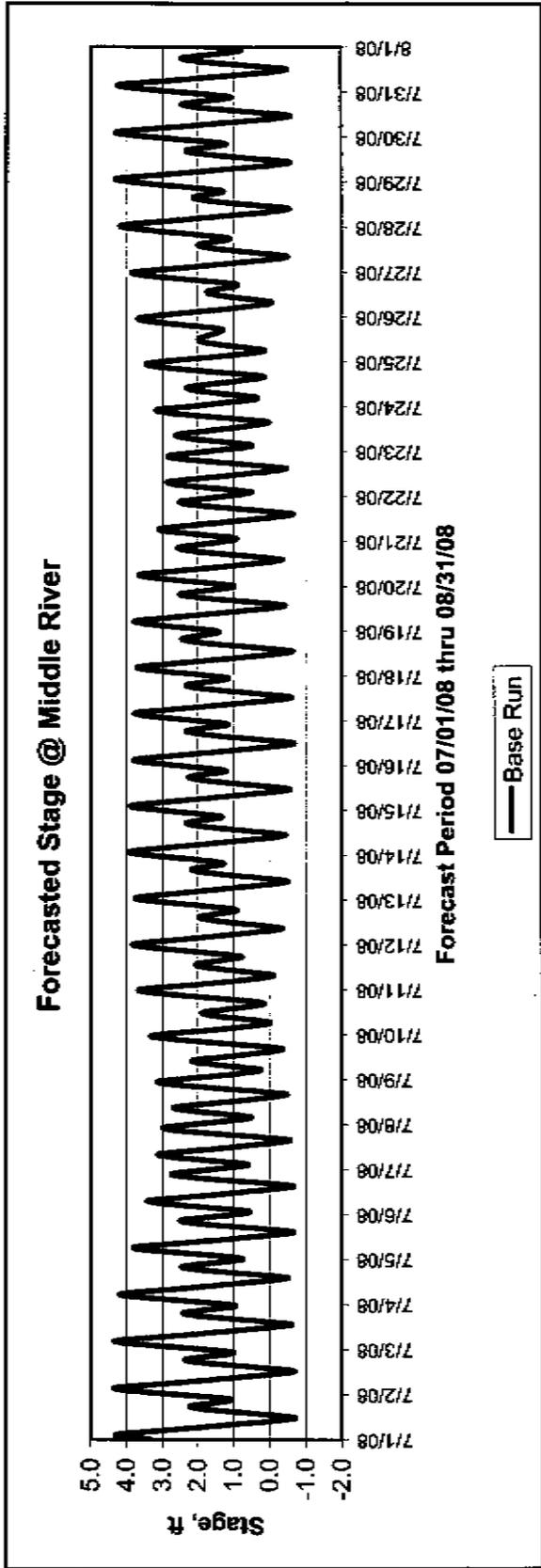
**COMPARISON OF BASELINE &
HISTORICAL STAGE
(15-MINUTE)**

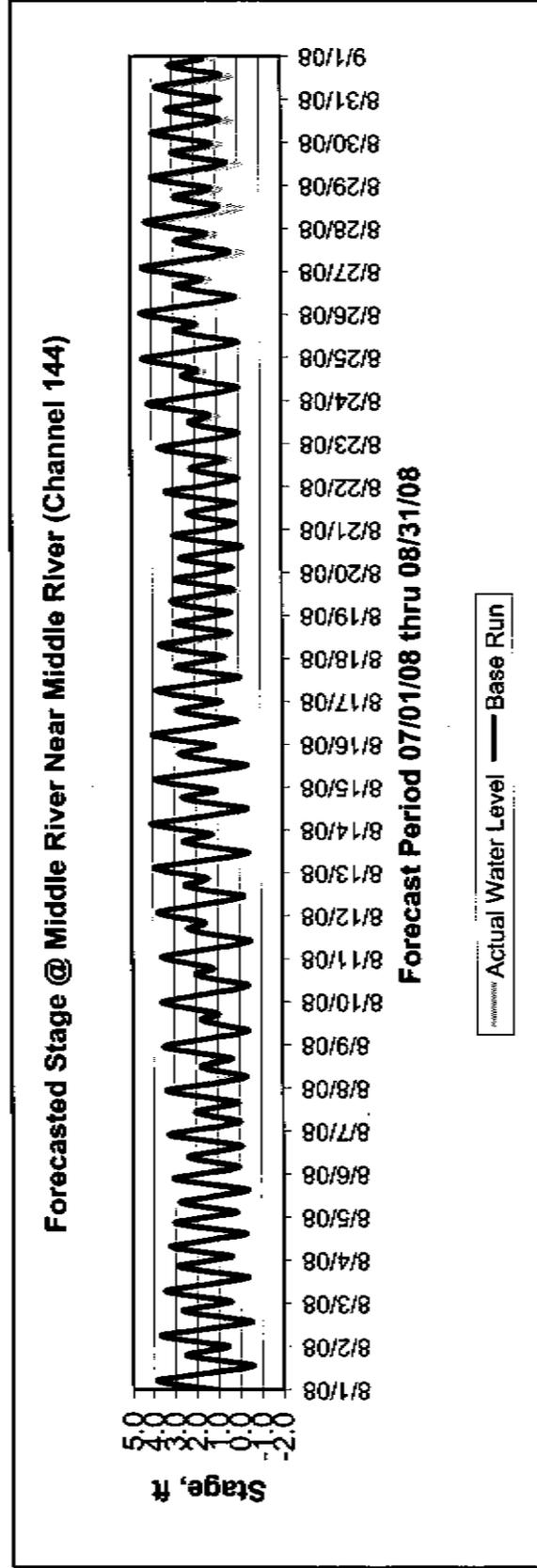
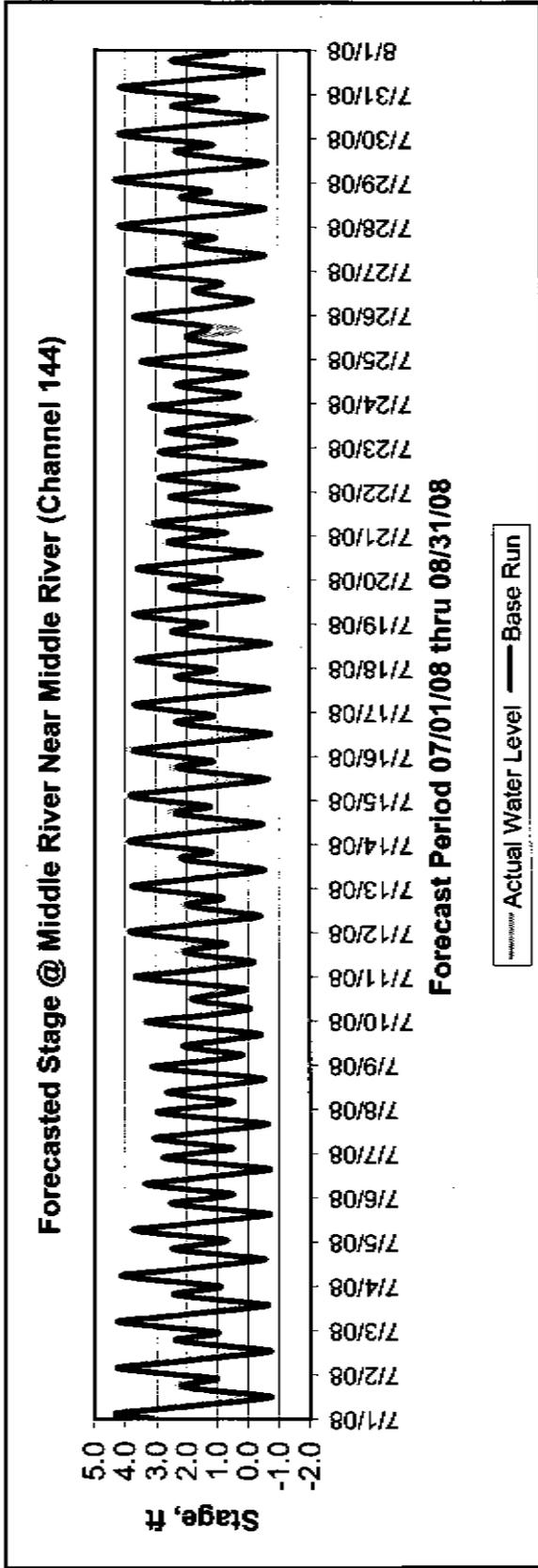
DSM2 Stage Station Locations

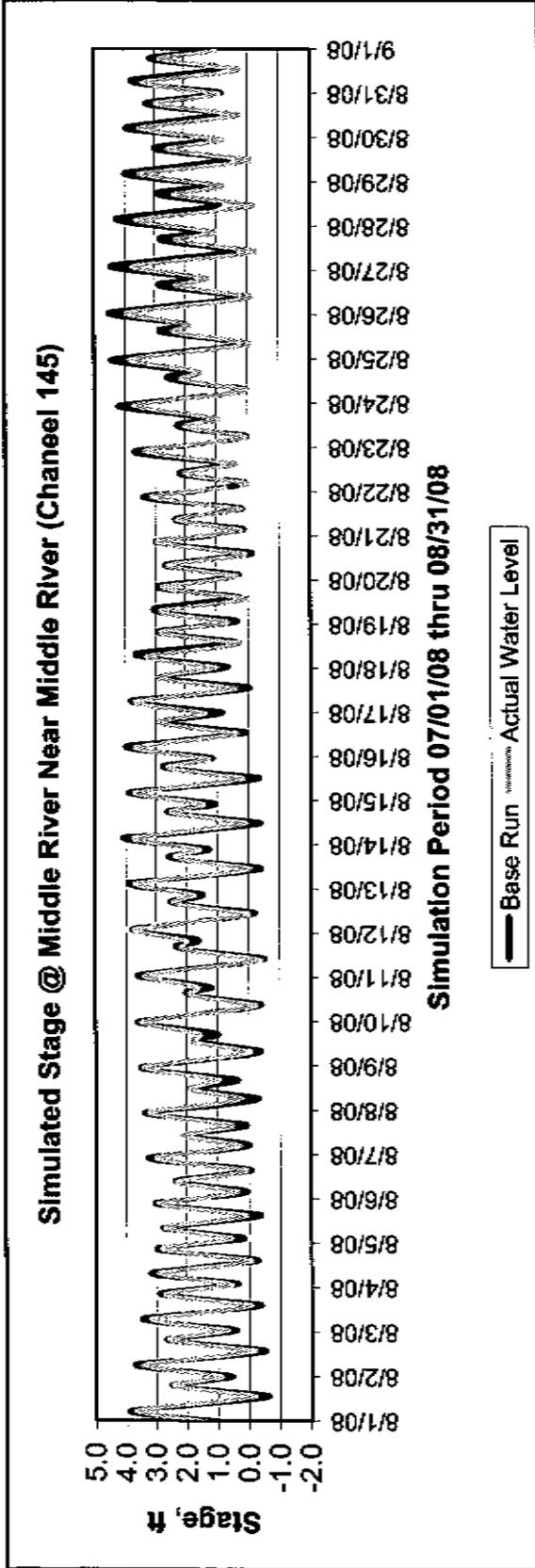
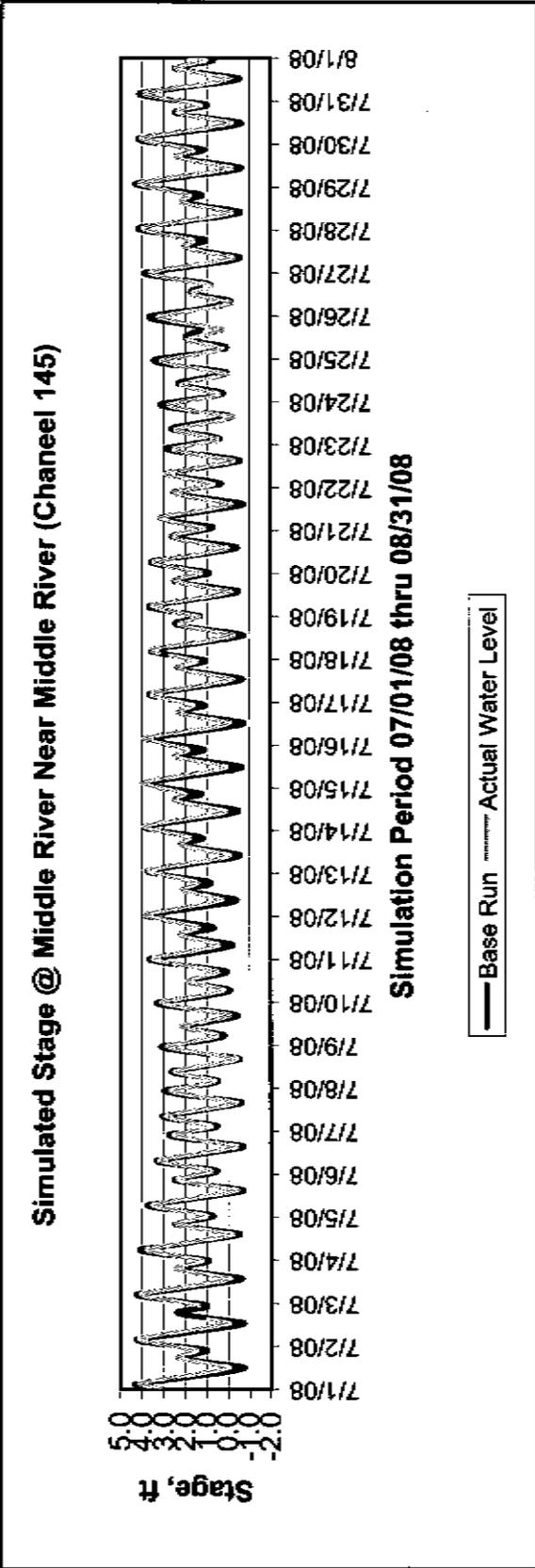


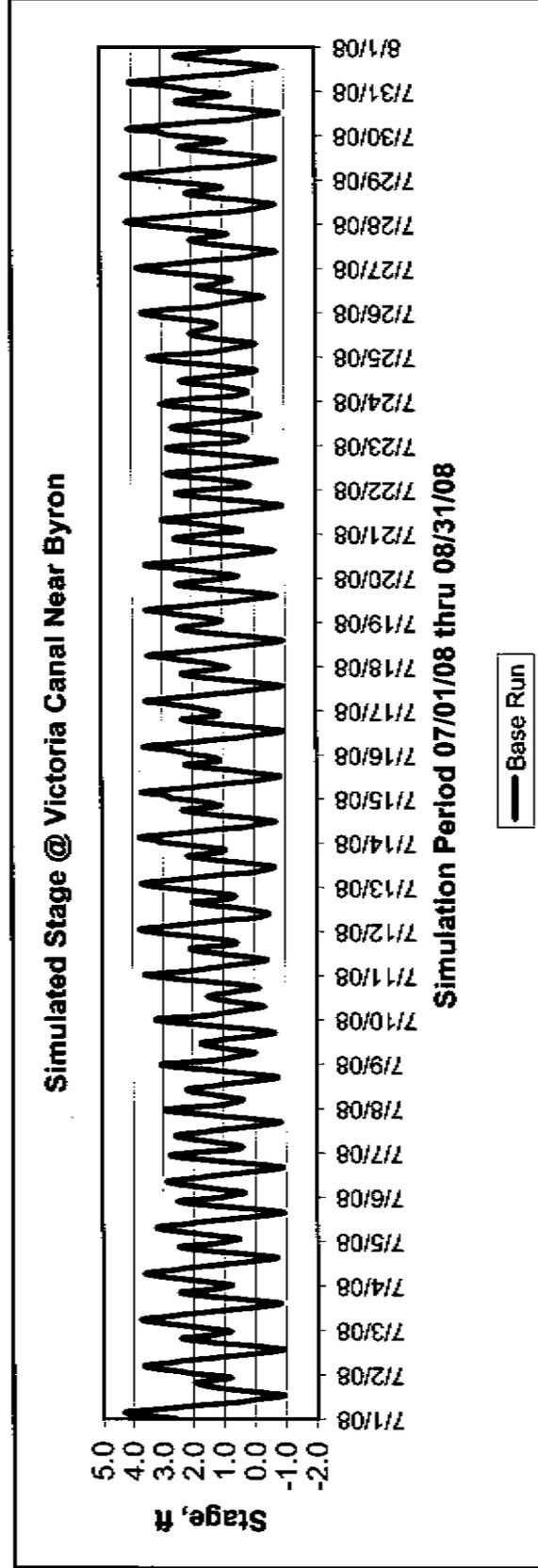
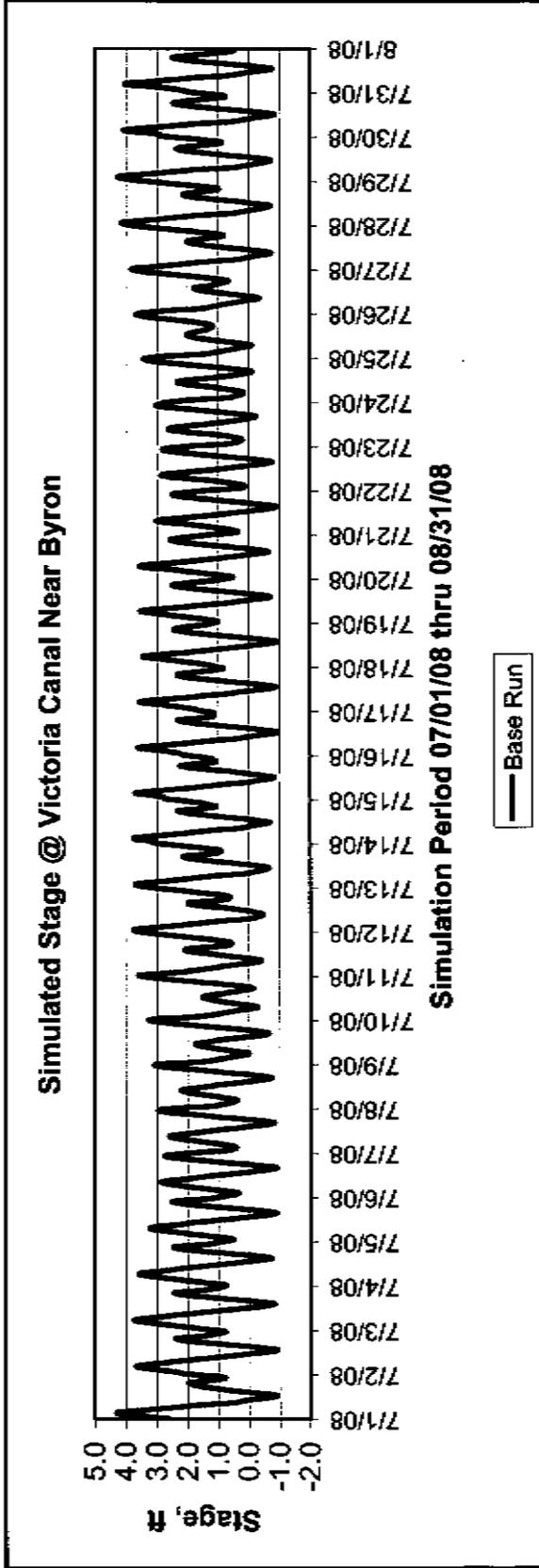
DSM2 ID	CDEC ID
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213_0	GLC
CCFB2200	CIS
CFTRN000	TRN
CHGRL009DS	GCT
CHGRL205	DGL
CHVCT000	VCU
RMID015_144	MDM
RMID015_145	MDM
RMID027	MTB
RMID129	MHR
ROLD024	BAC/OBI
ROLD034	ORB
ROLD047	ODM/OAD
ROLD059	OLD
ROLD074	OH1
RSAN058	RRI
RSAN072	BDT
RSAN087	MSD
SLTMP000	TPI
SLTMP017	TPS

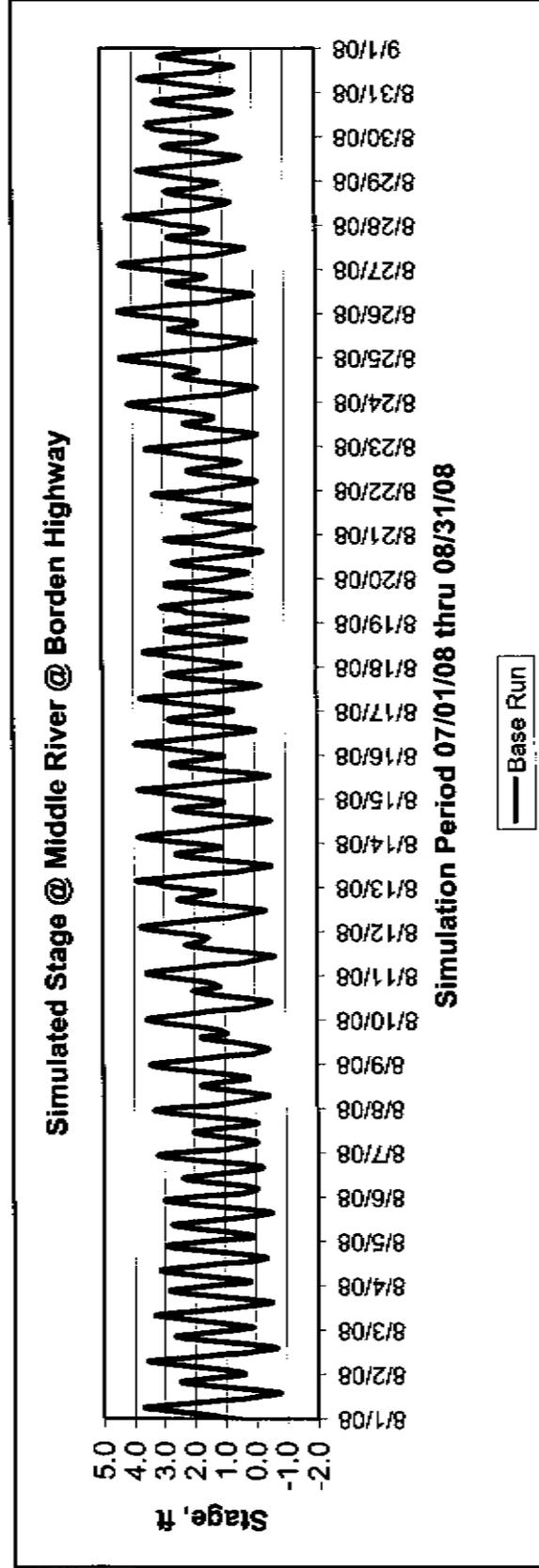
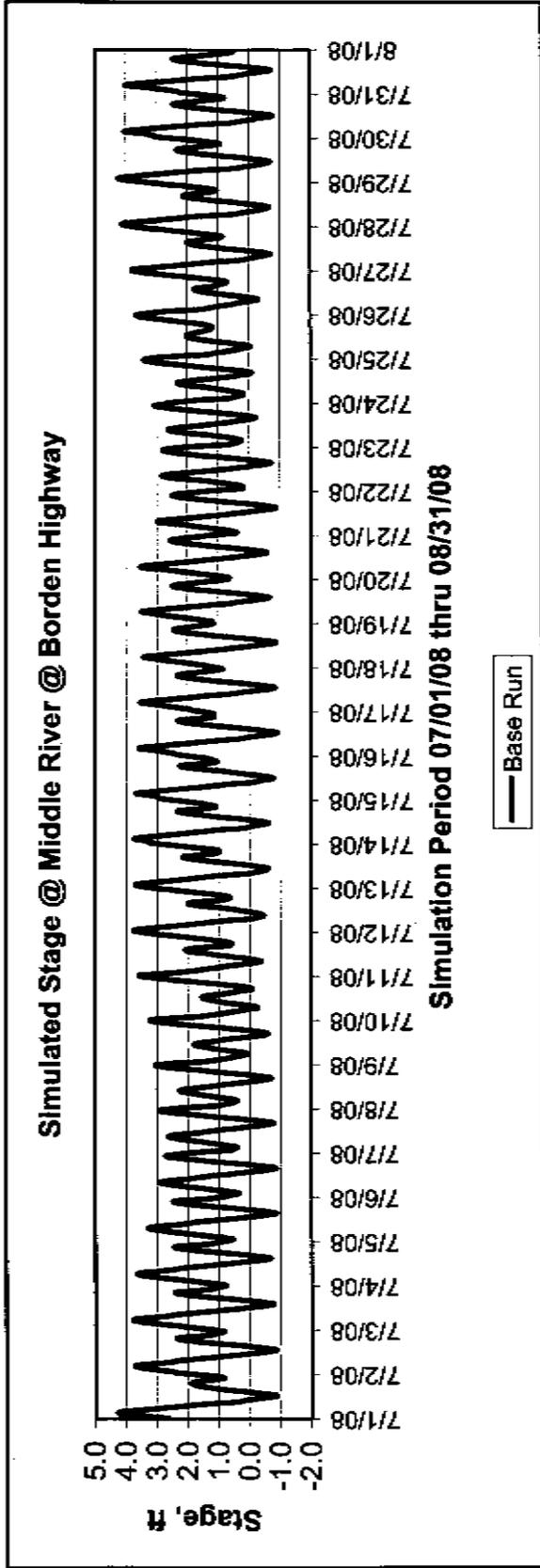
MIDDLE RIVER - STAGE

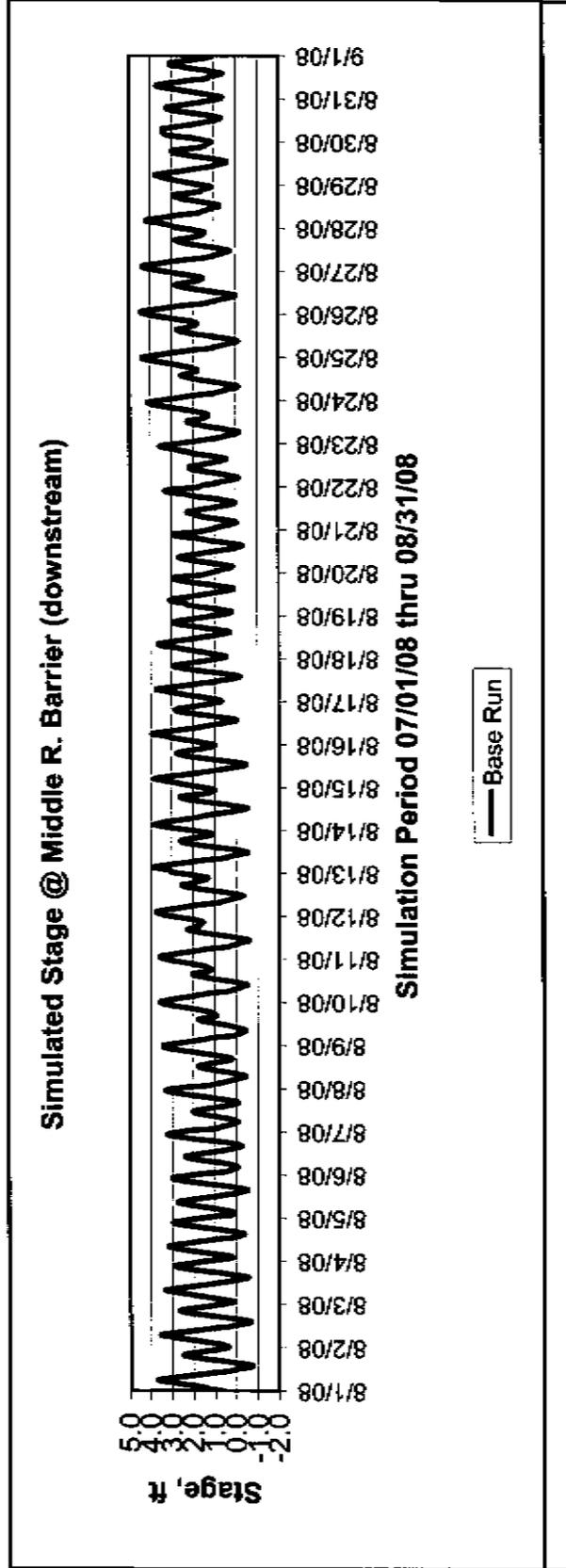
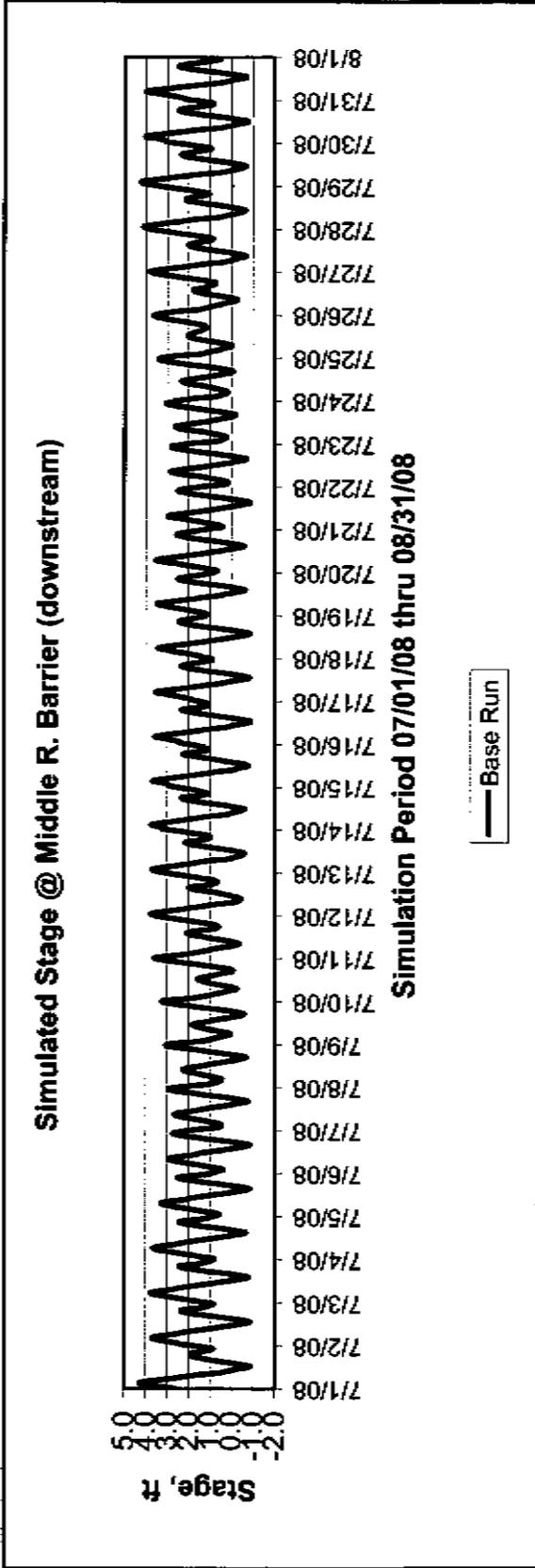




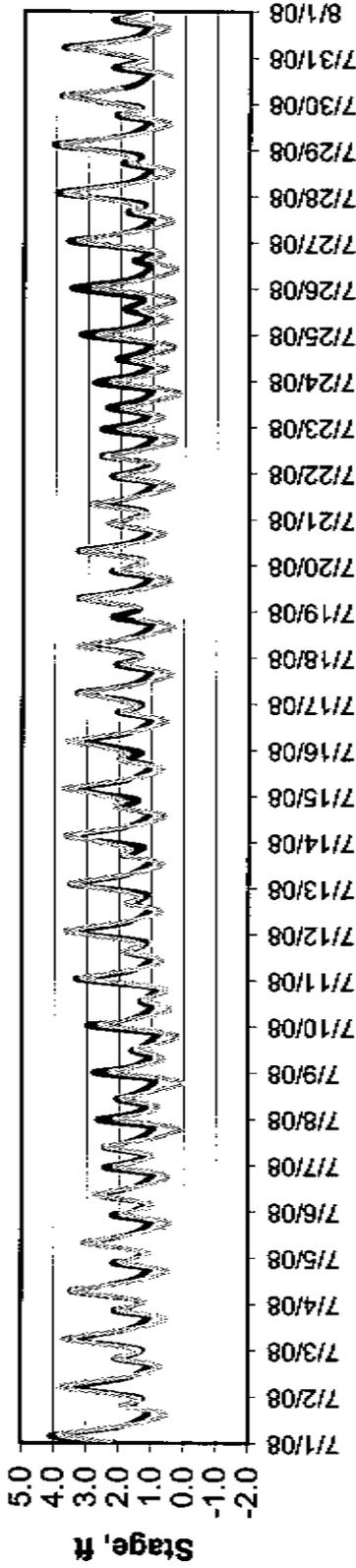






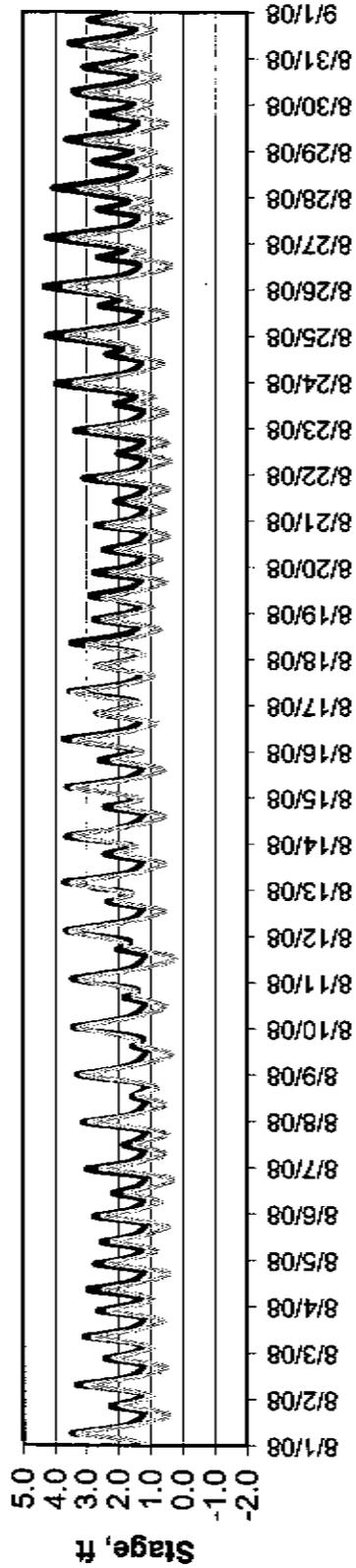


Simulated Stage @ Middle River @ Tracy Blvd

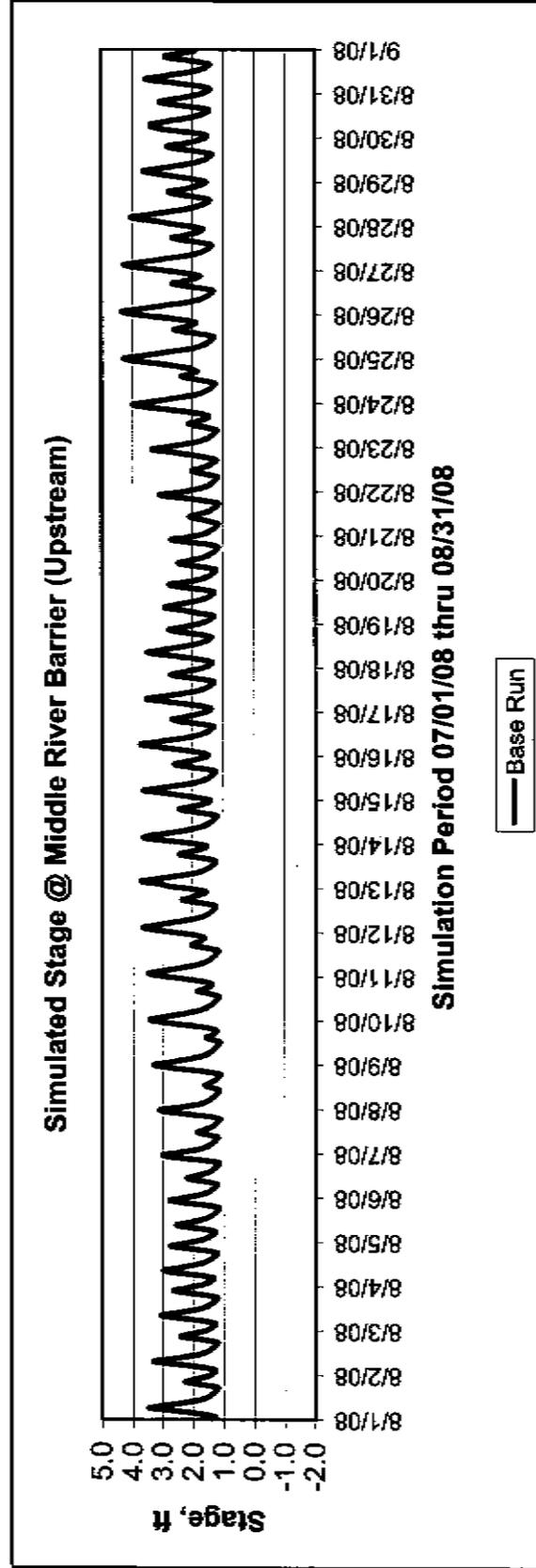
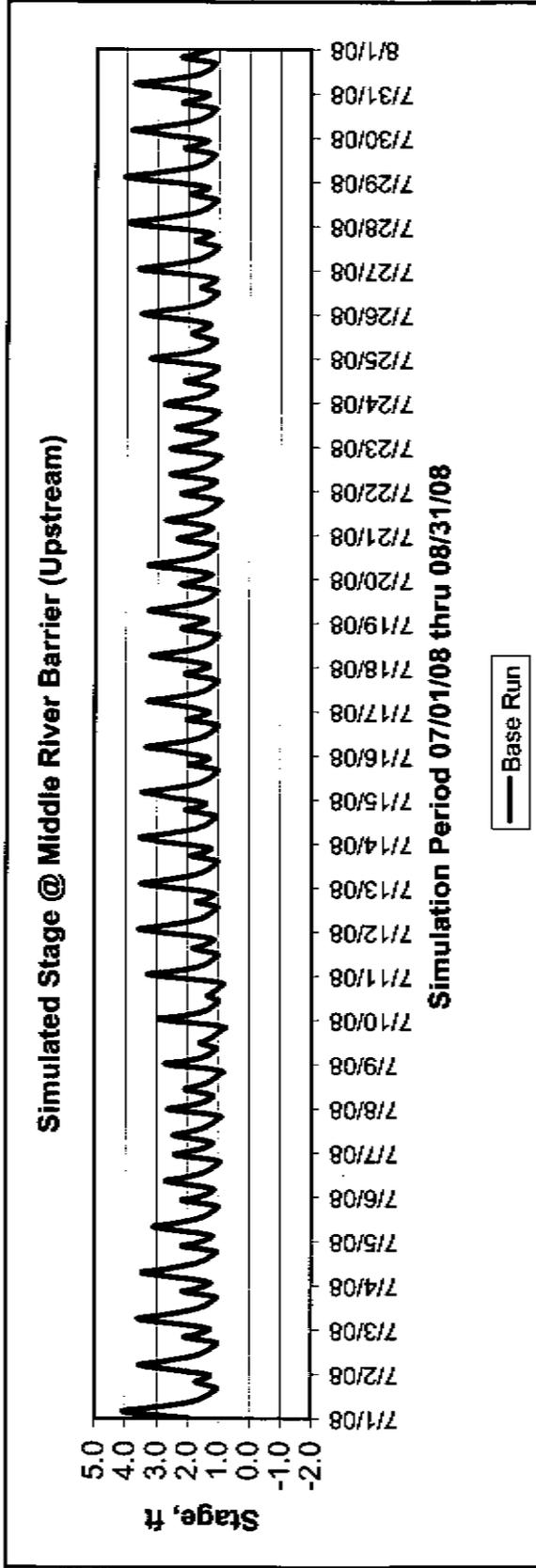


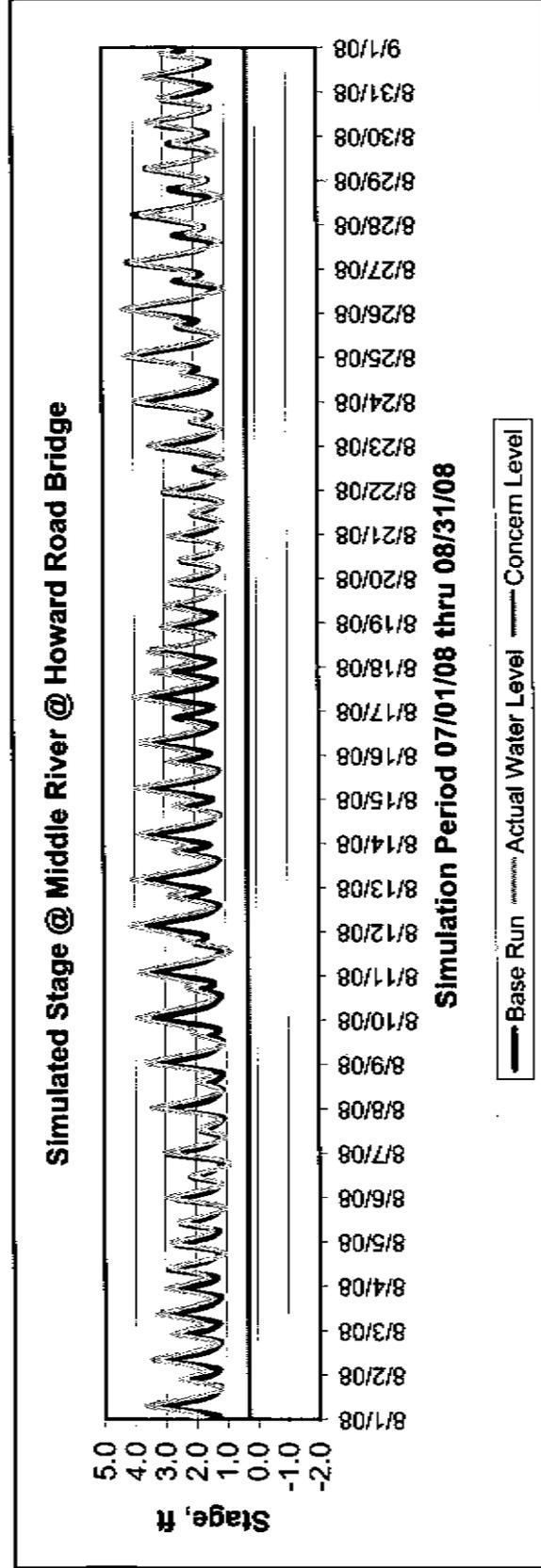
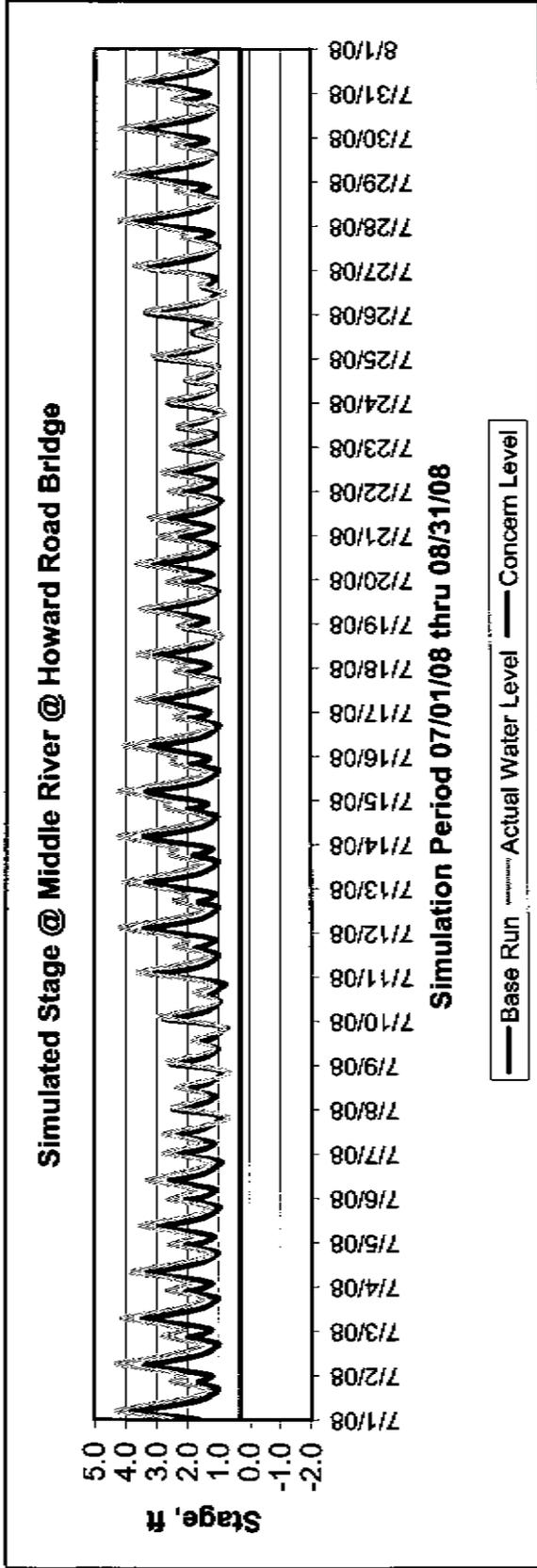
Simulation Generally Looks Good;
Appropriate Datum Correction Needed

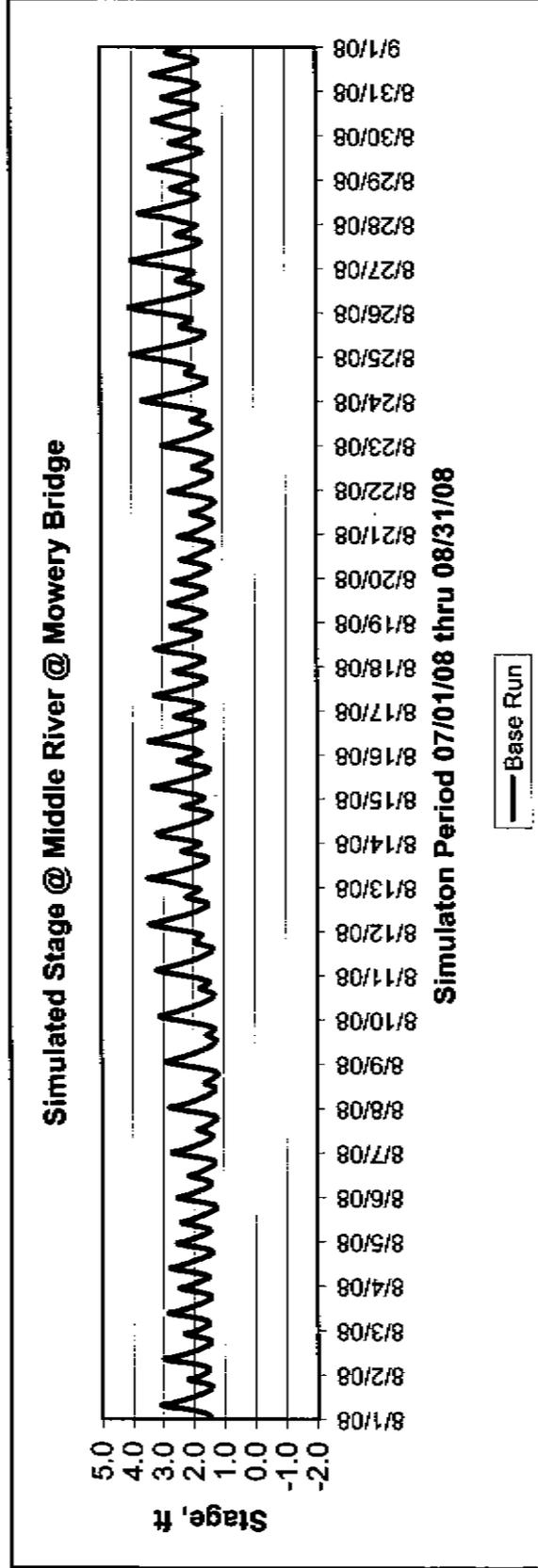
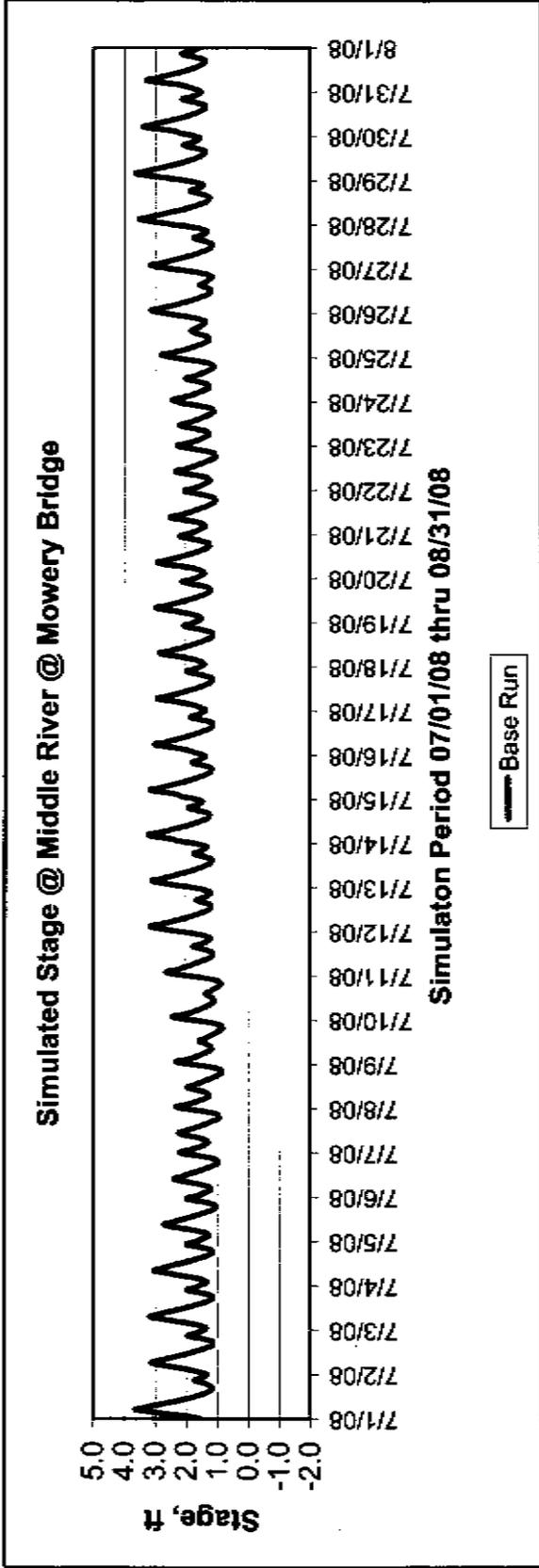
Simulated Stage @ Middle River @ Tracy Blvd

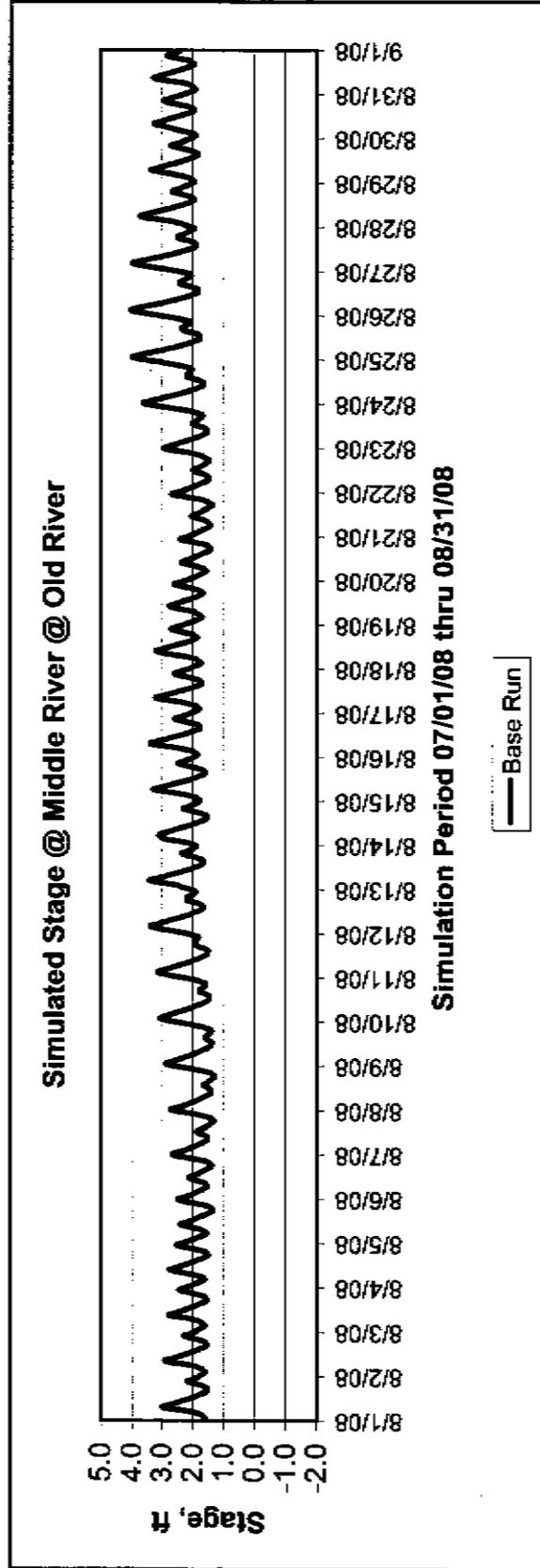
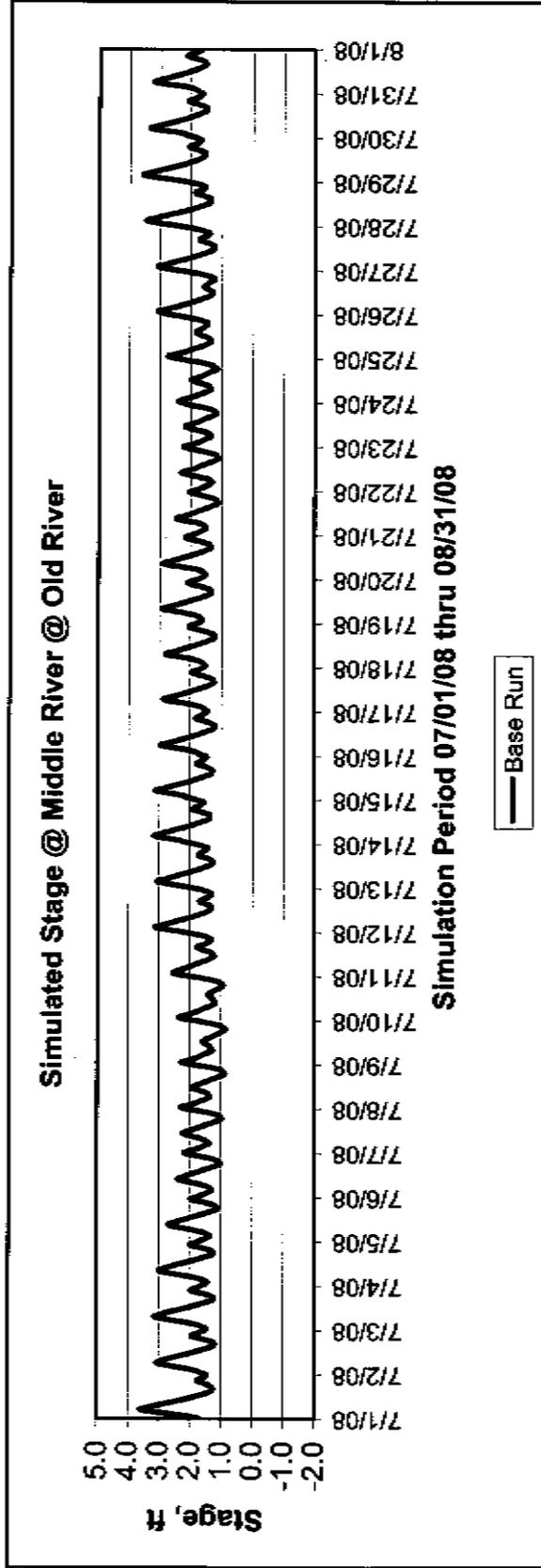


Simulation Generally Looks Good;
Appropriate Datum Correction Needed

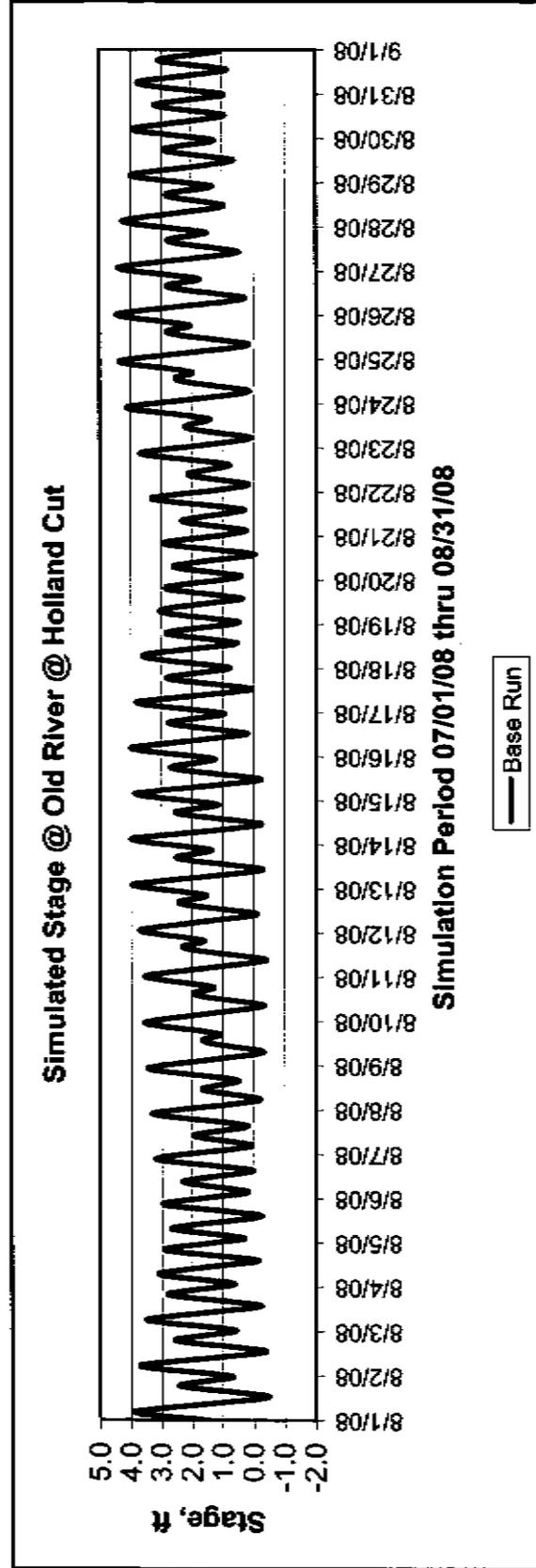
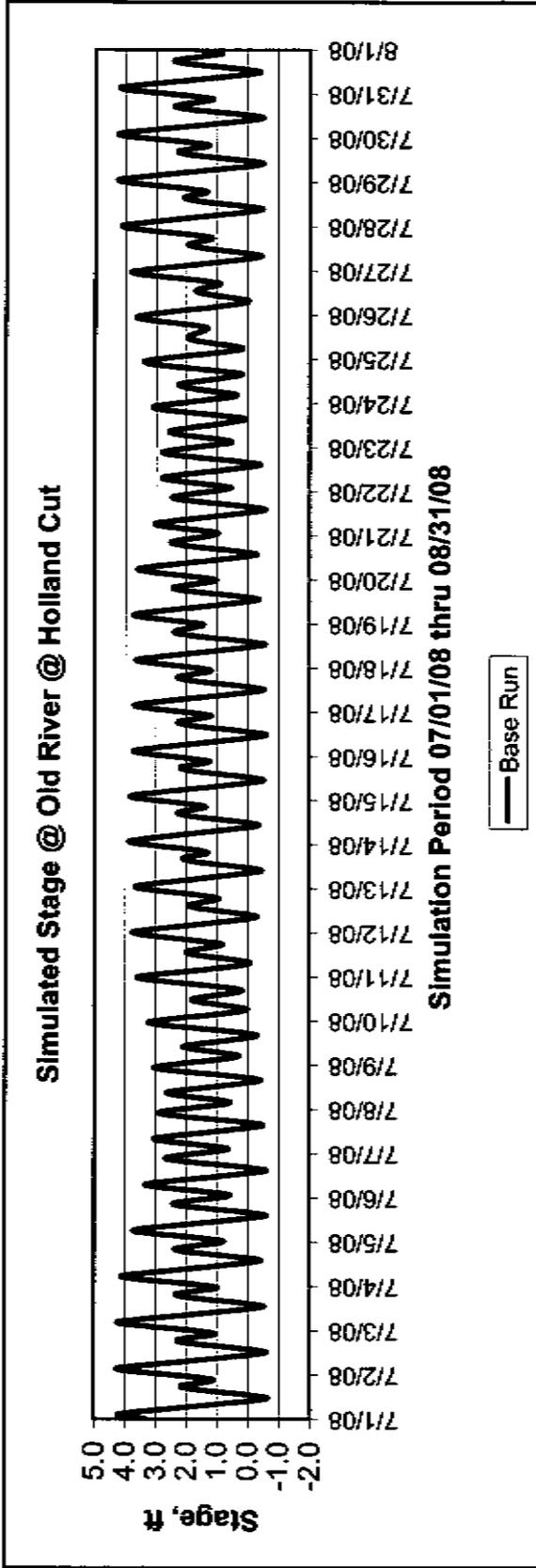




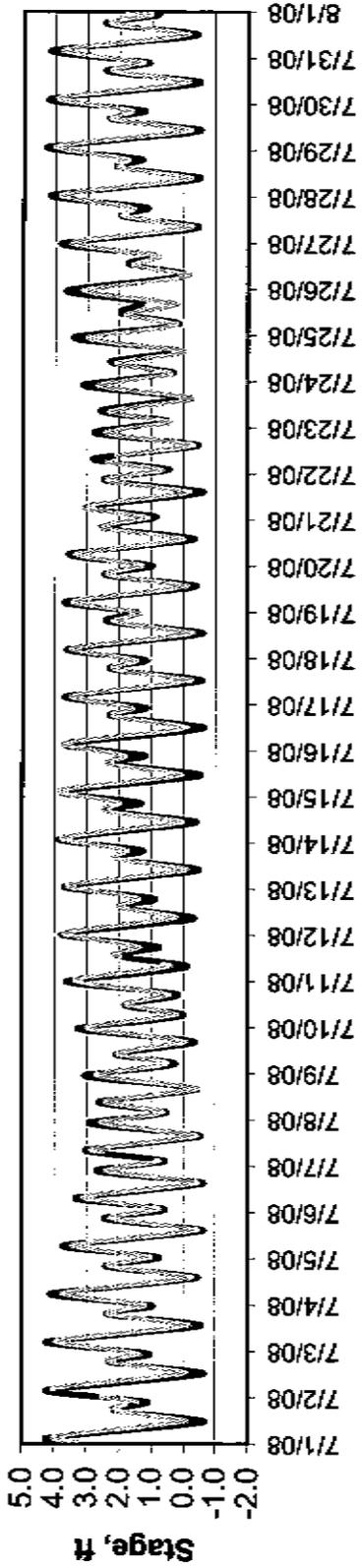




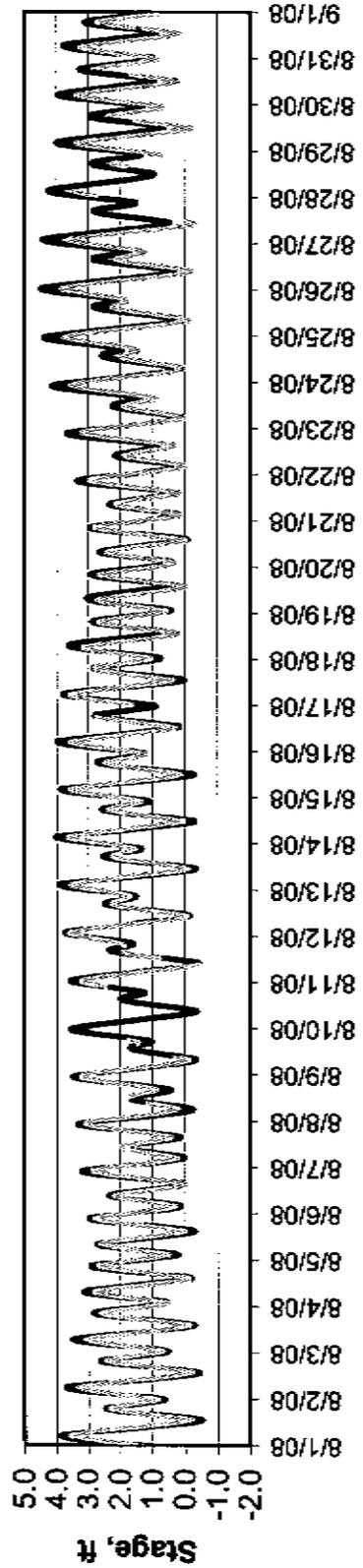
OLD RIVER - STAGE



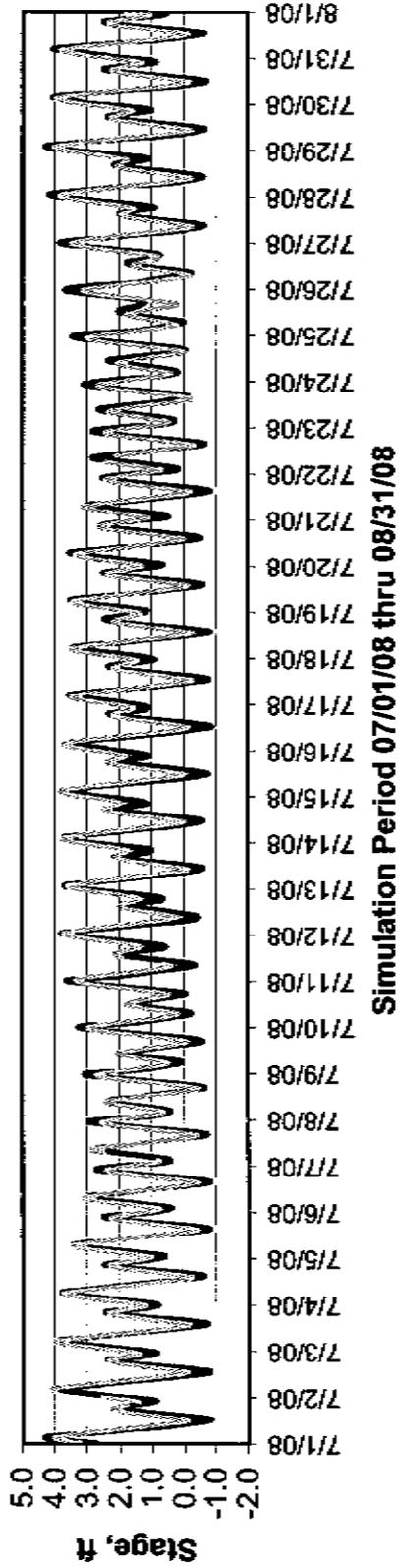
Simulated Stage @ Old River @ Bacon Island



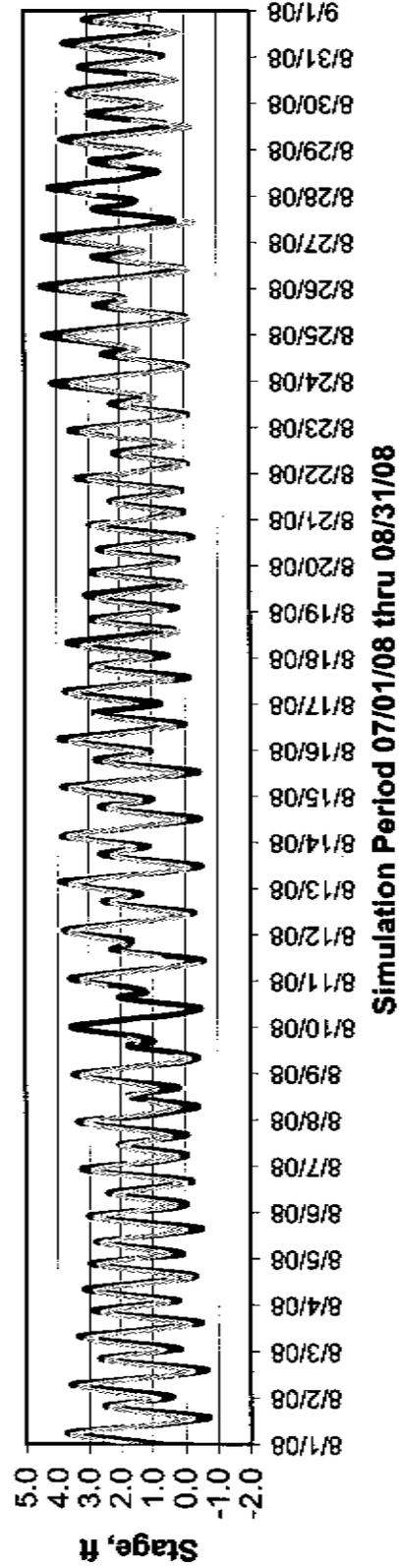
Simulated Stage @ Old River @ Bacon Island



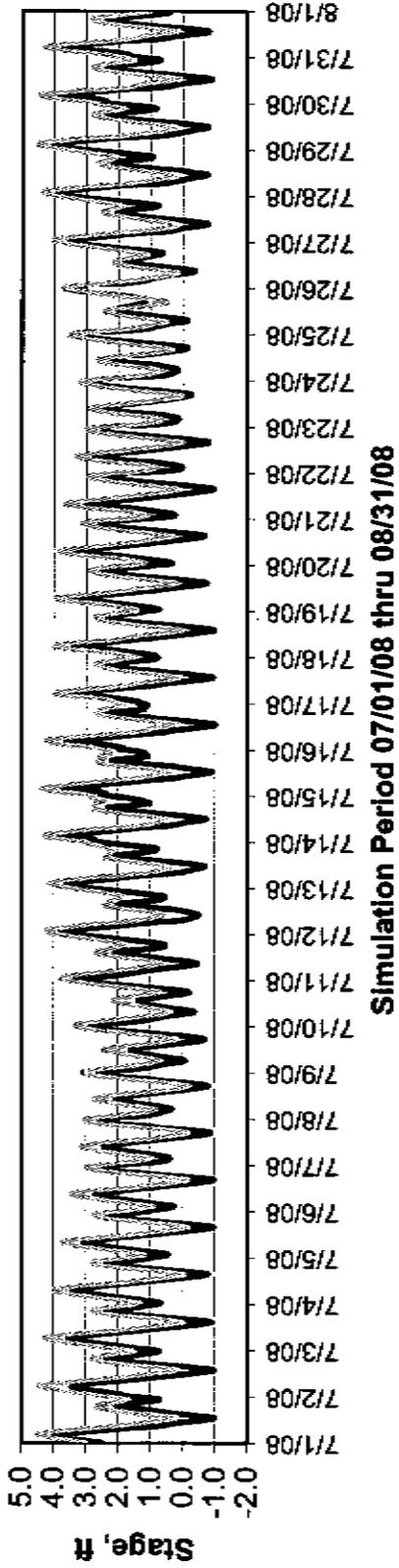
Simulated Stage @ Old River Near Byron



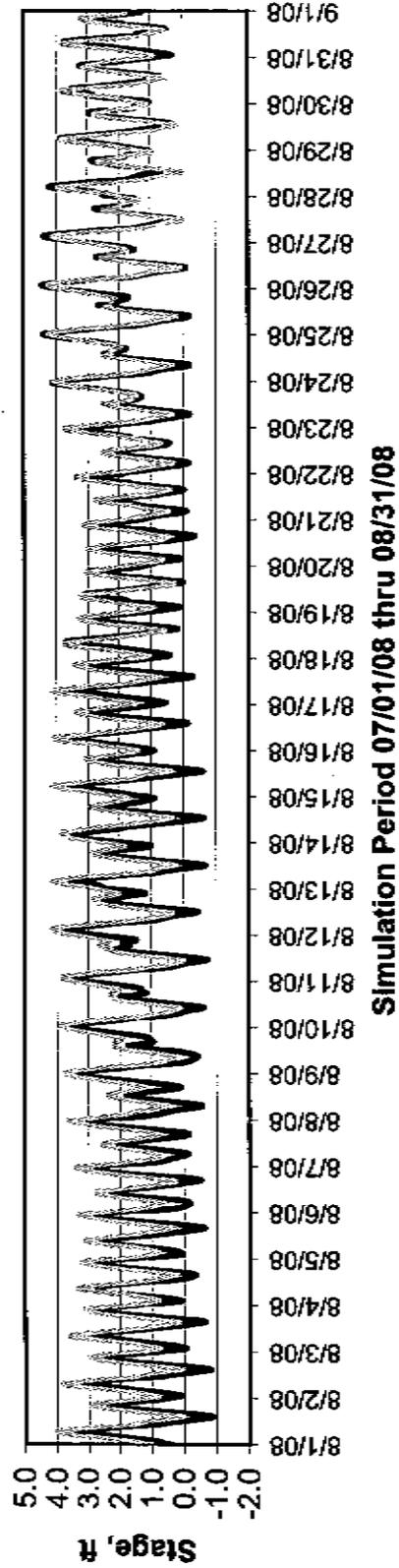
Simulated Stage @ Old River Near Byron

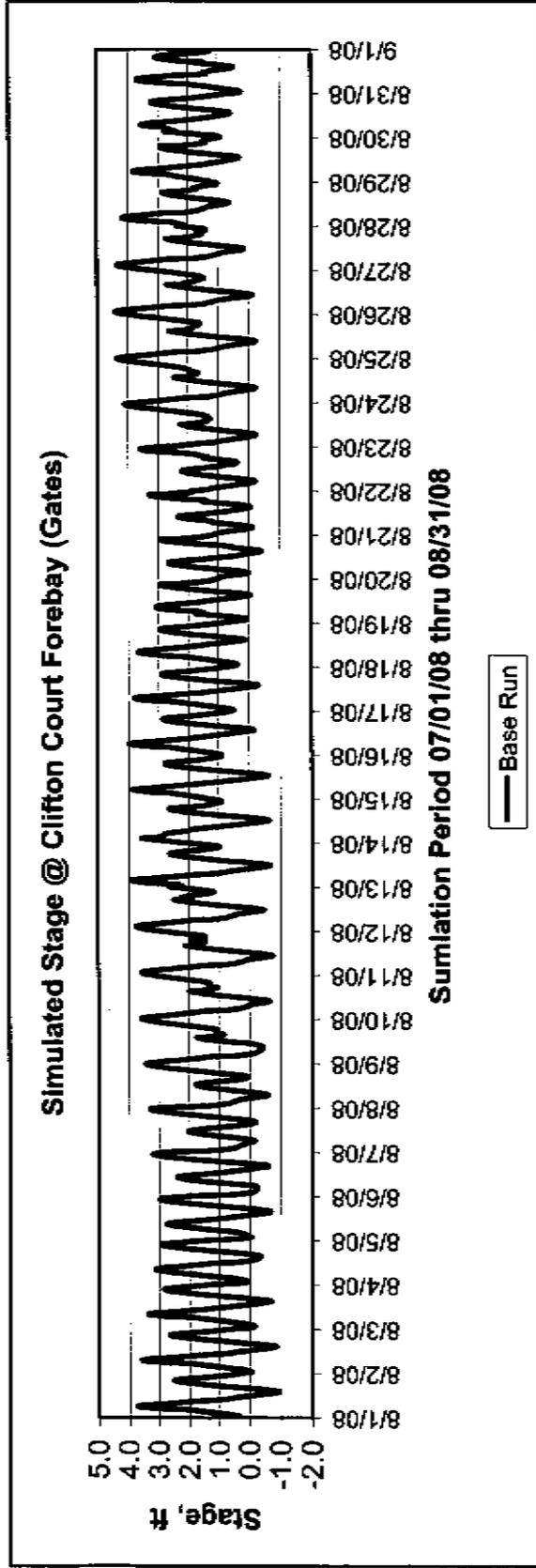
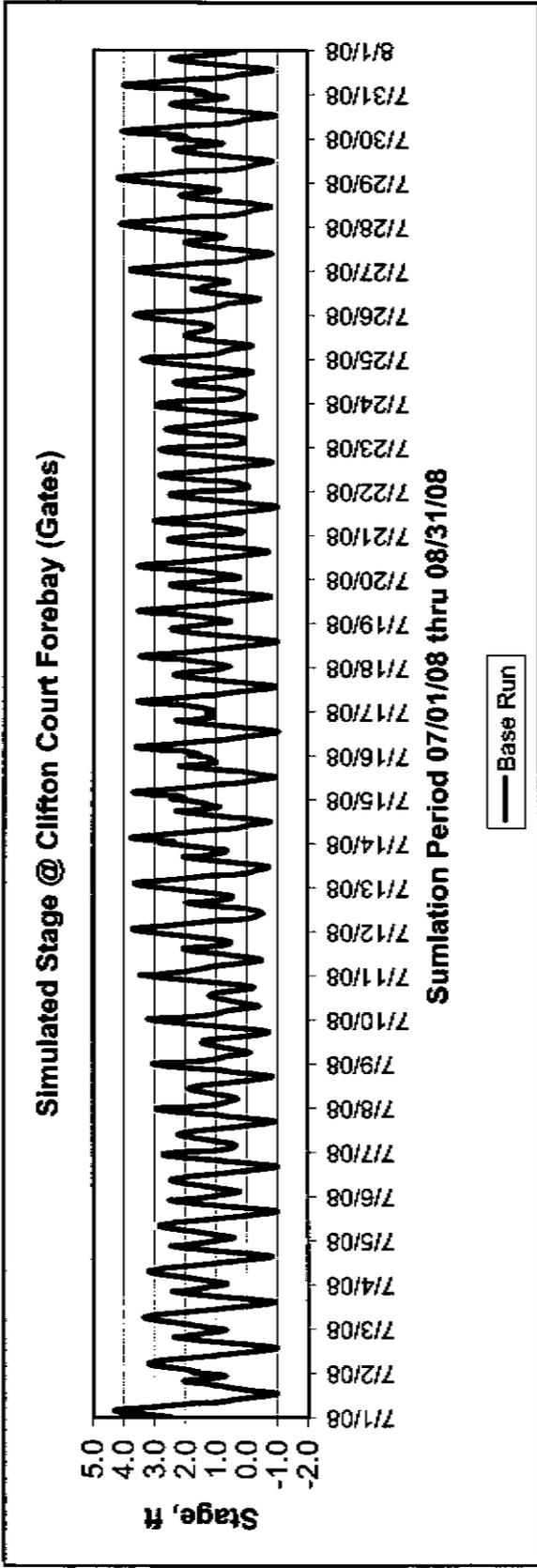


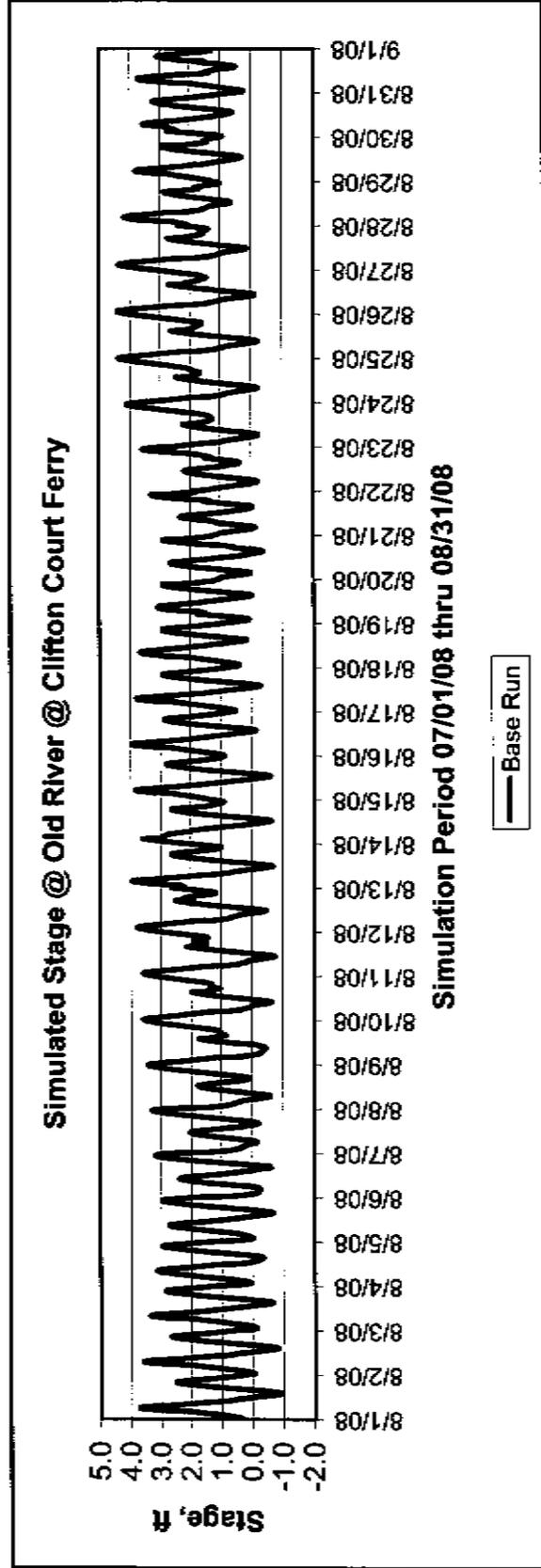
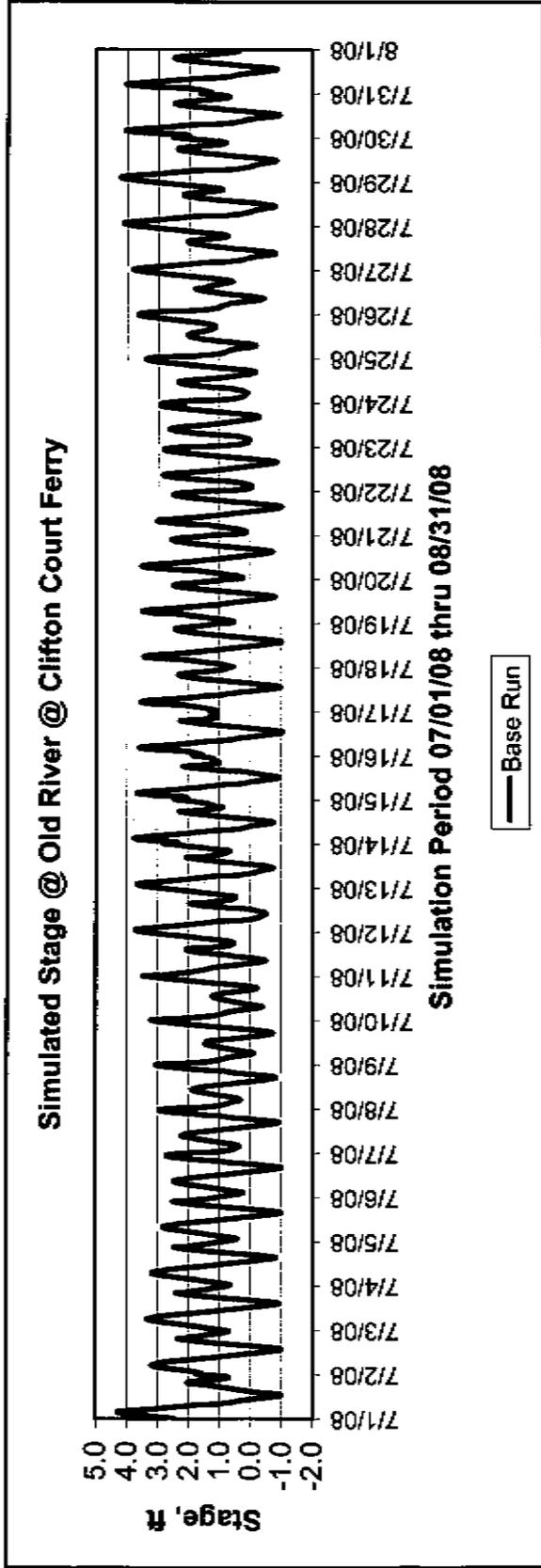
Simulated Stage @ West of Union Island (Old R. @ Coney Island)

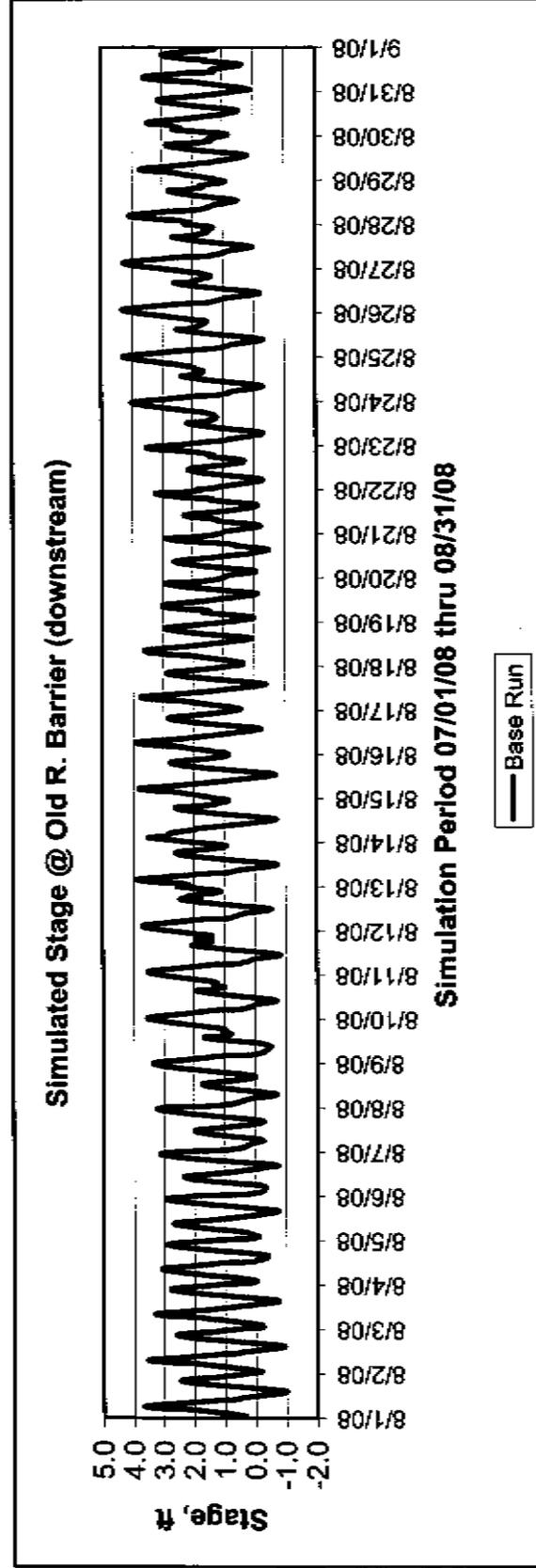
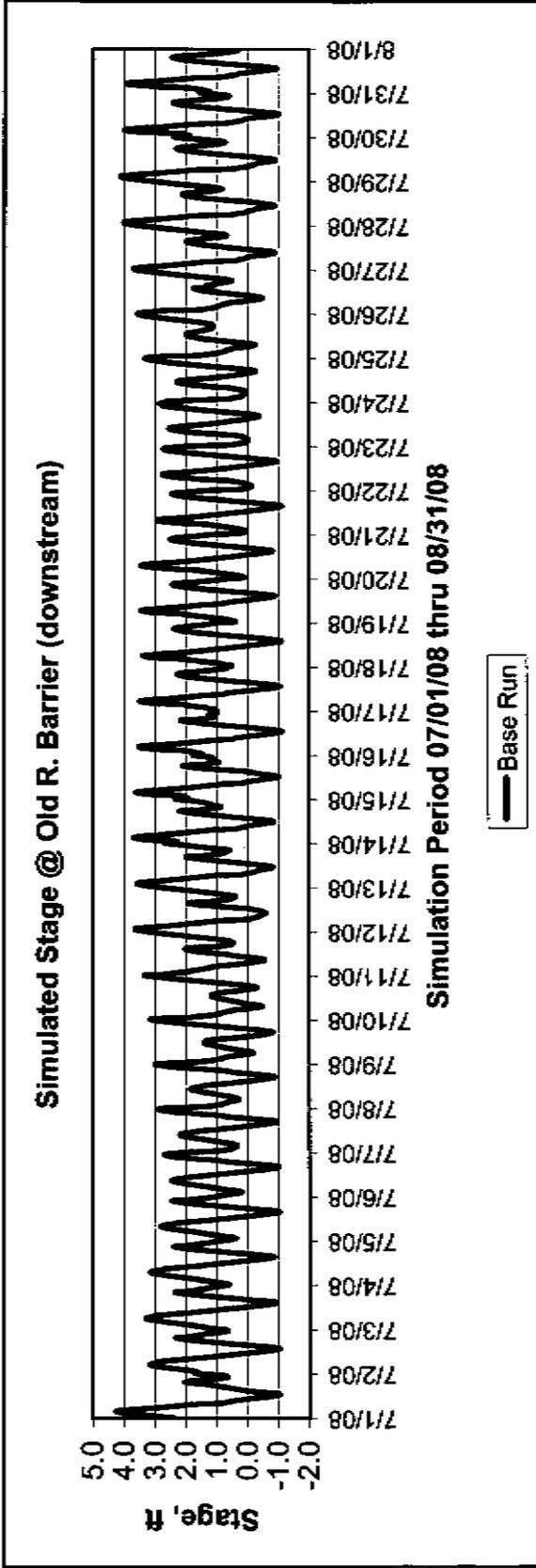


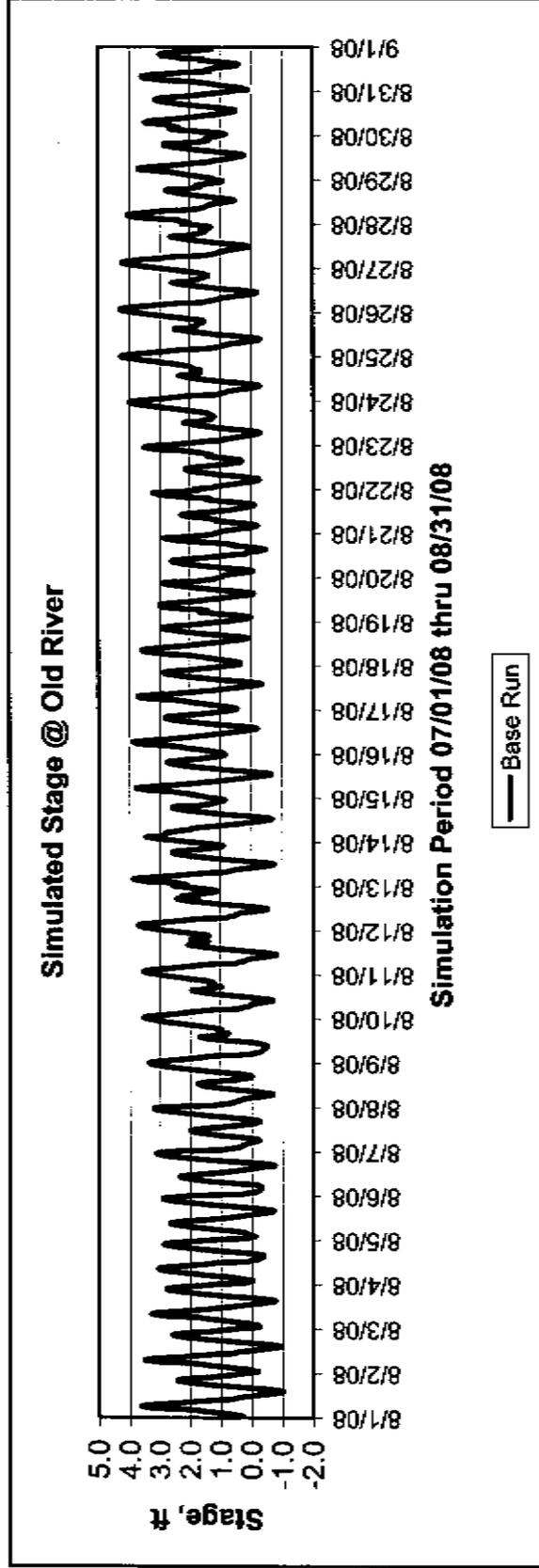
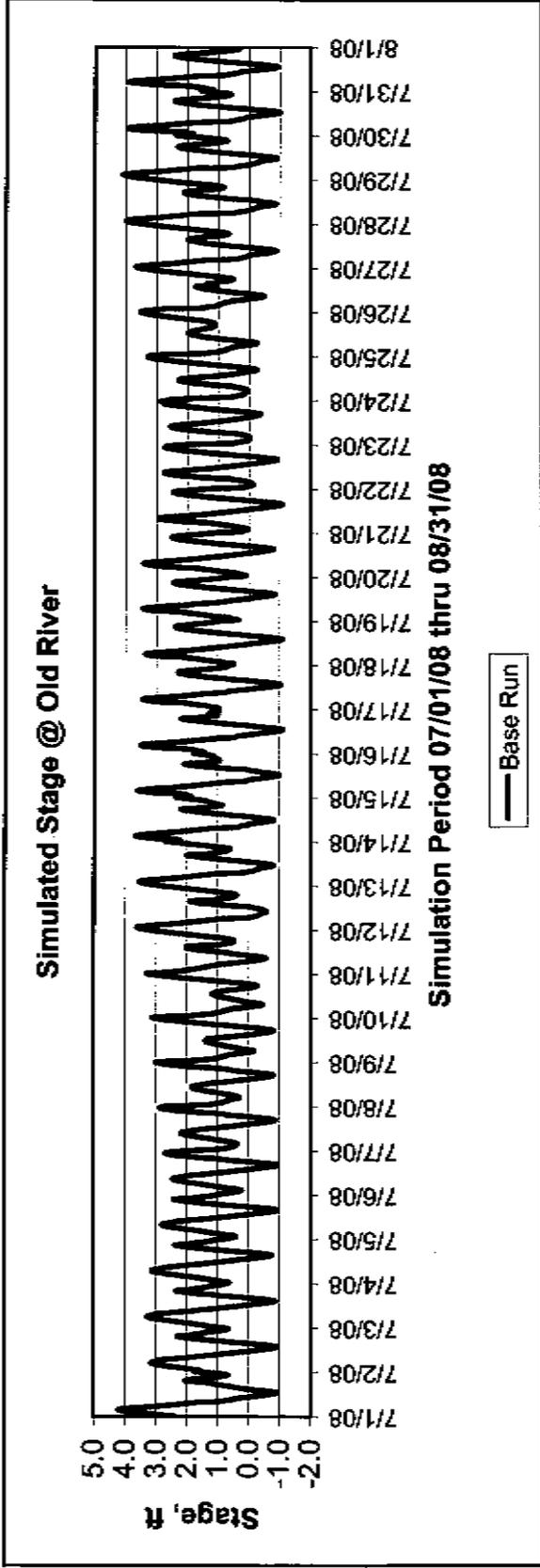
Simulated Stage @ West of Union Island (Old R. @ Coney Island)

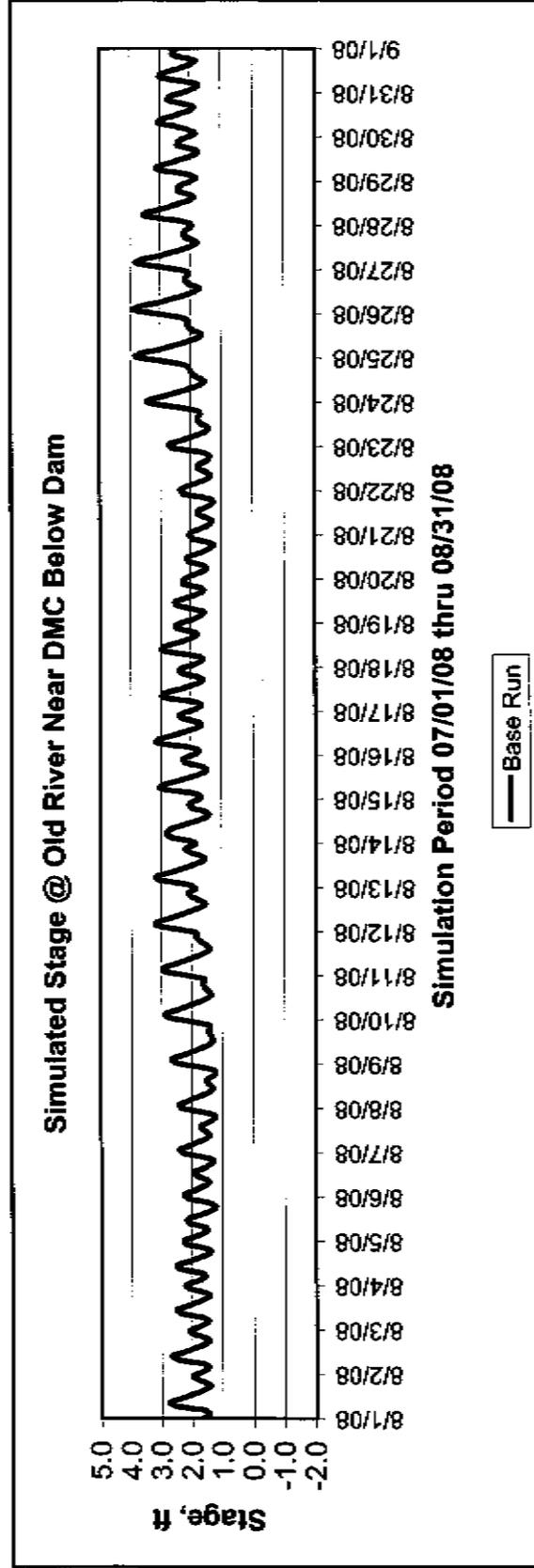
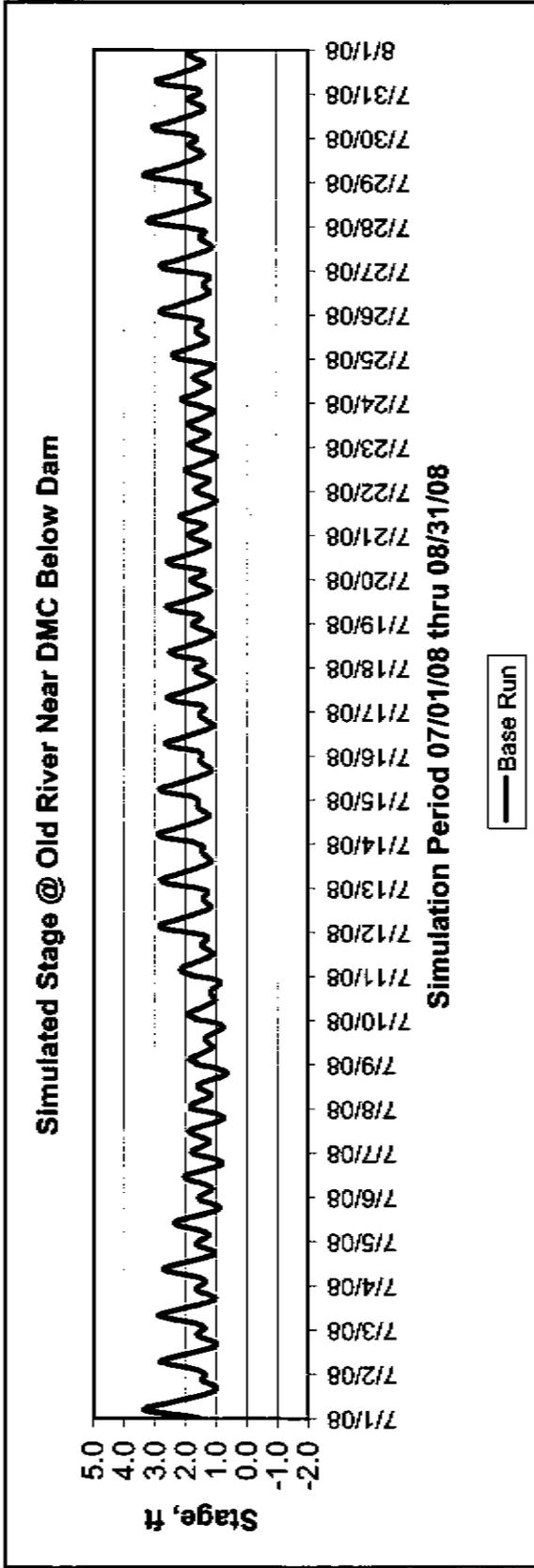


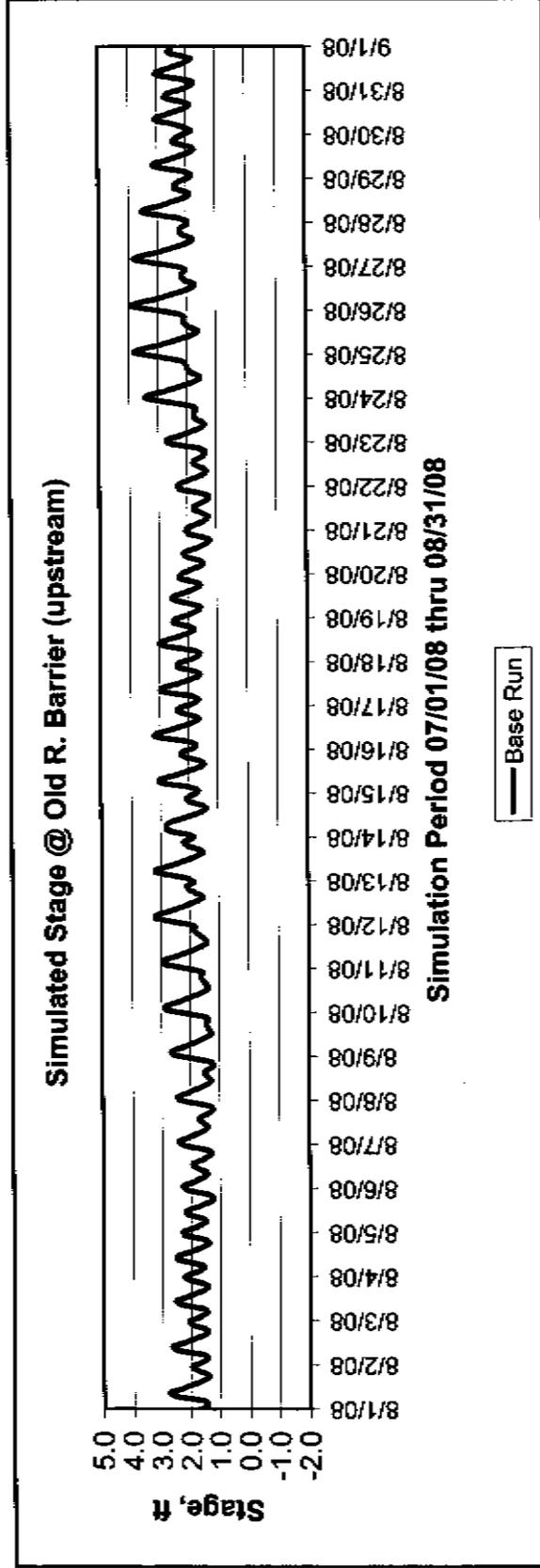
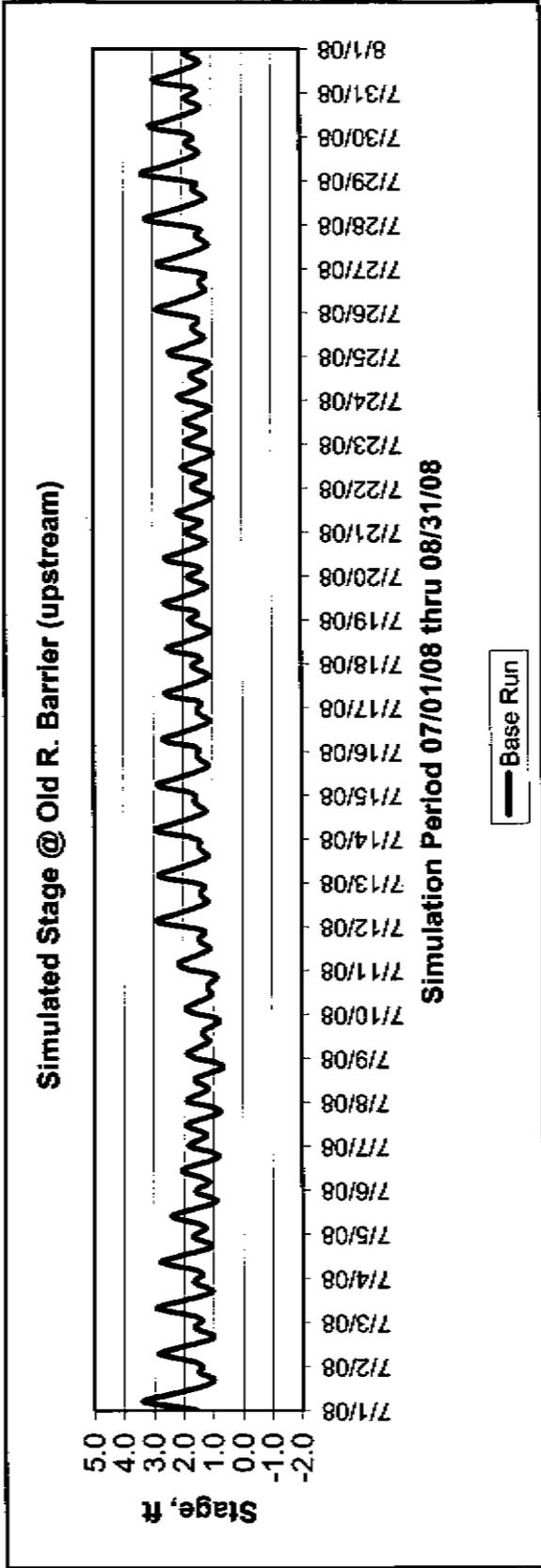


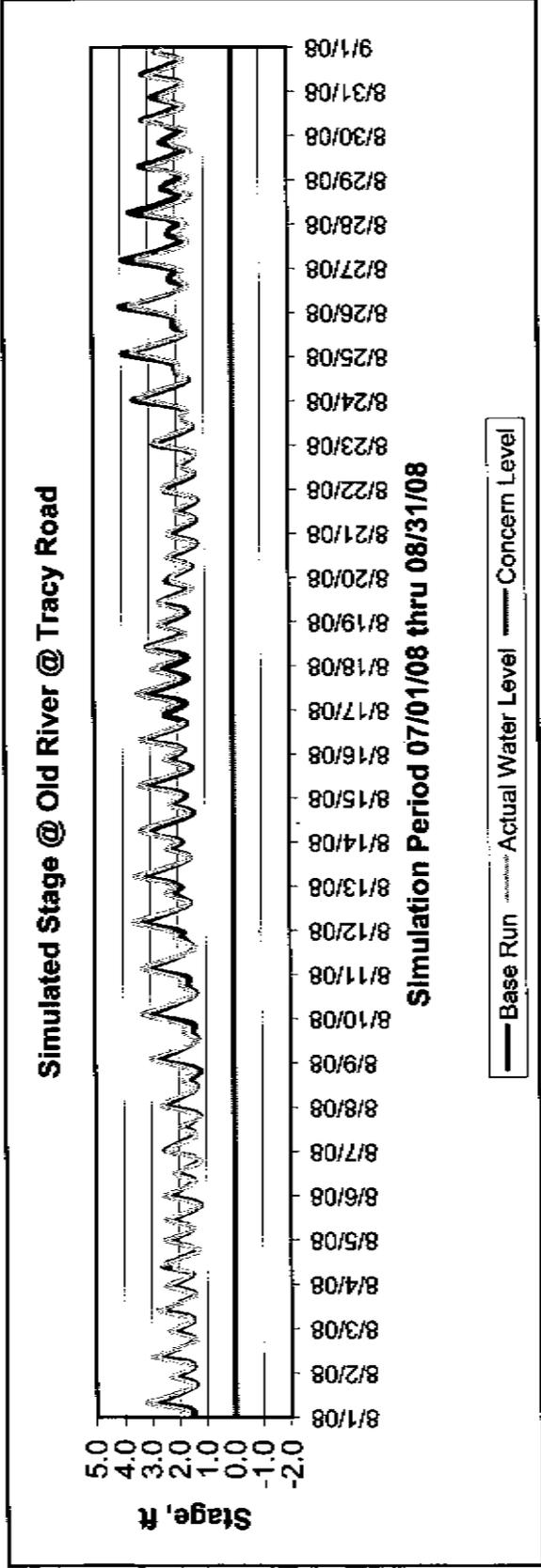
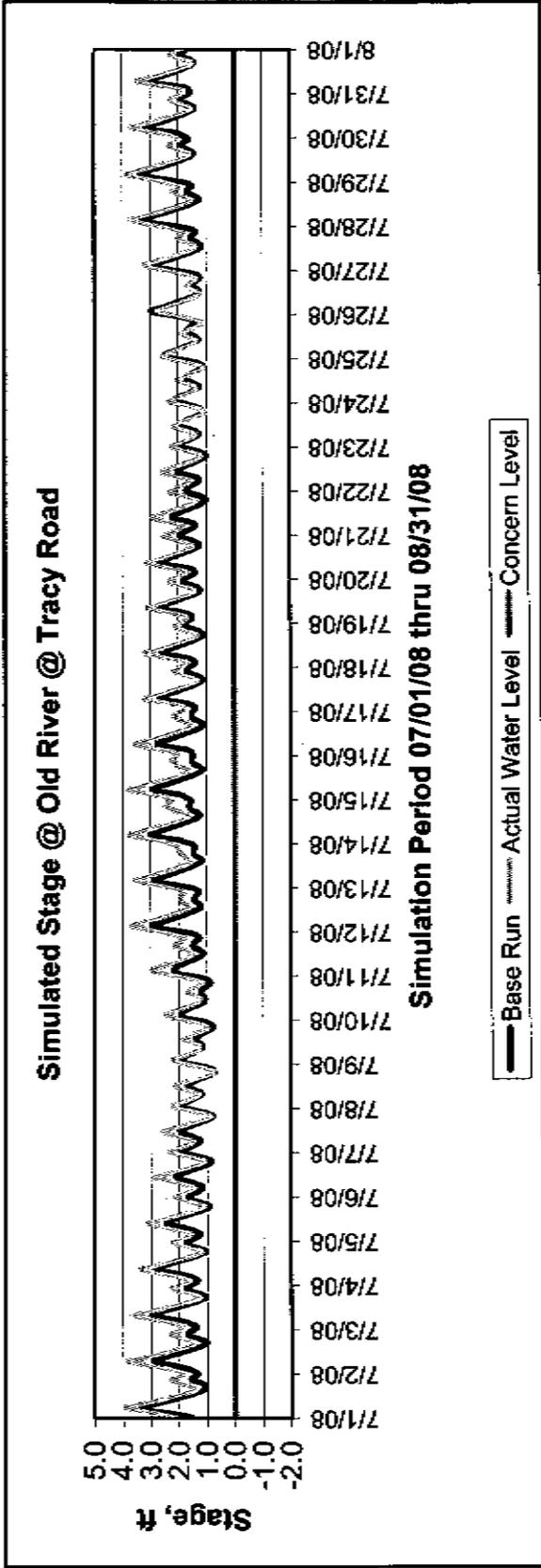


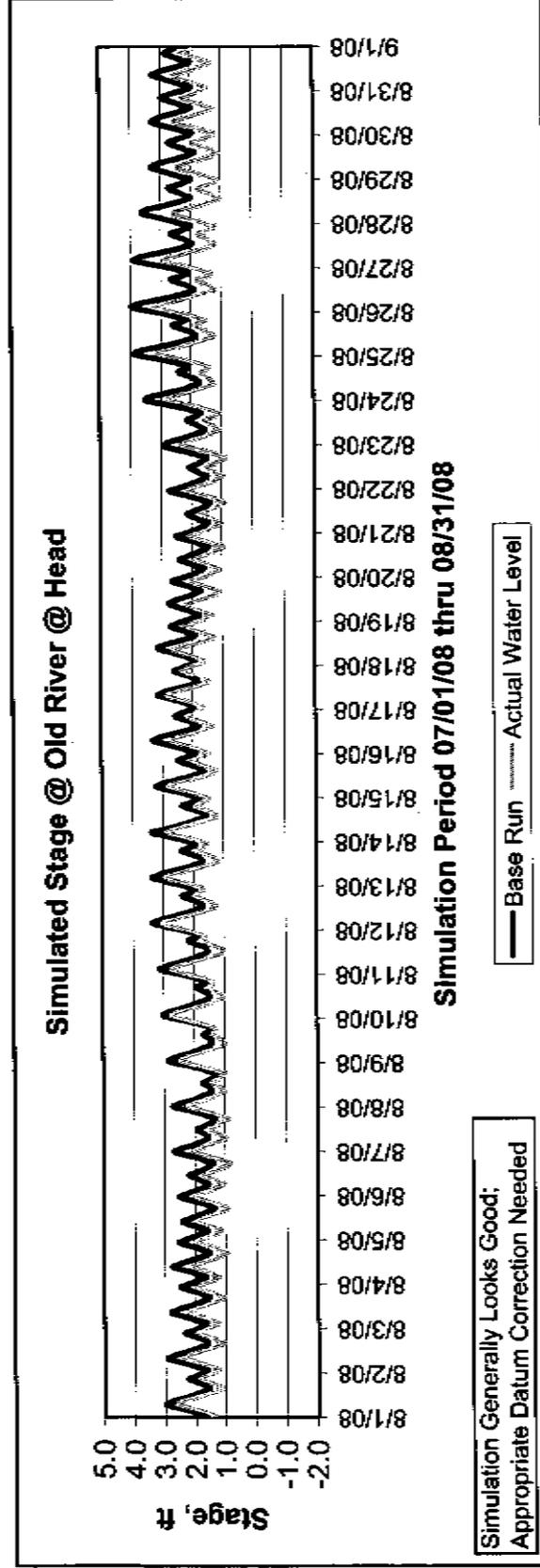
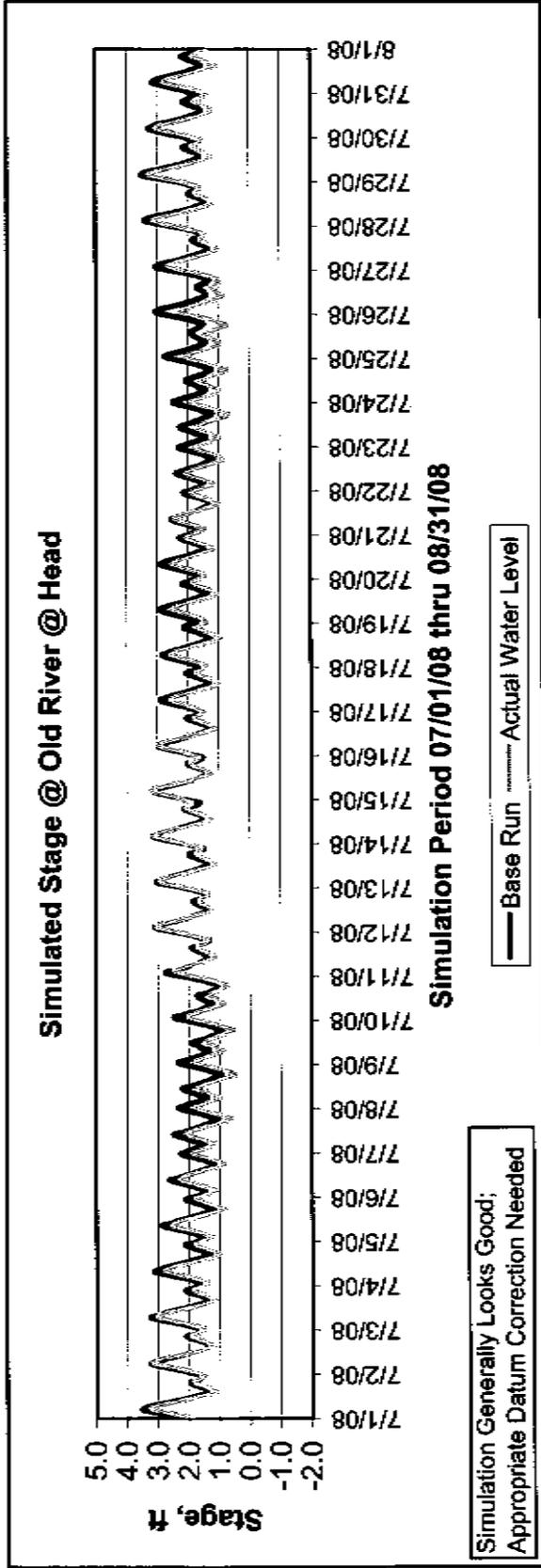


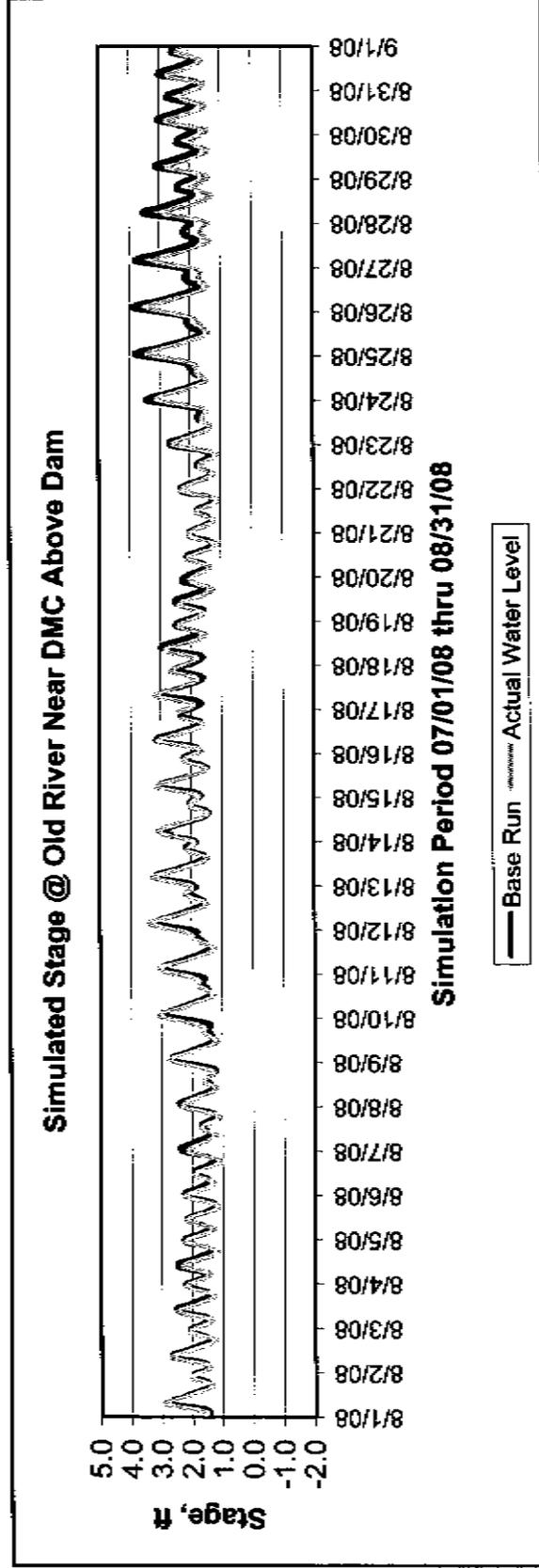
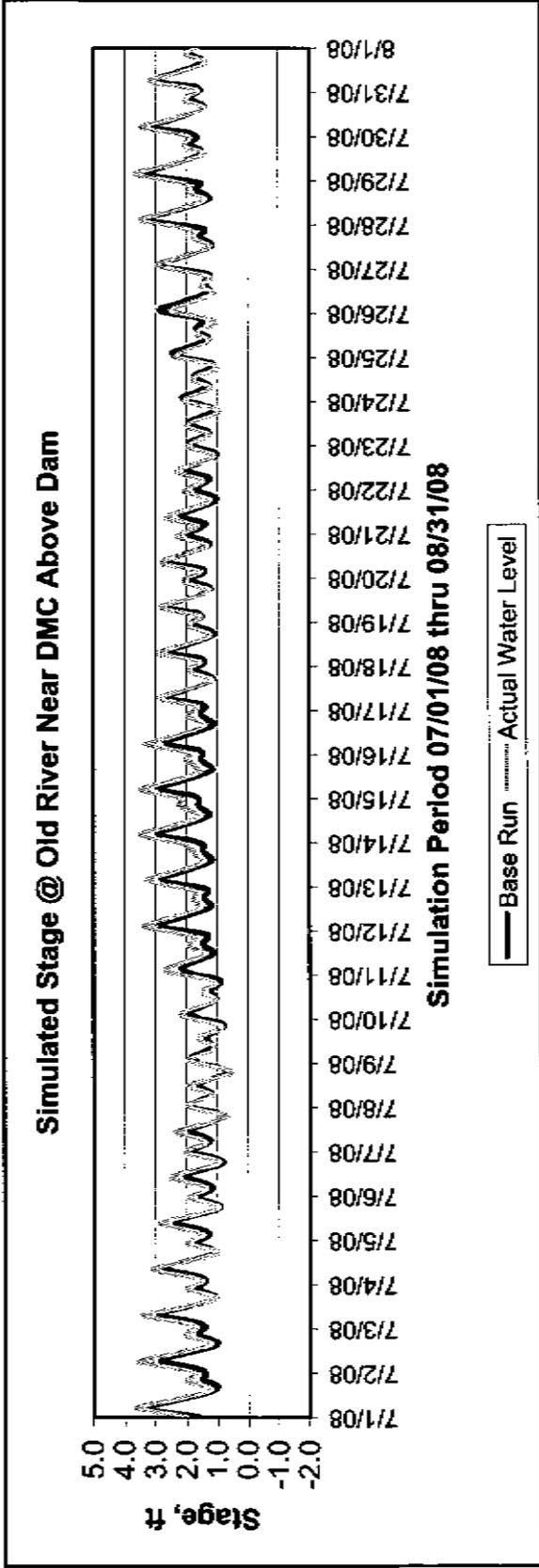


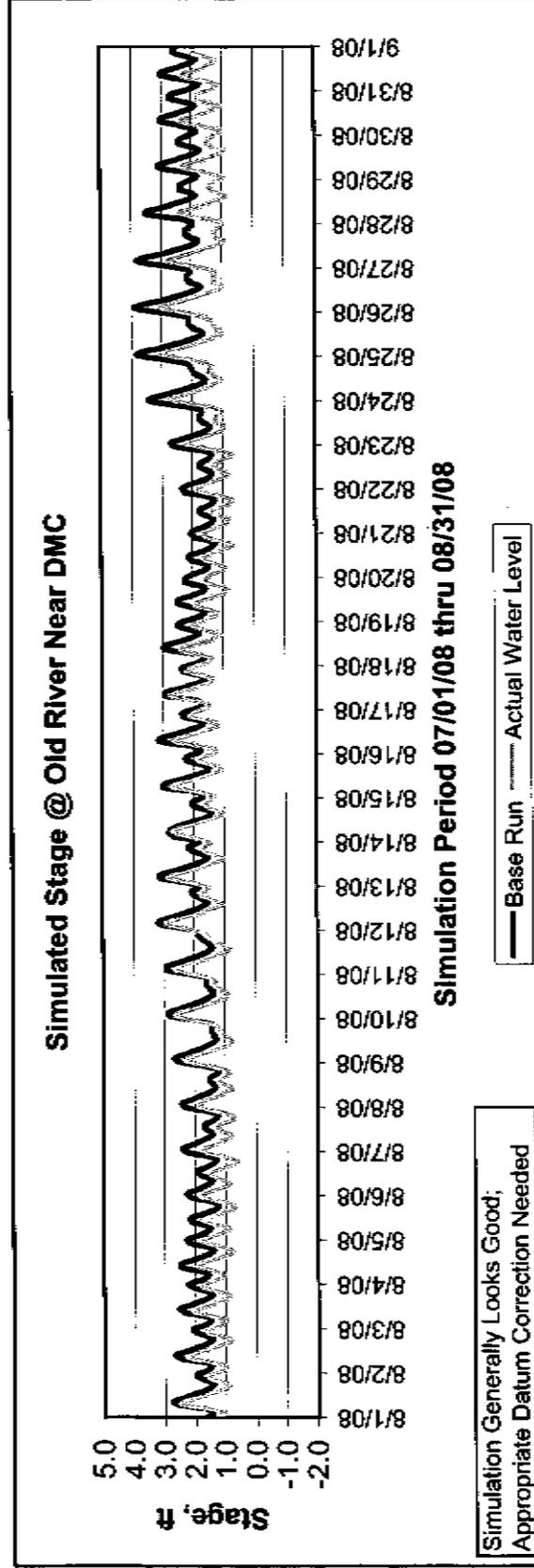
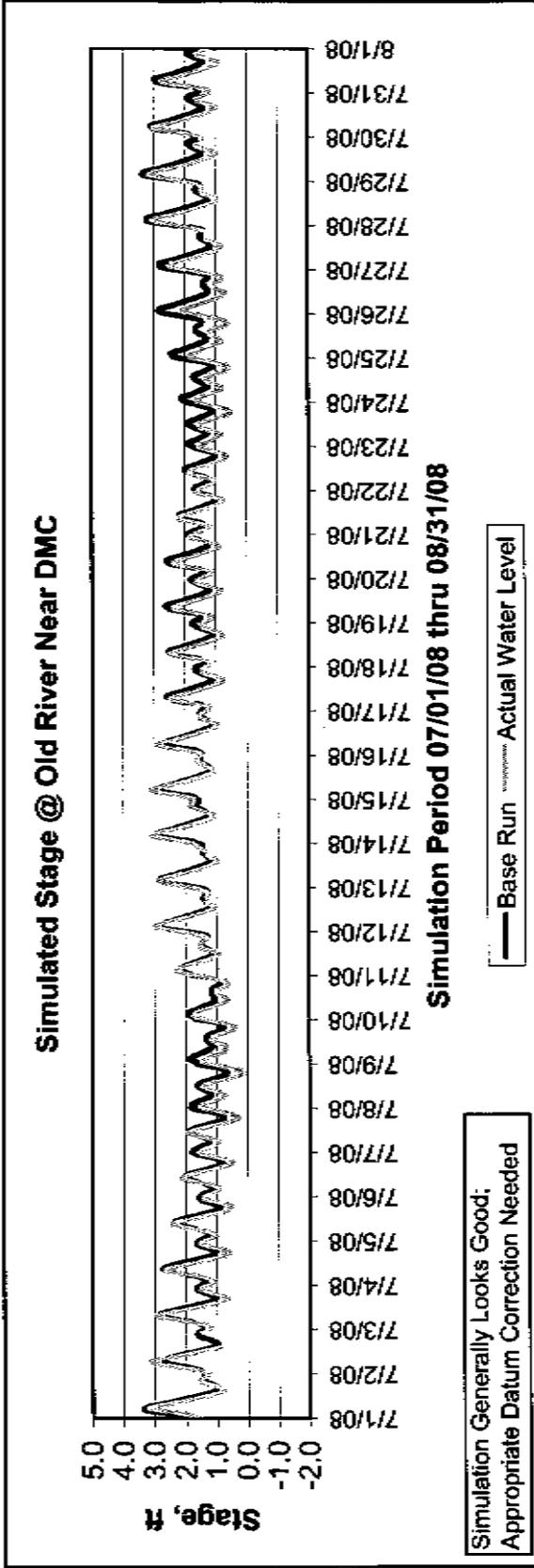




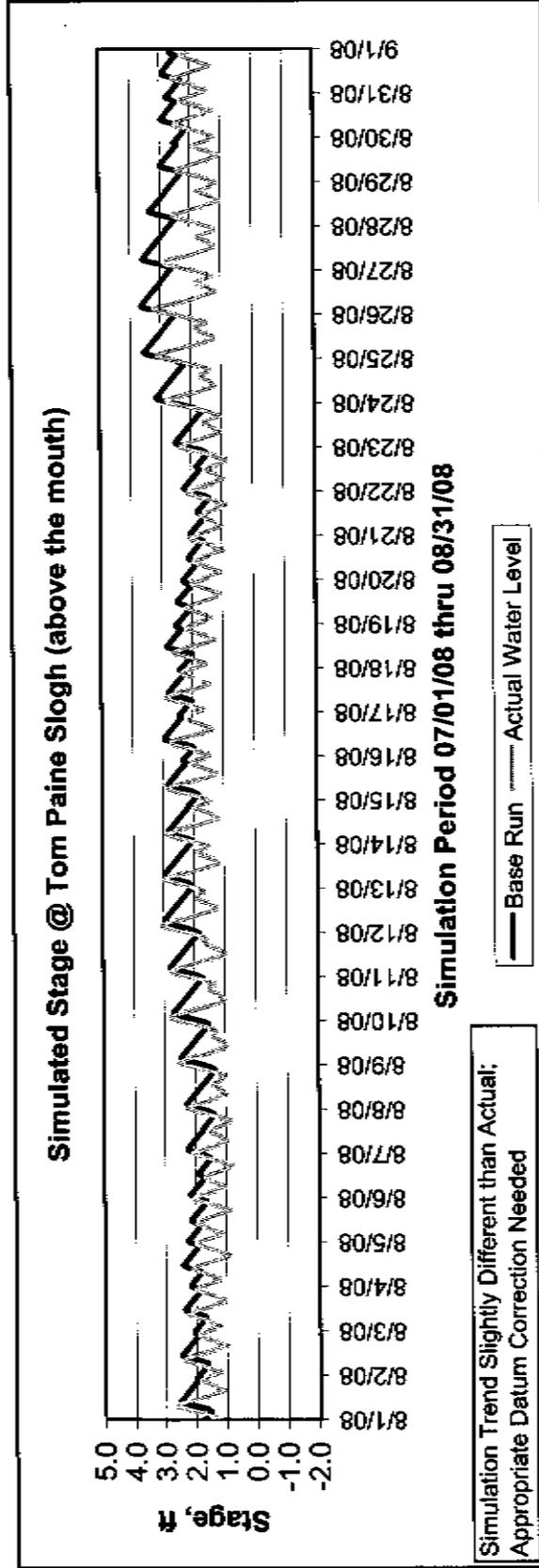
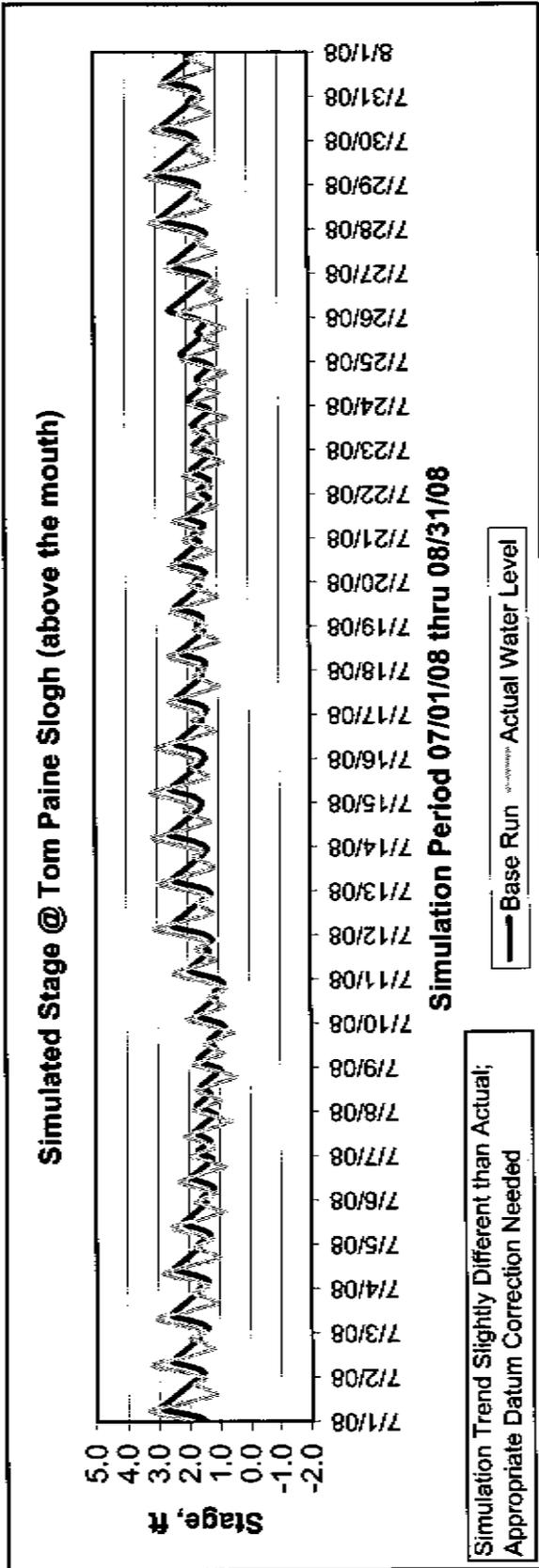


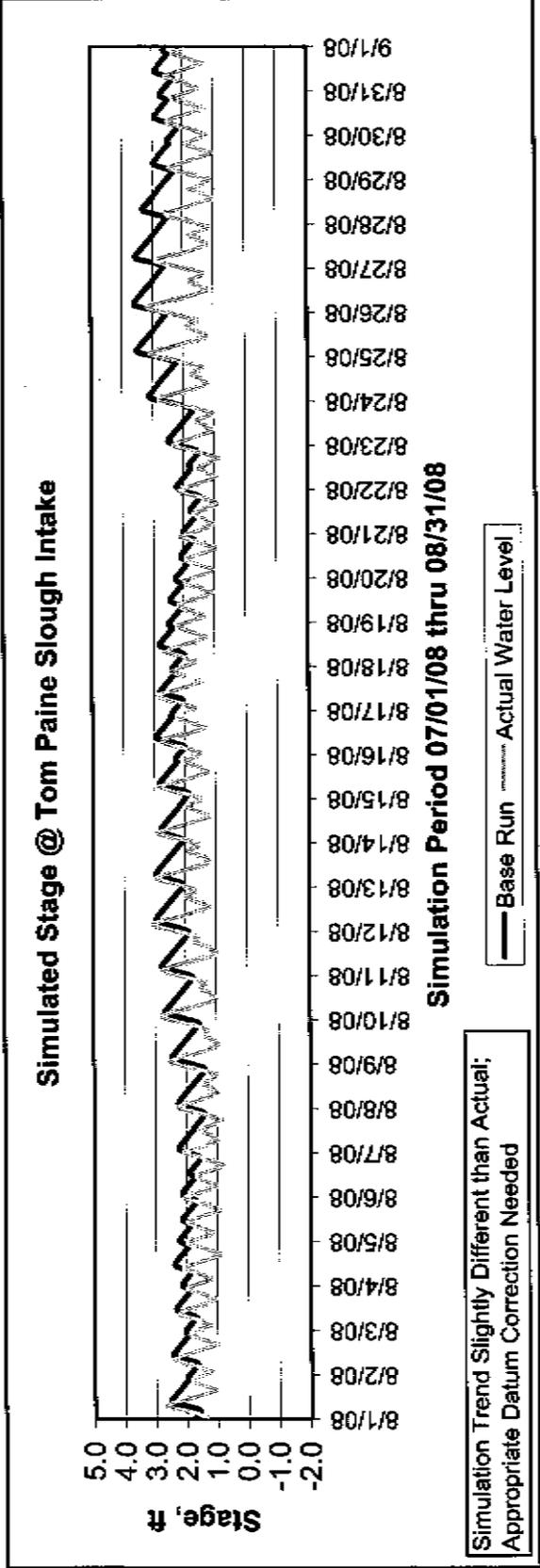
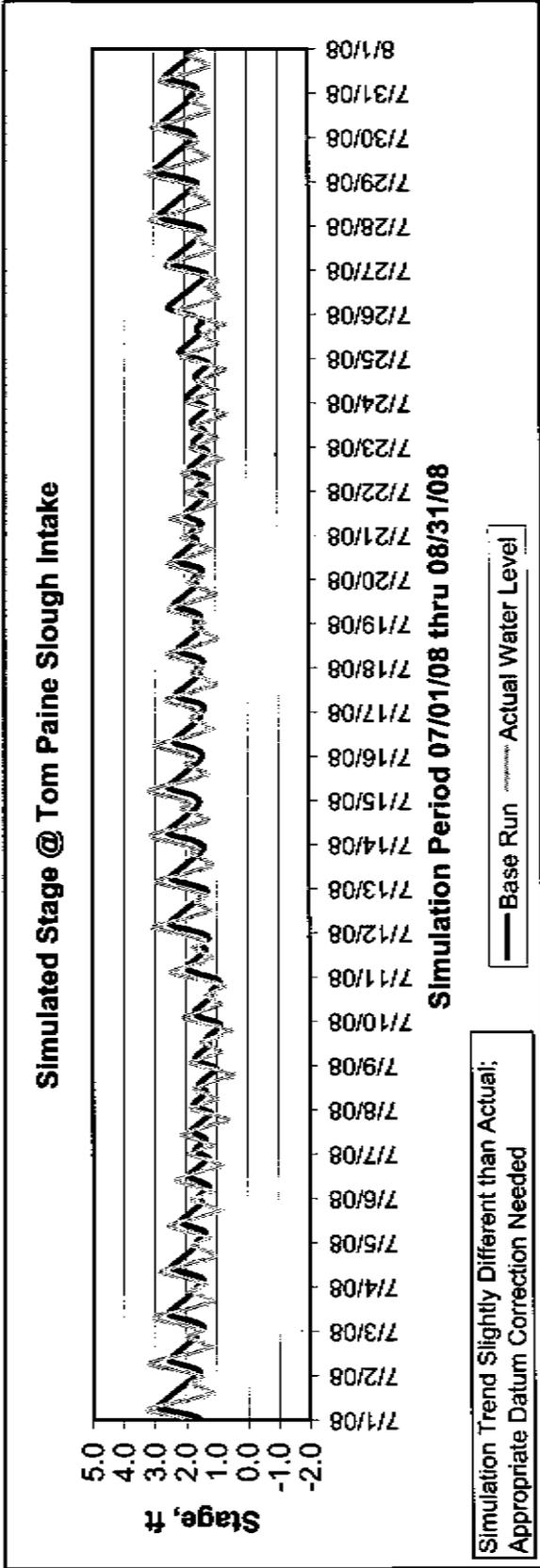




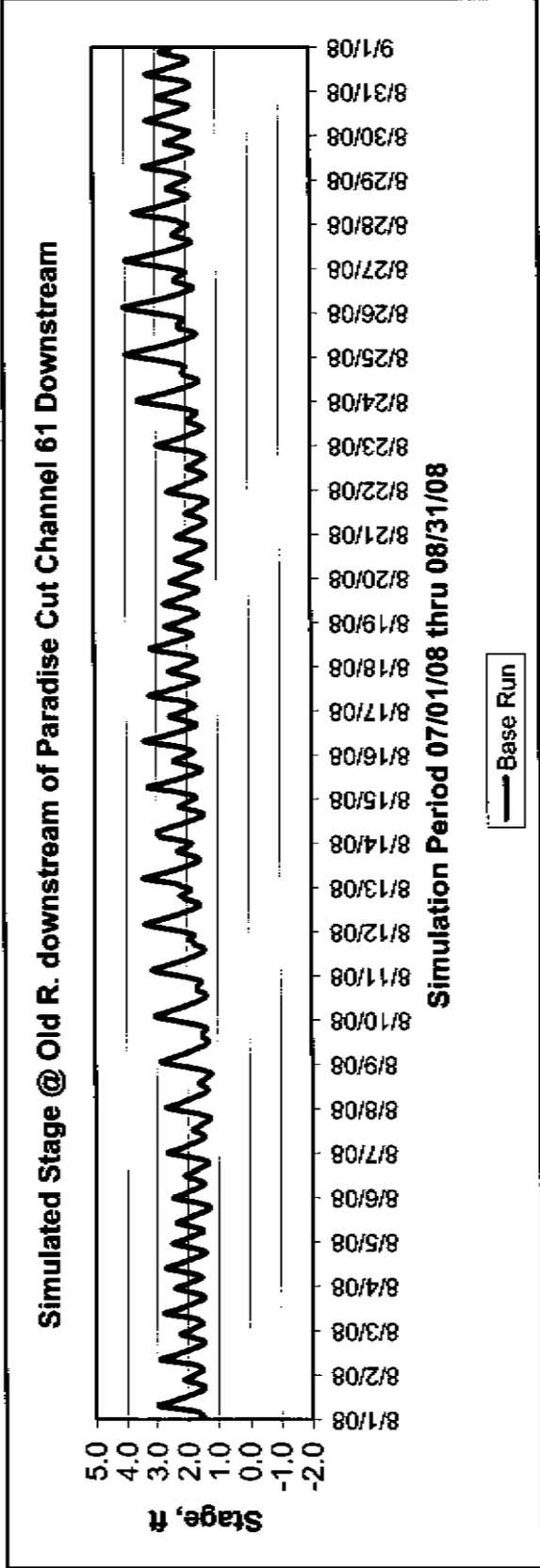
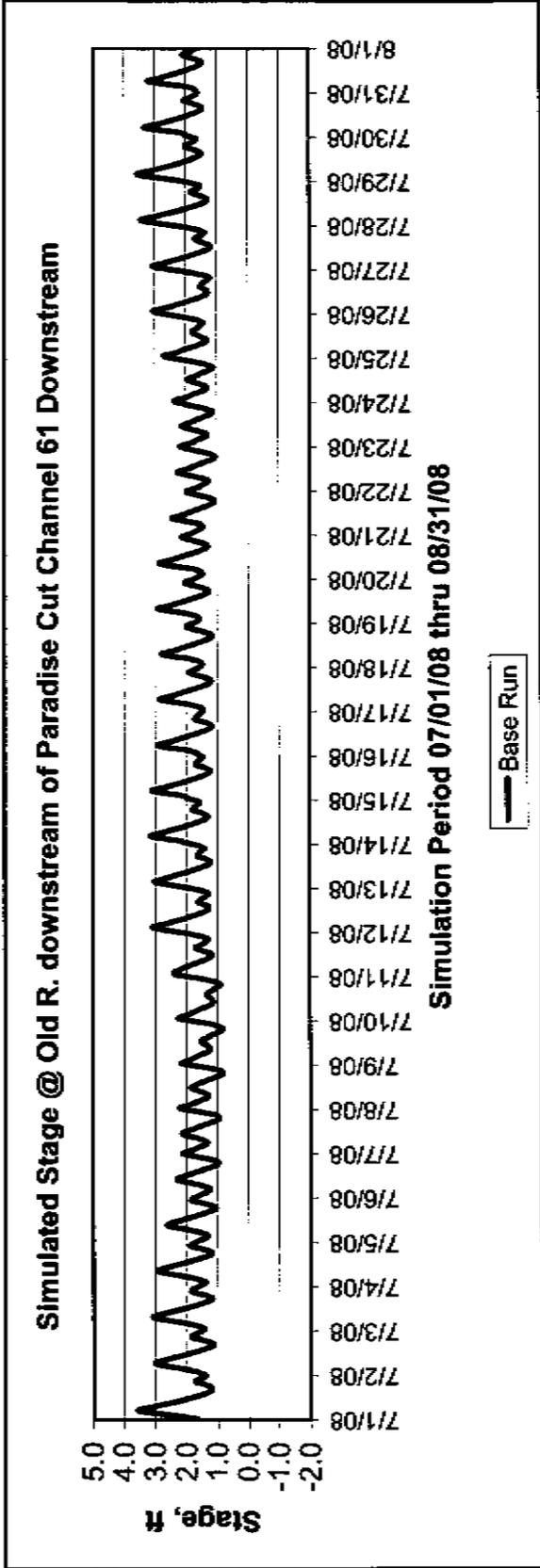


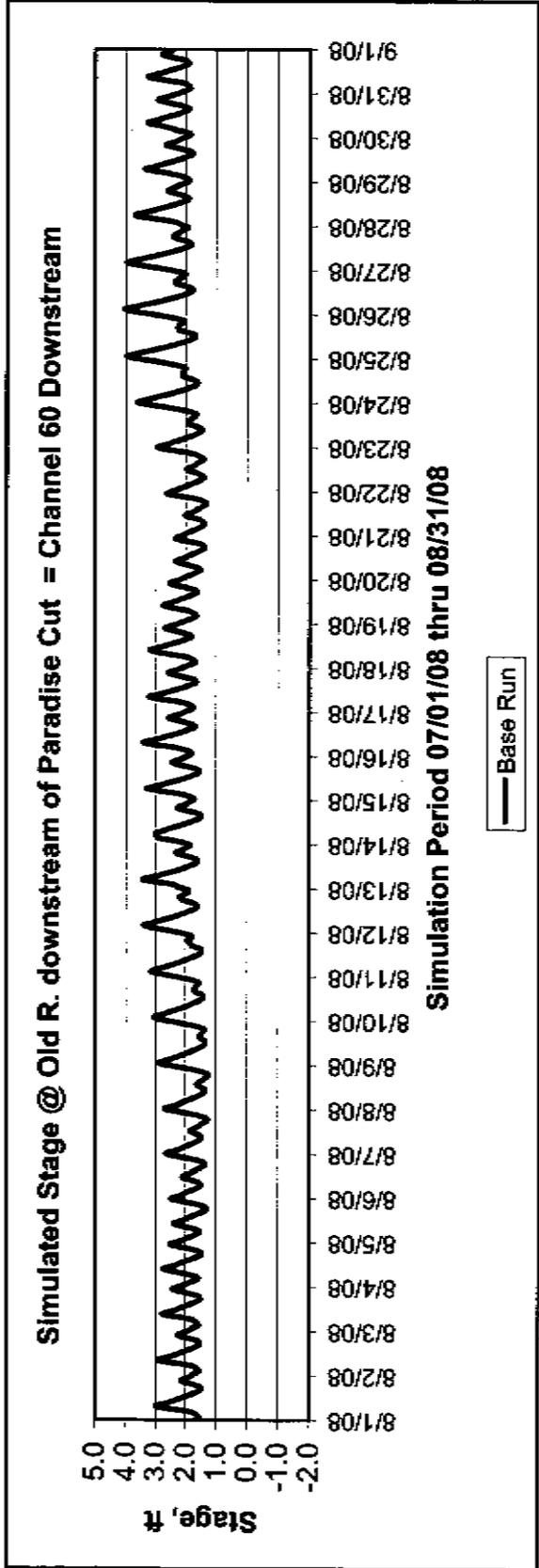
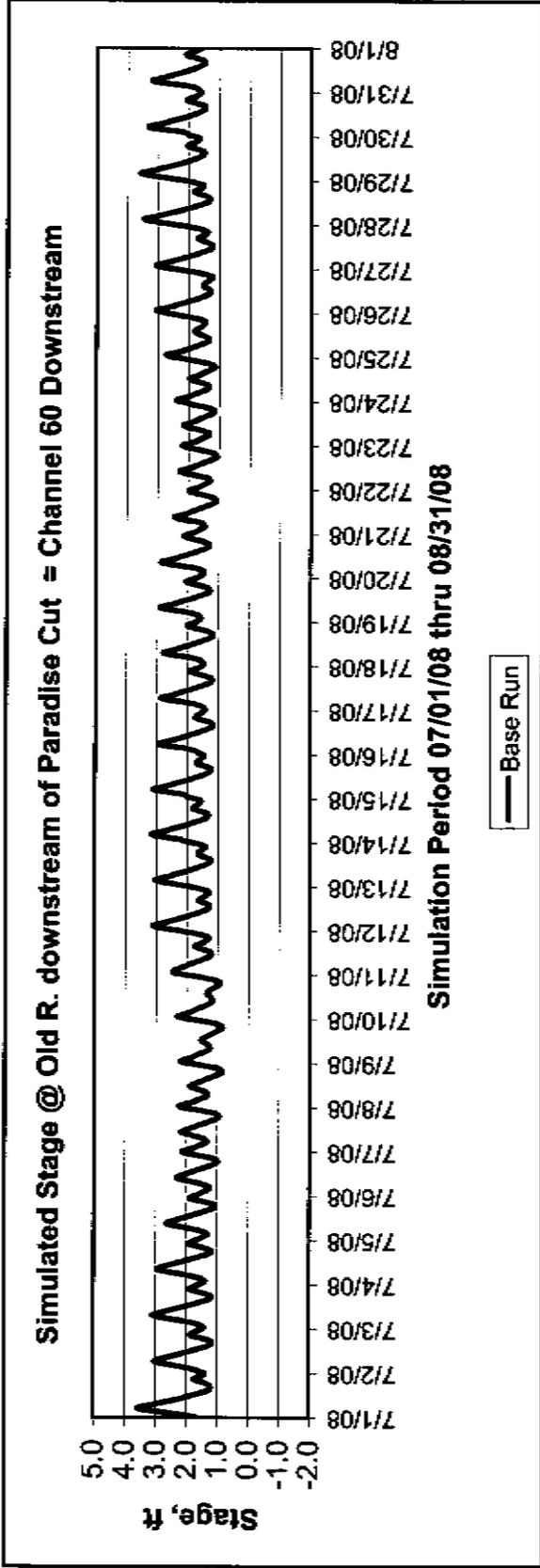
TOM PAINE SLOUGH - STAGE

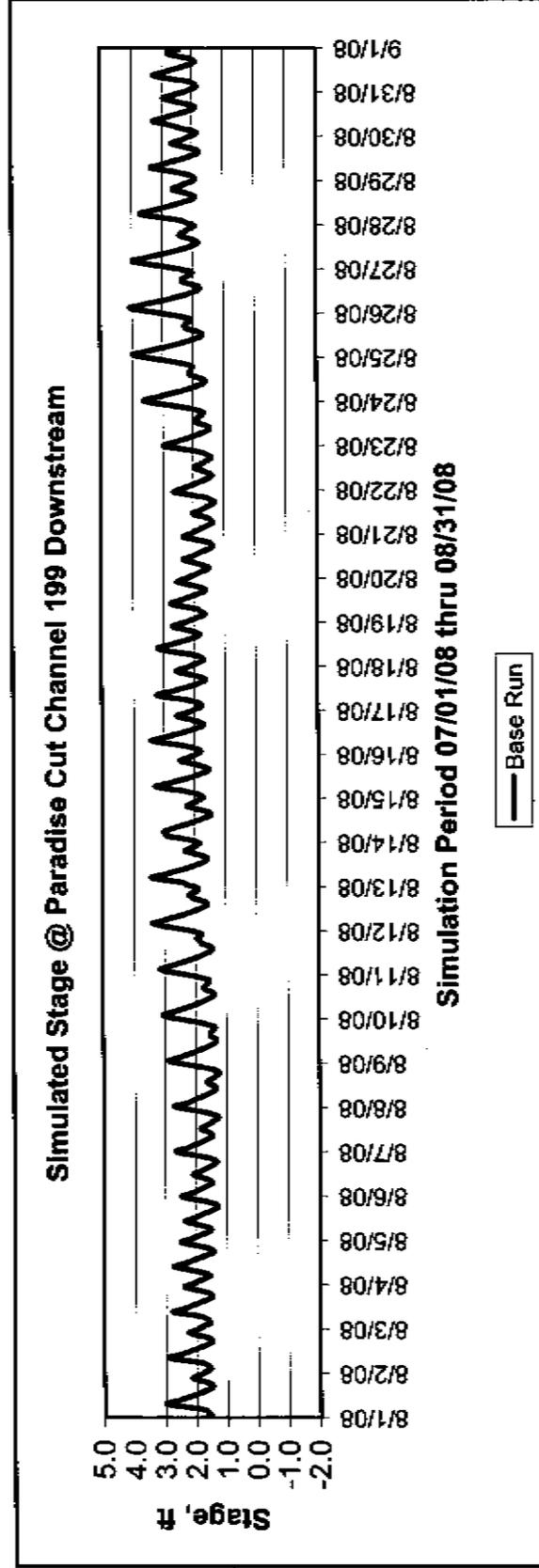
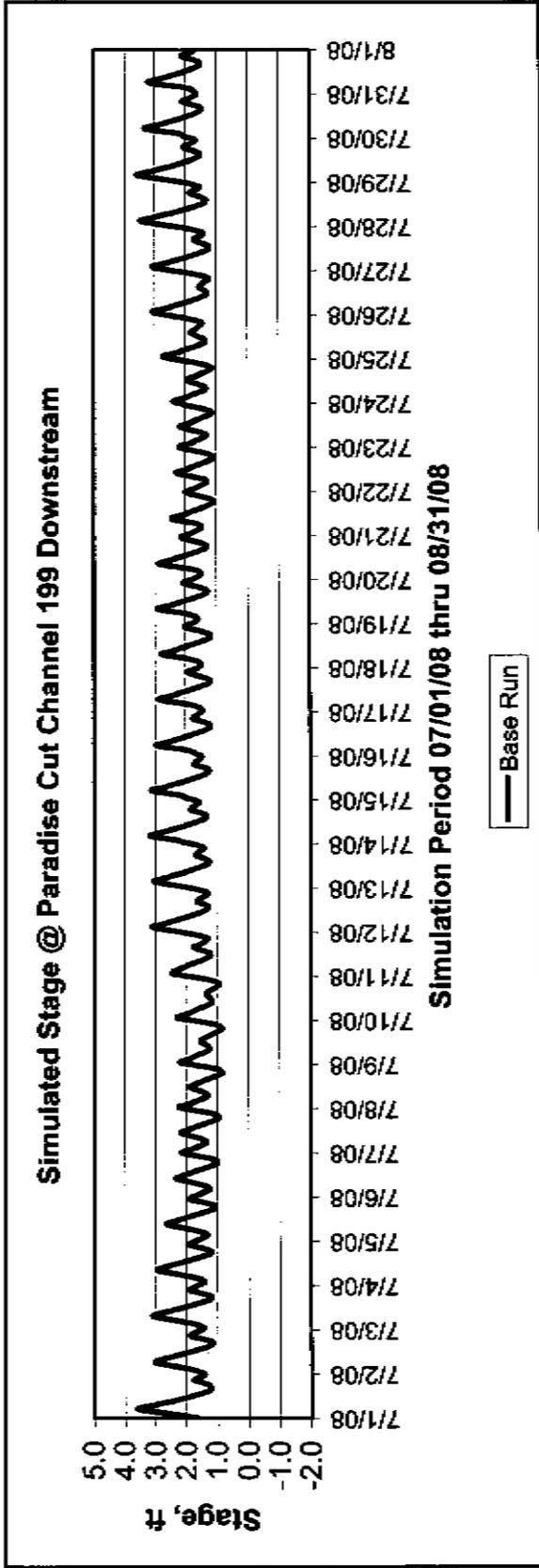


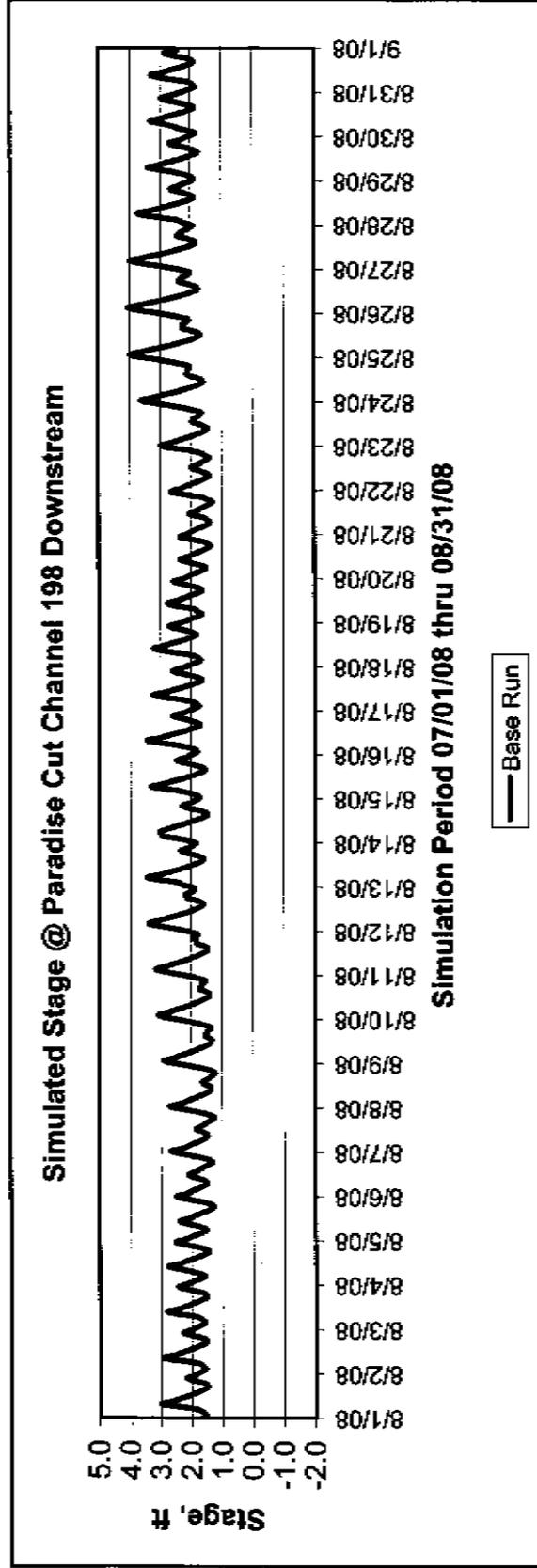
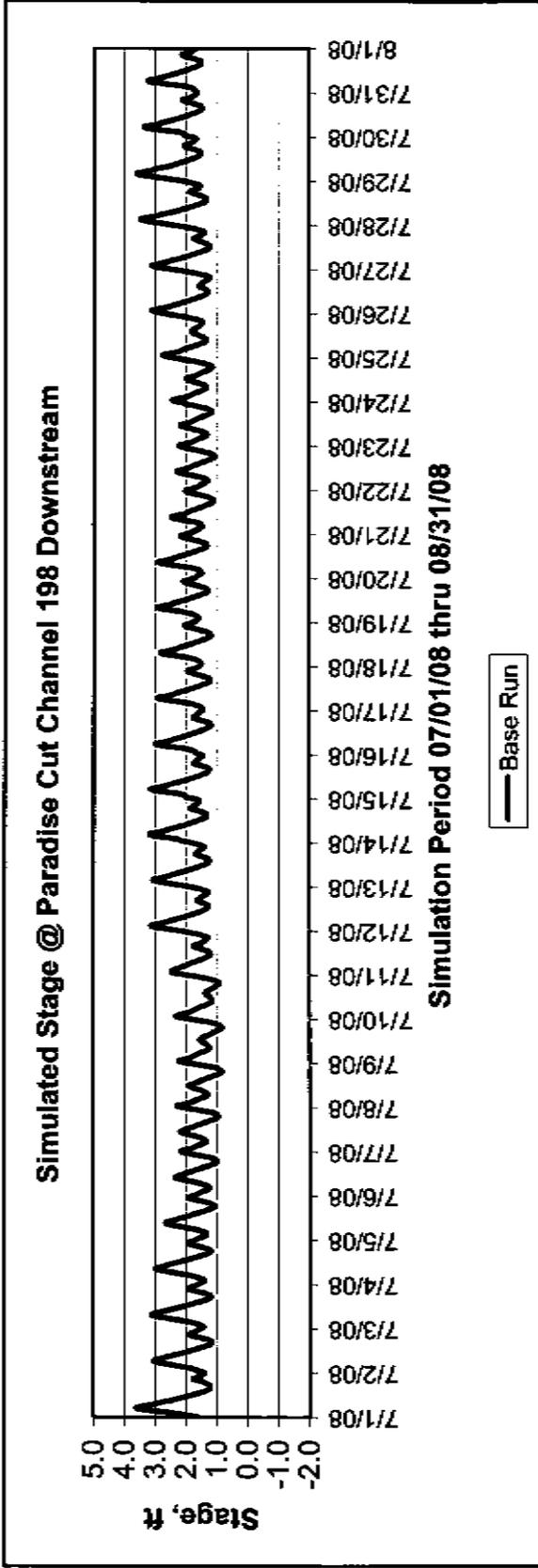


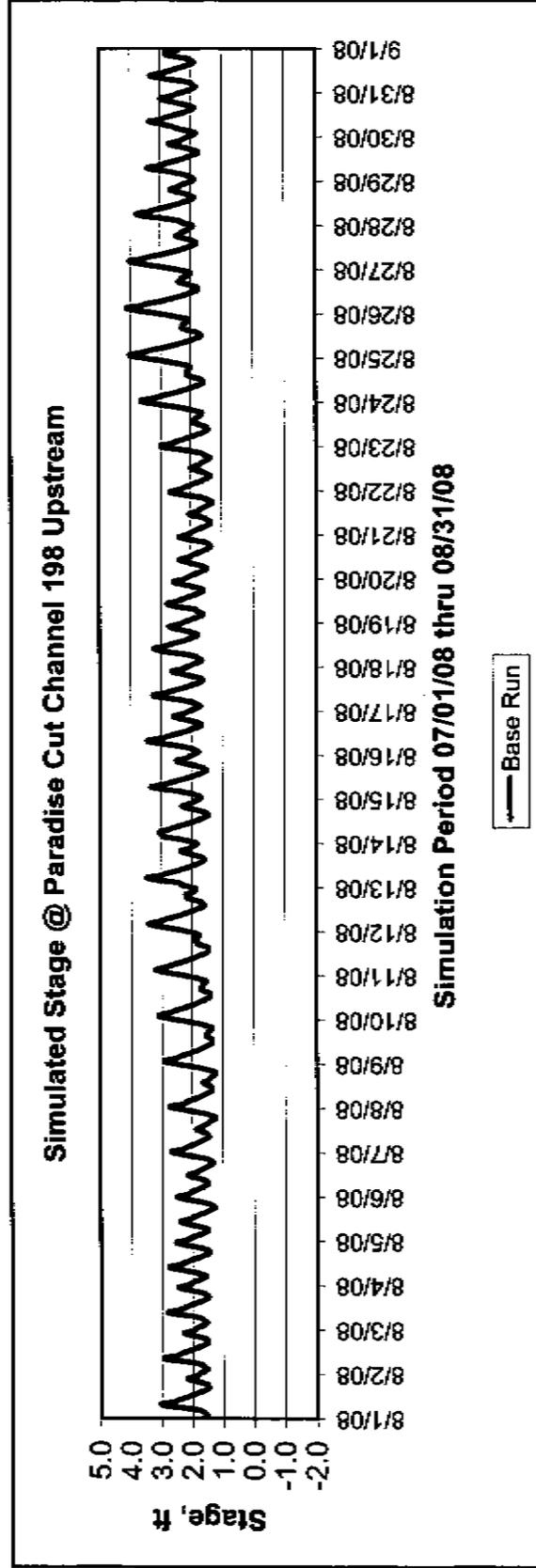
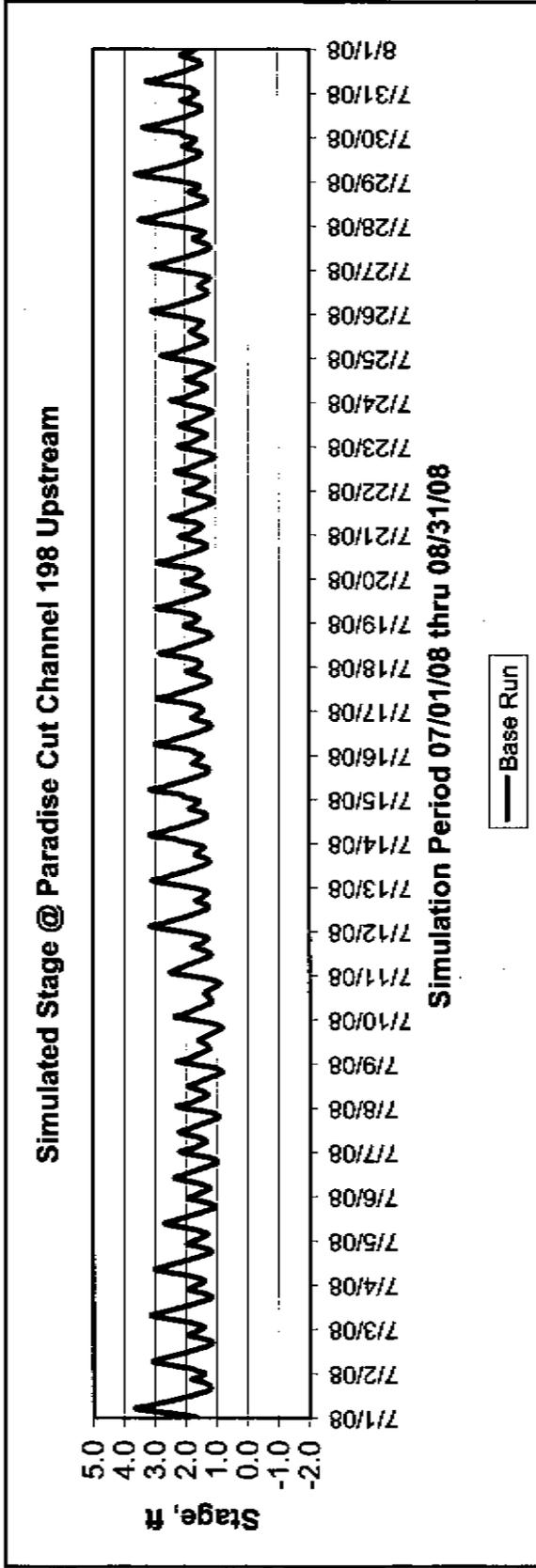
PARADISE CUT- STAGE

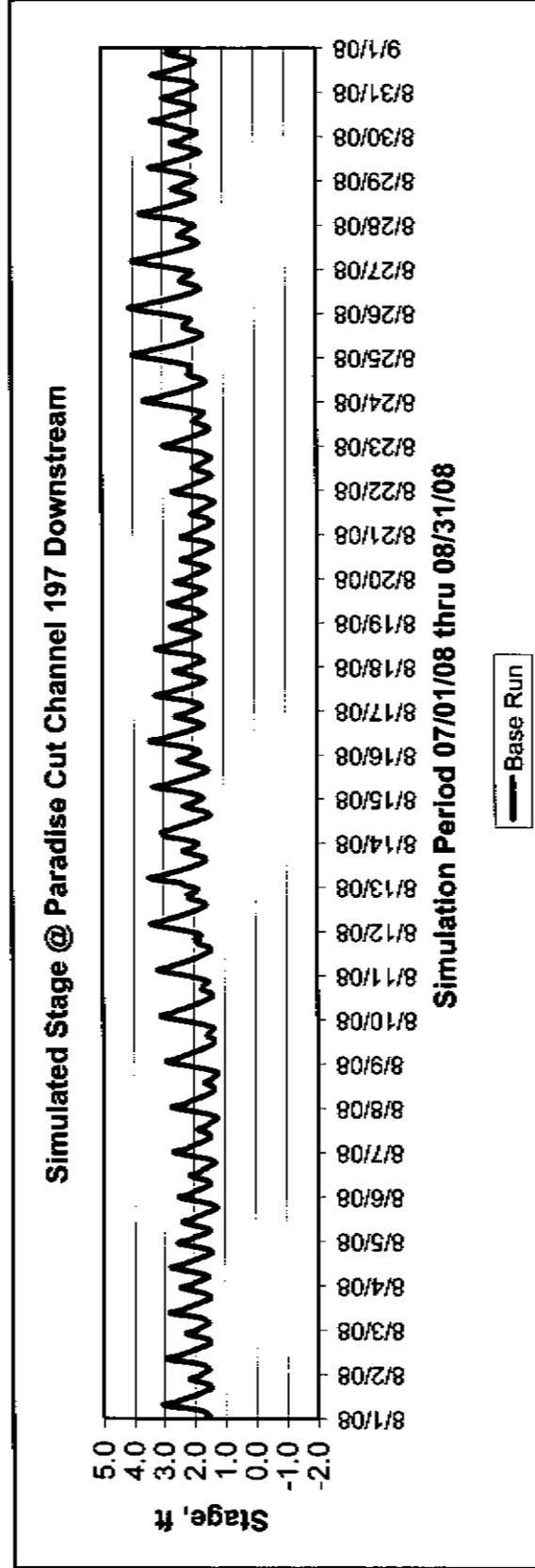
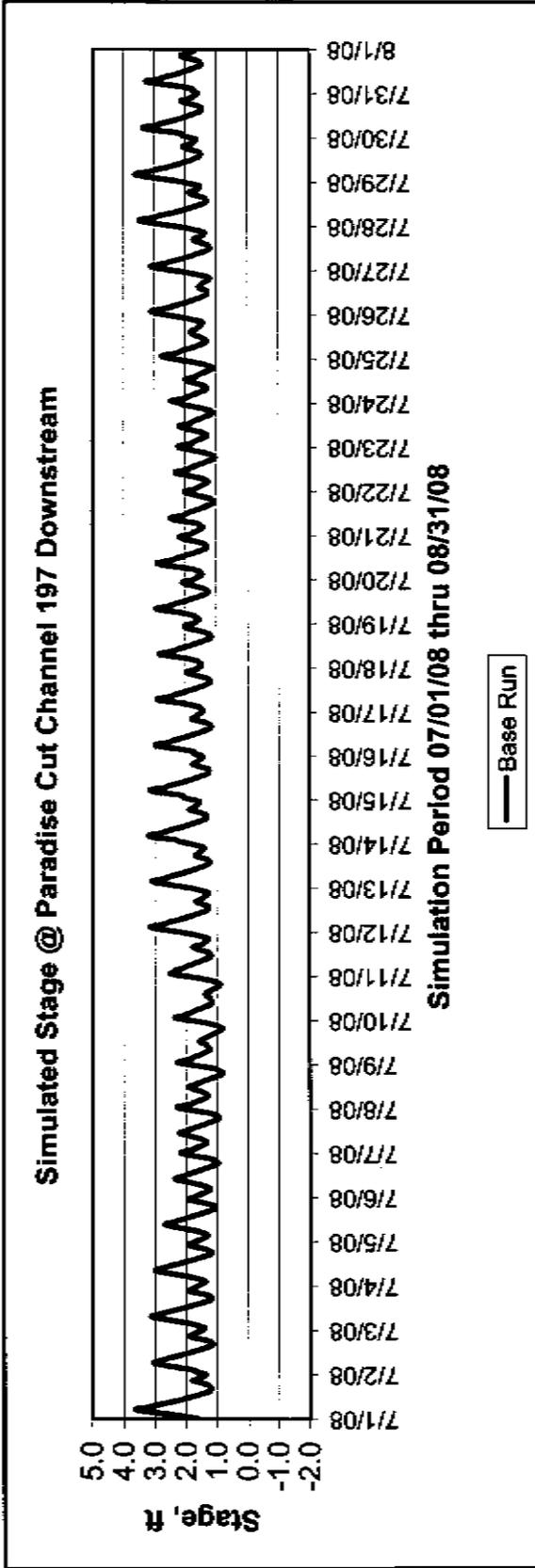


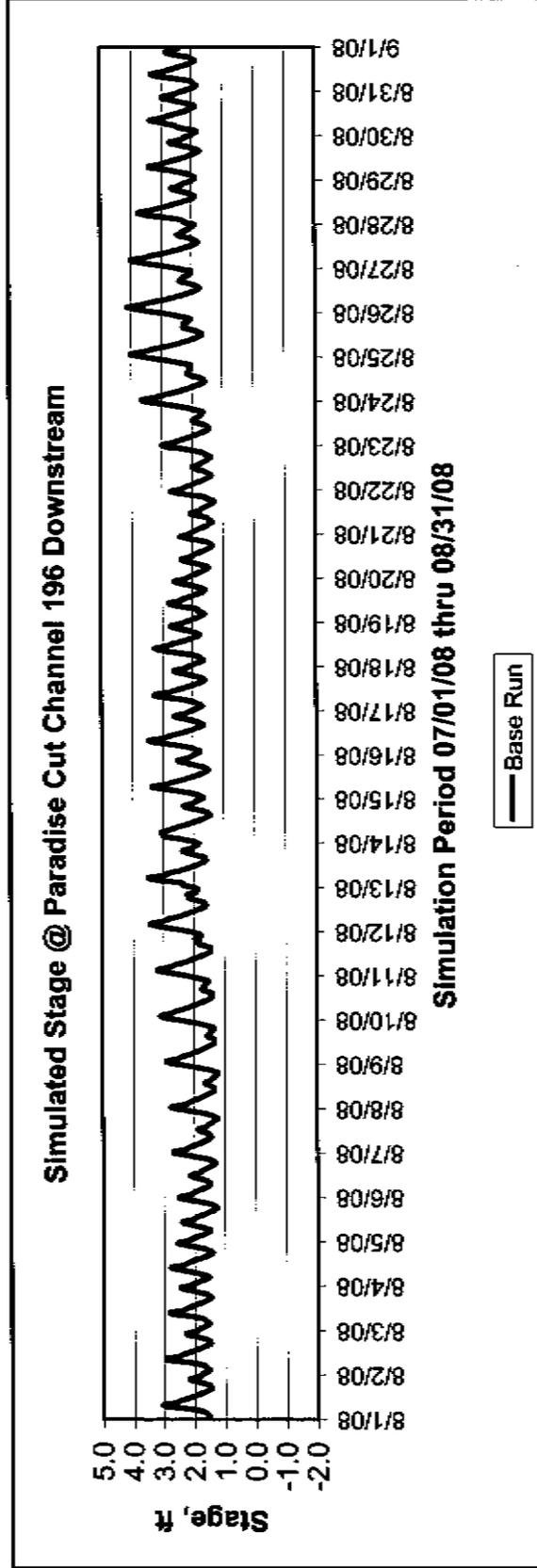
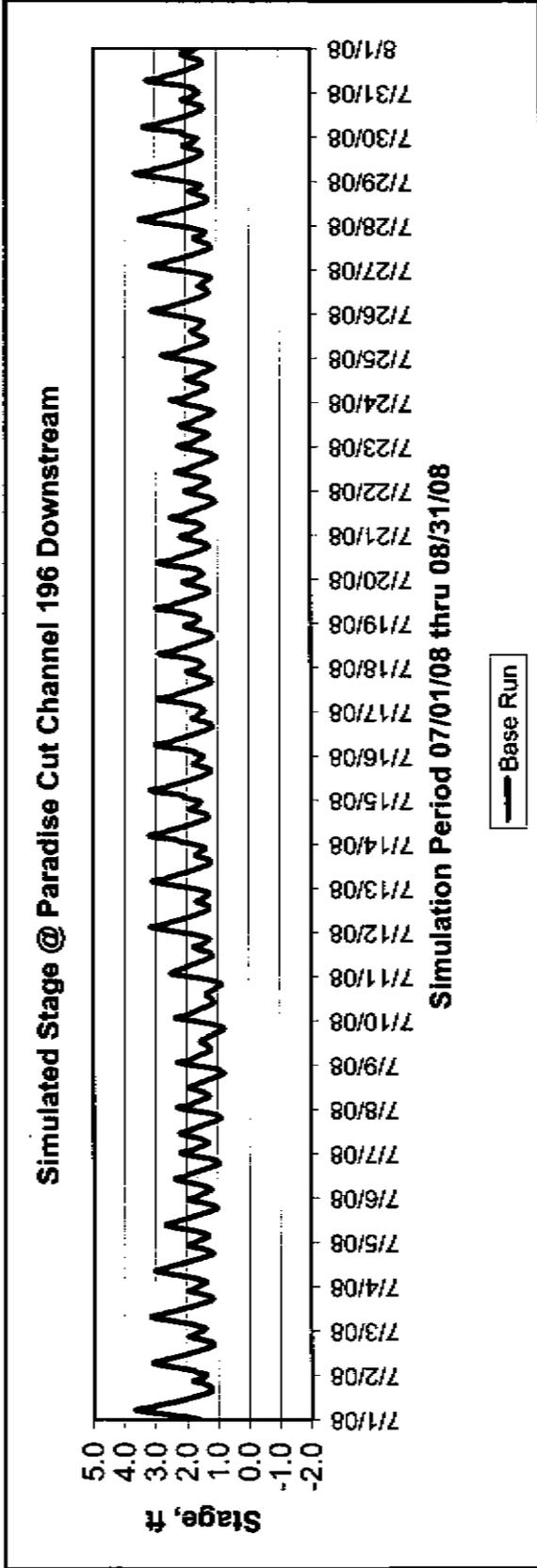


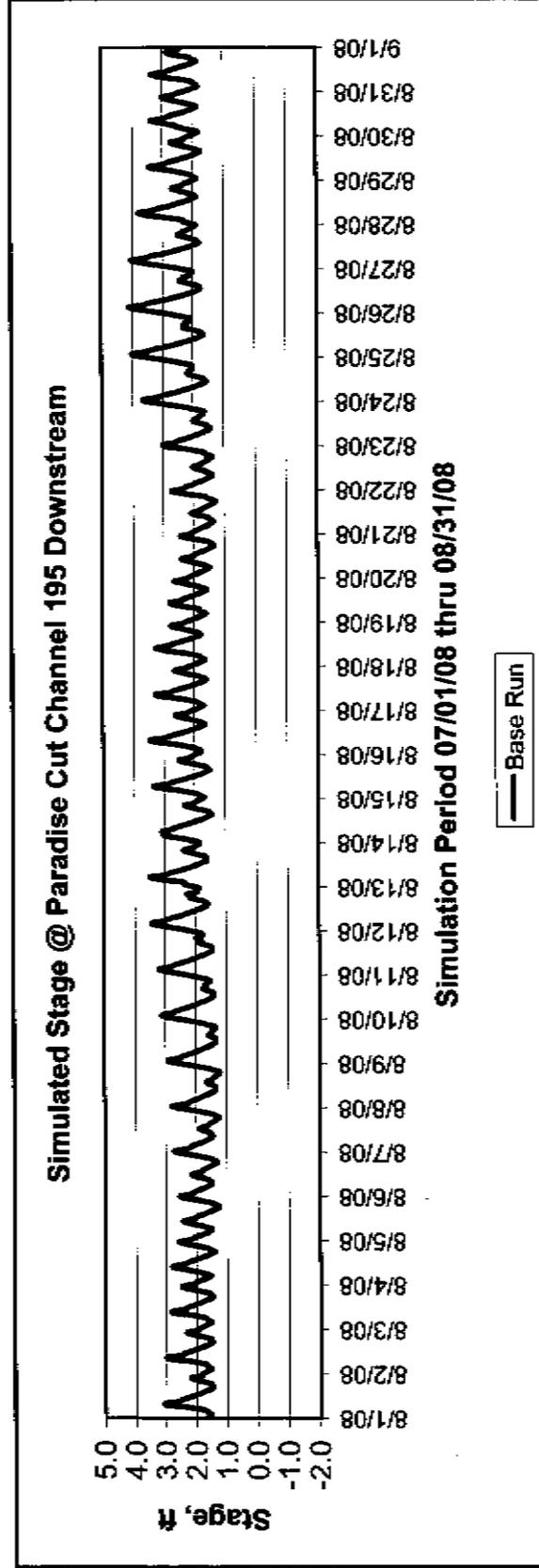
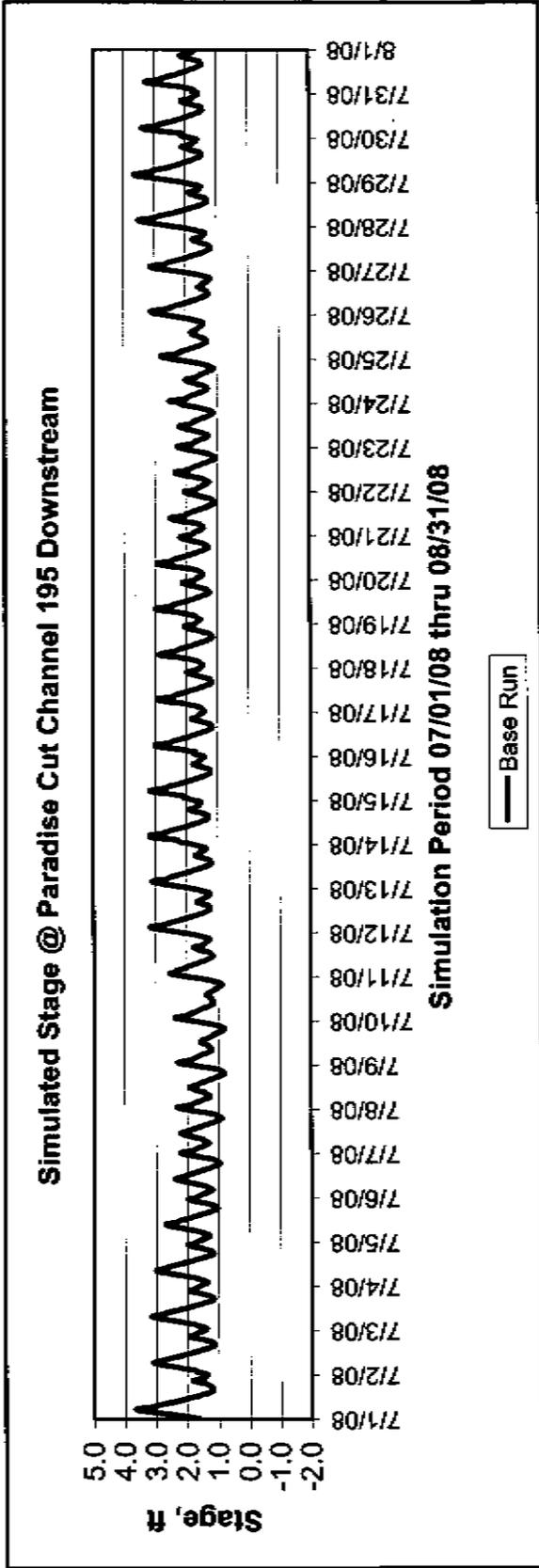




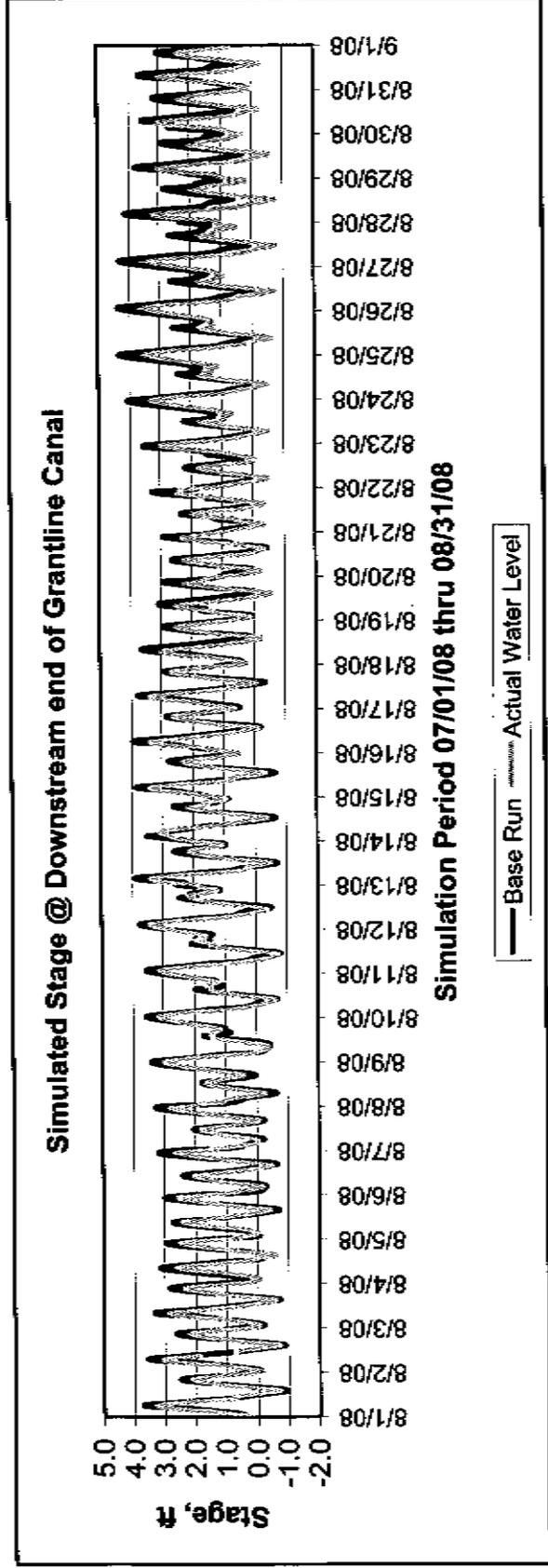
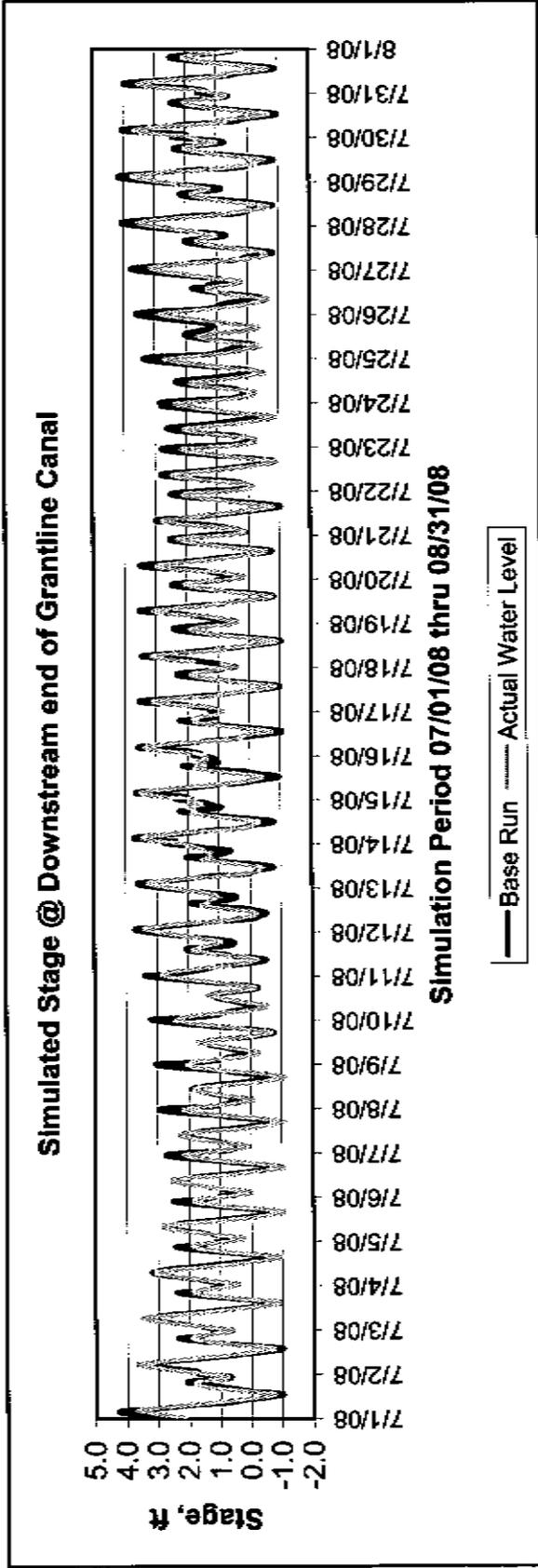


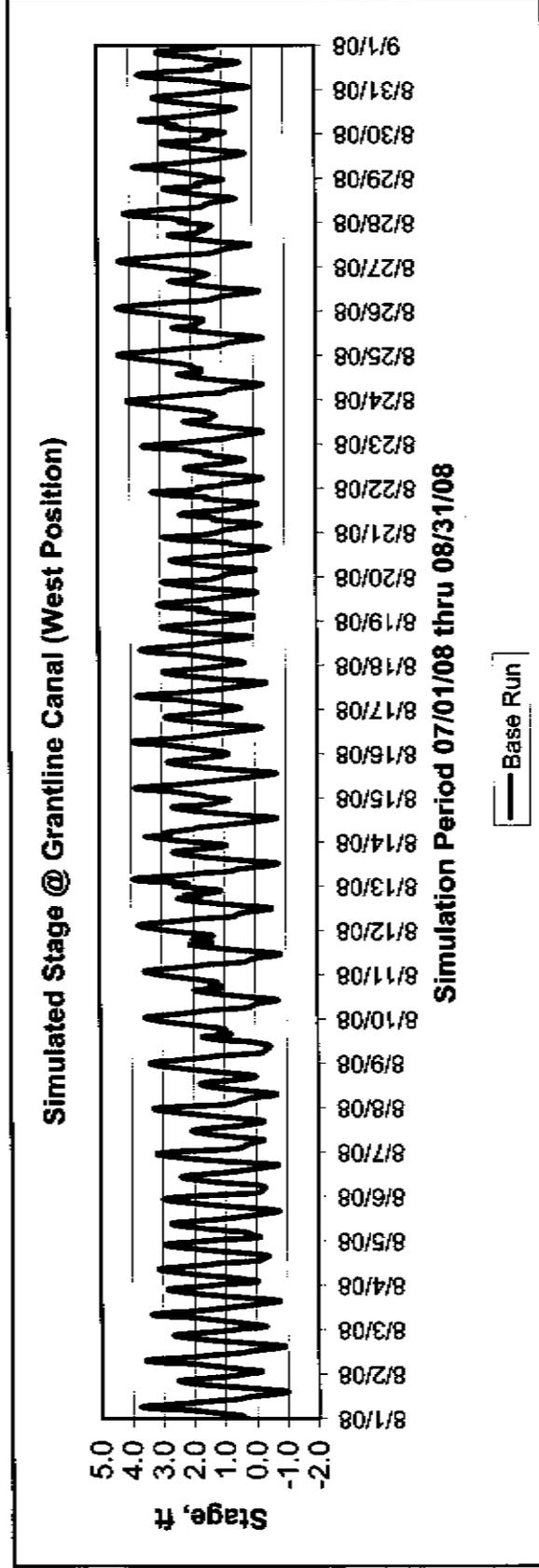
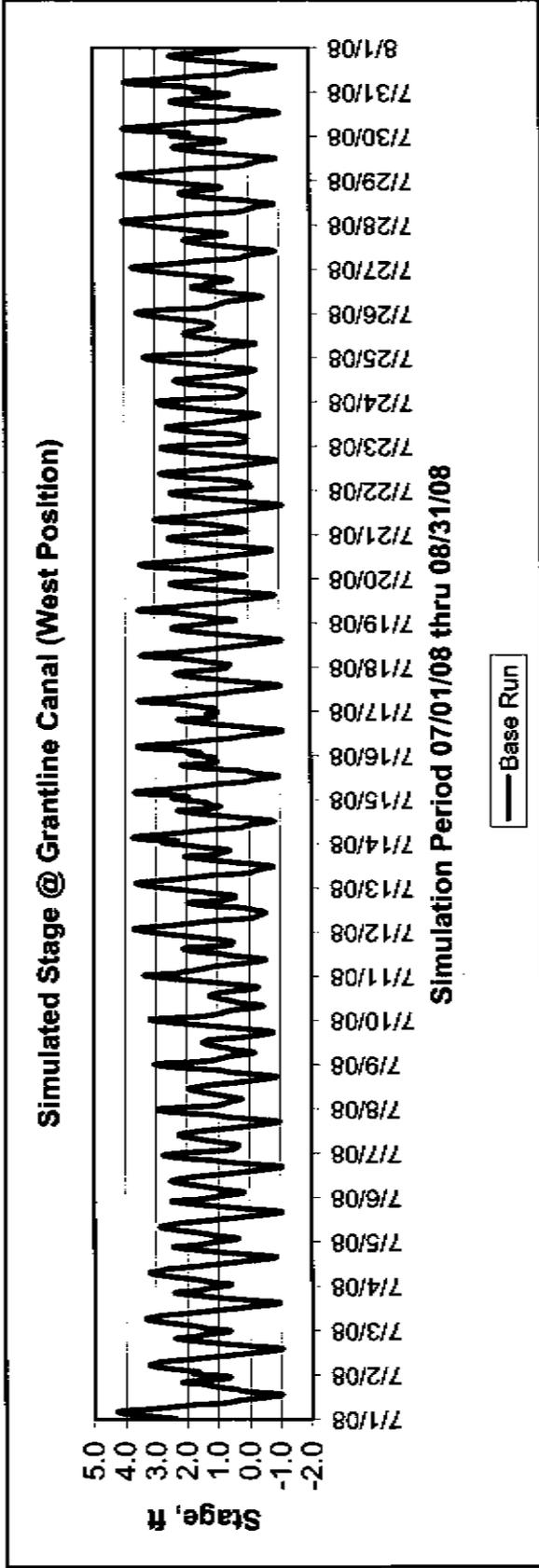


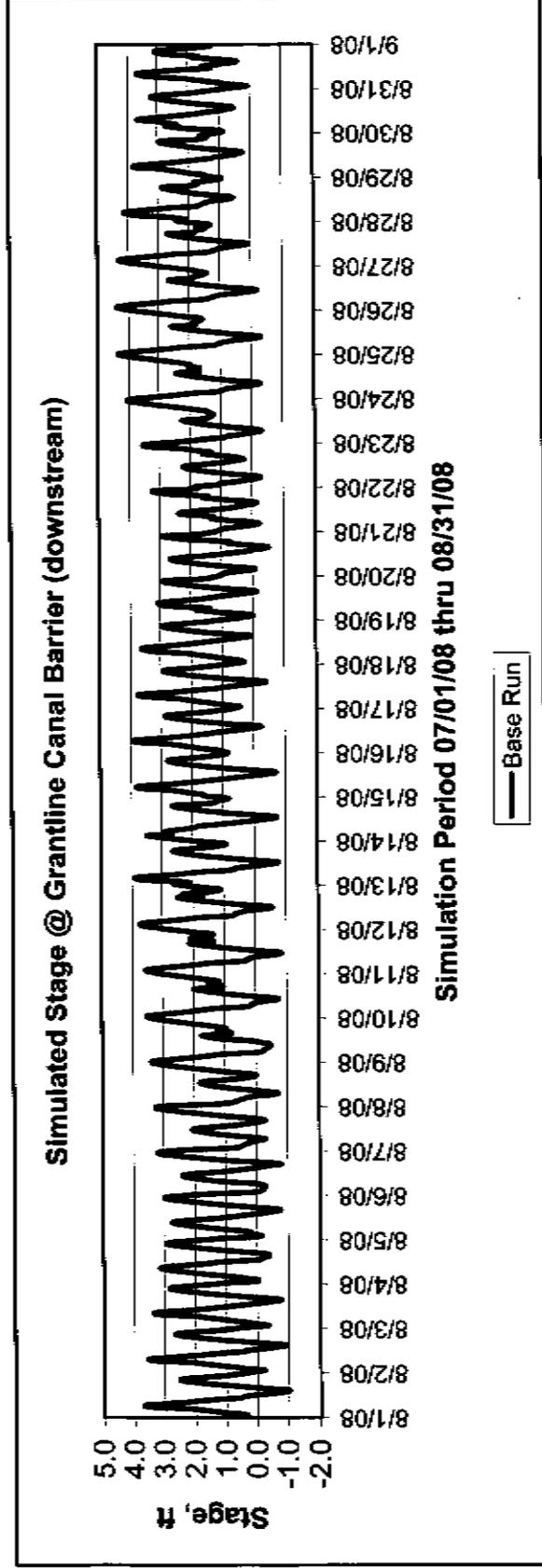
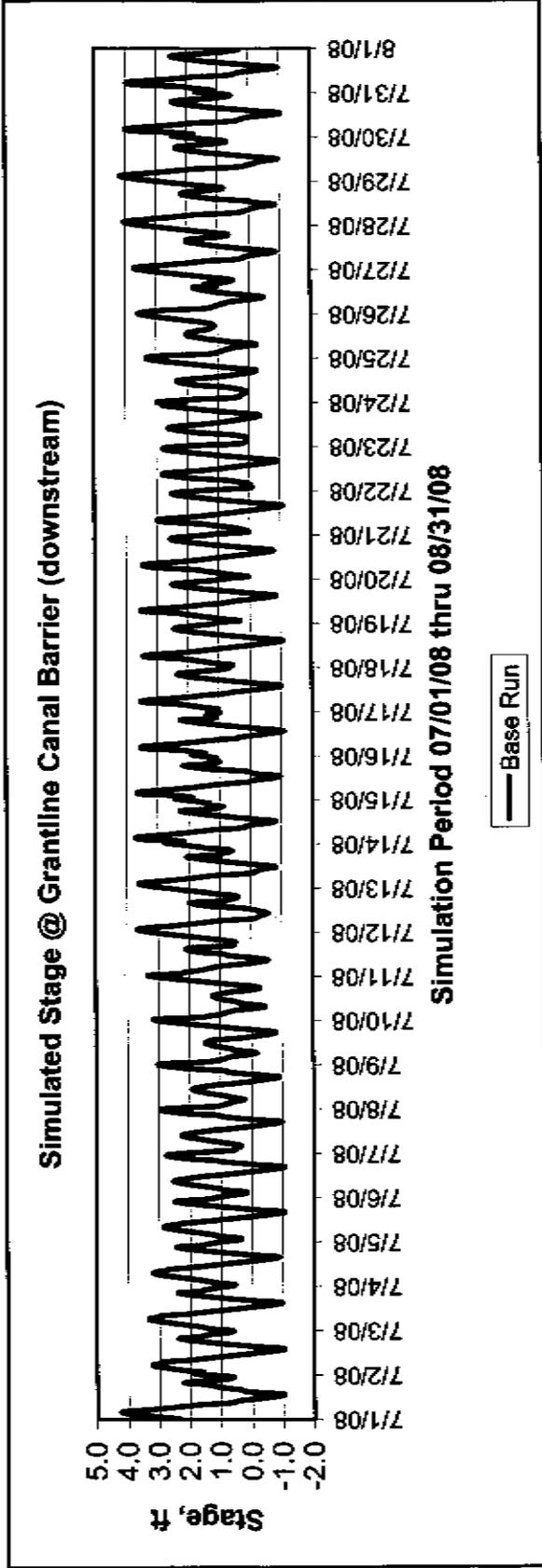


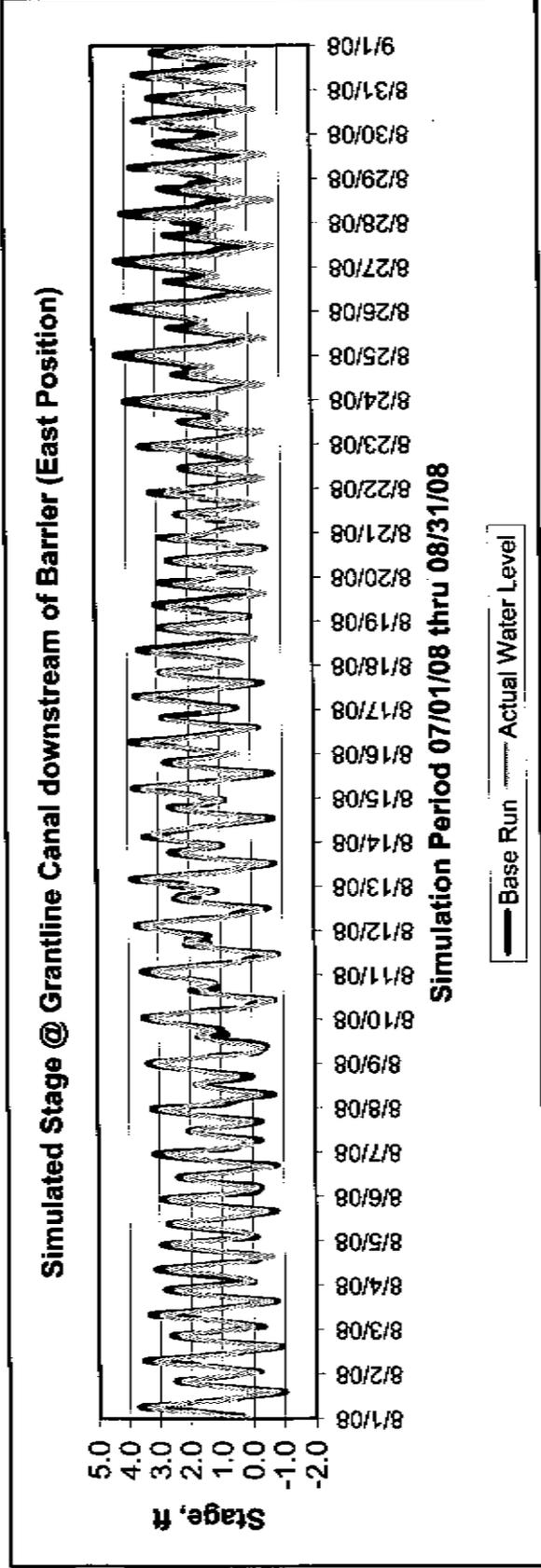
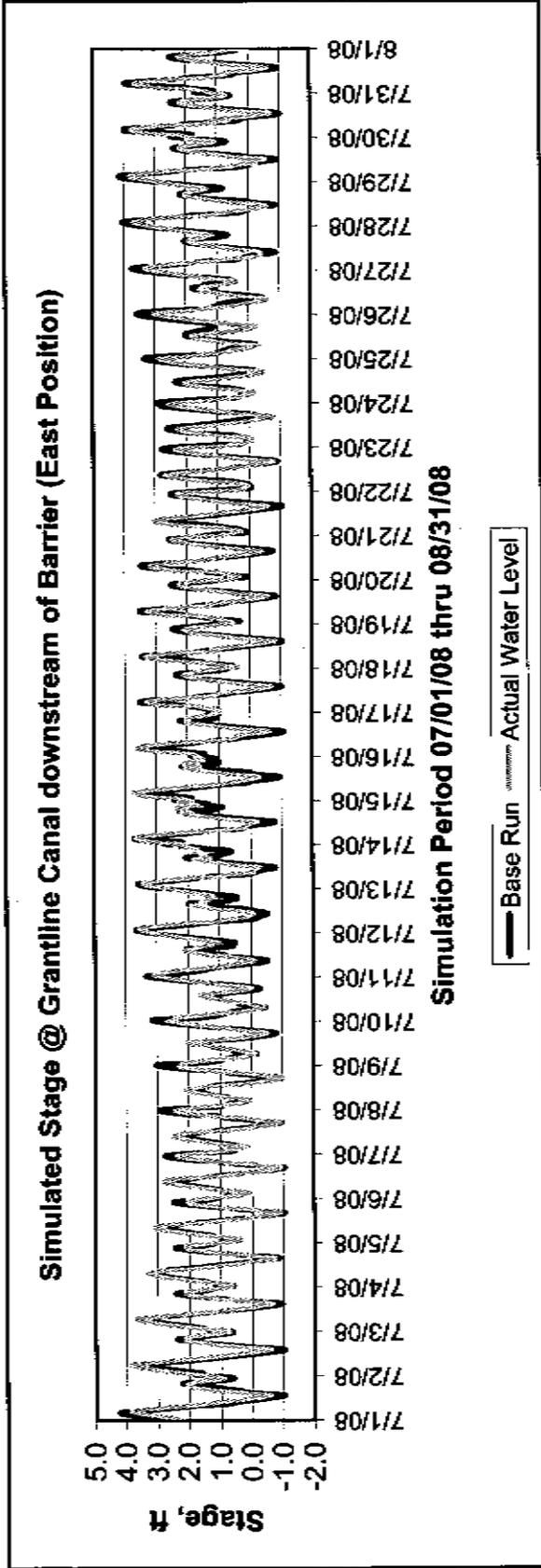


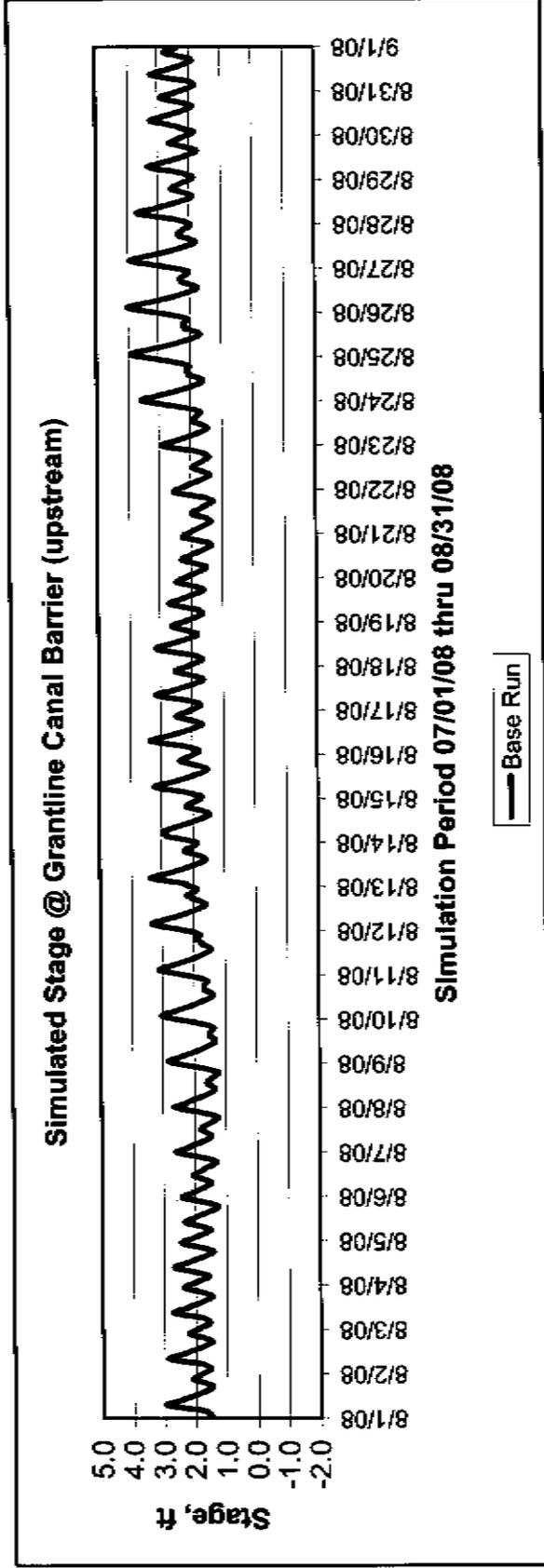
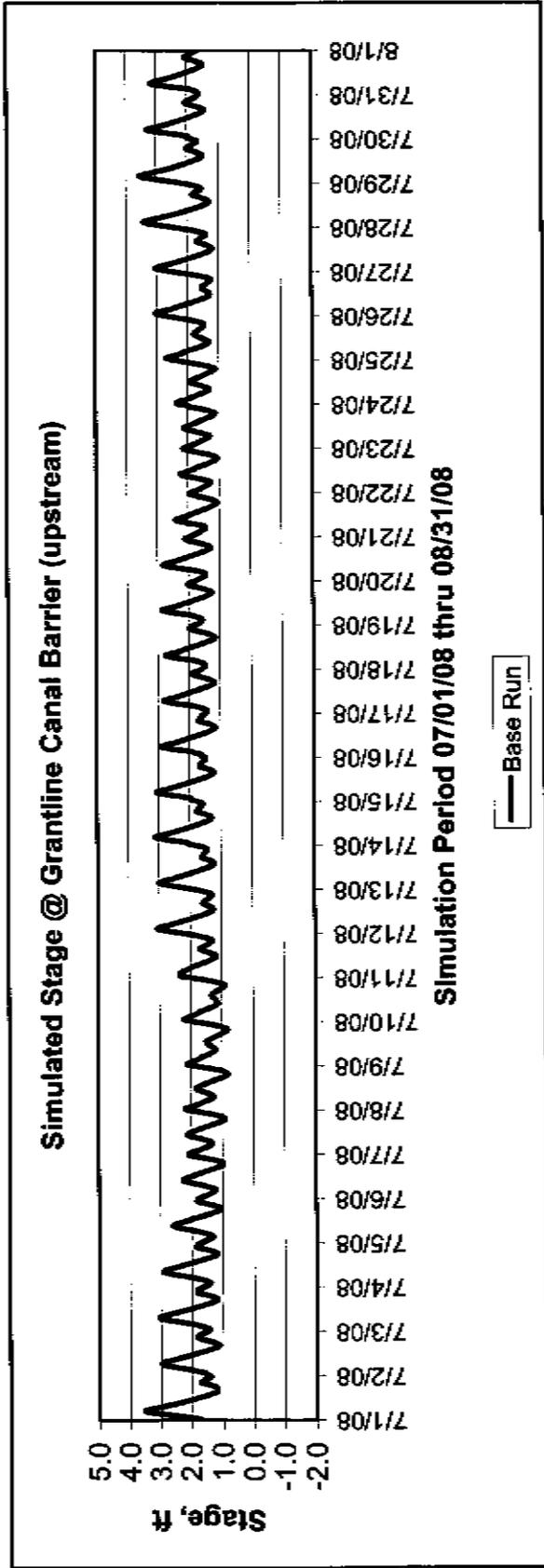
GRANTLINE CANAL - STAGE

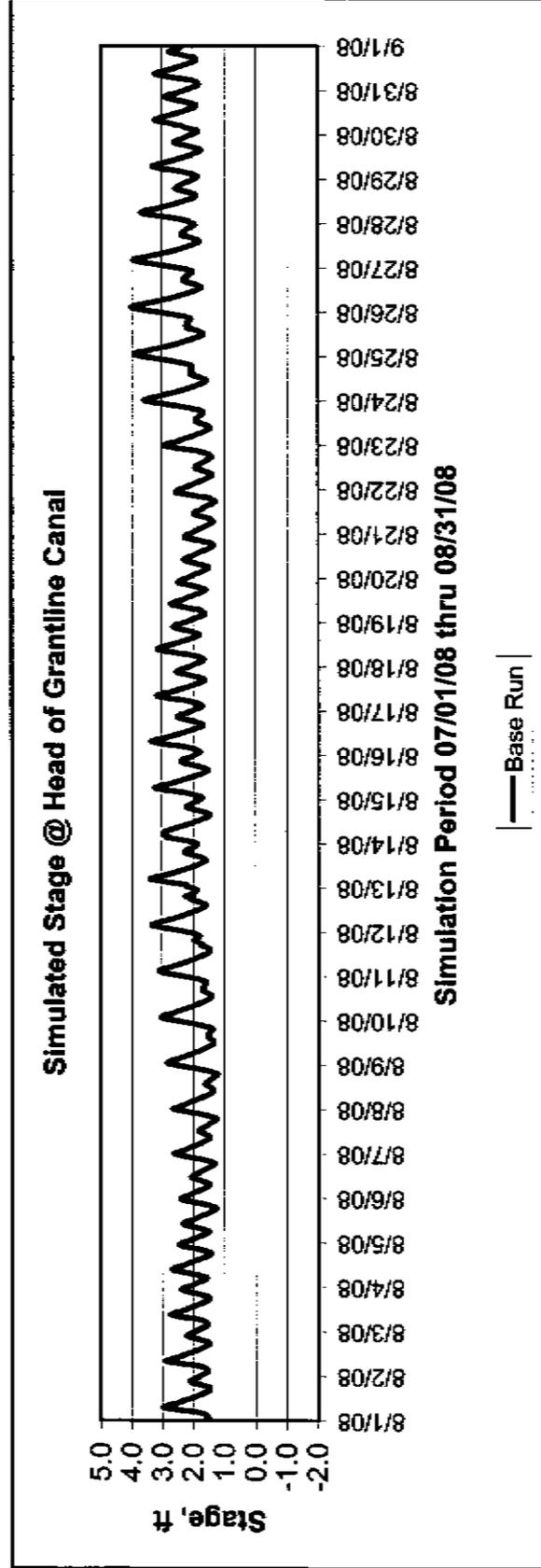
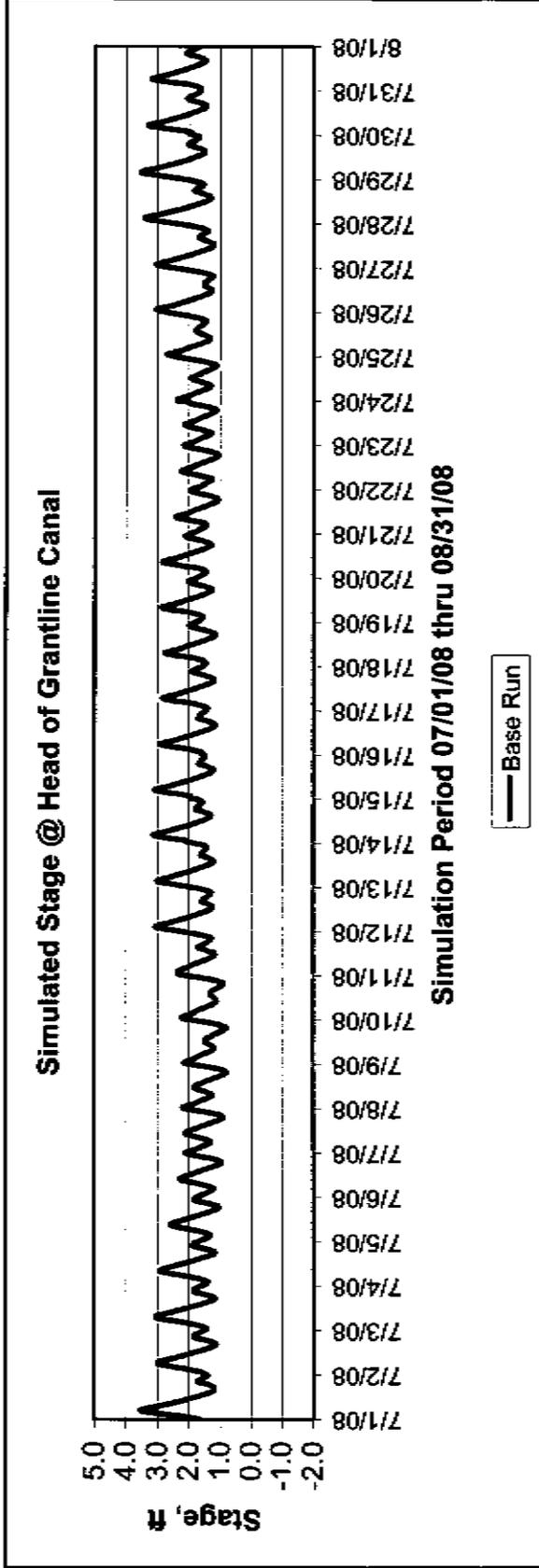


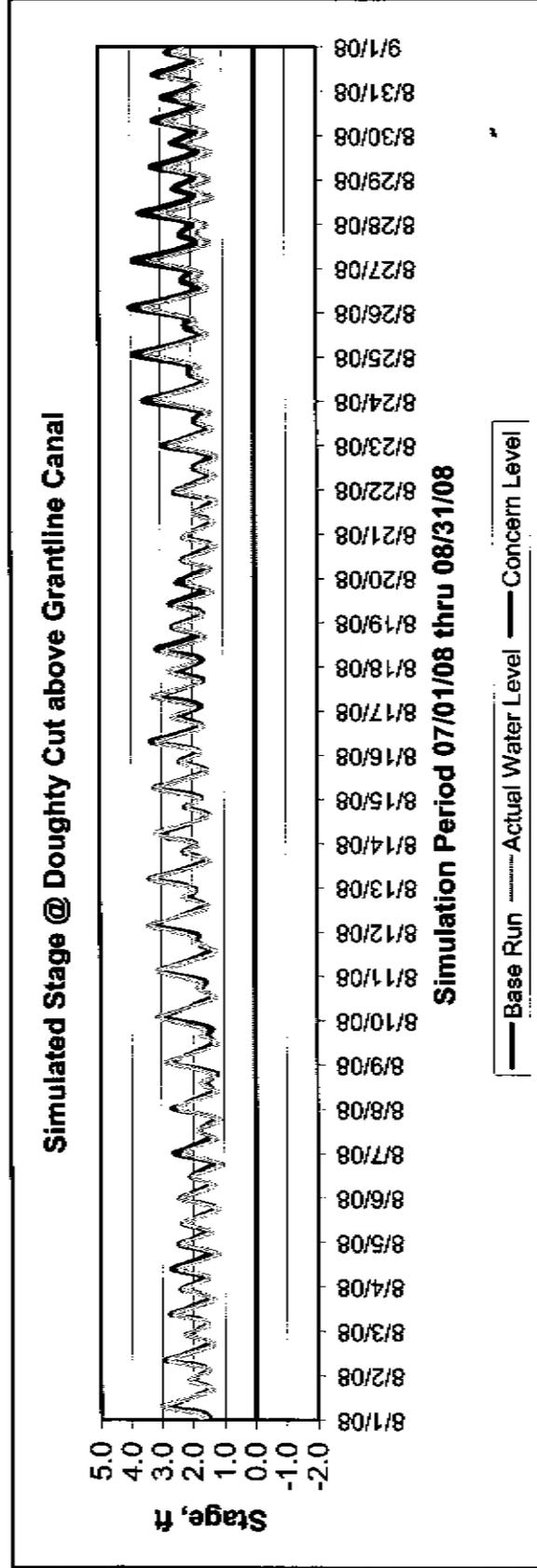
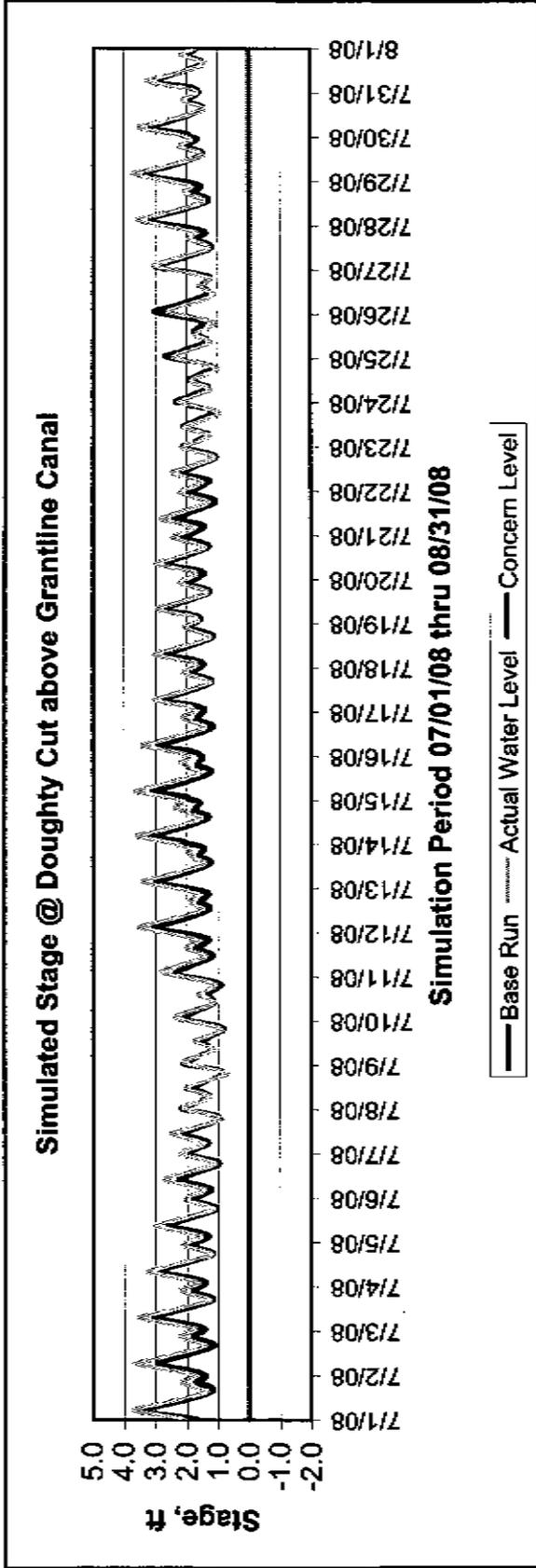




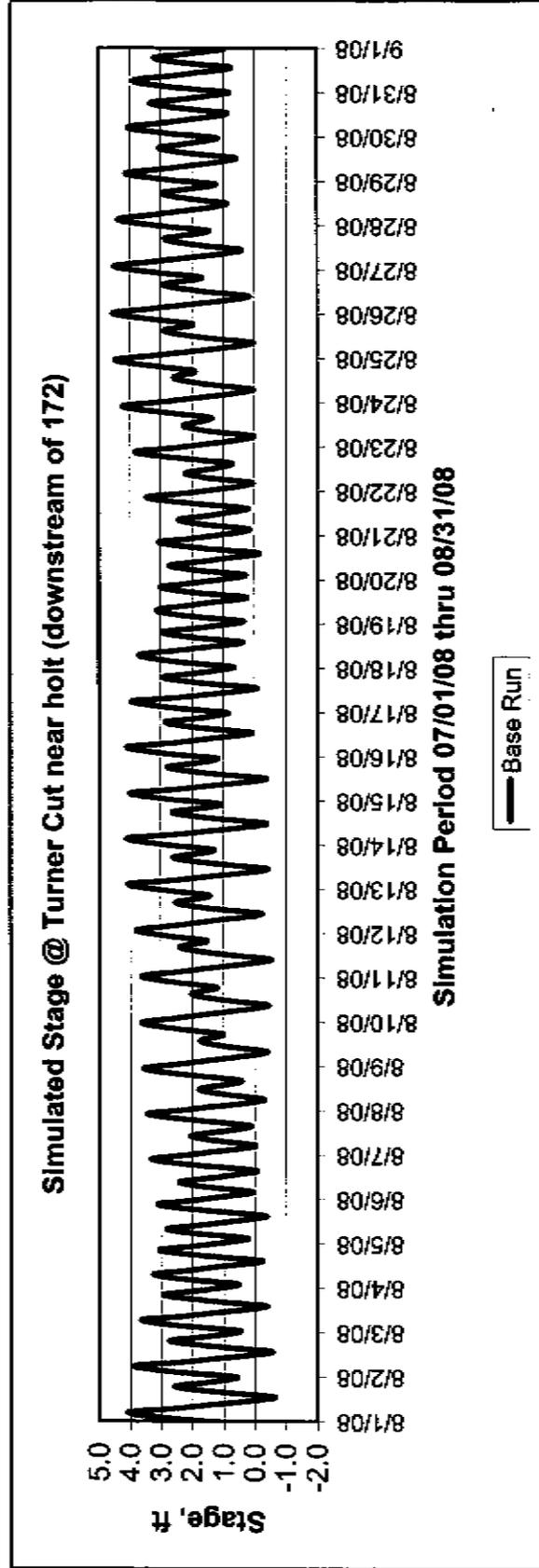
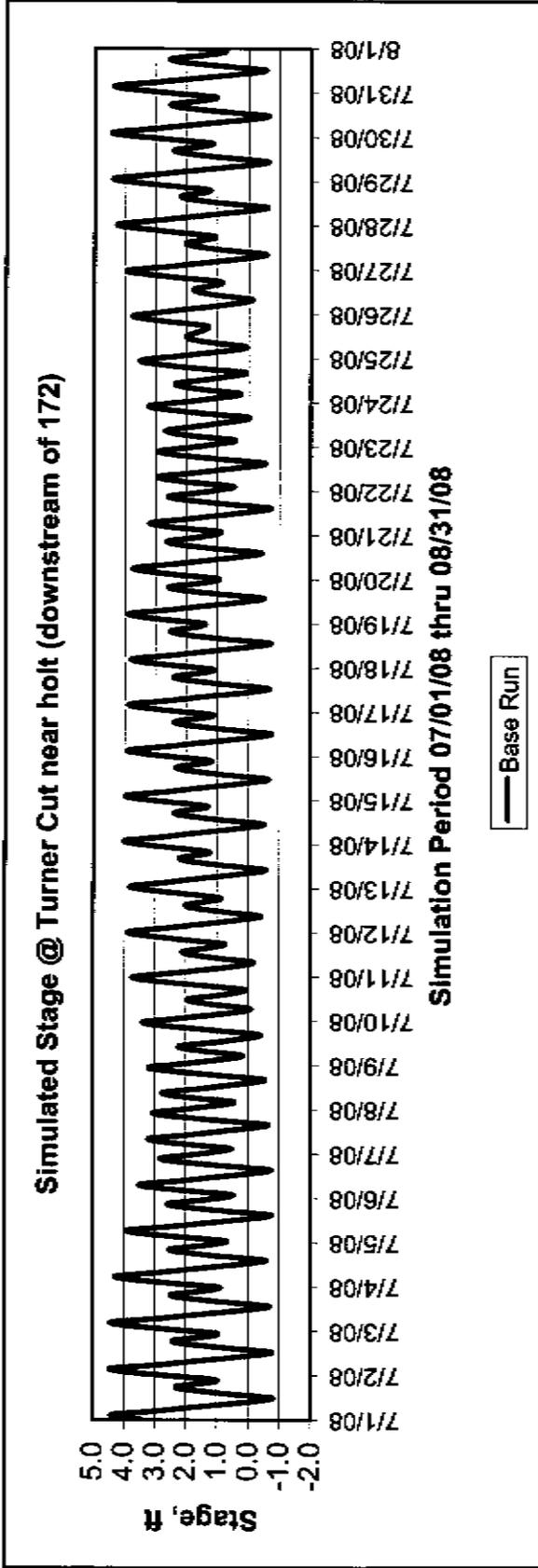


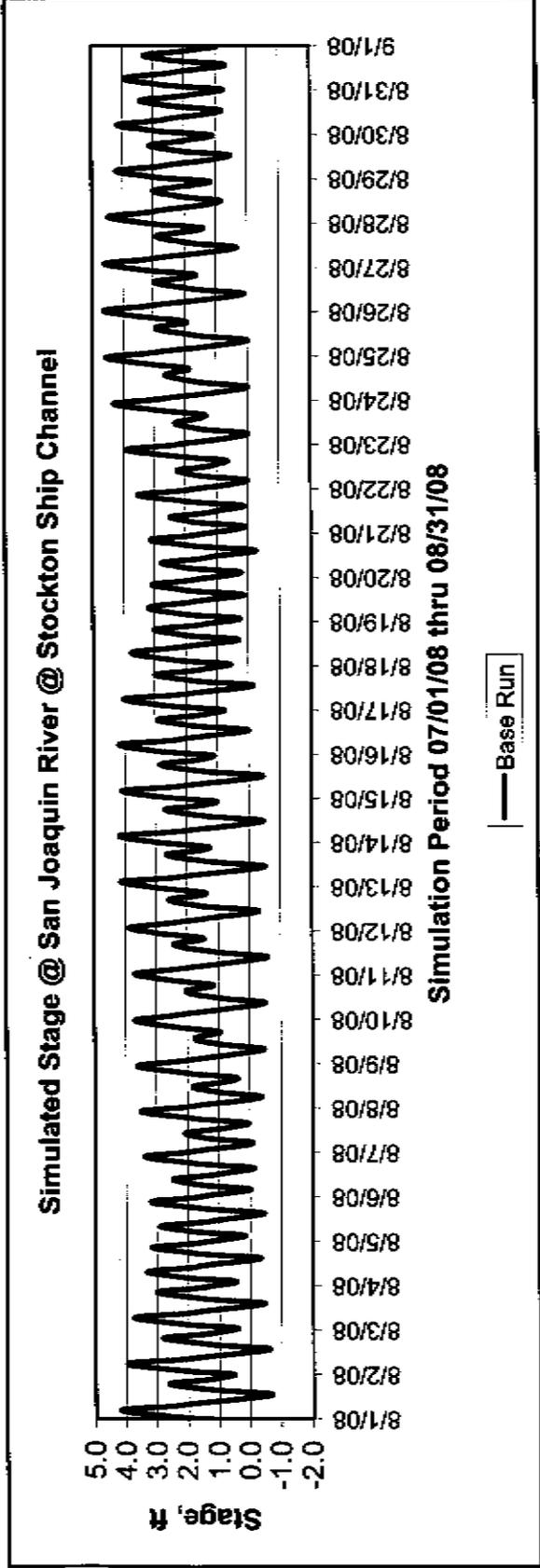
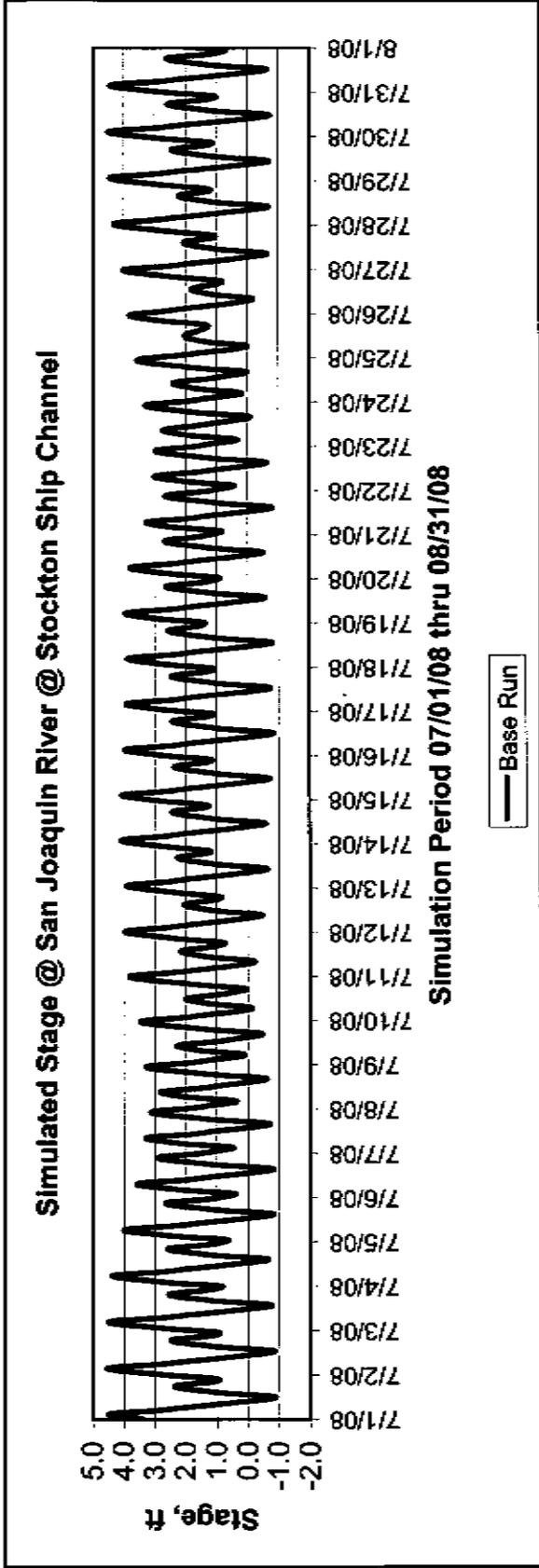


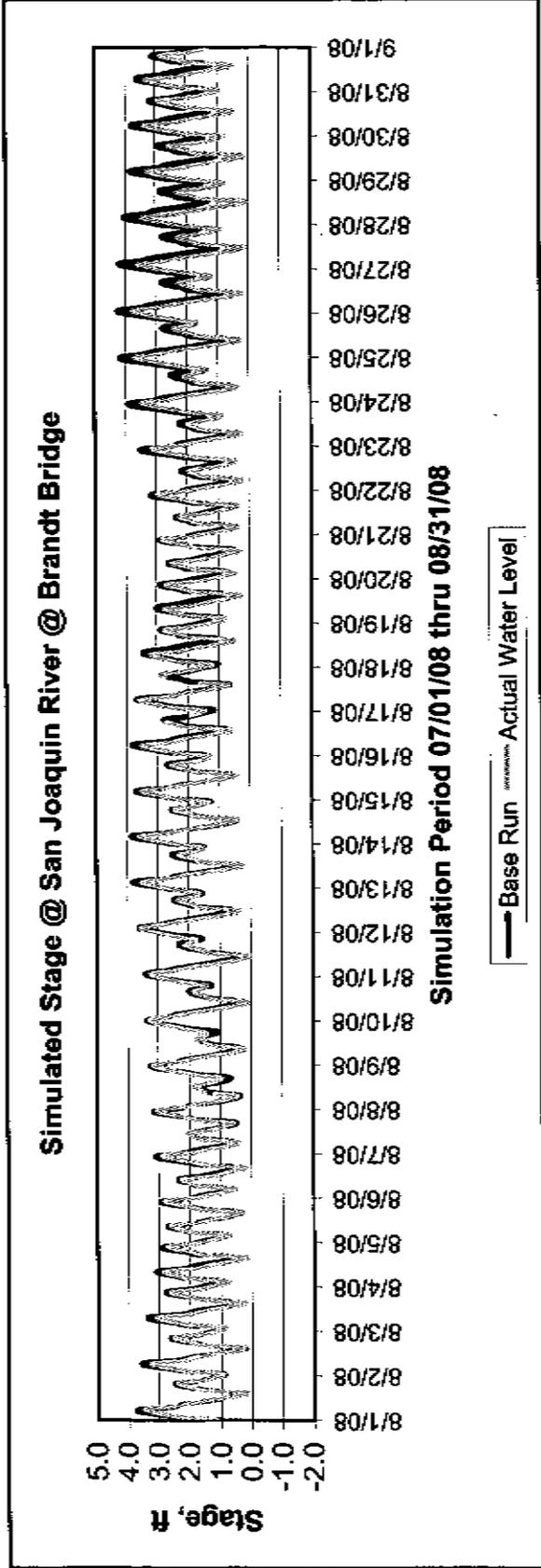
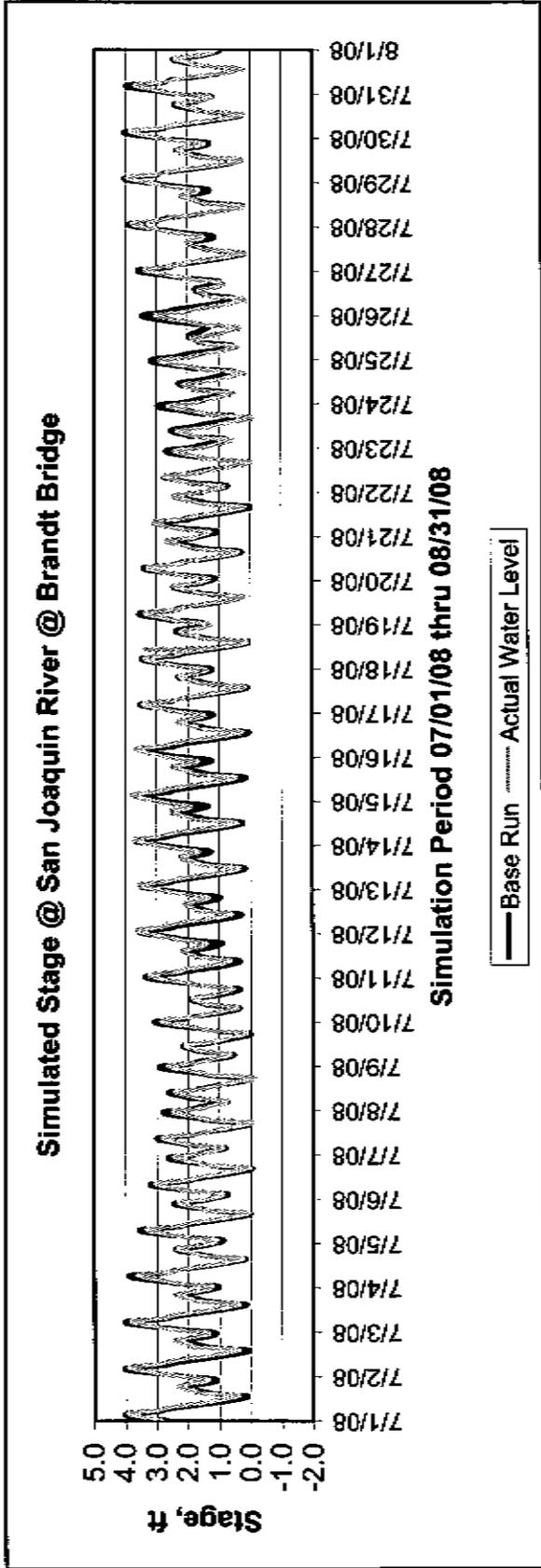


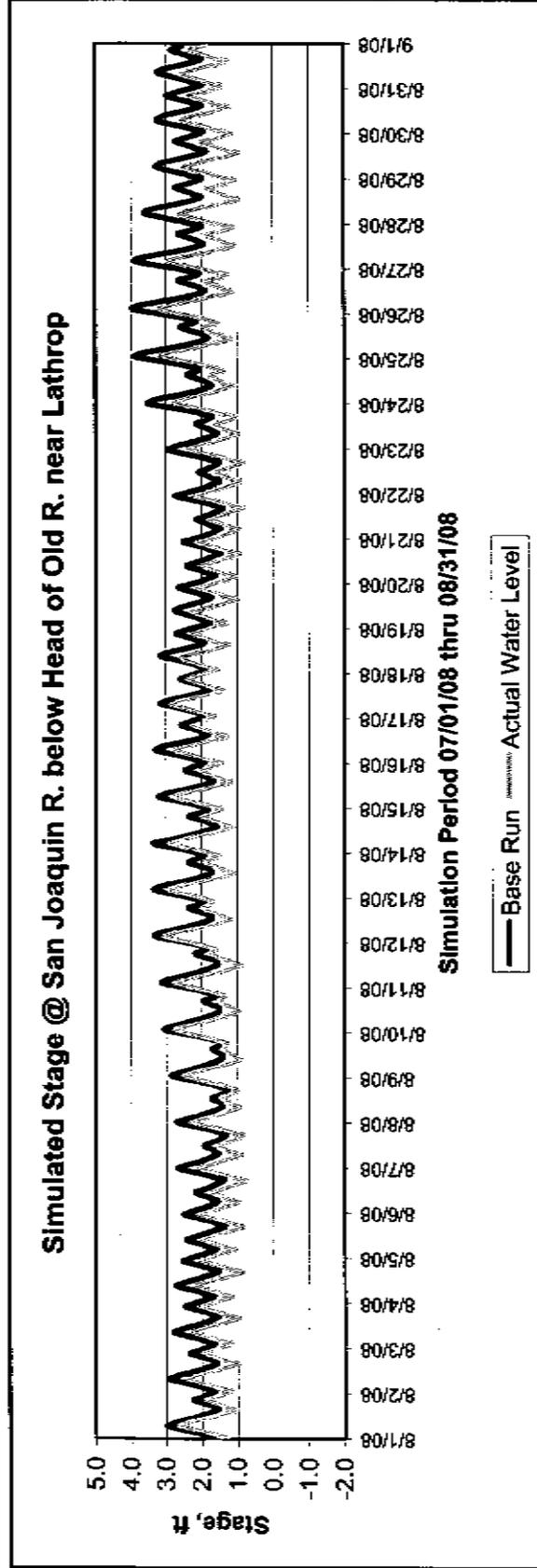
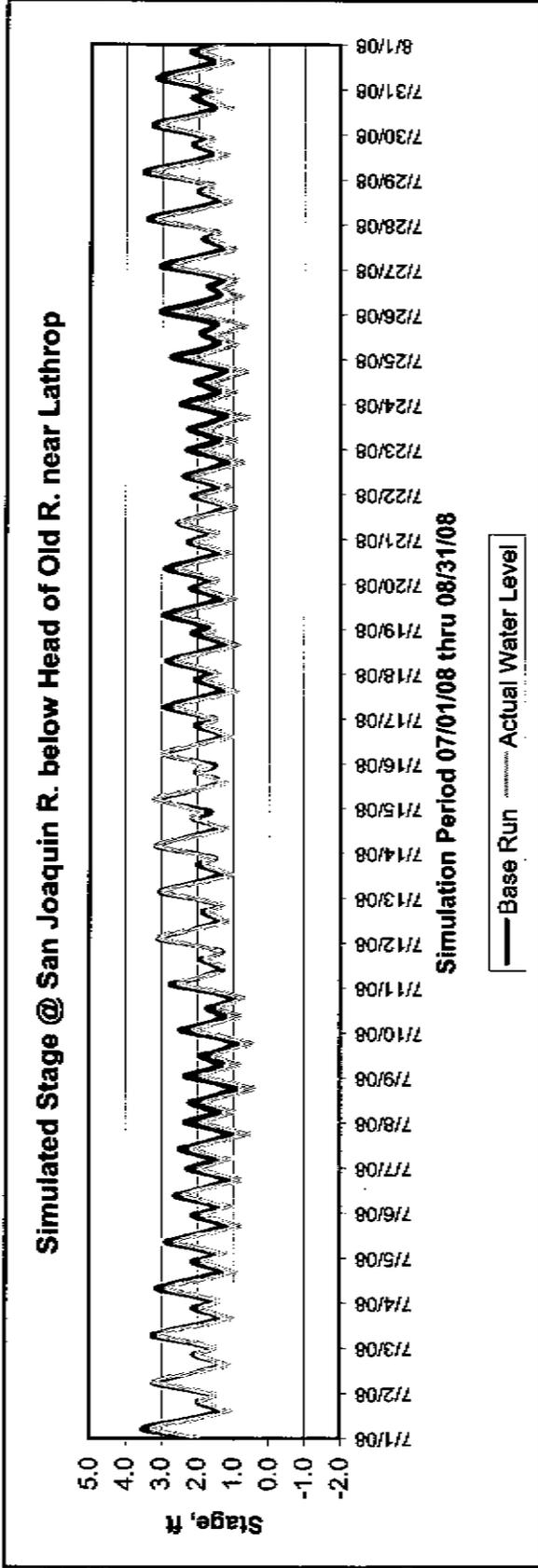


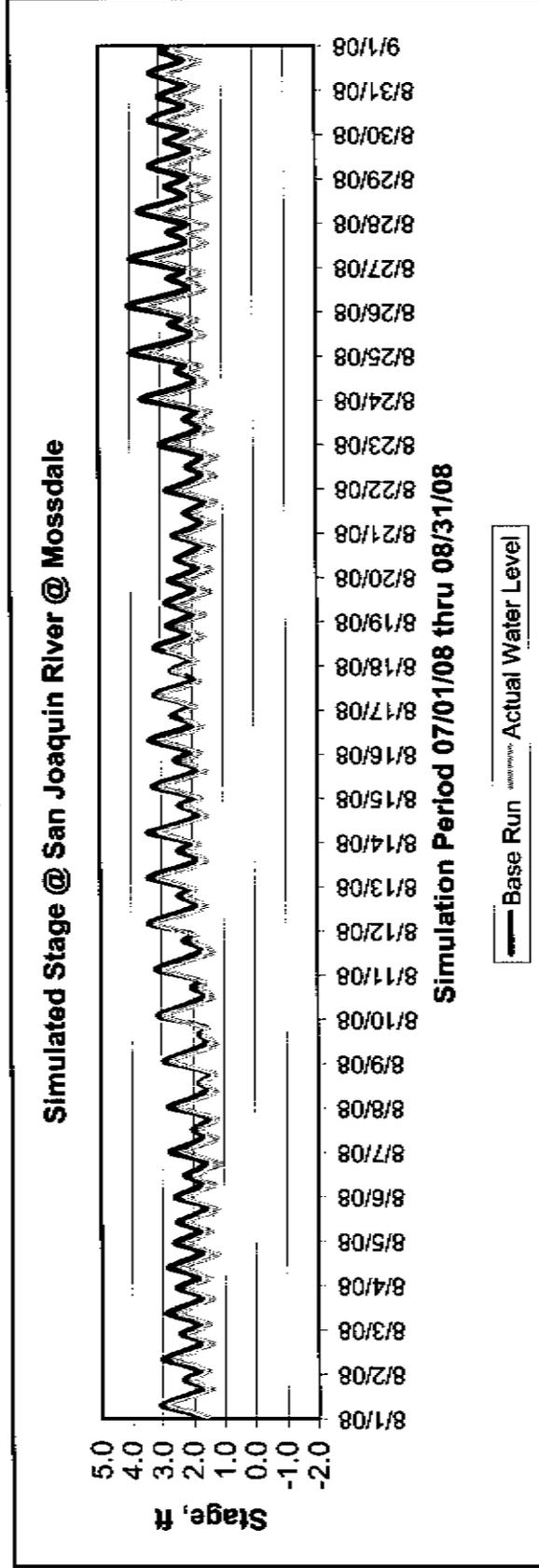
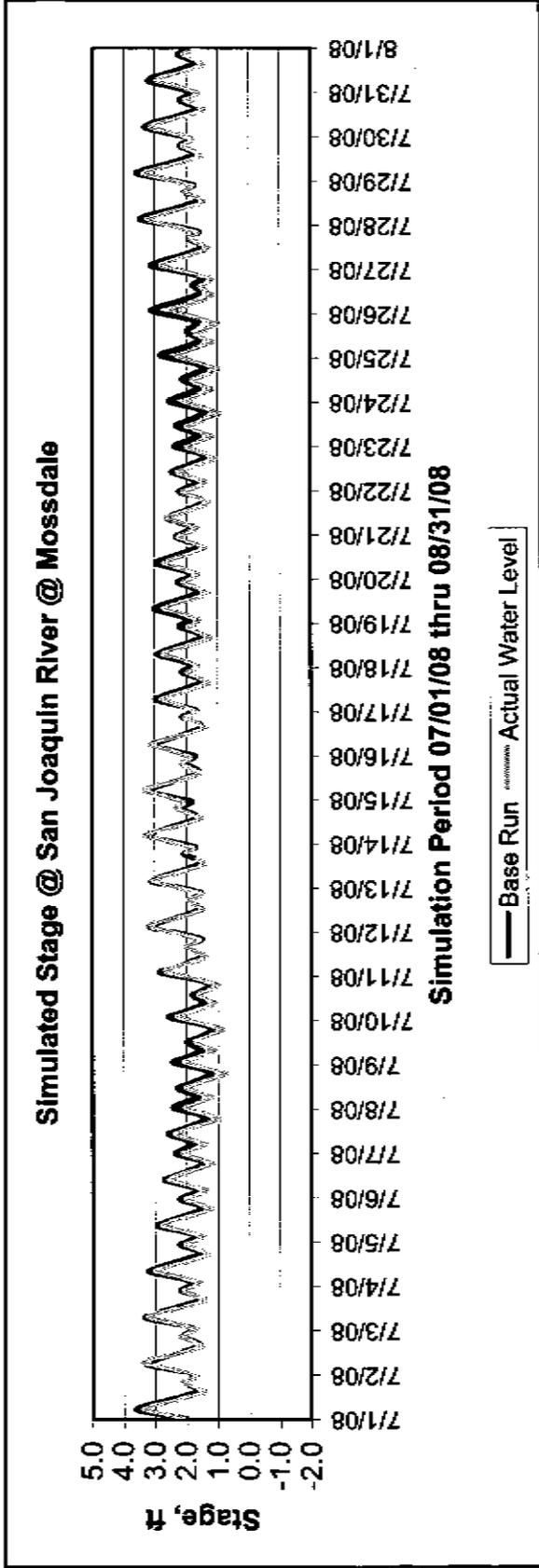
SAN JOAQUIN RIVER - STAGE





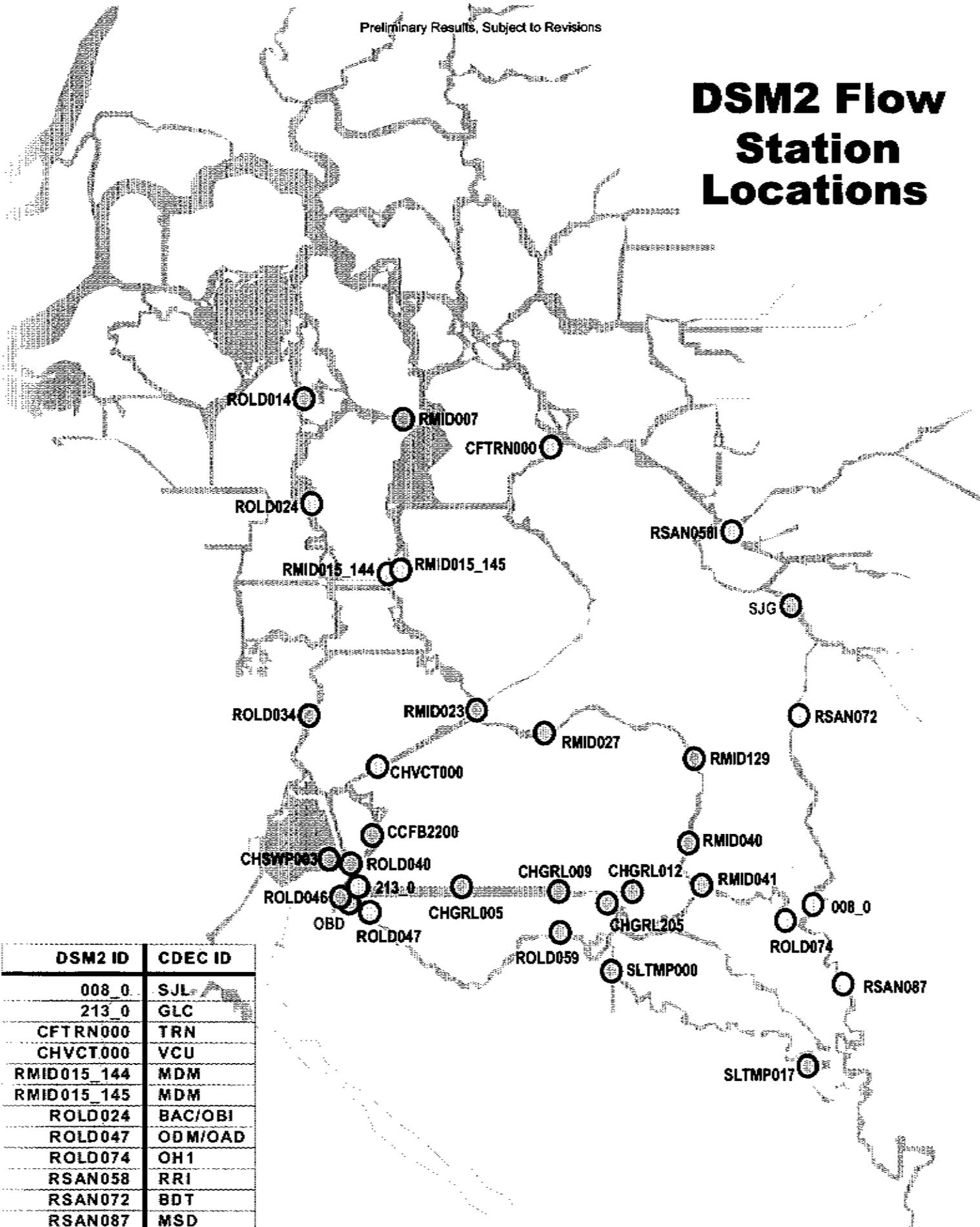






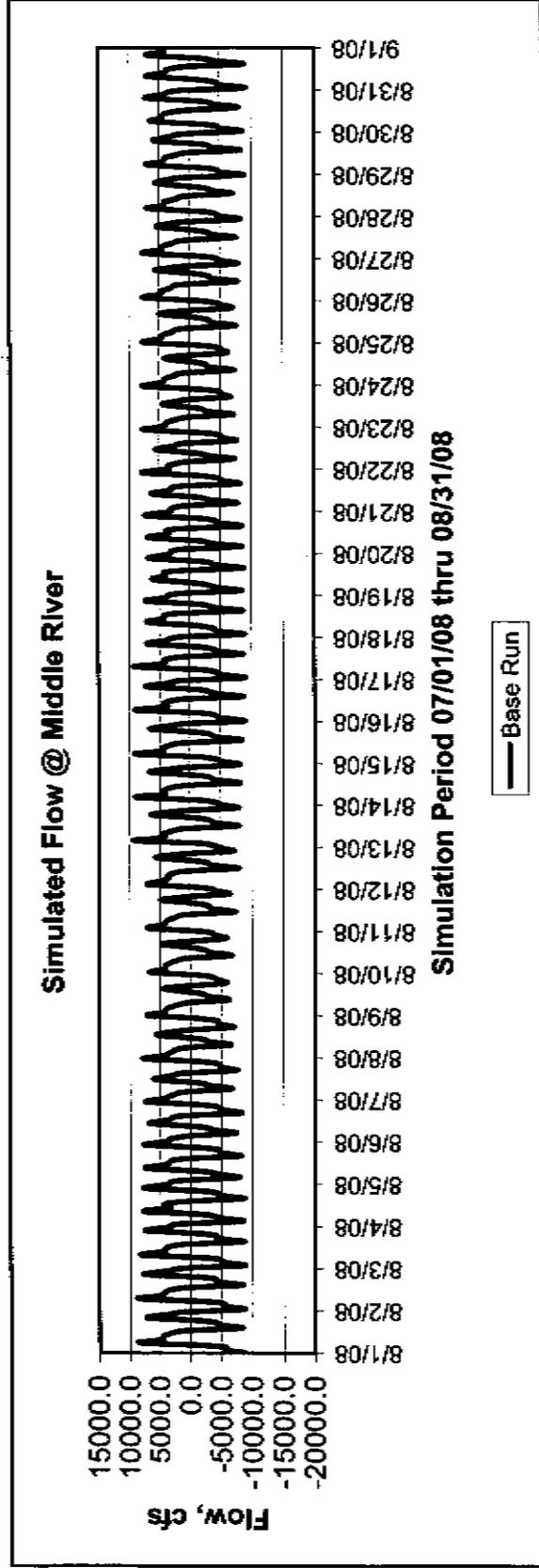
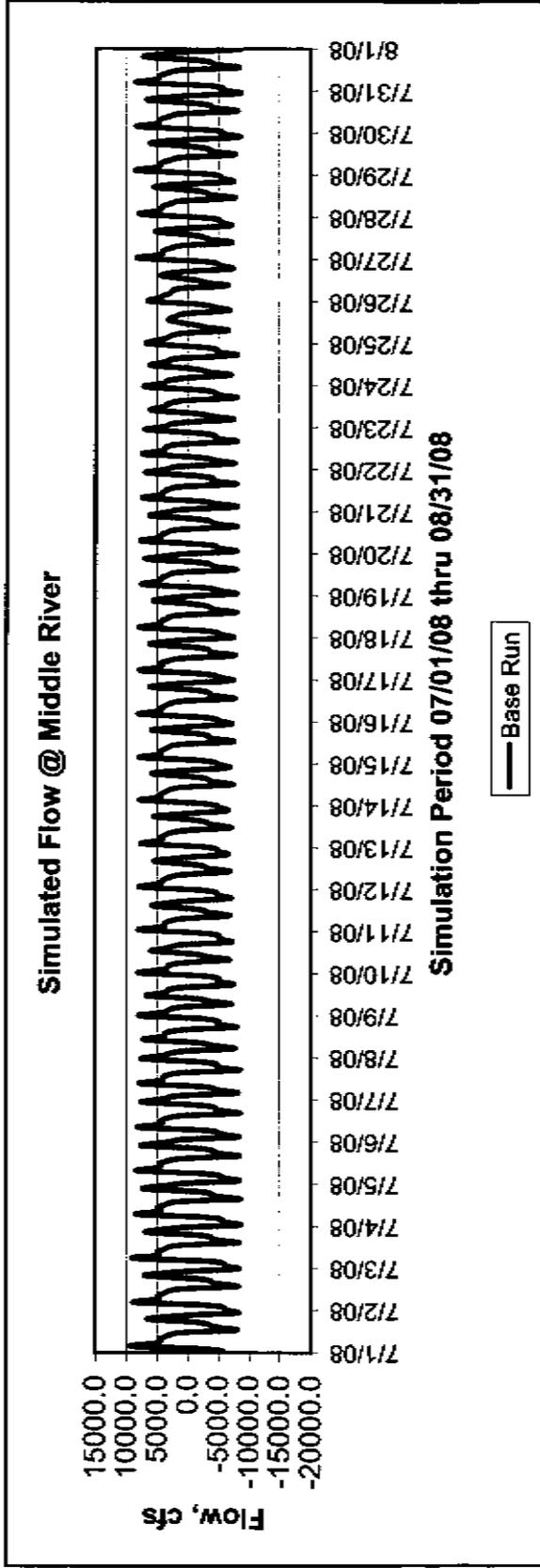
**COMPARISON OF BASELINE &
HISTORICAL FLOW
(15-MINUTE)**

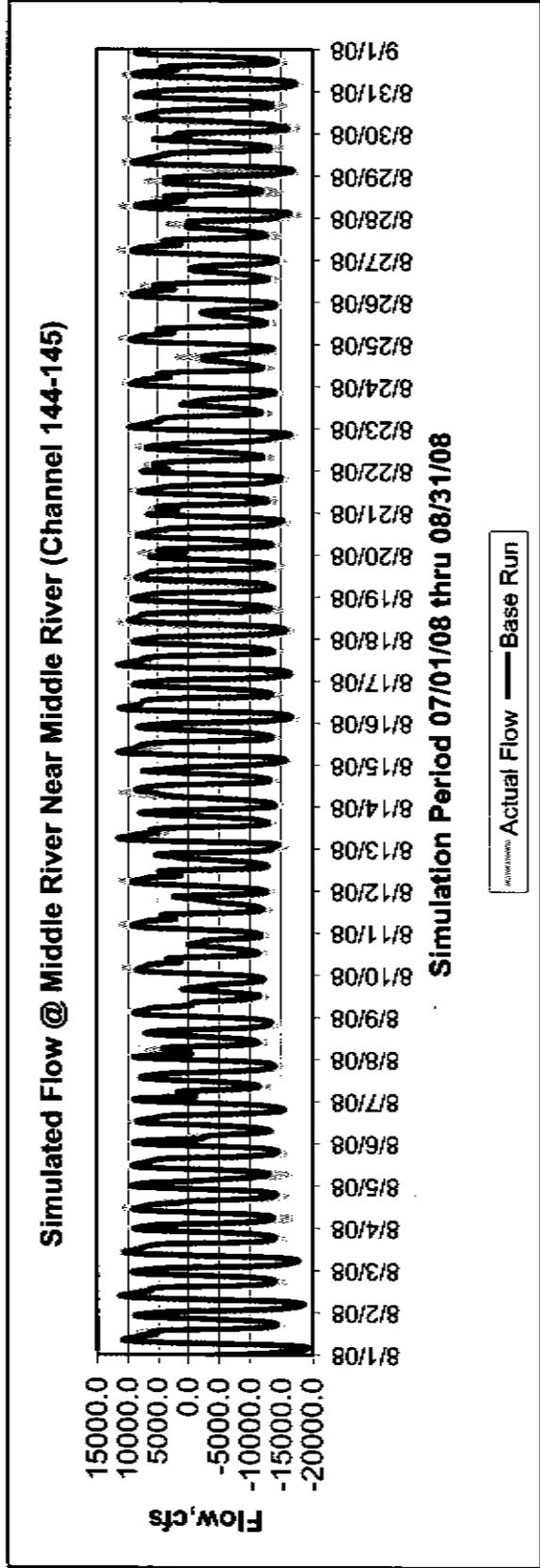
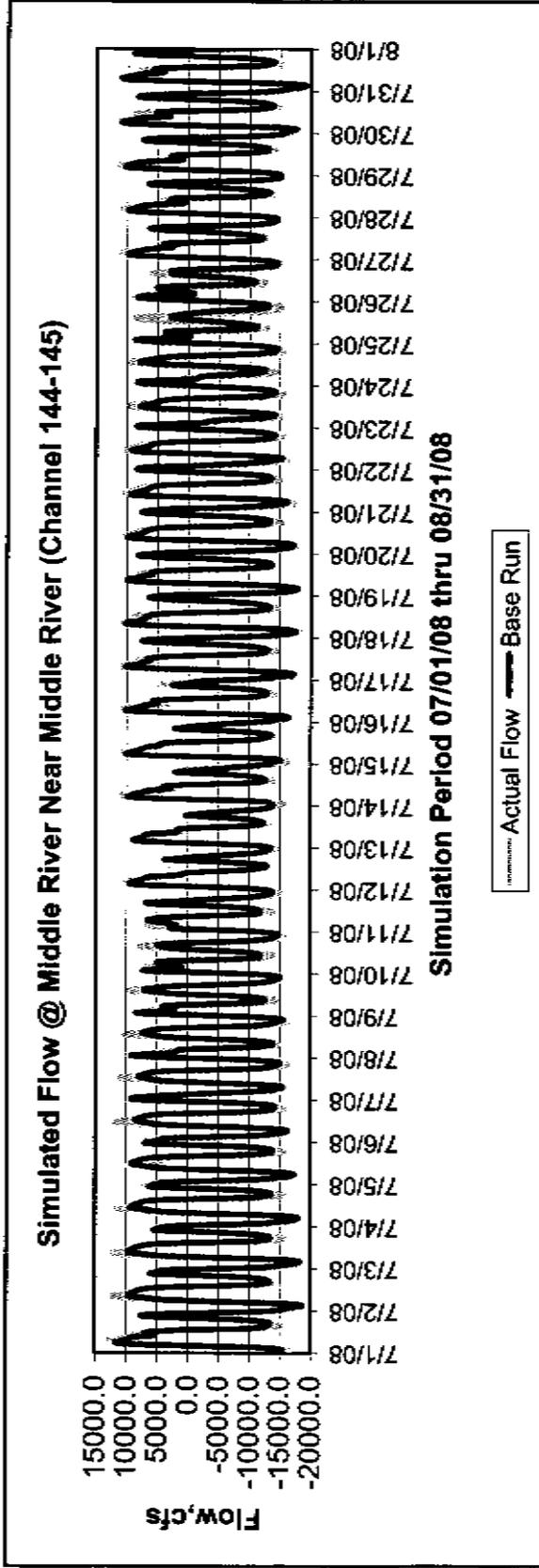
DSM2 Flow Station Locations

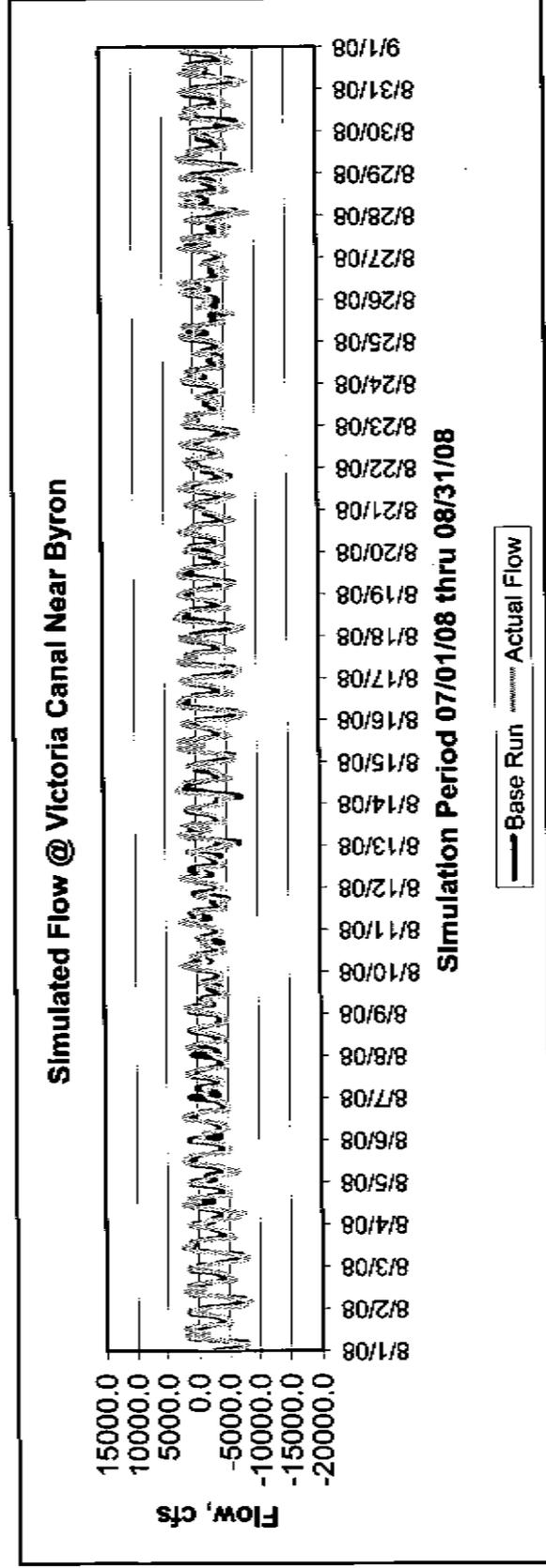
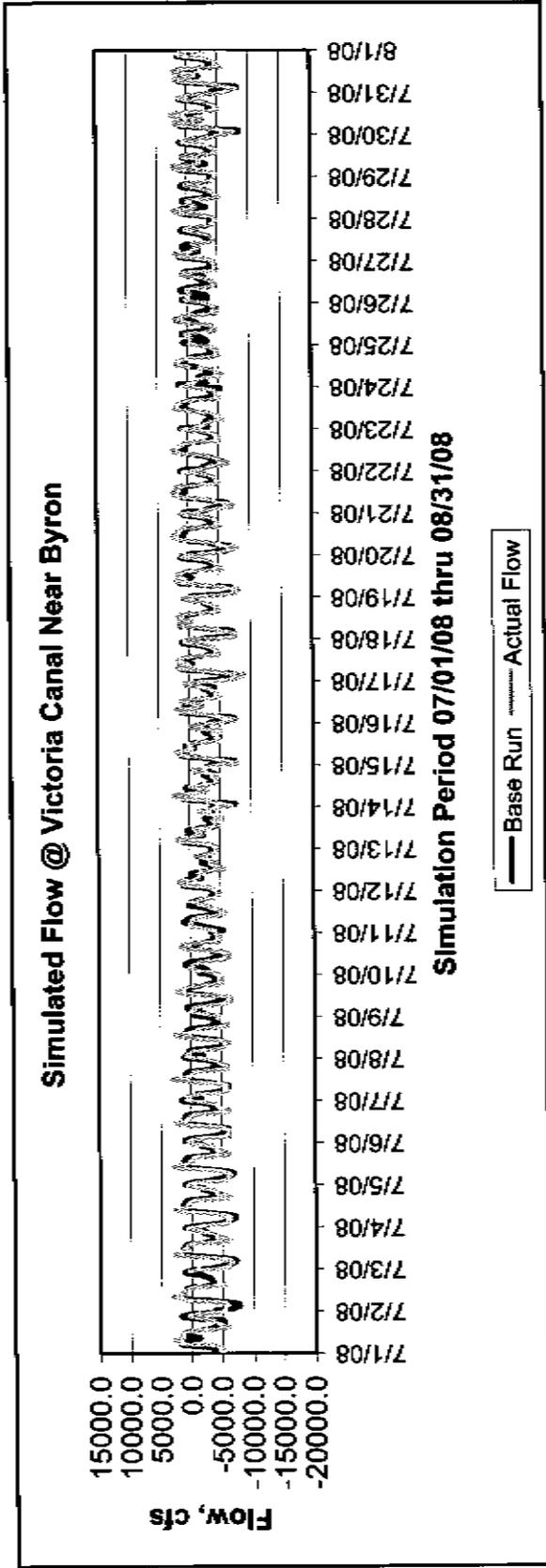


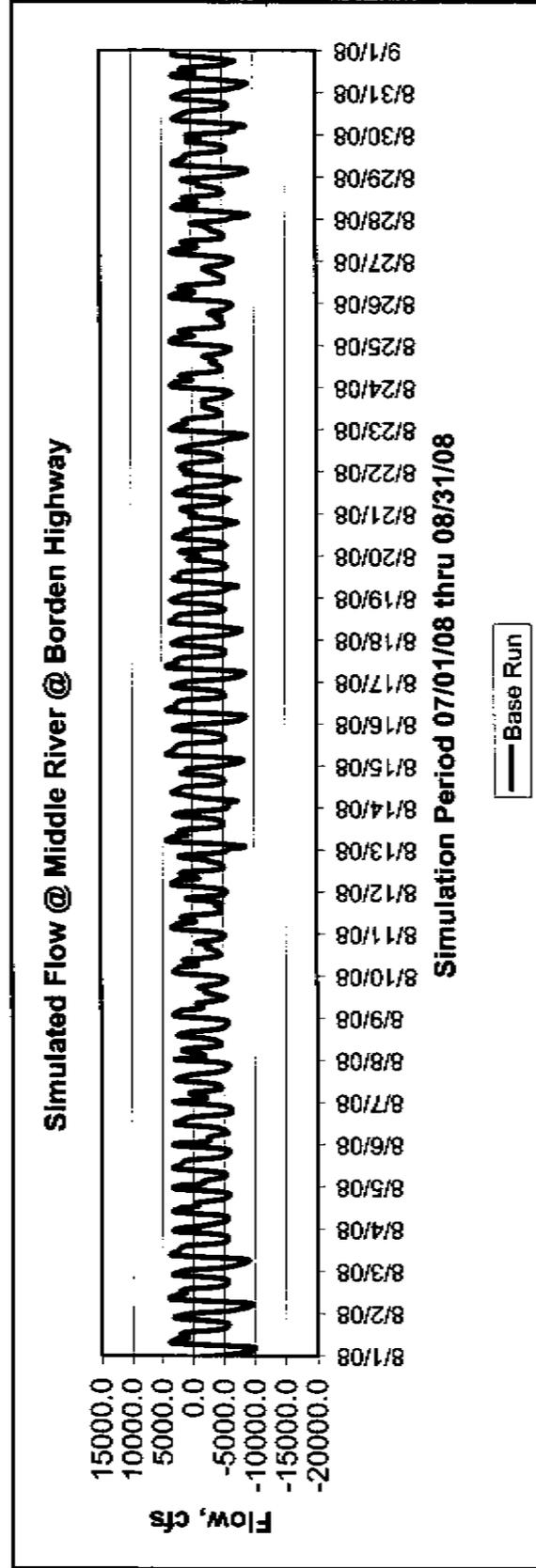
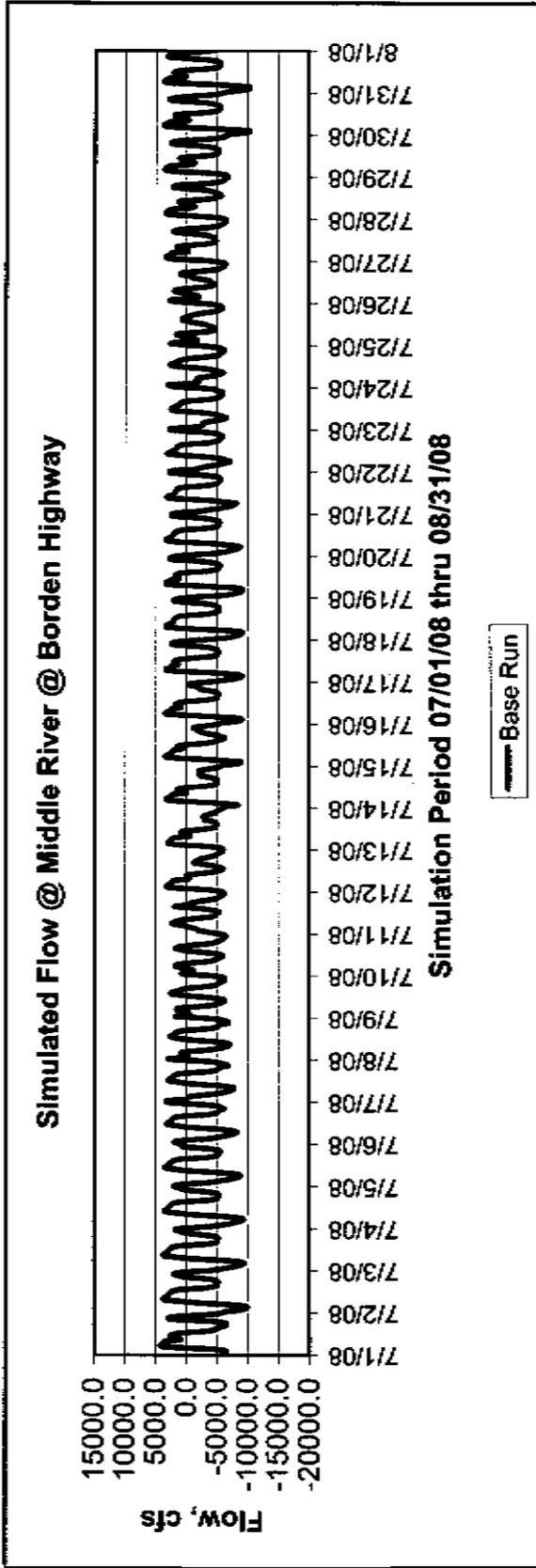
DSM2 ID	CDEC ID
008_0	SJL
213_0	GLC
CFTRN000	TRN
CHVCT.000	VCU
RMID015_144	MDM
RMID015_145	MDM
ROLD024	BAC/OBI
ROLD047	ODM/OAD
ROLD074	OH1
RSAN058	RR1
RSAN072	BDT
RSAN087	MSD

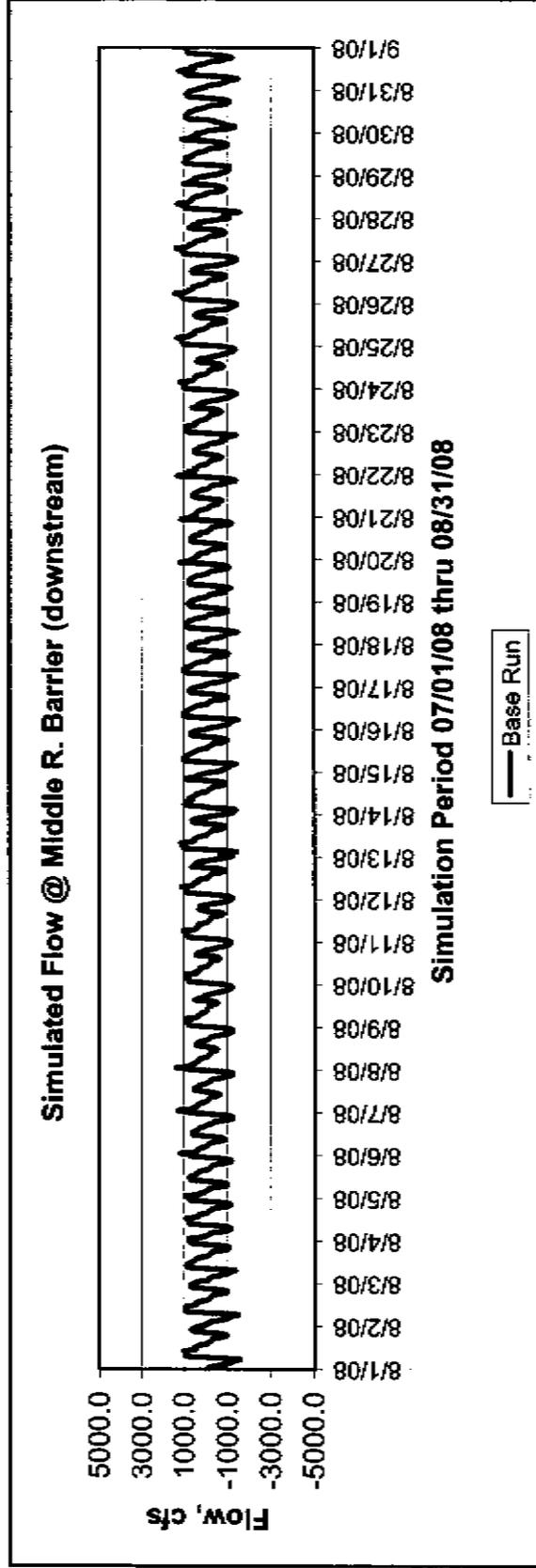
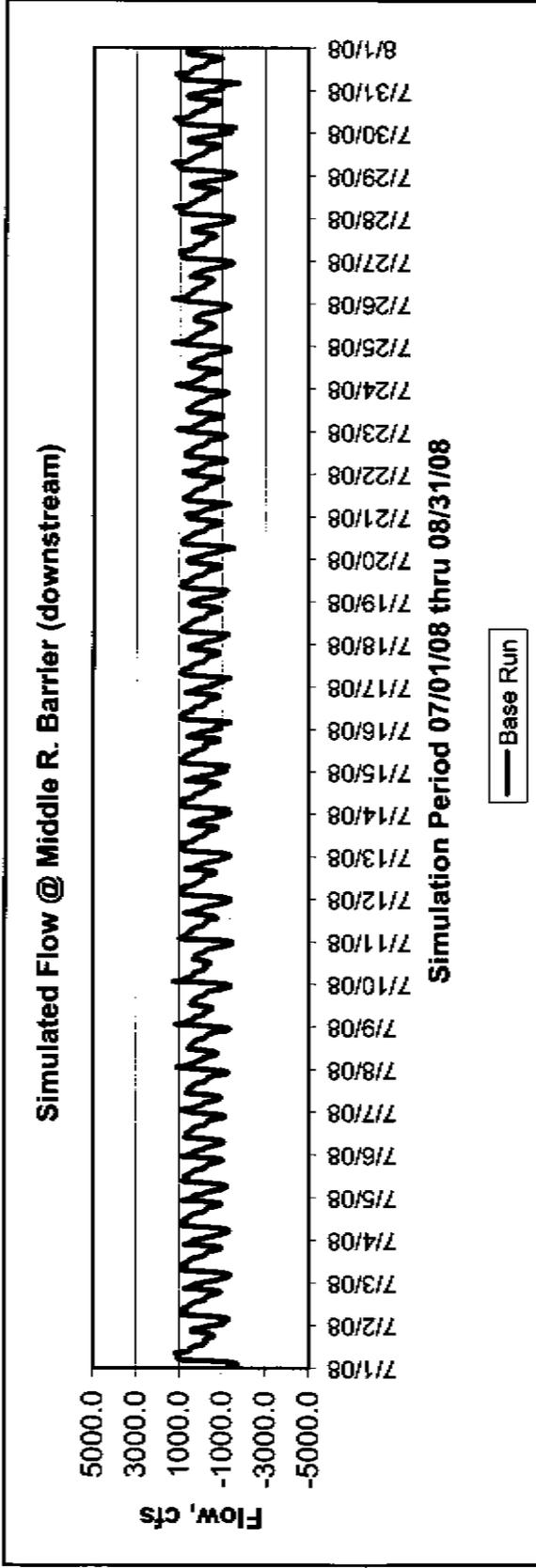
MIDDLE RIVER - FLOW

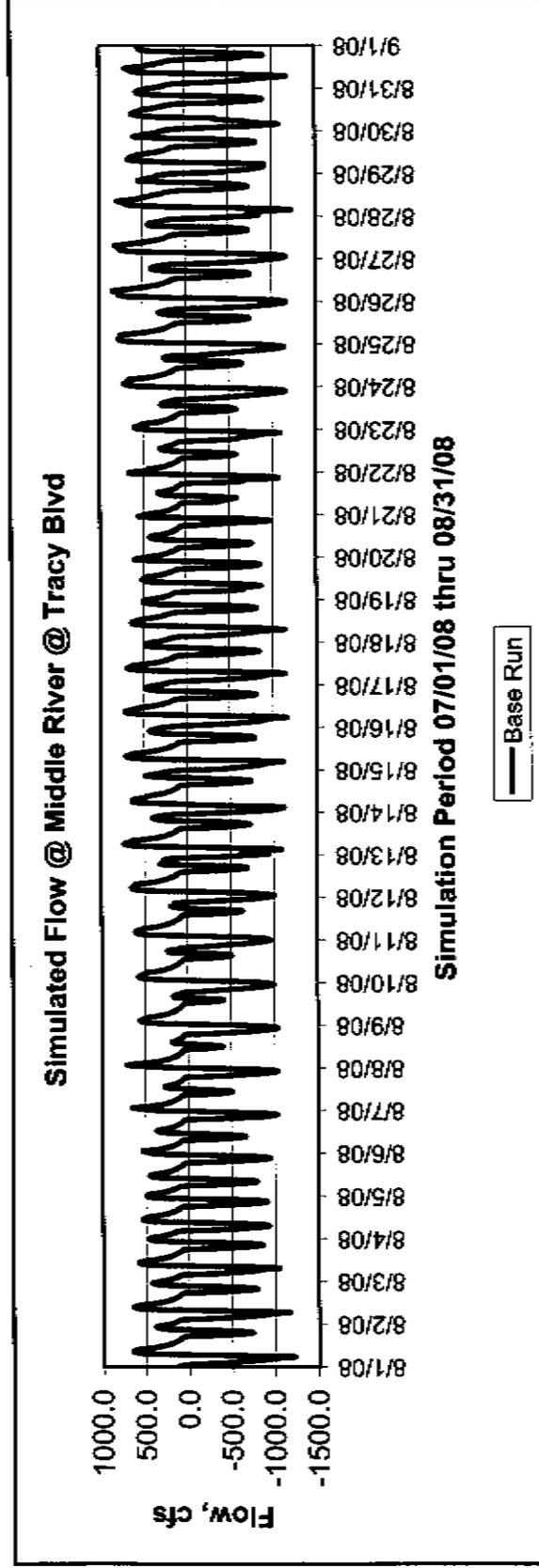
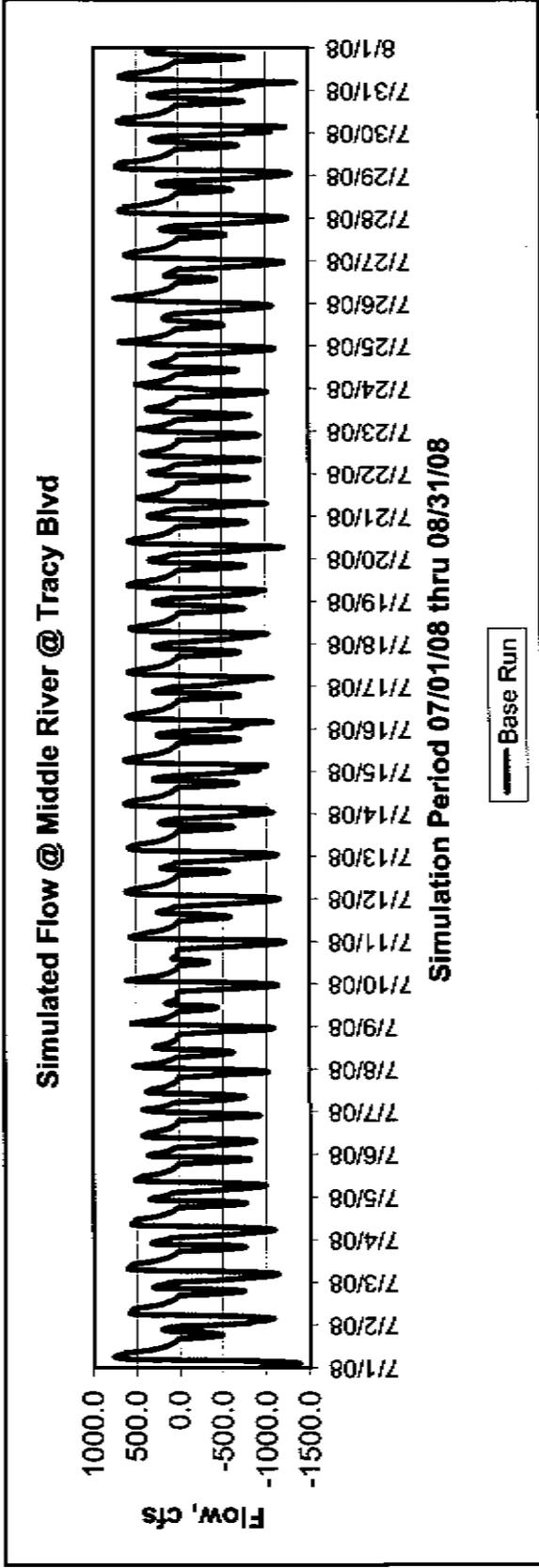


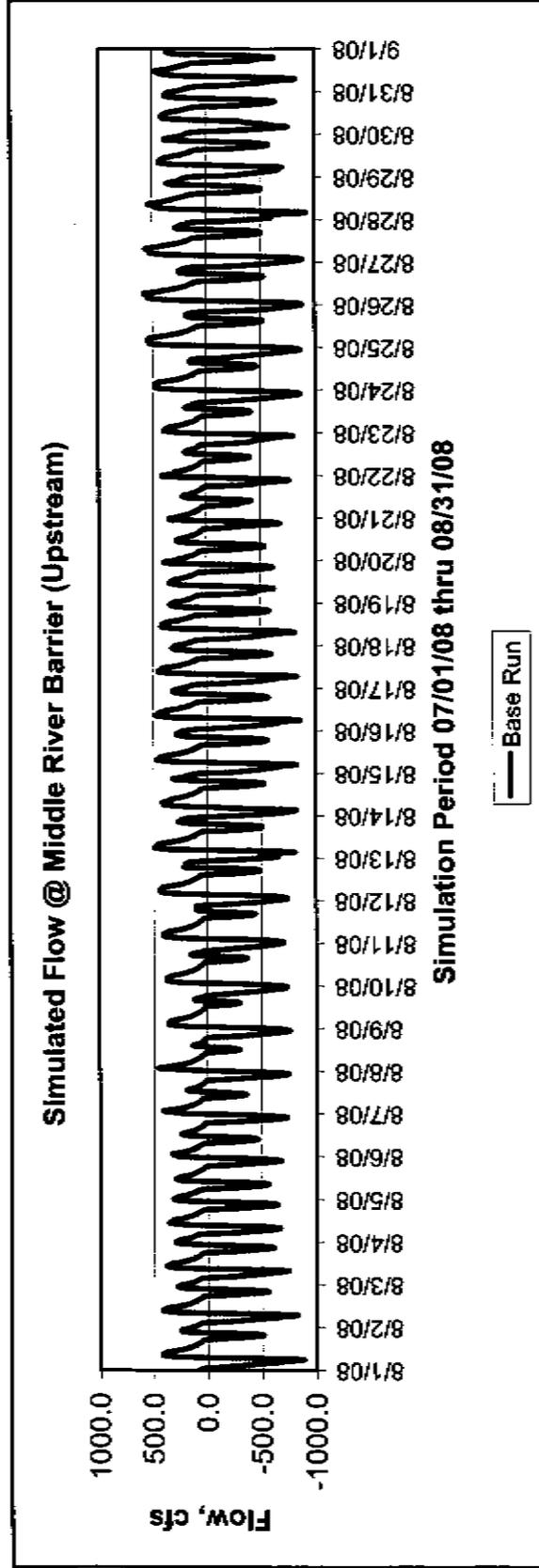
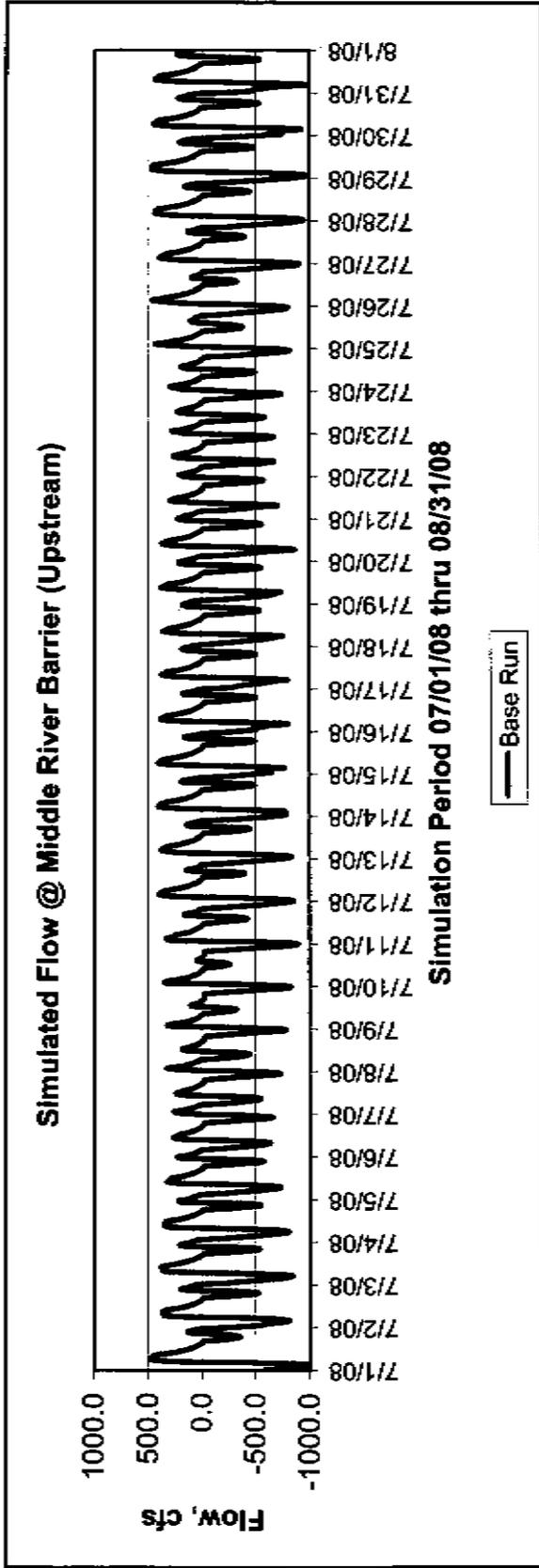


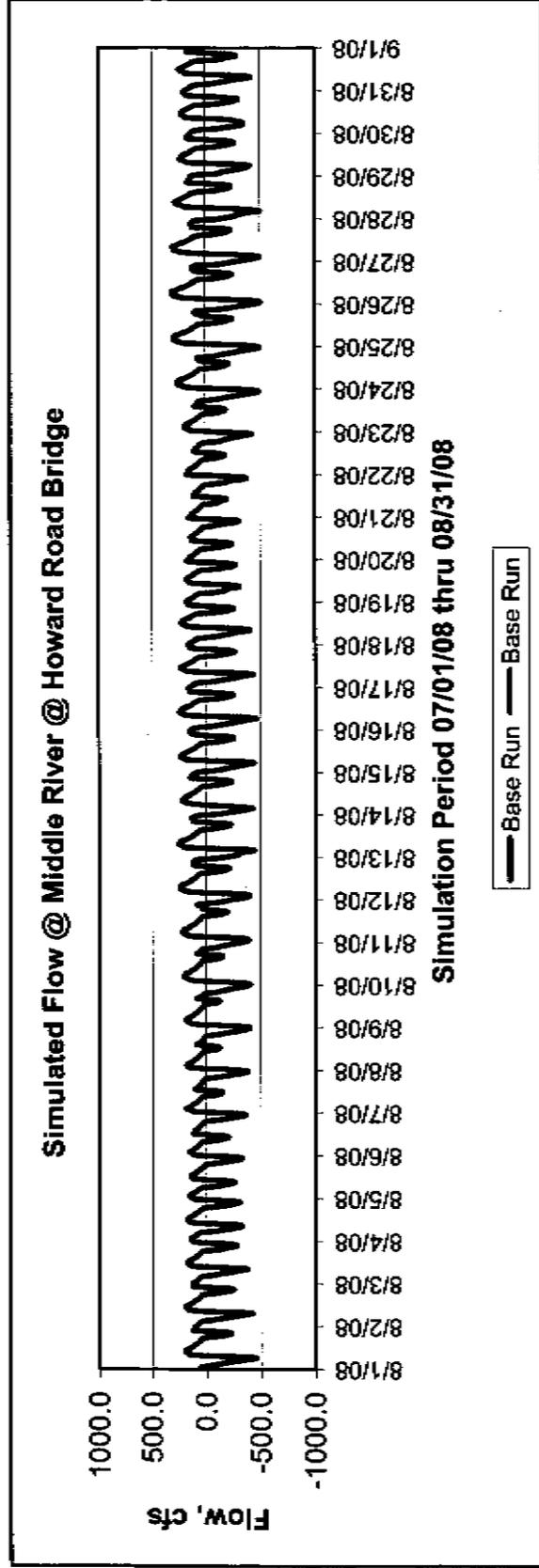
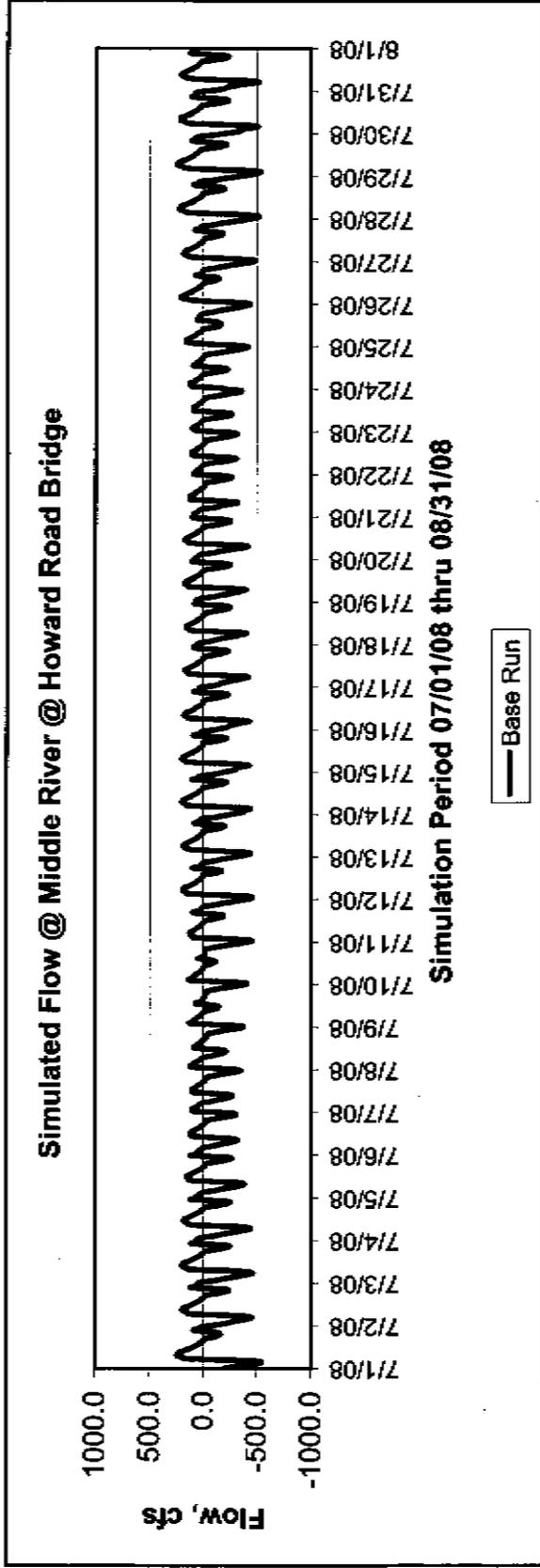


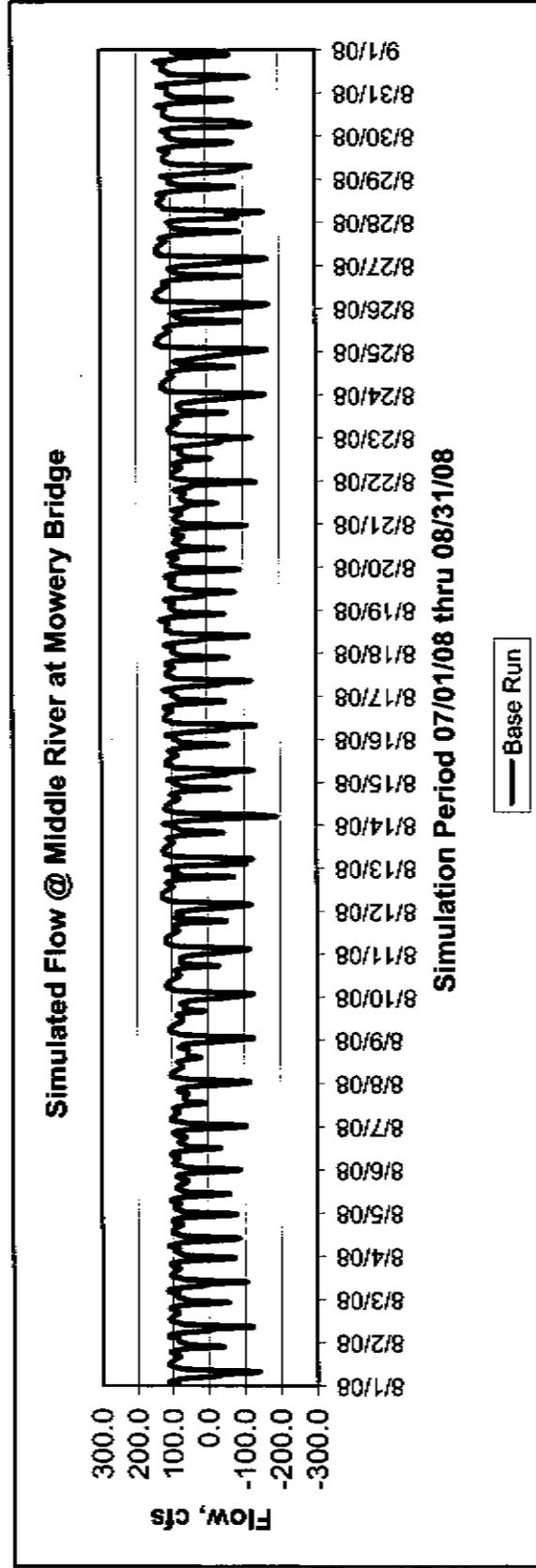
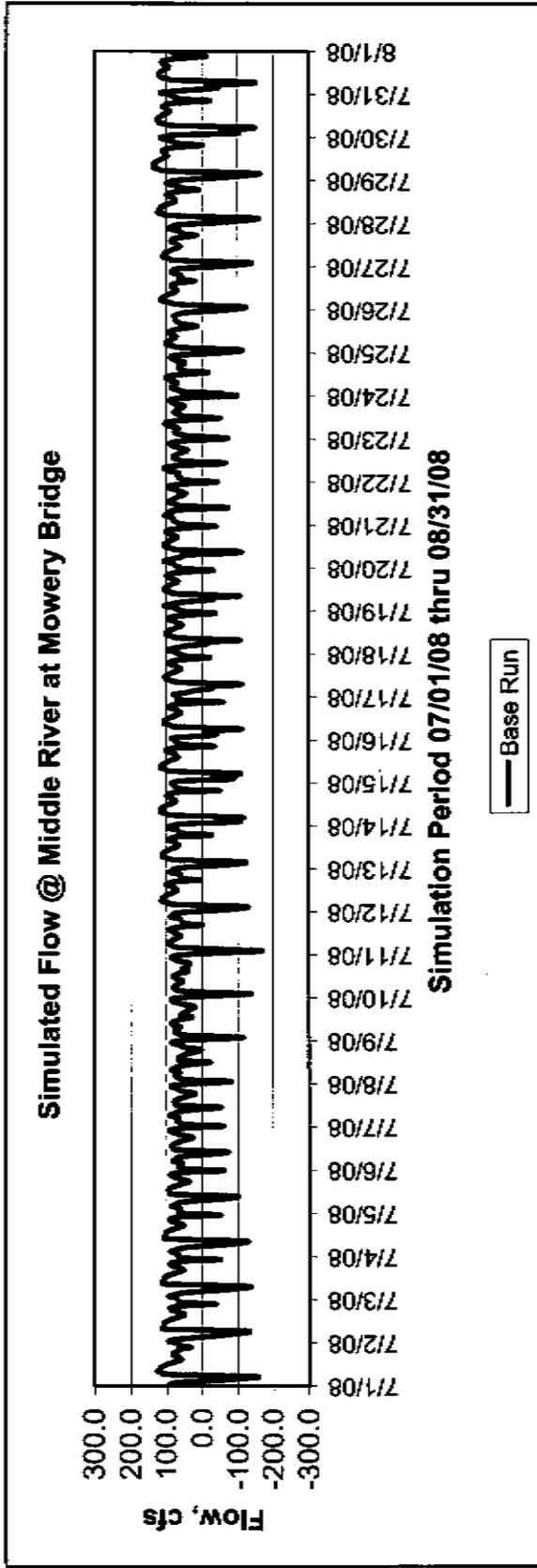


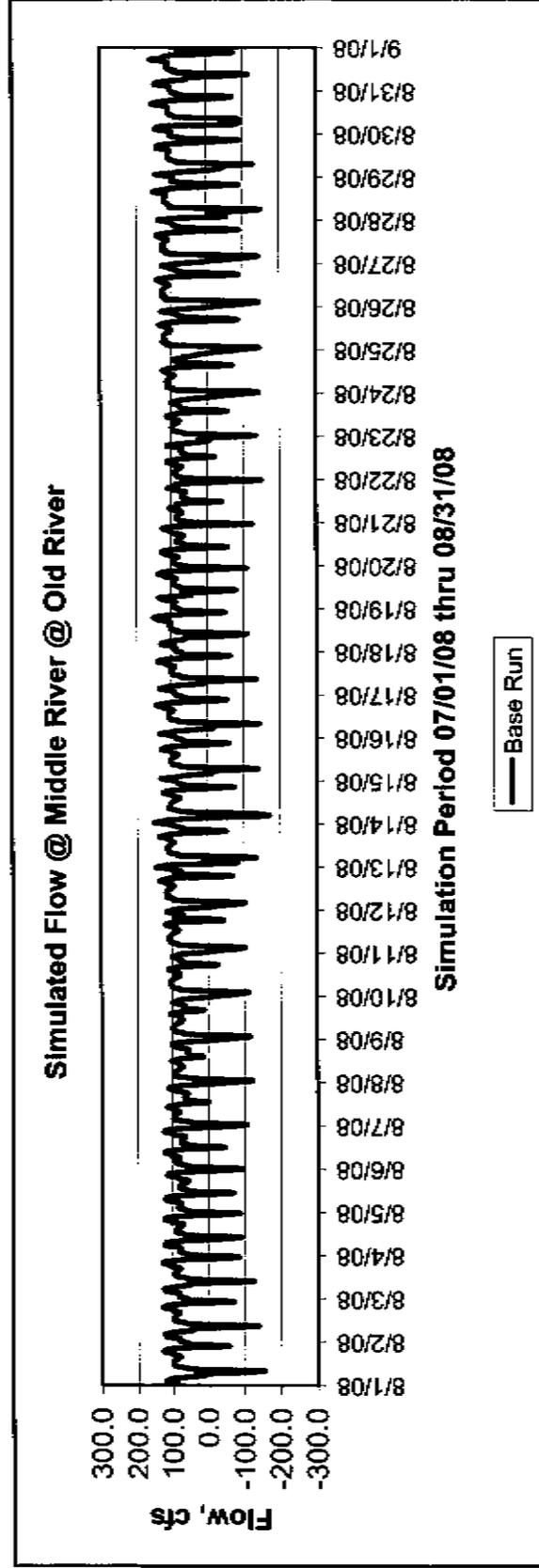
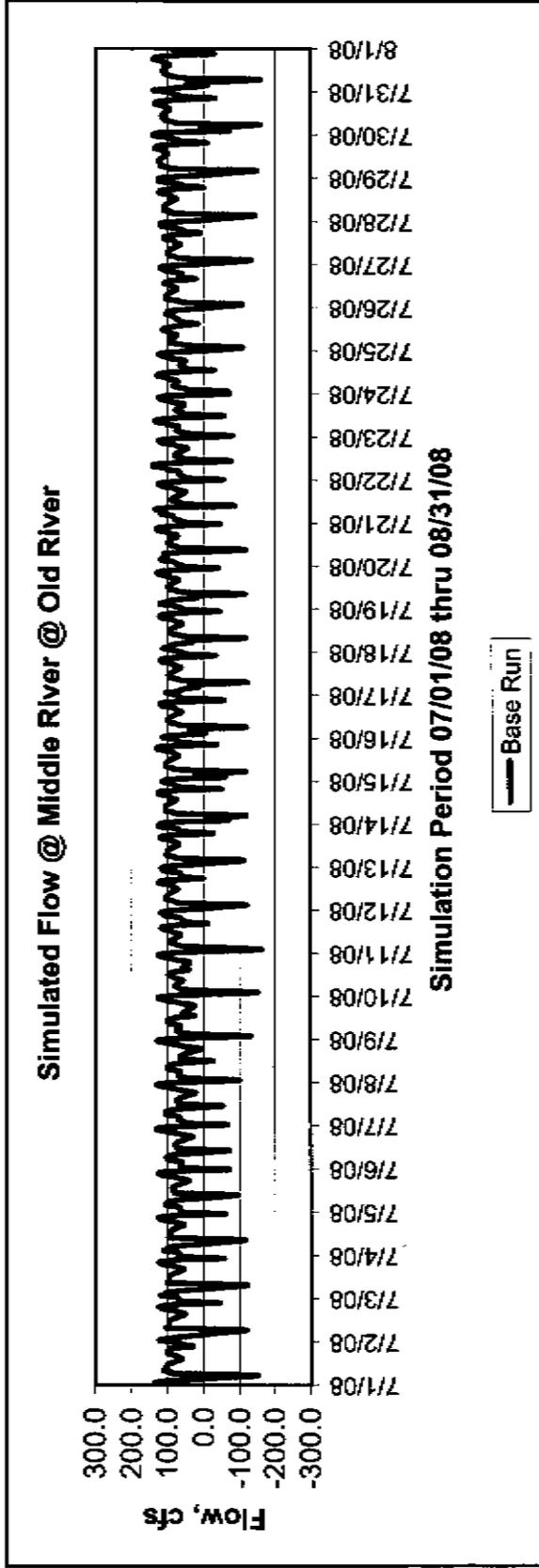




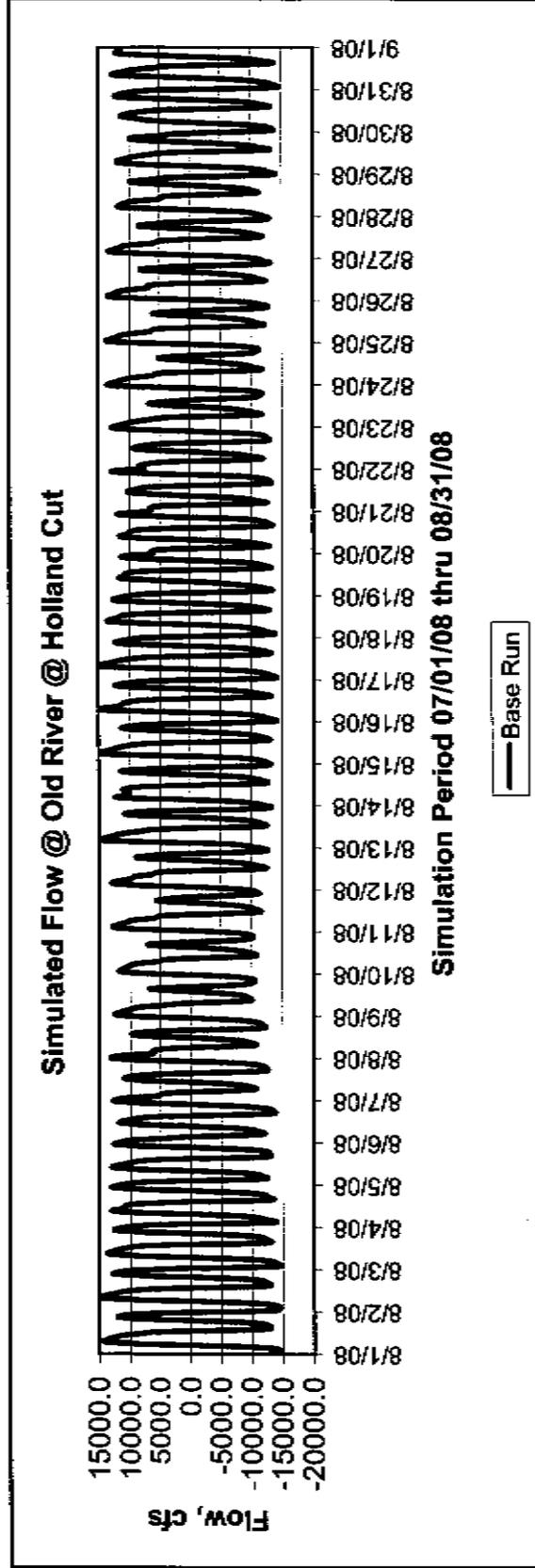
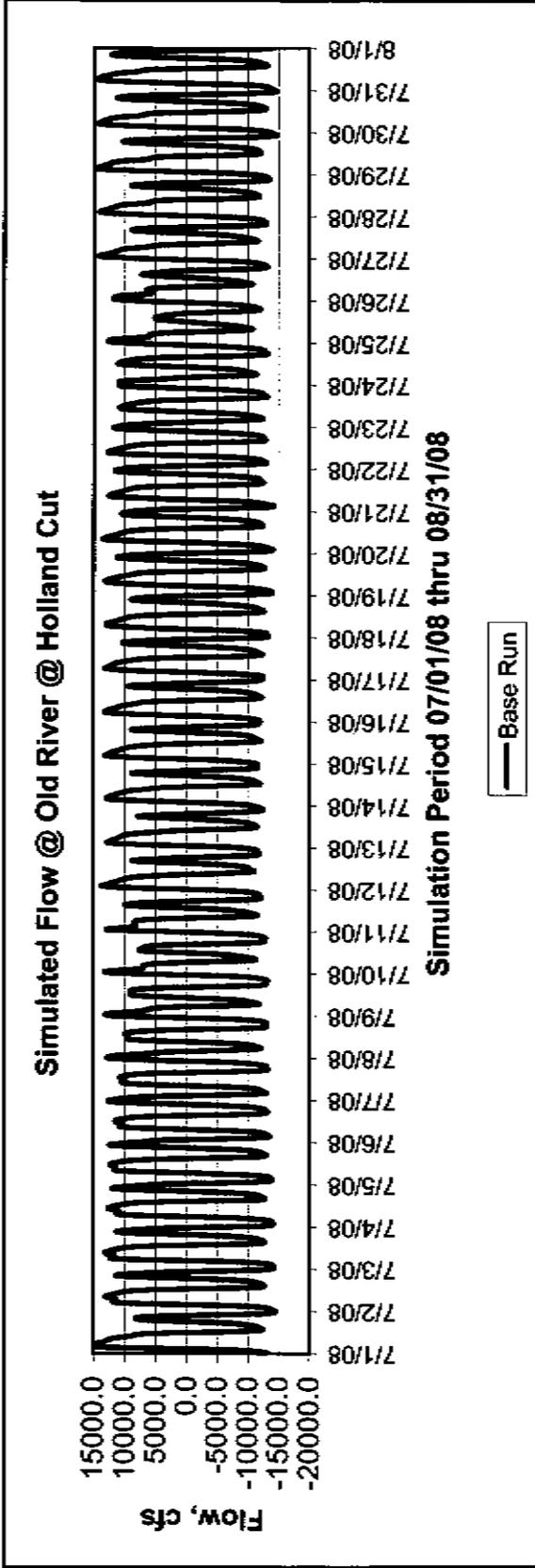


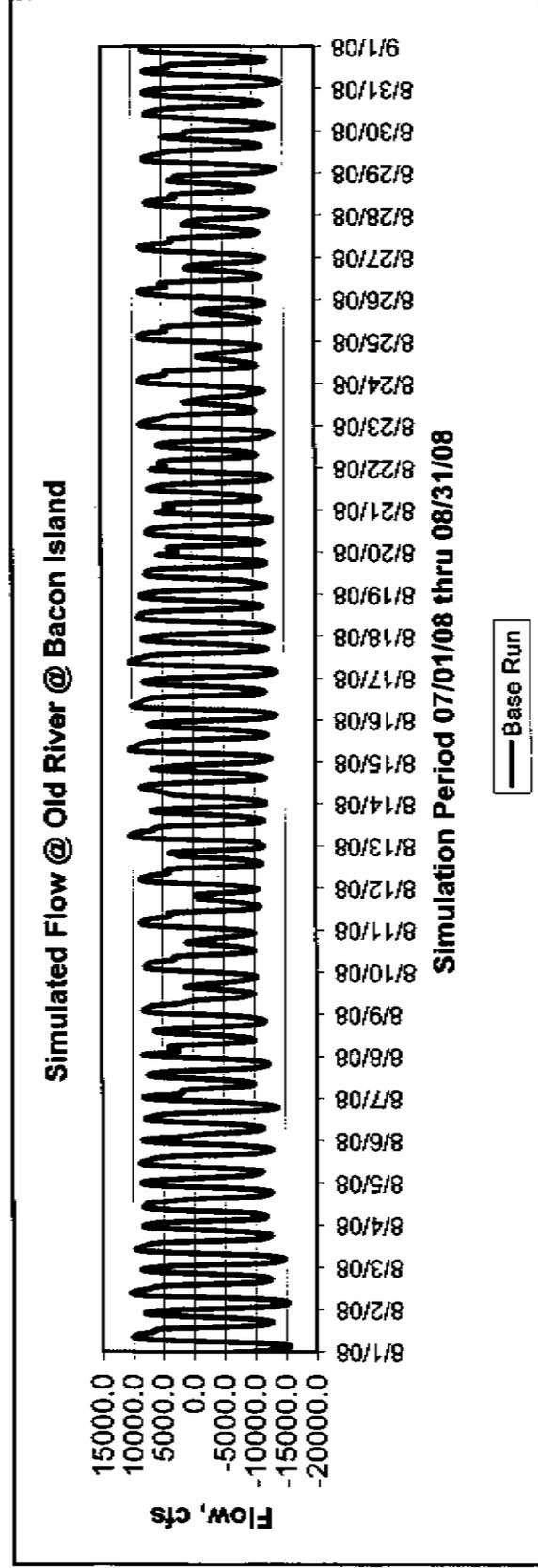
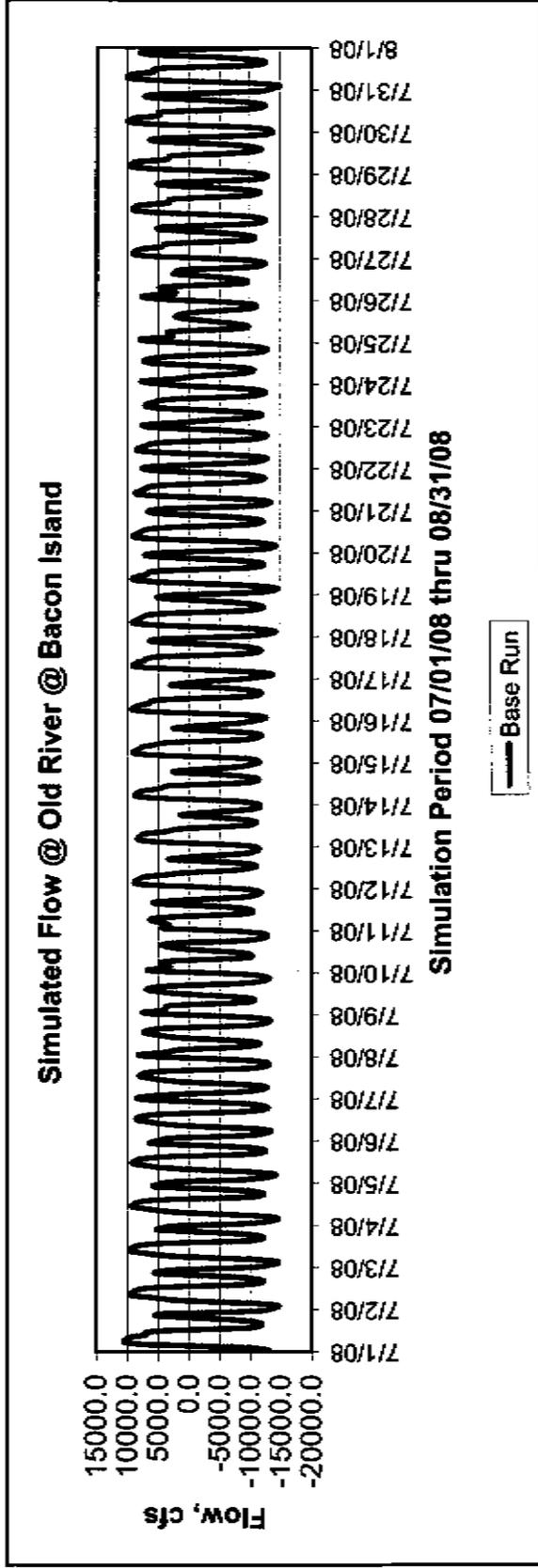


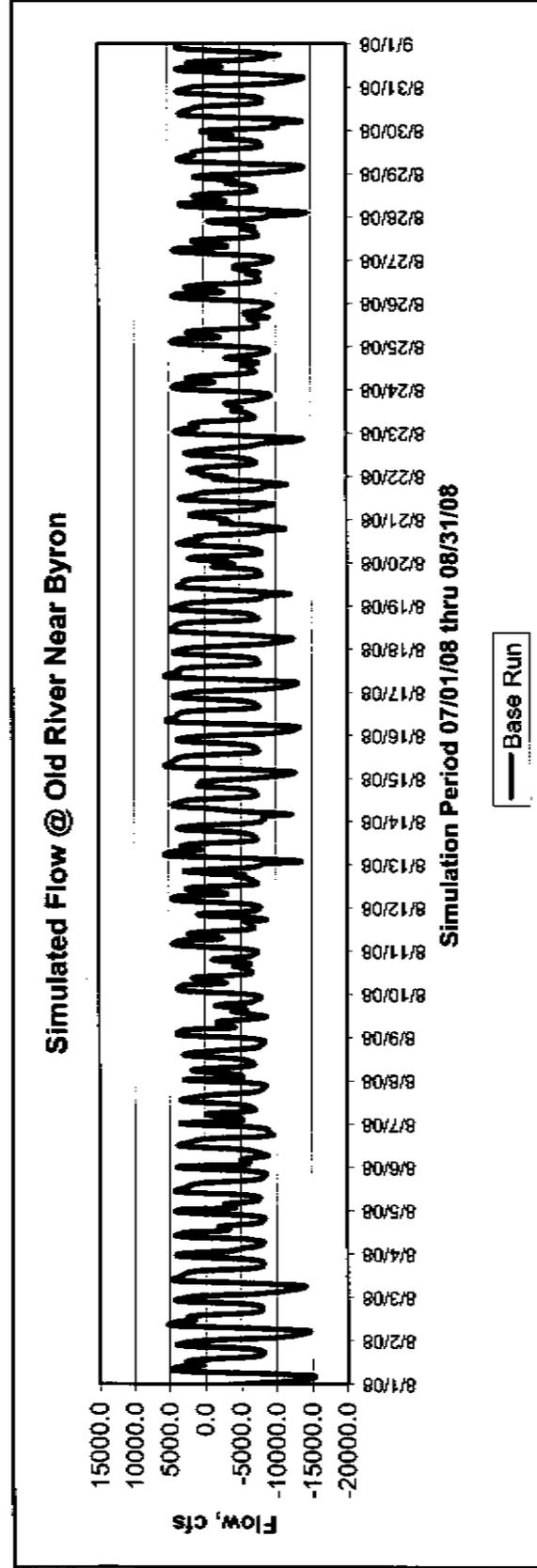
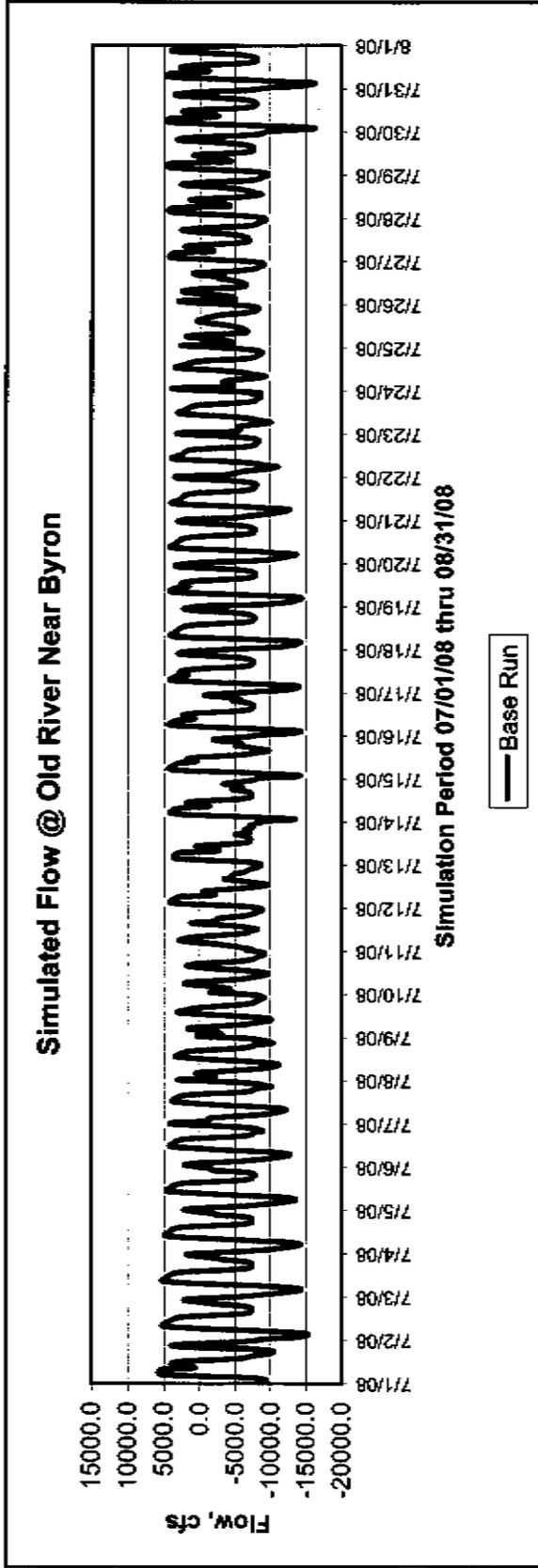


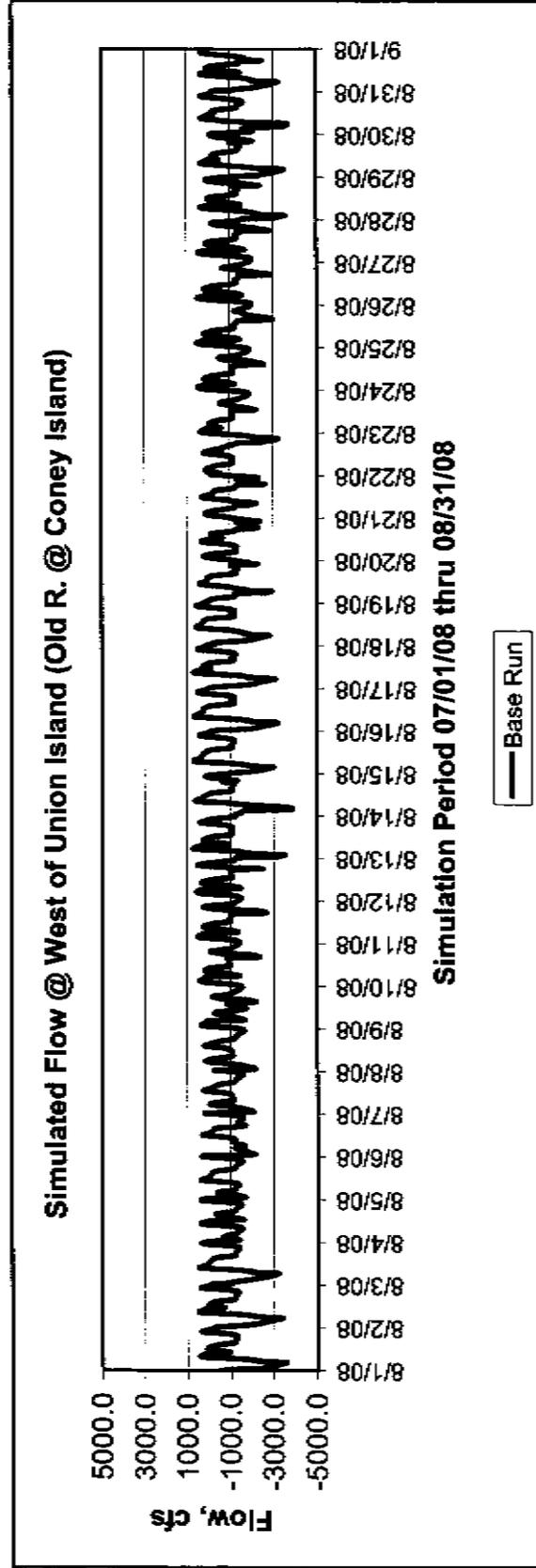
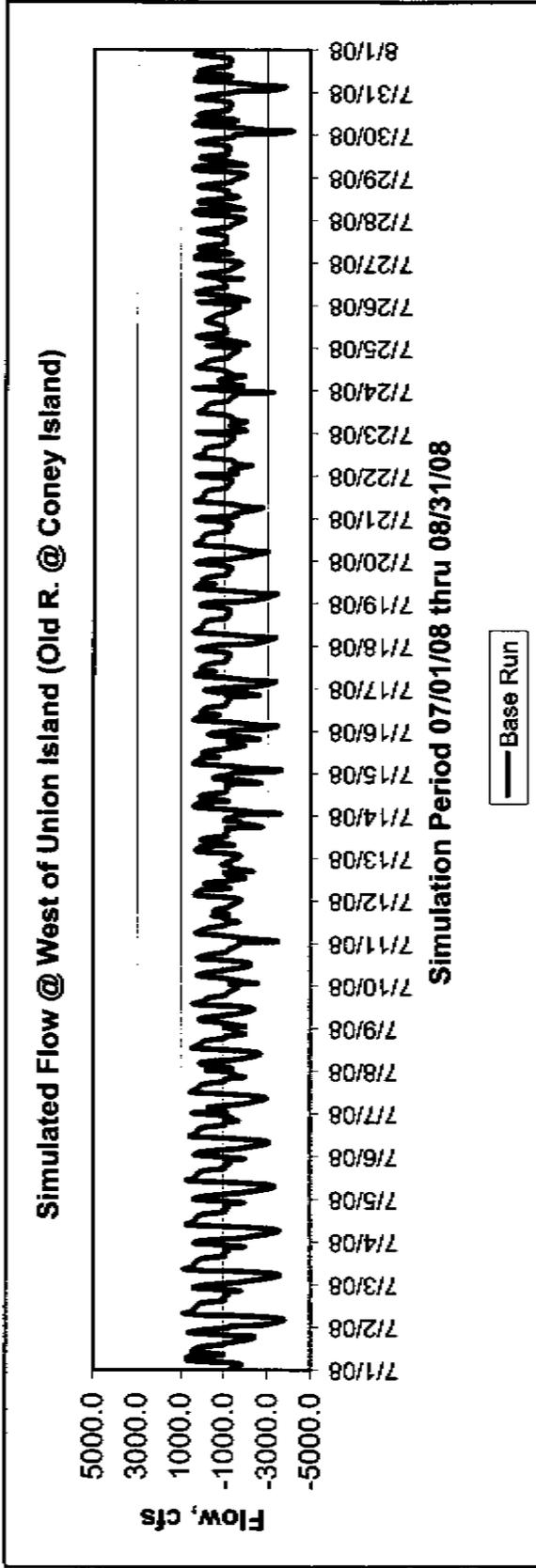


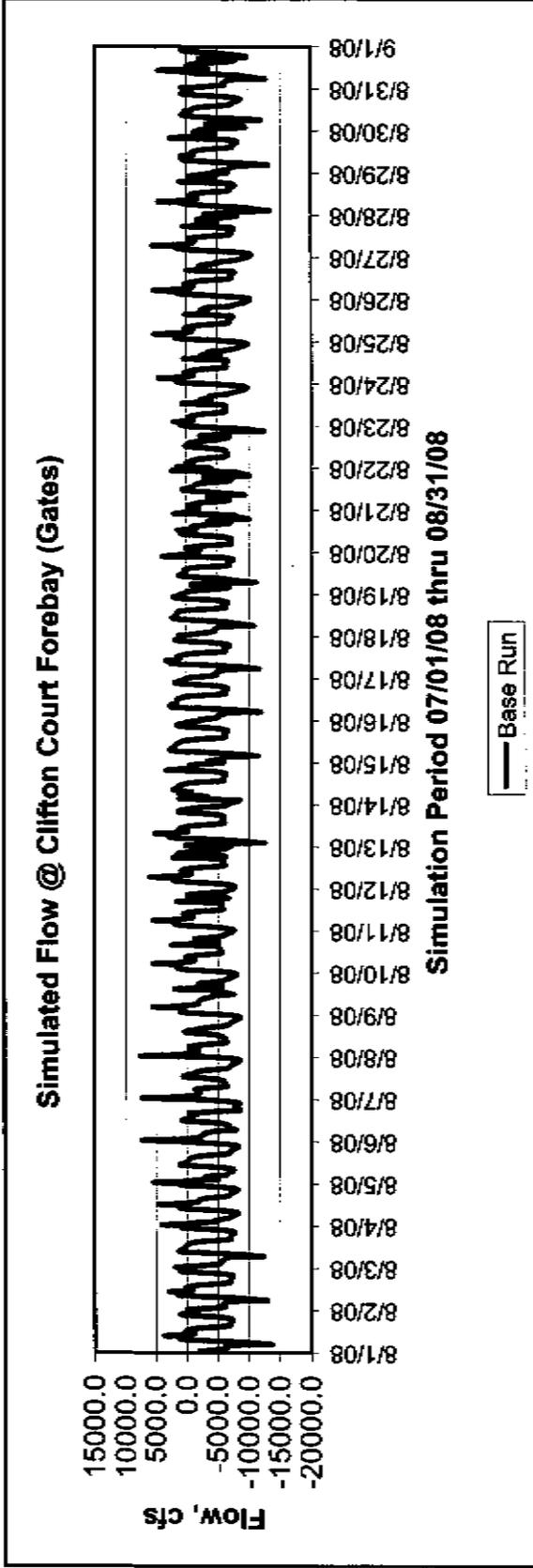
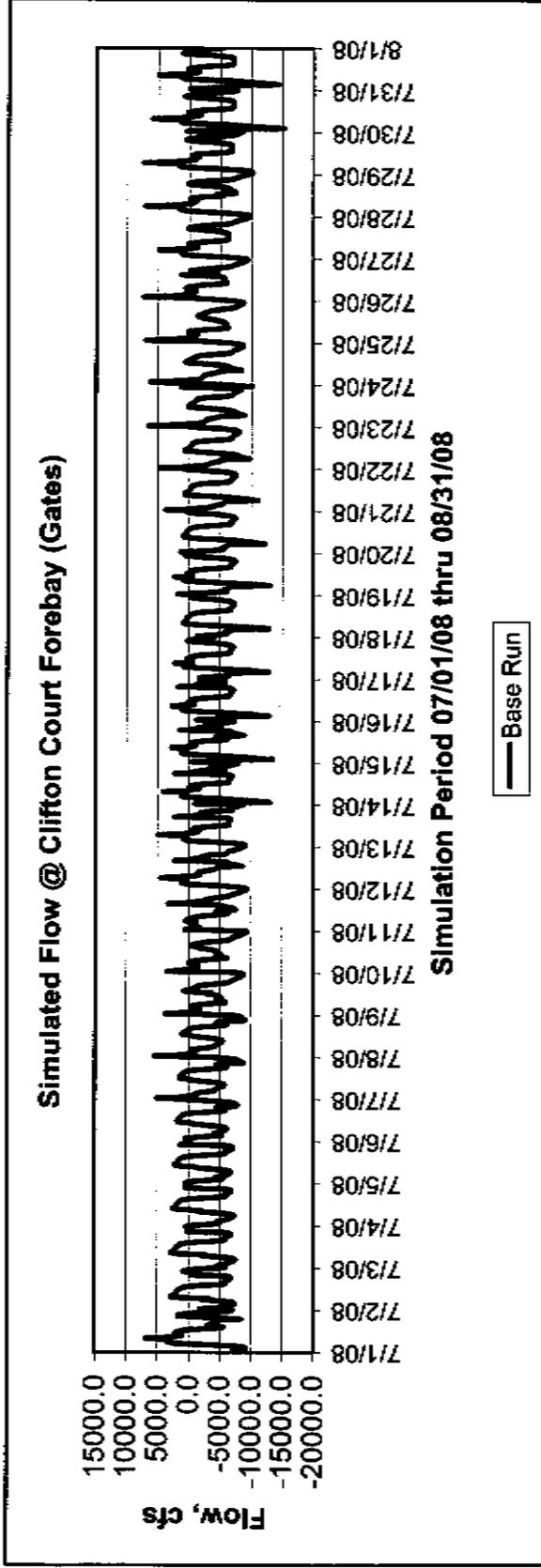
OLD RIVER - FLOW

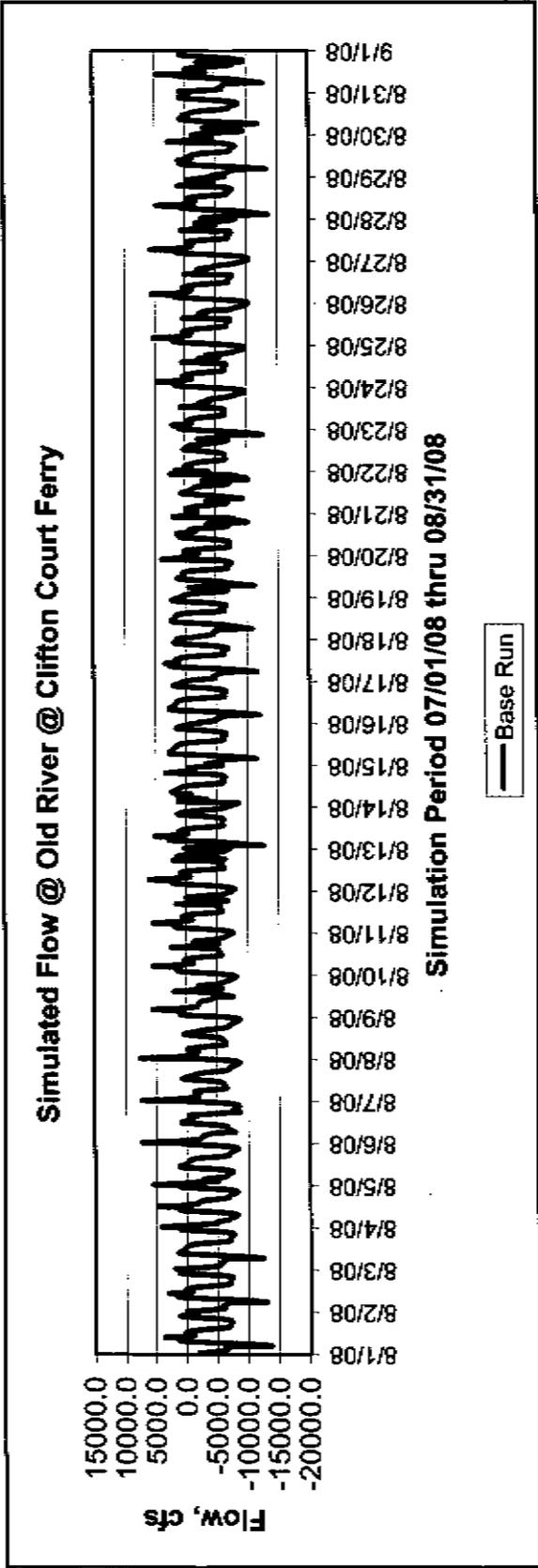
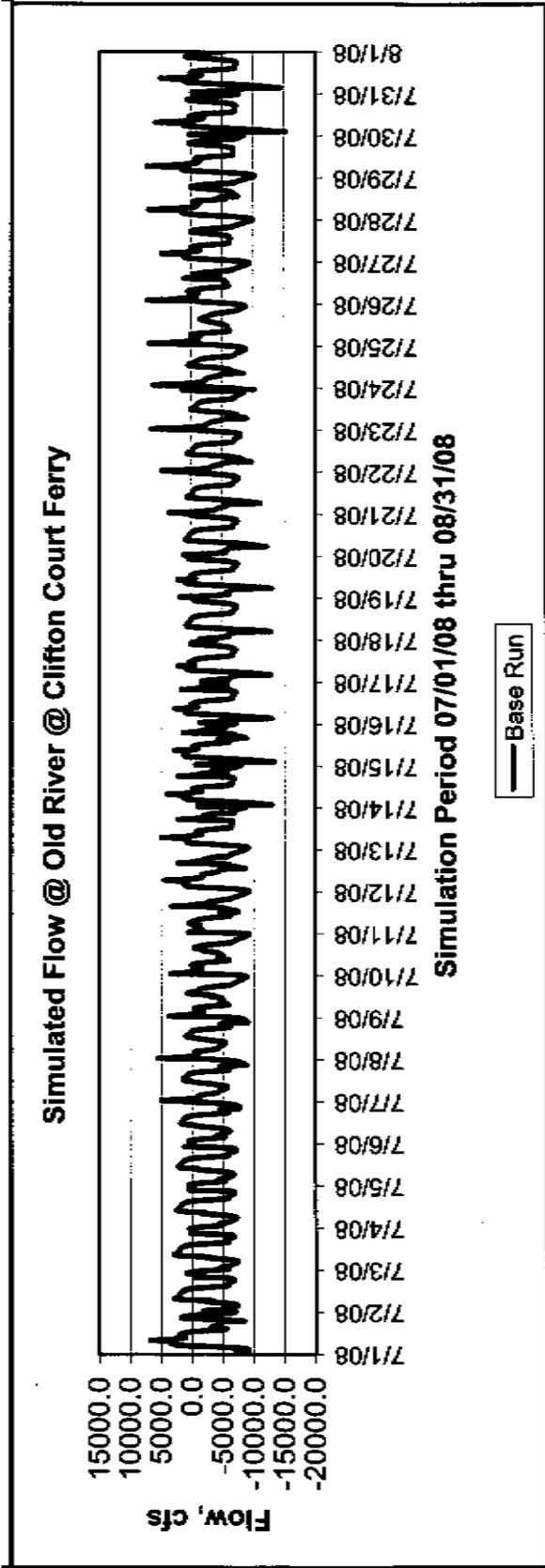


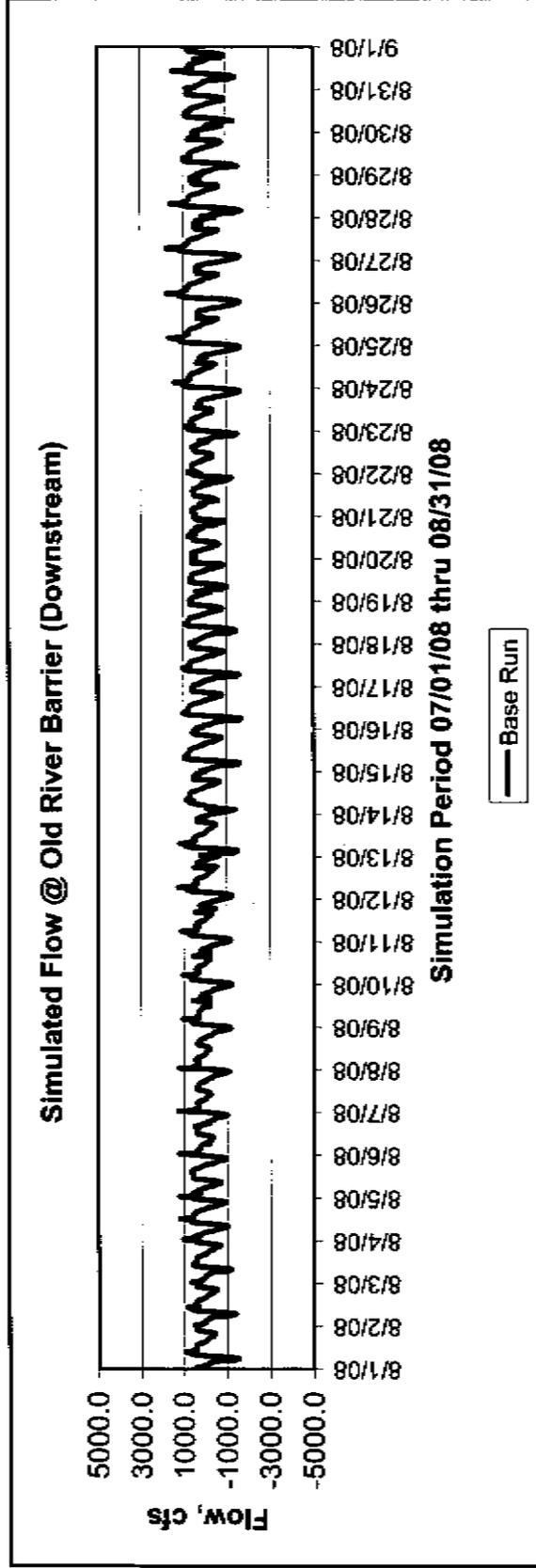
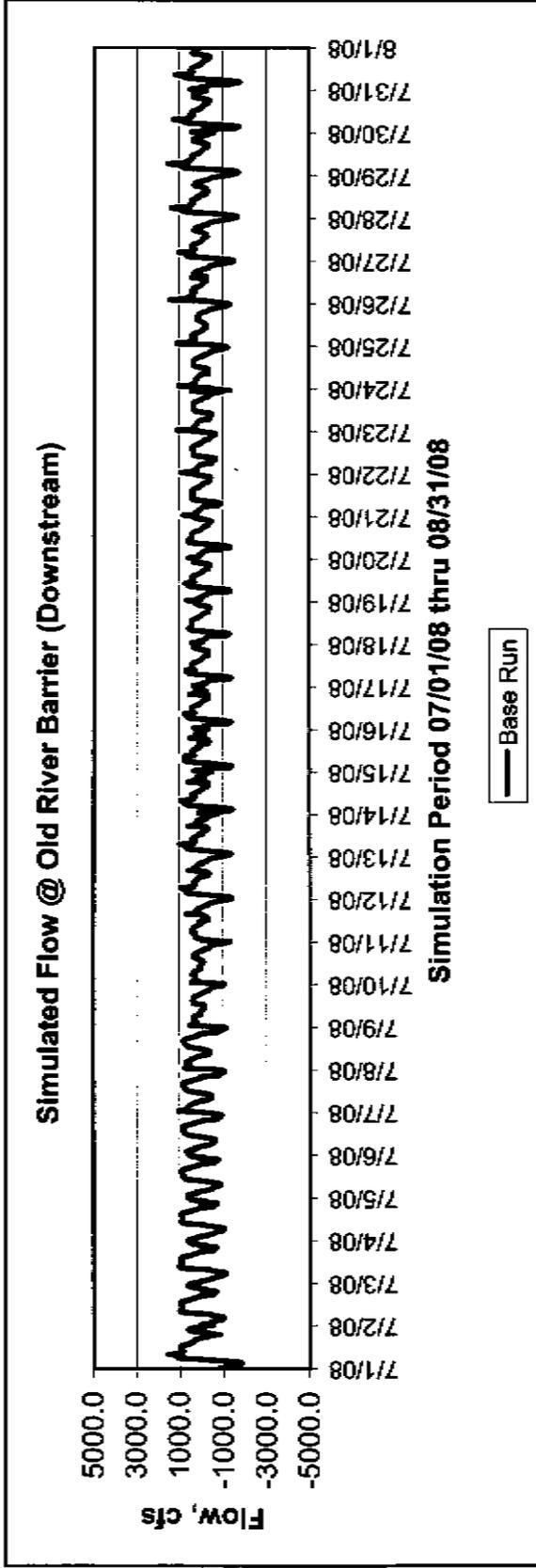


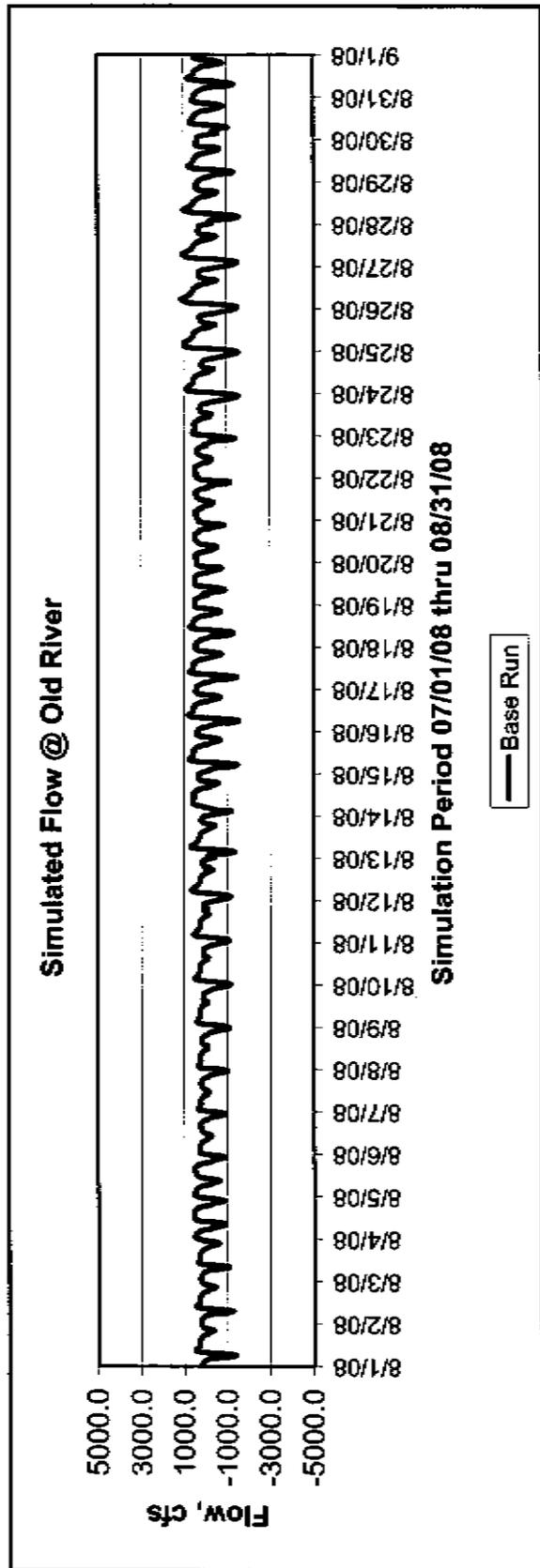
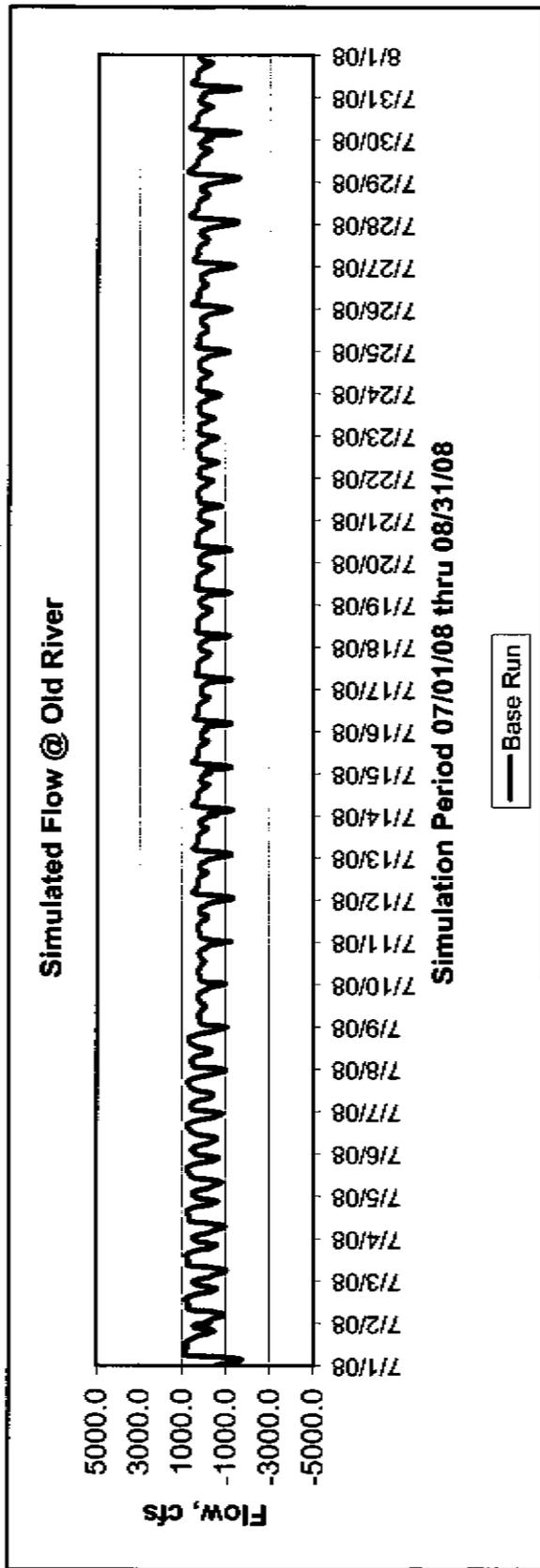


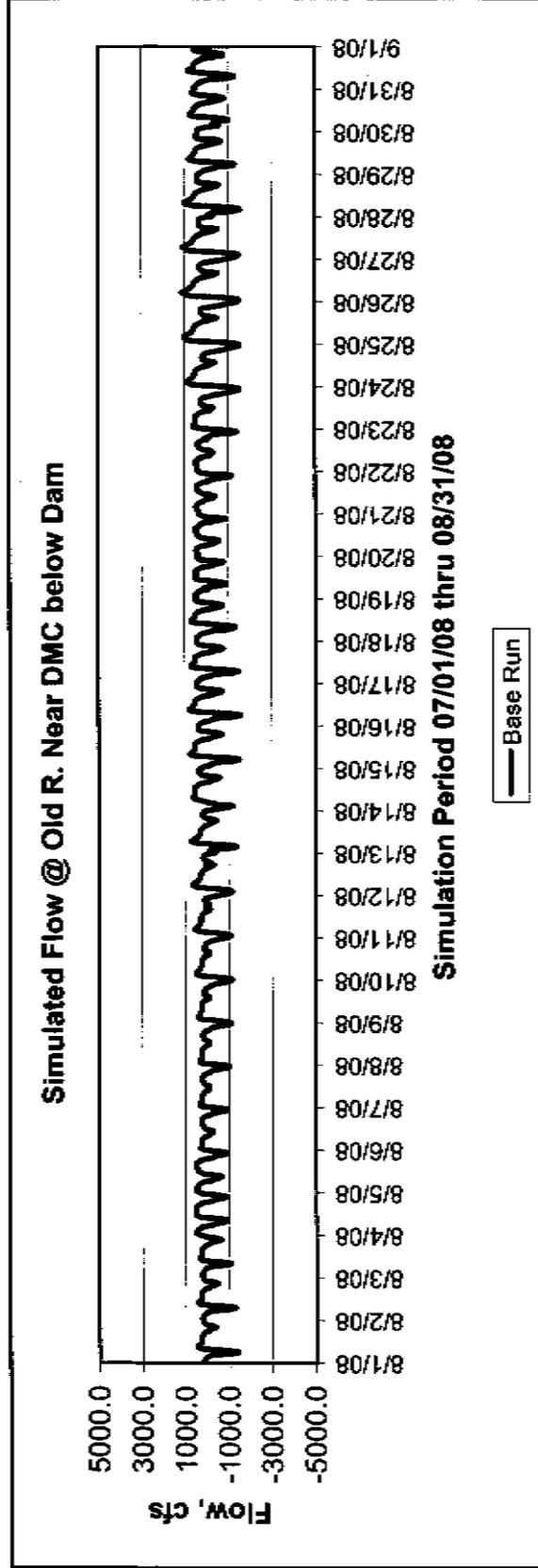
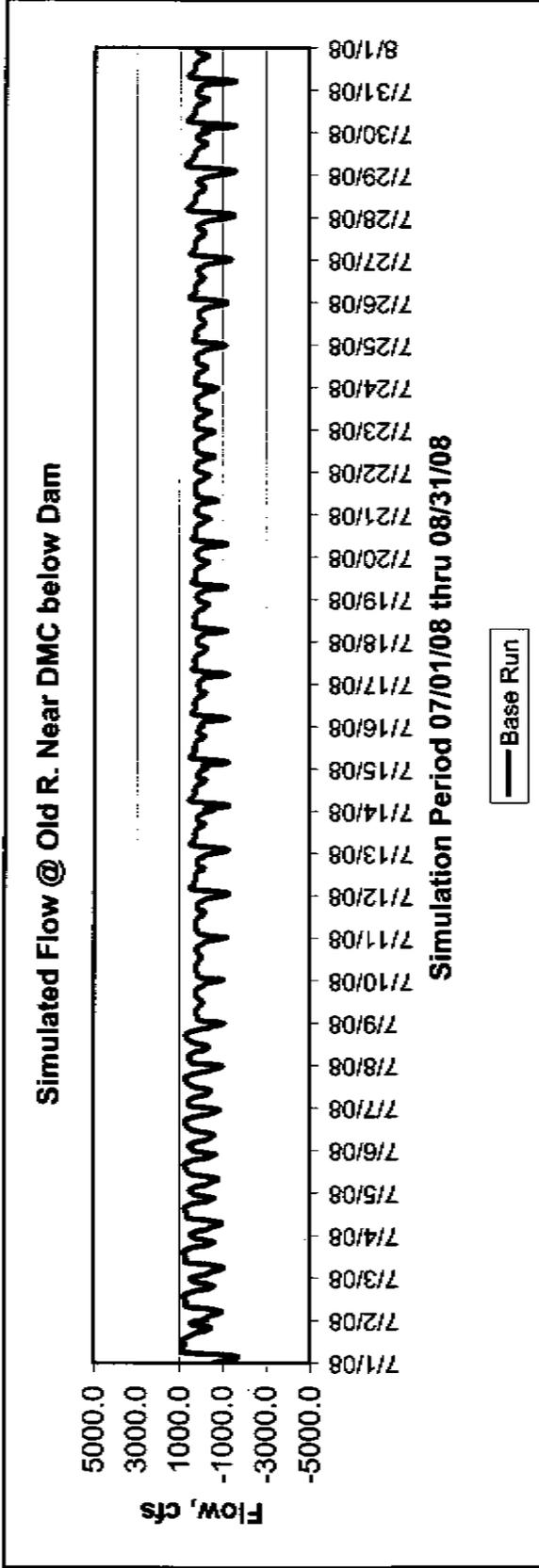


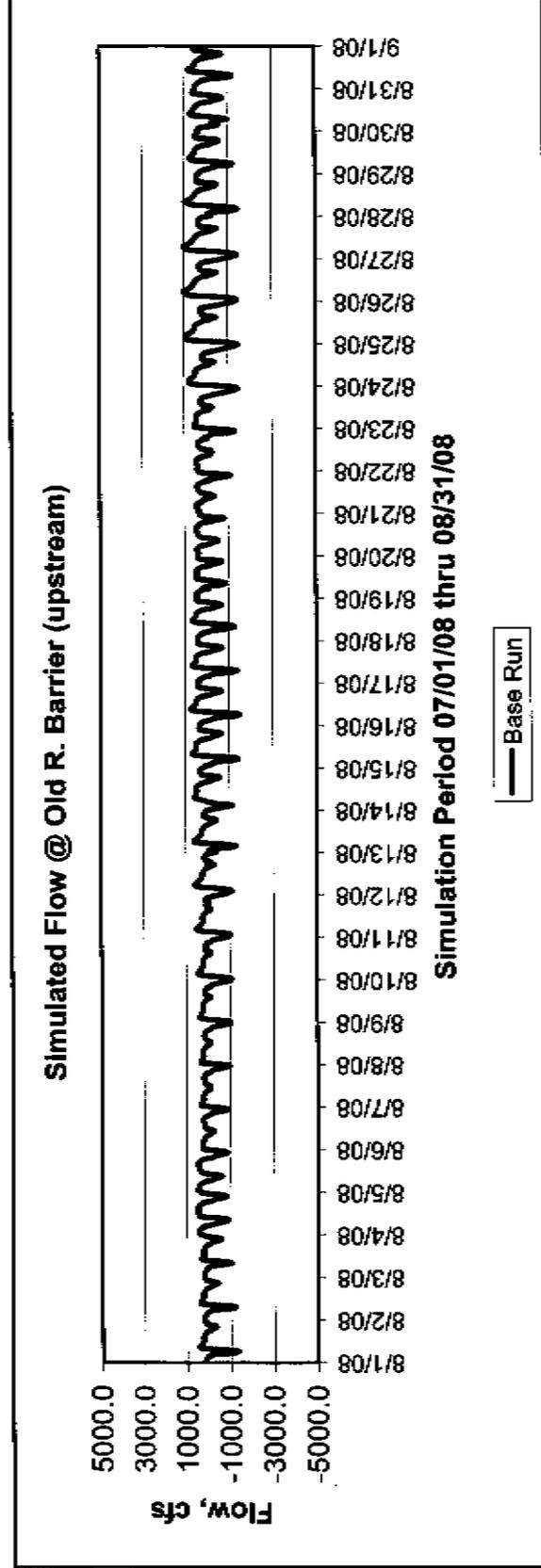
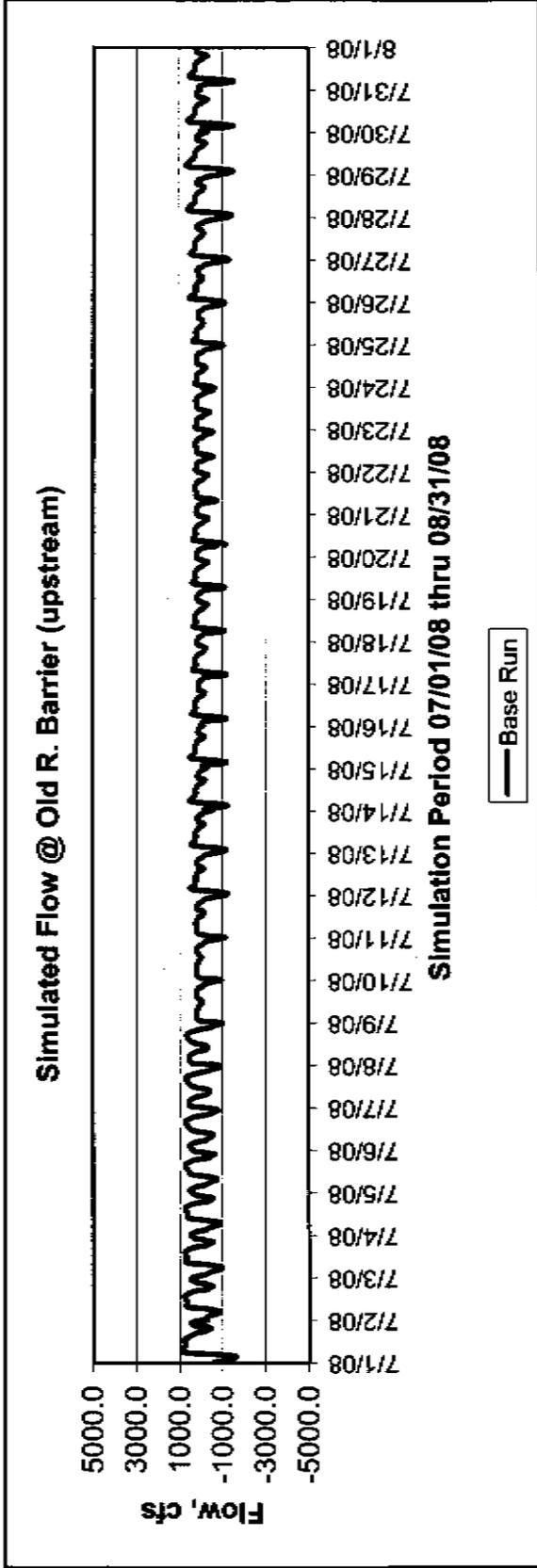


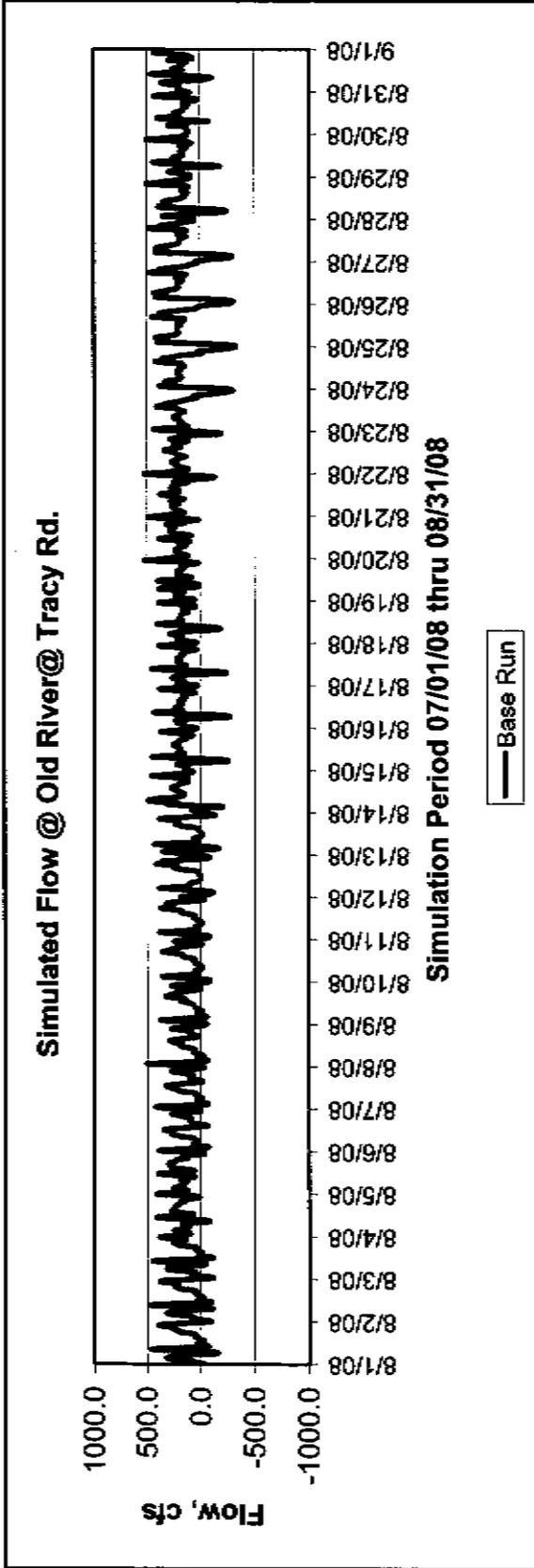
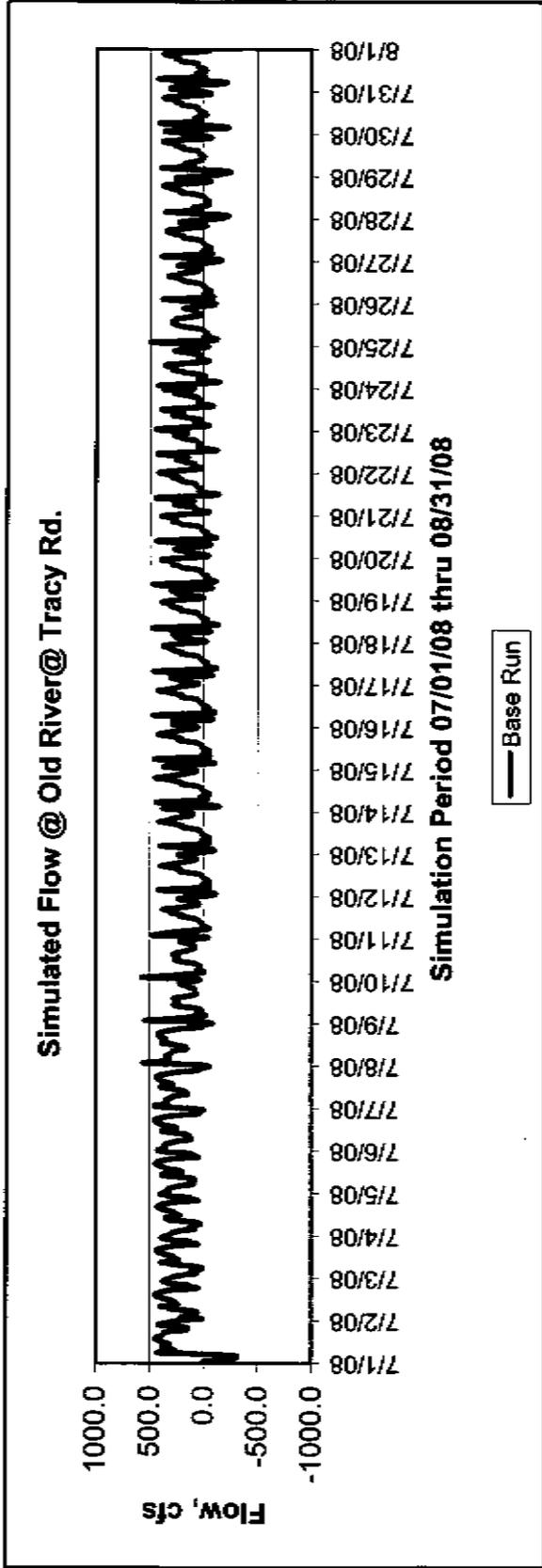


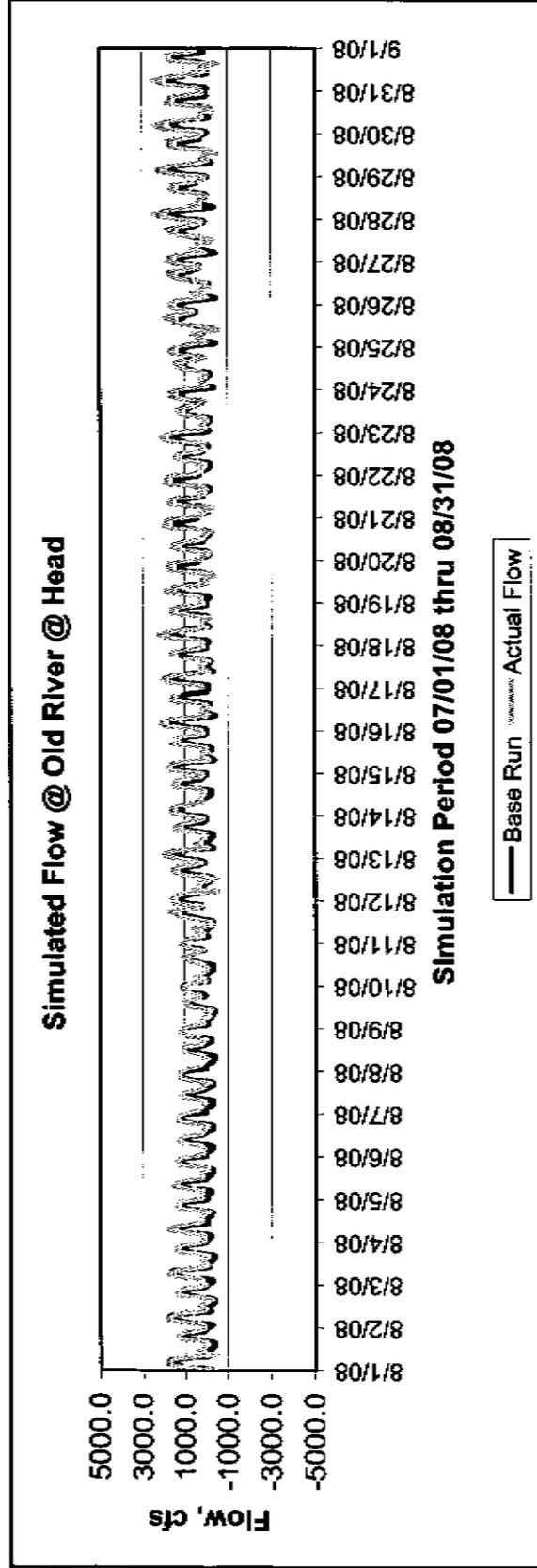
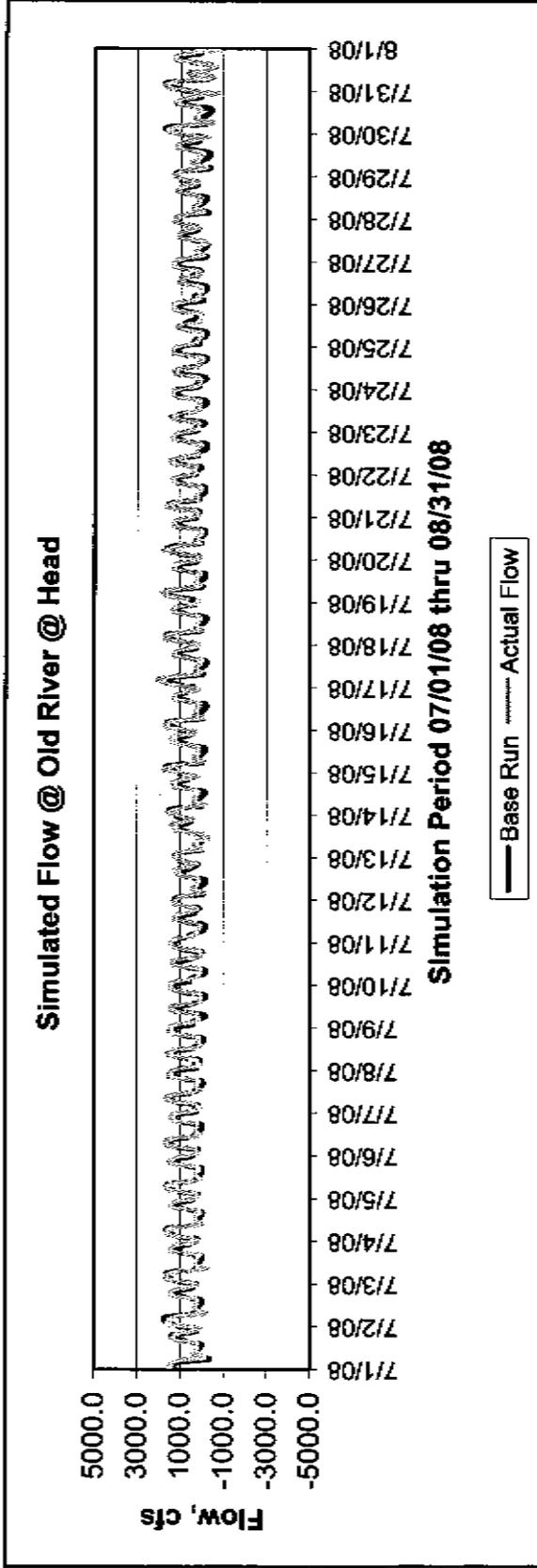




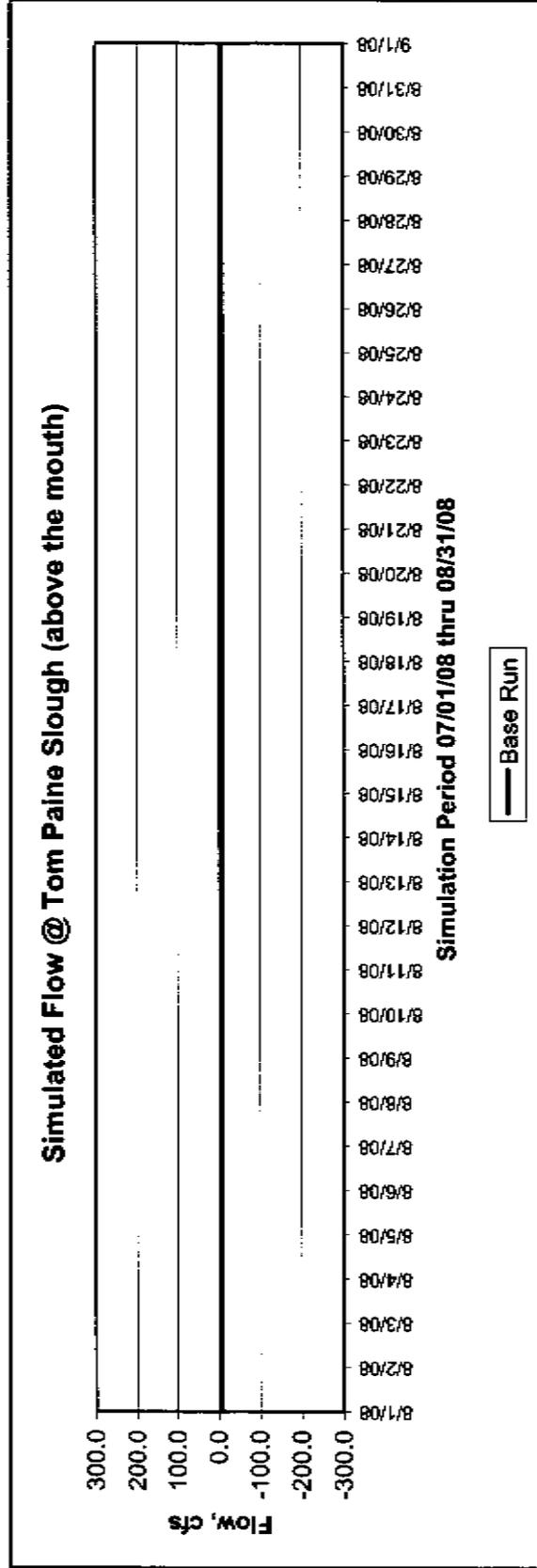
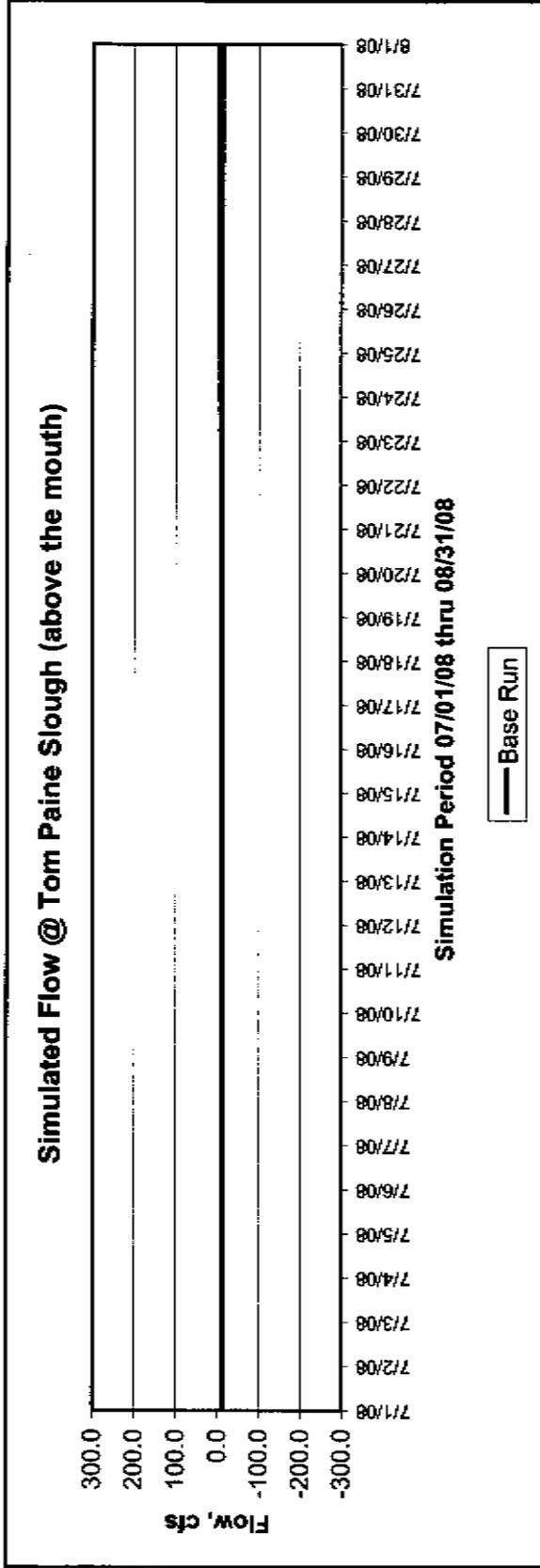


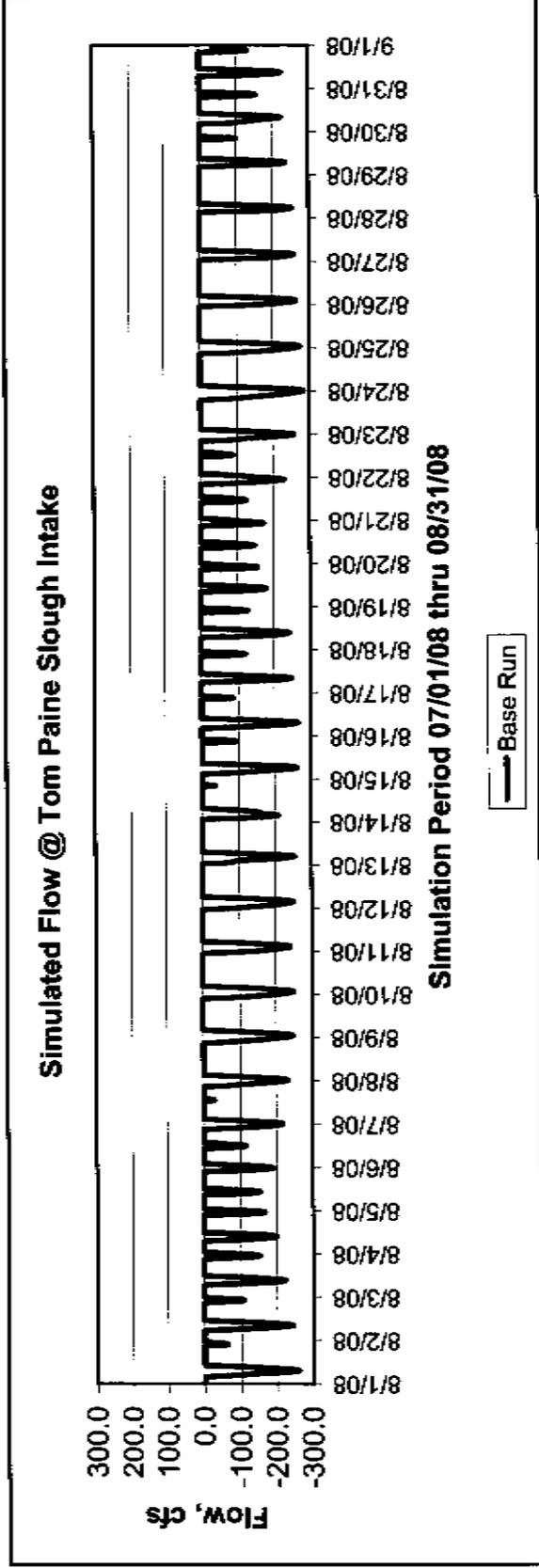
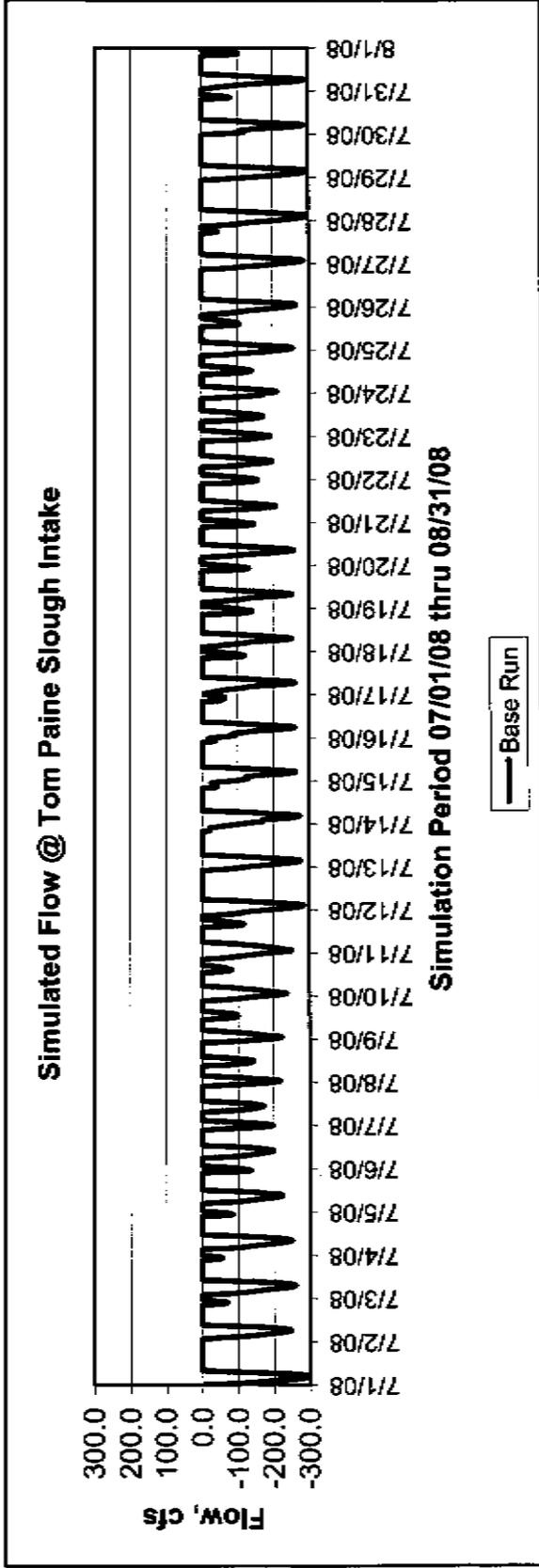




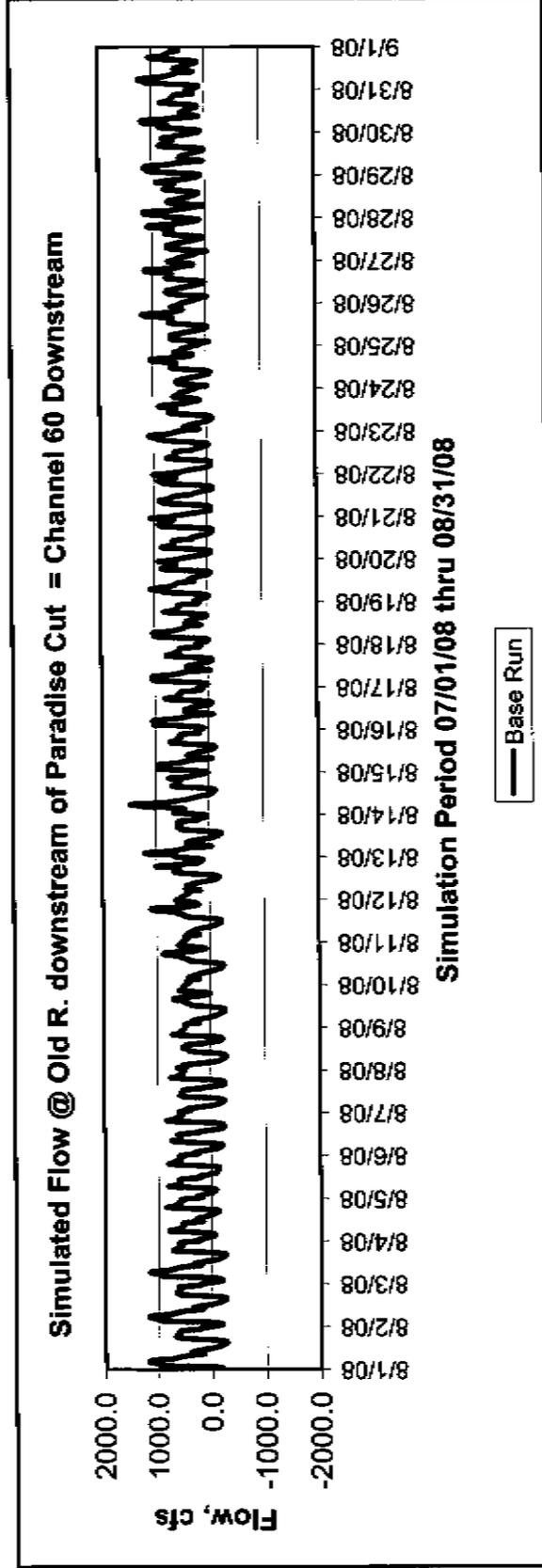
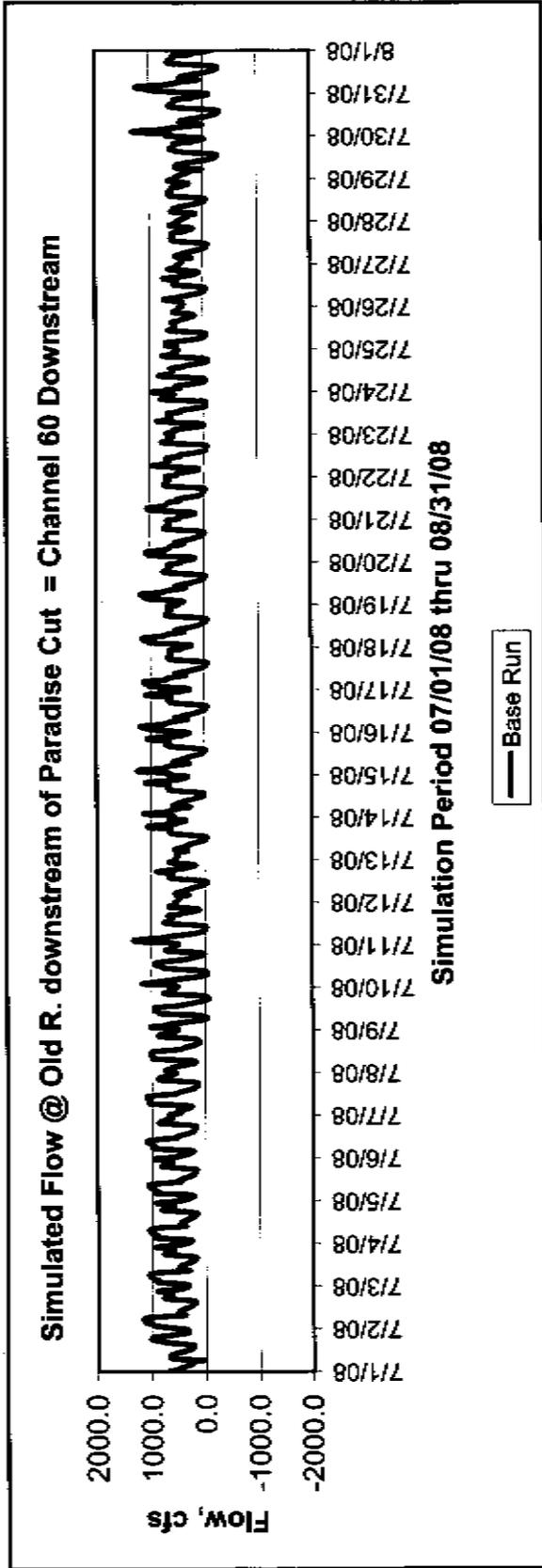


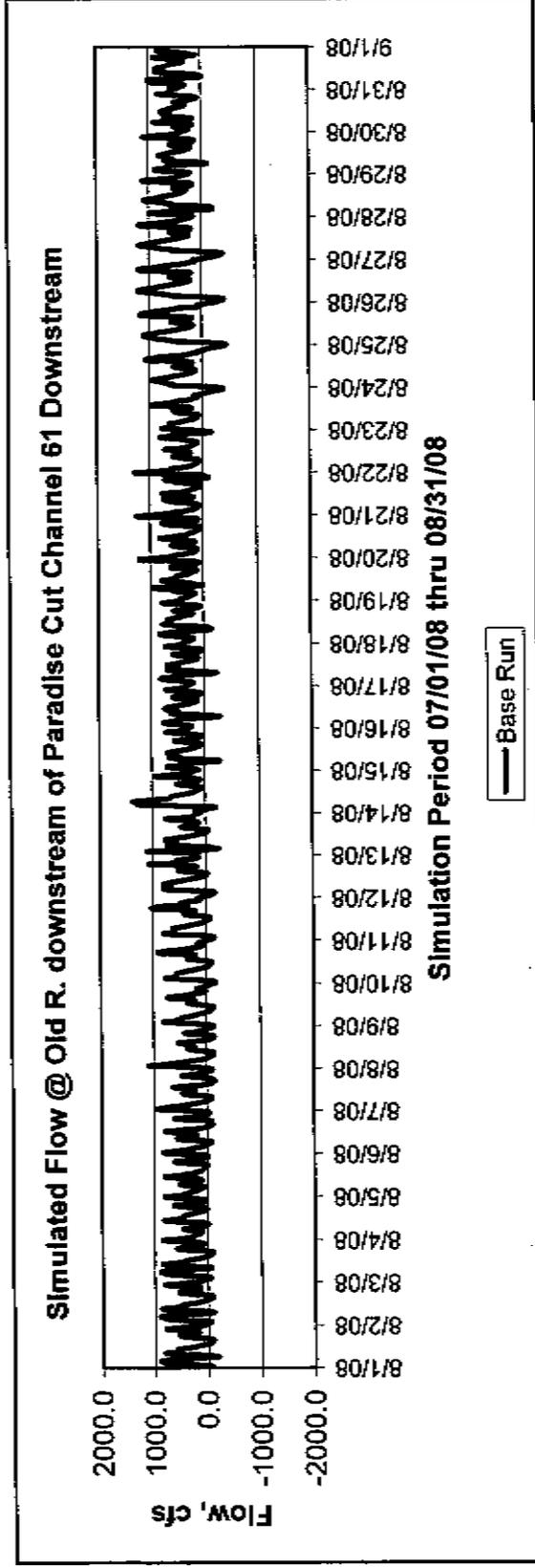
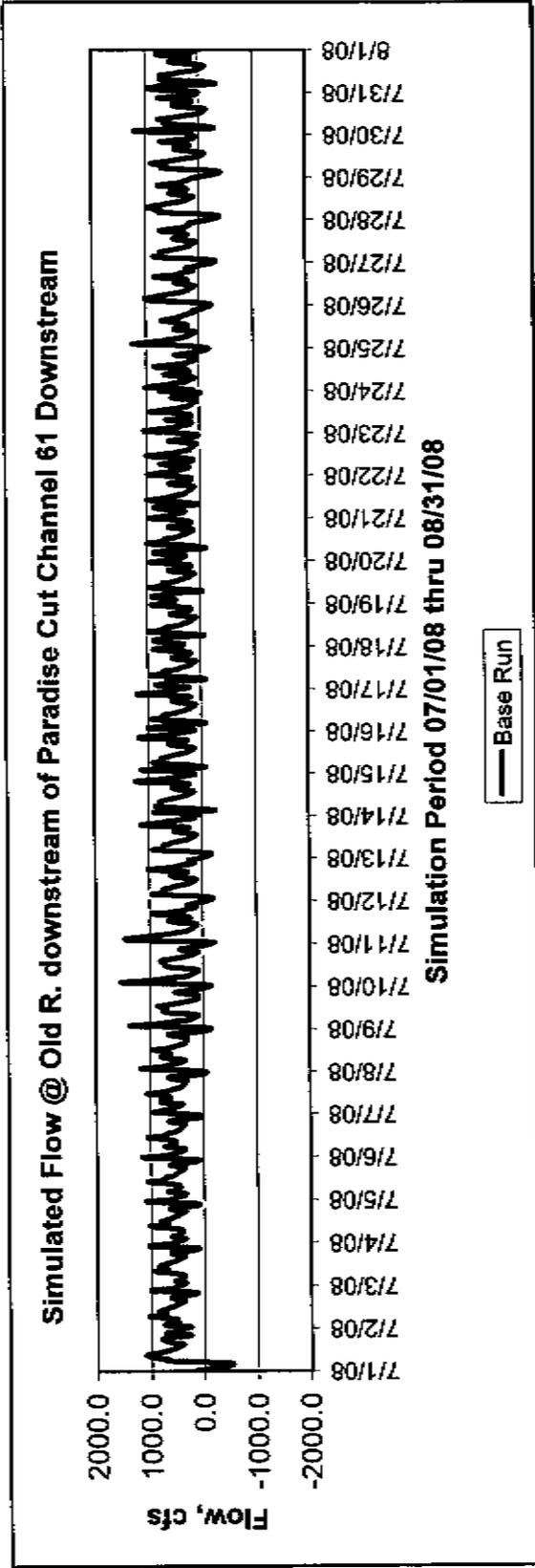
TOM PAINE SLOUGH - FLOW



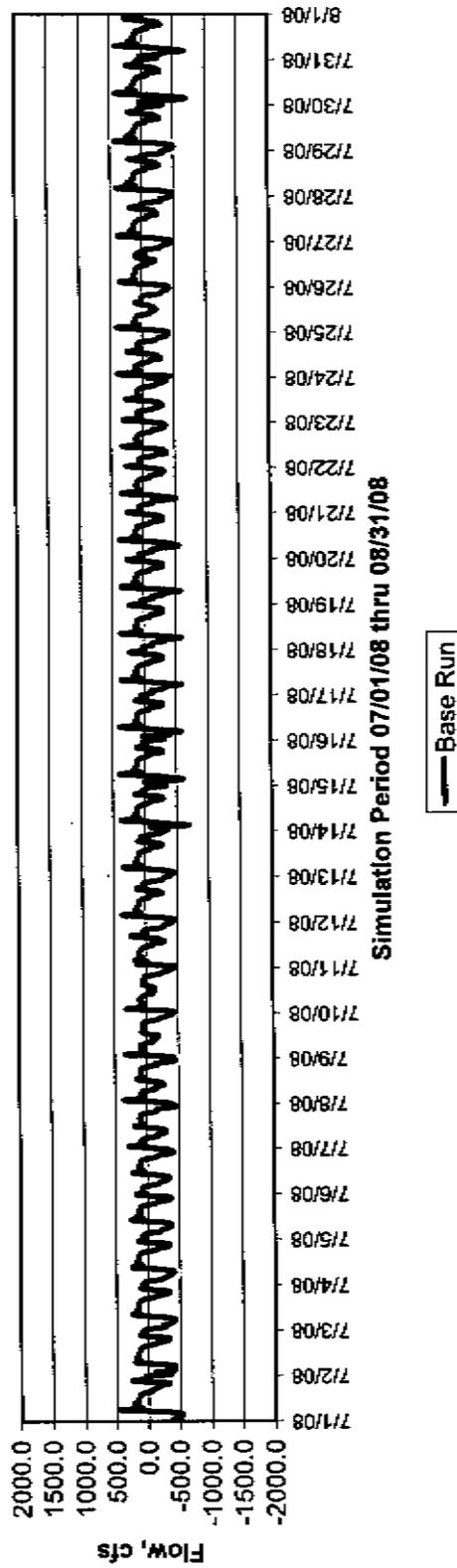


PARADISE CUT- FLOW

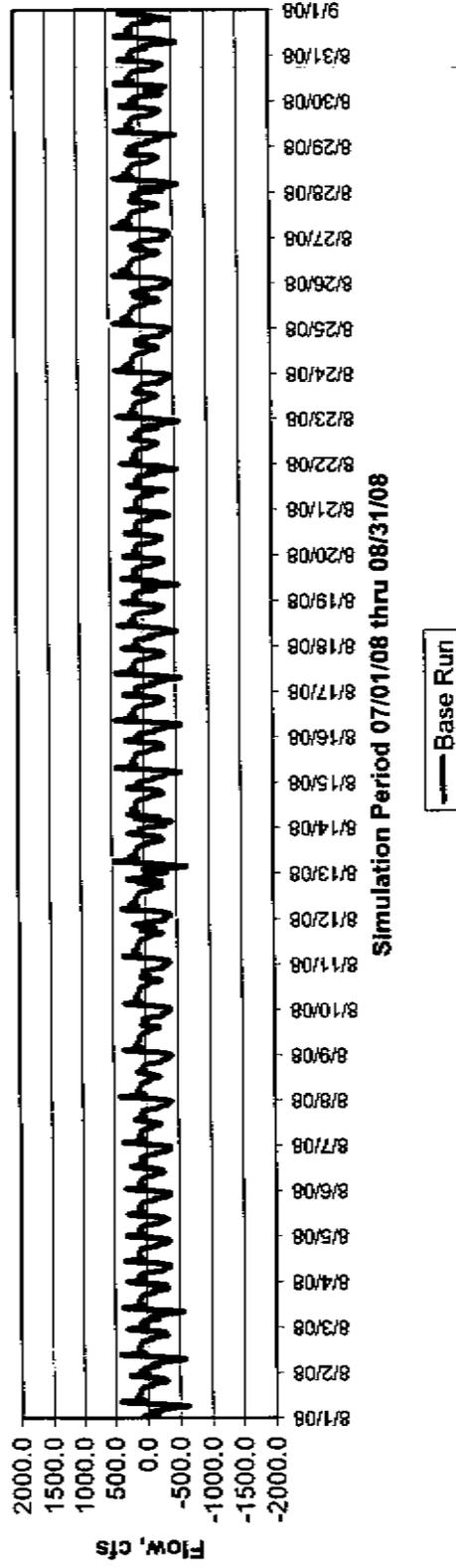


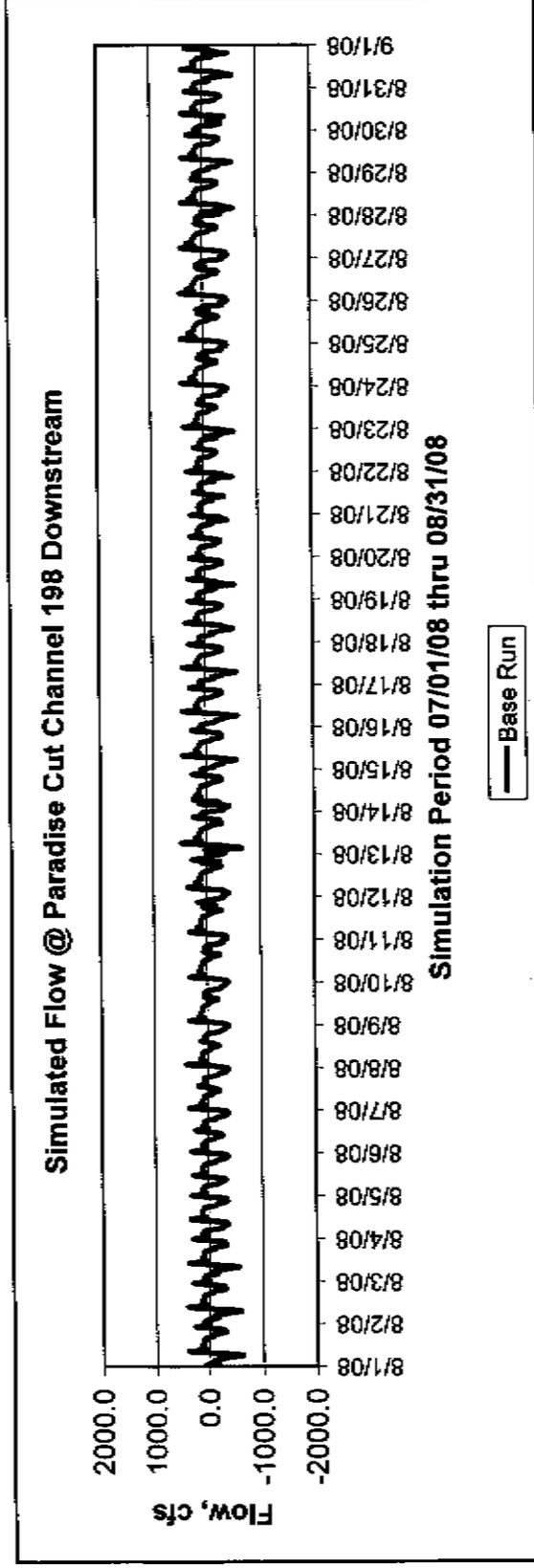
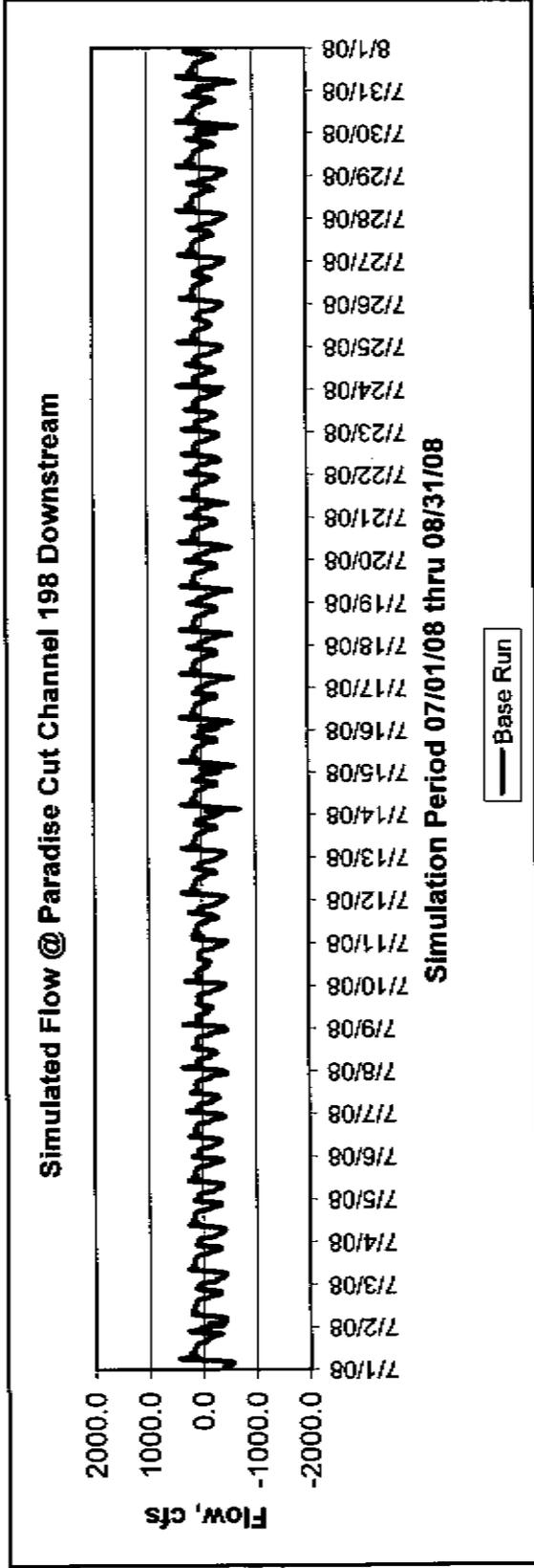


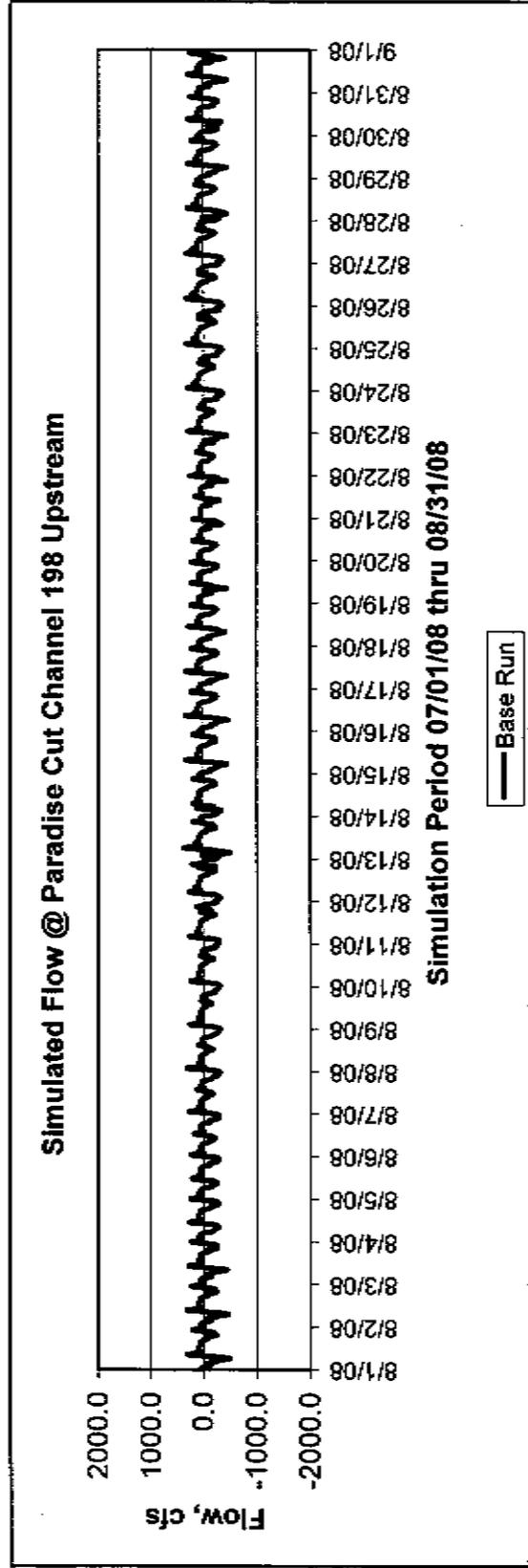
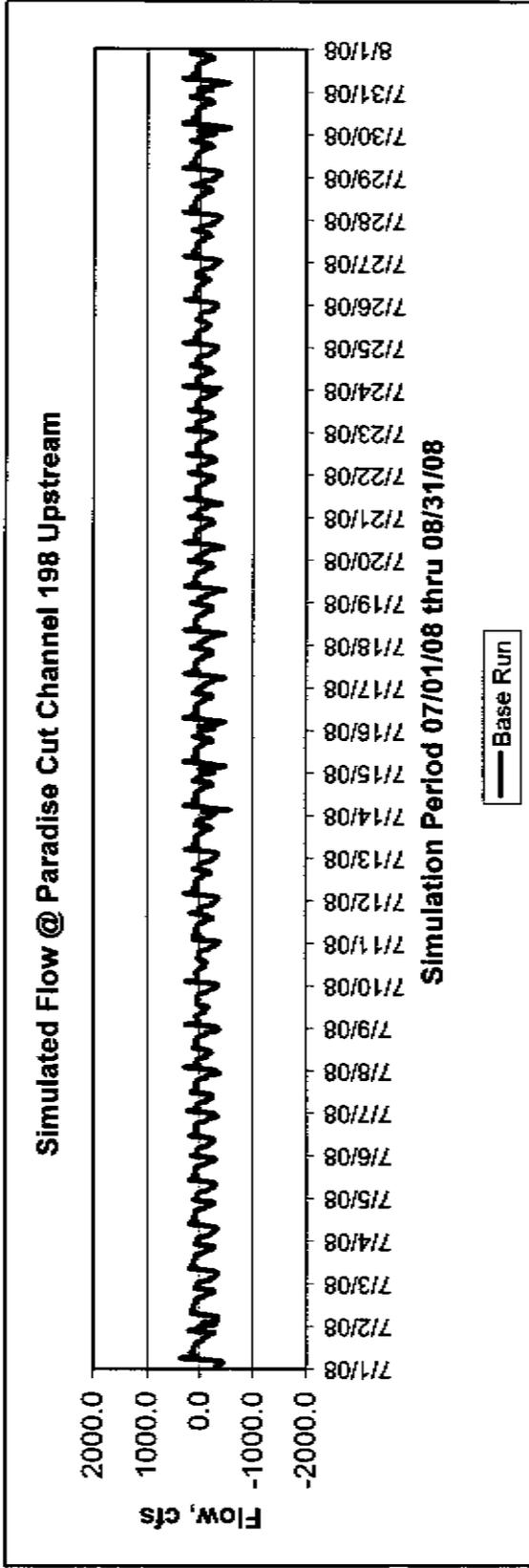
Simulated Flow @ Paradise Cut Channel 199 Downstream

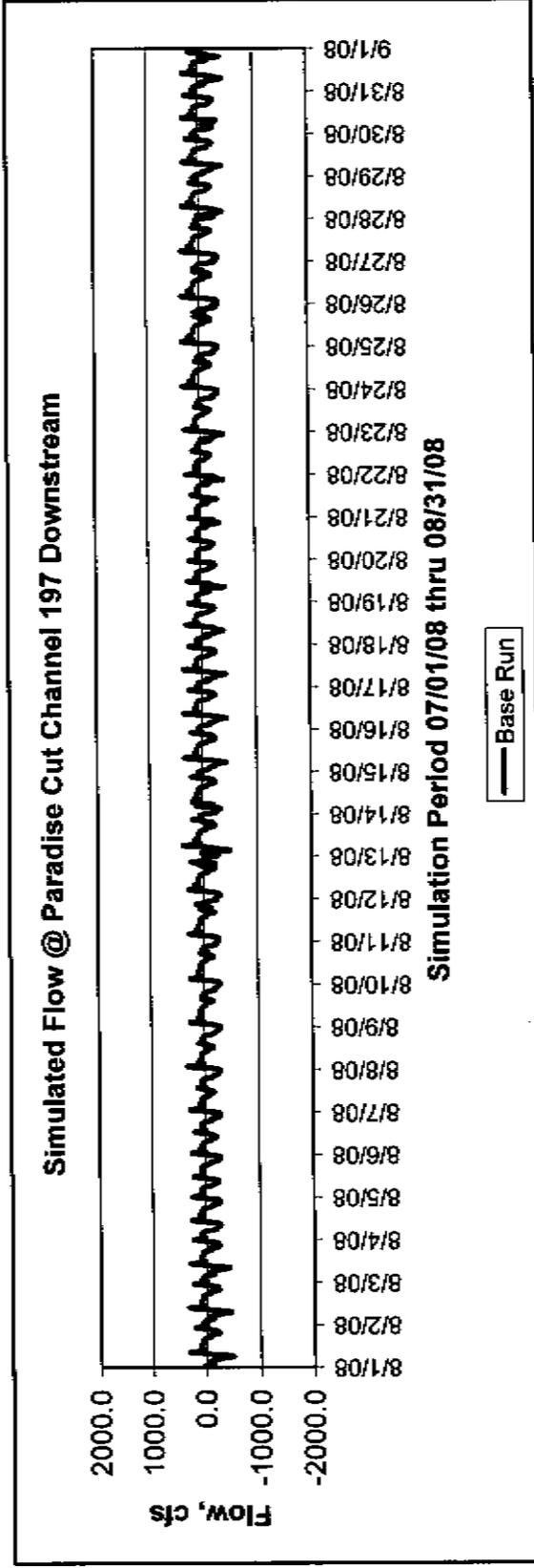
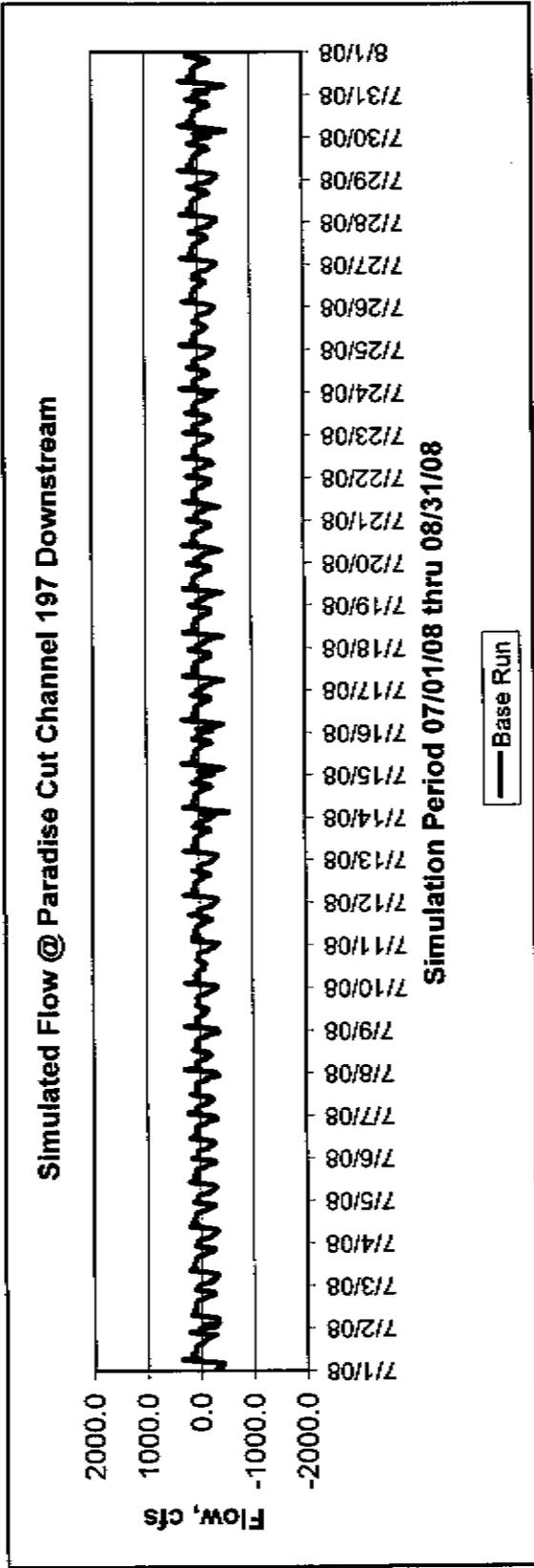


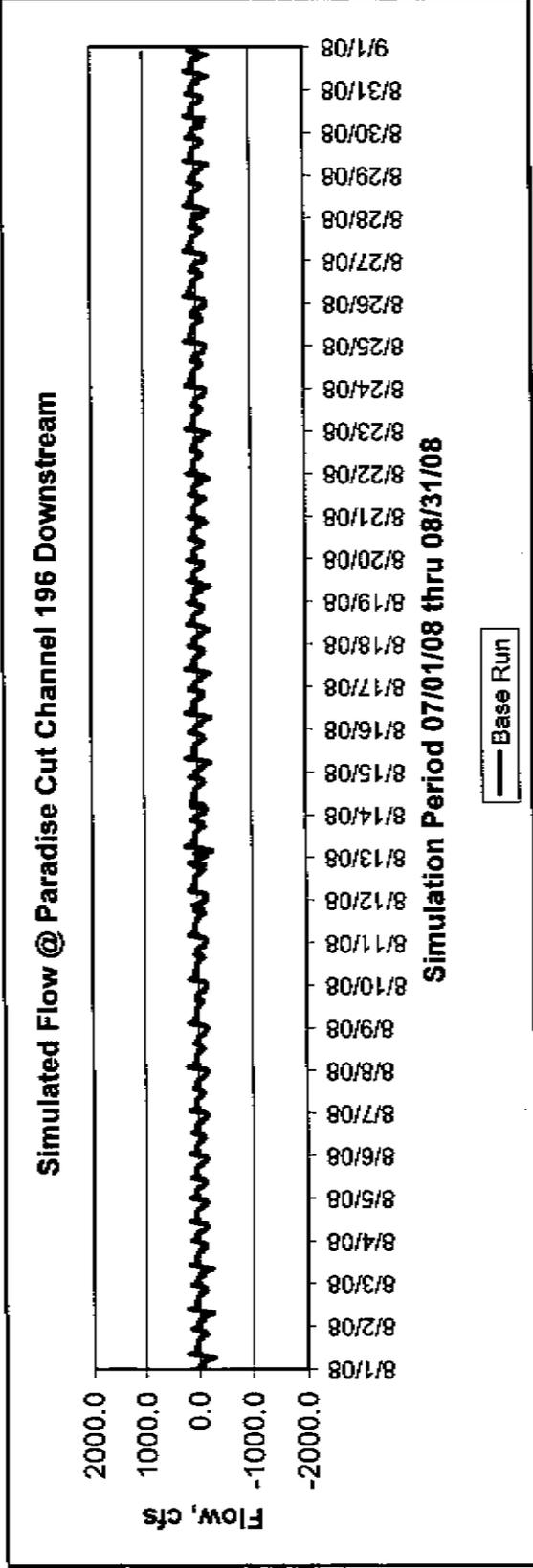
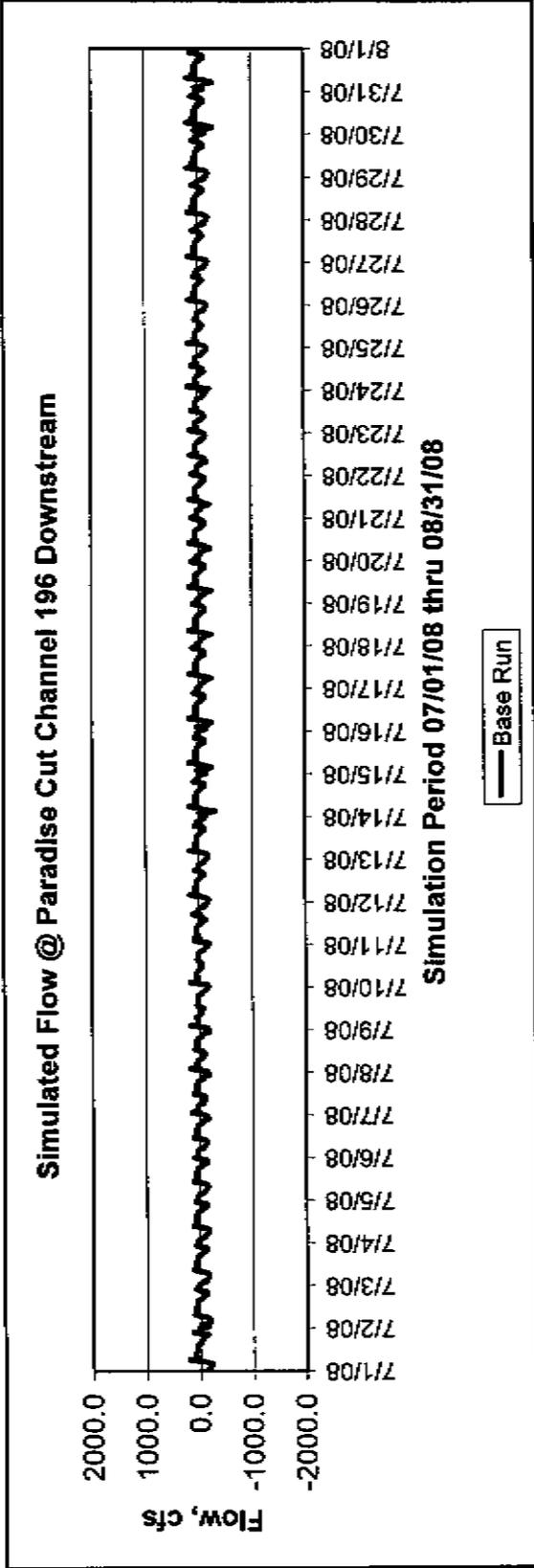
Simulated Flow @ Paradise Cut Channel 199 Downstream



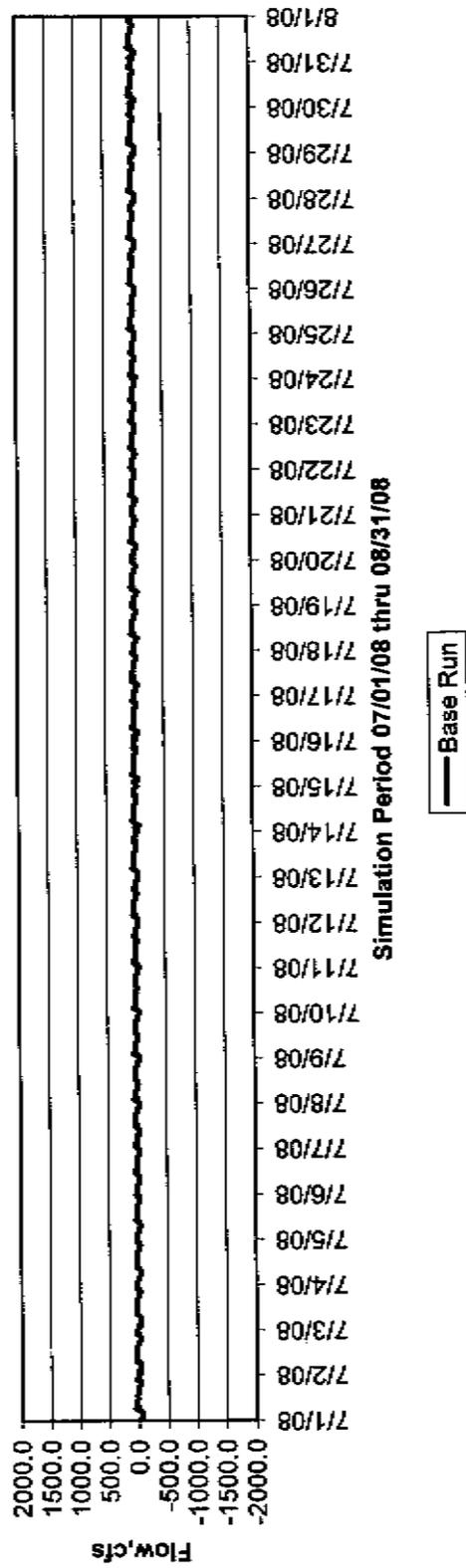




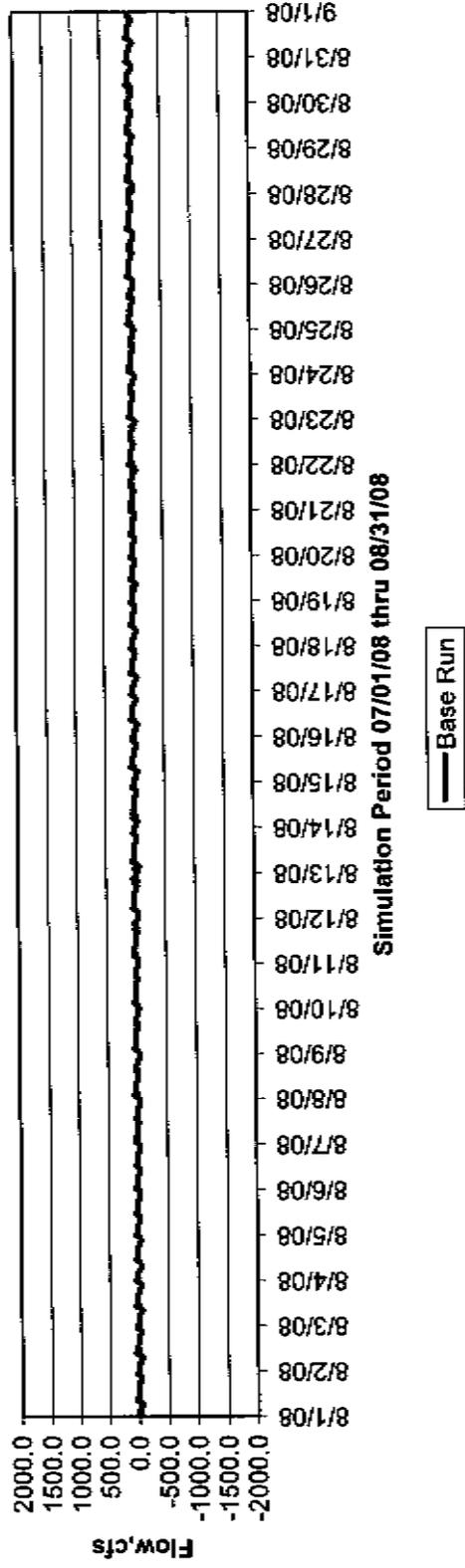




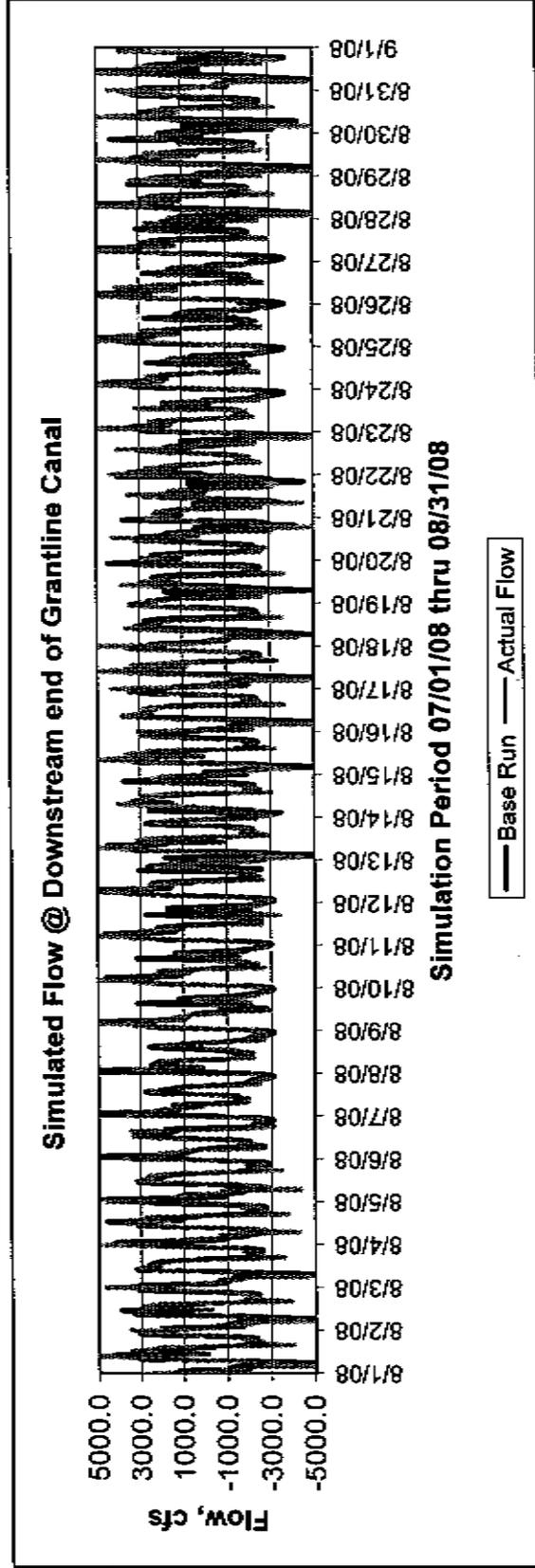
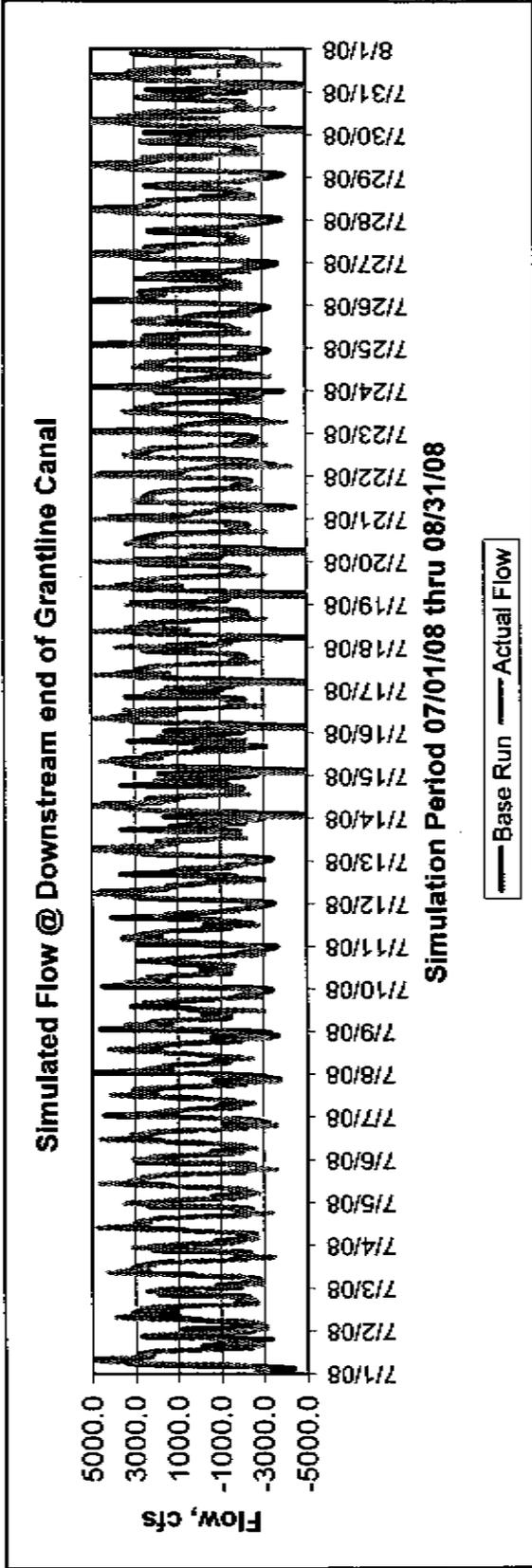
Simulated Flow @ Paradise Cut Channel 195 Downstream

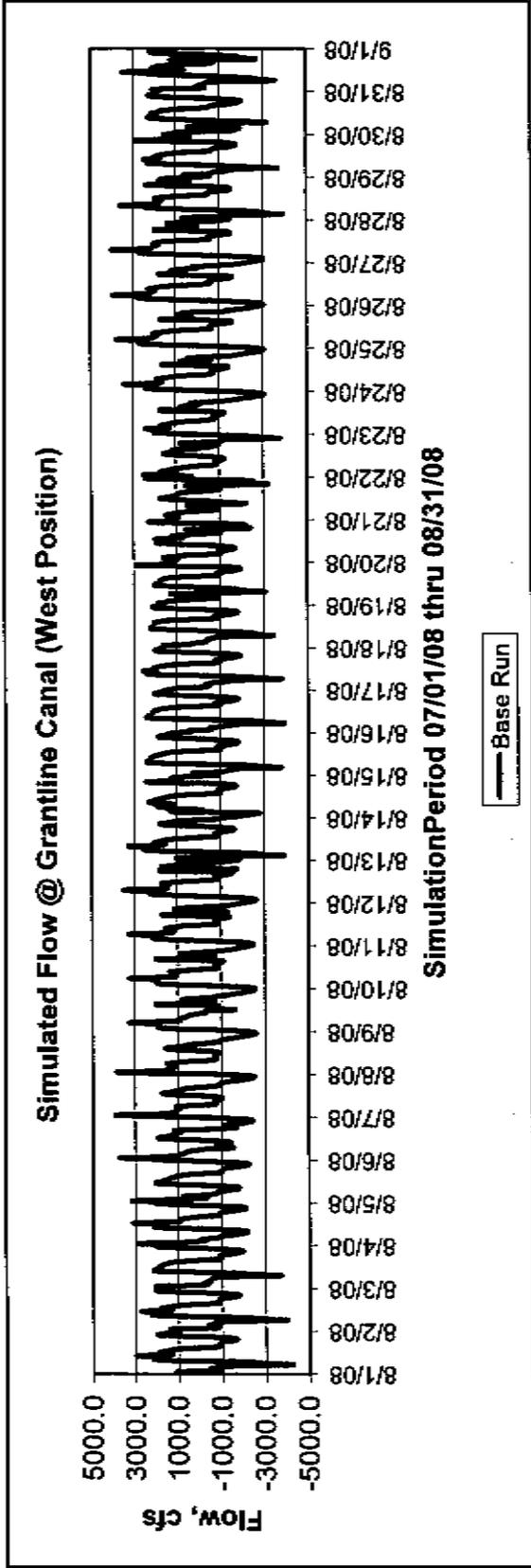
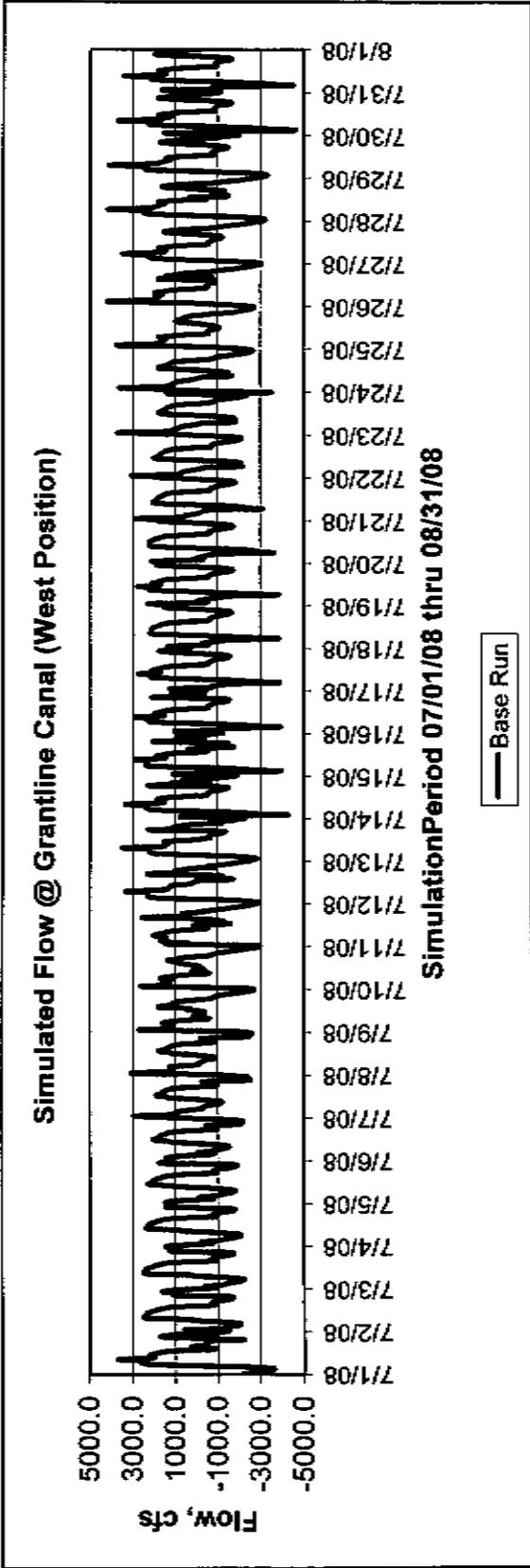


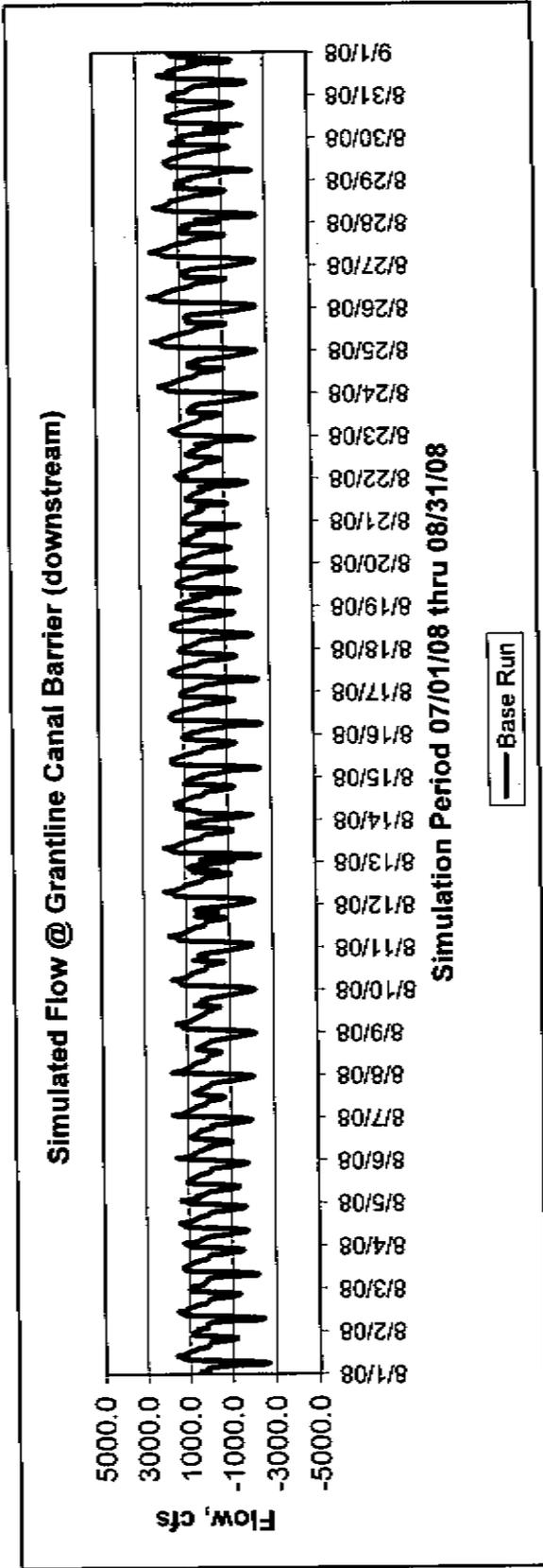
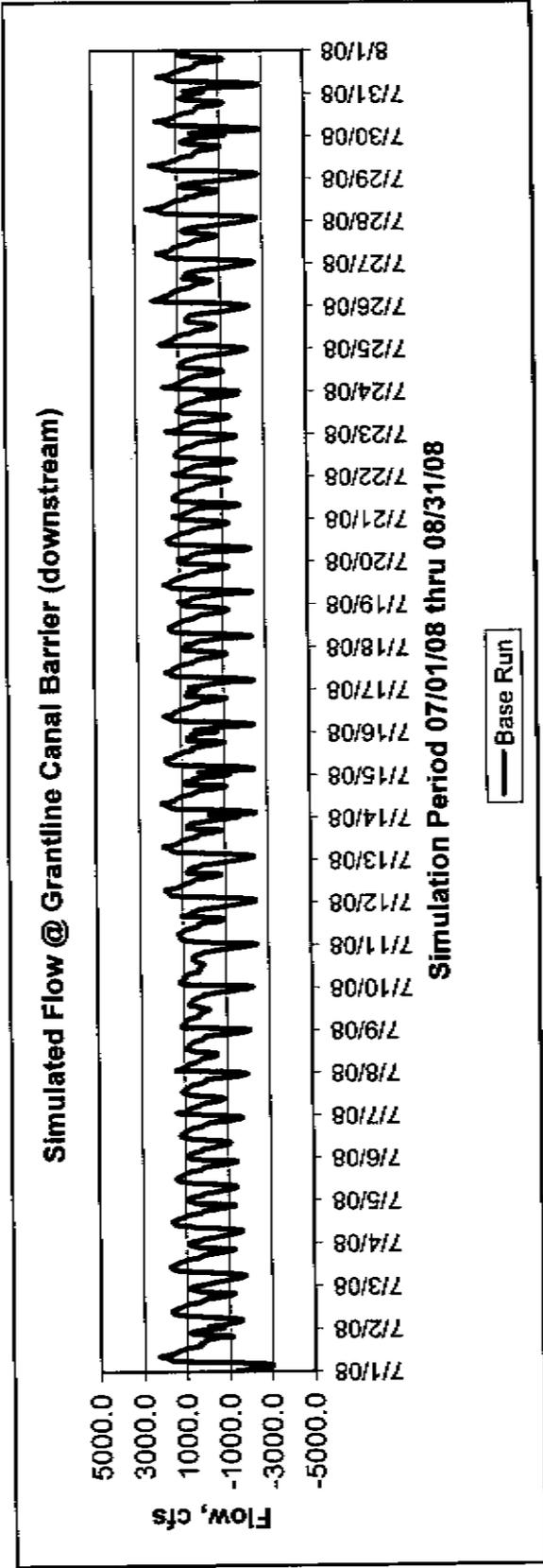
Simulated Flow @ Paradise Cut Channel 195 Downstream



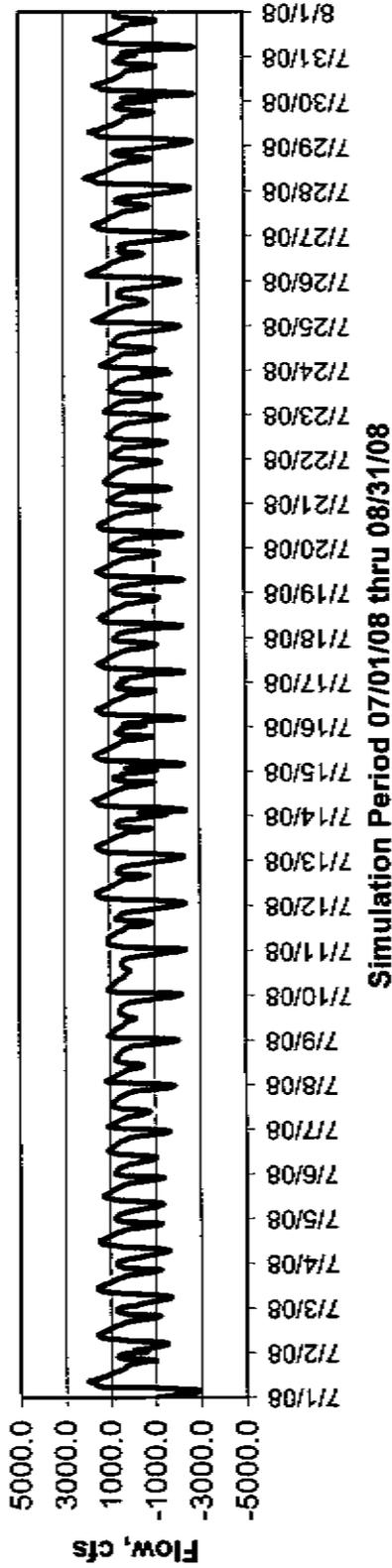
GRANTLINE CANAL - FLOW



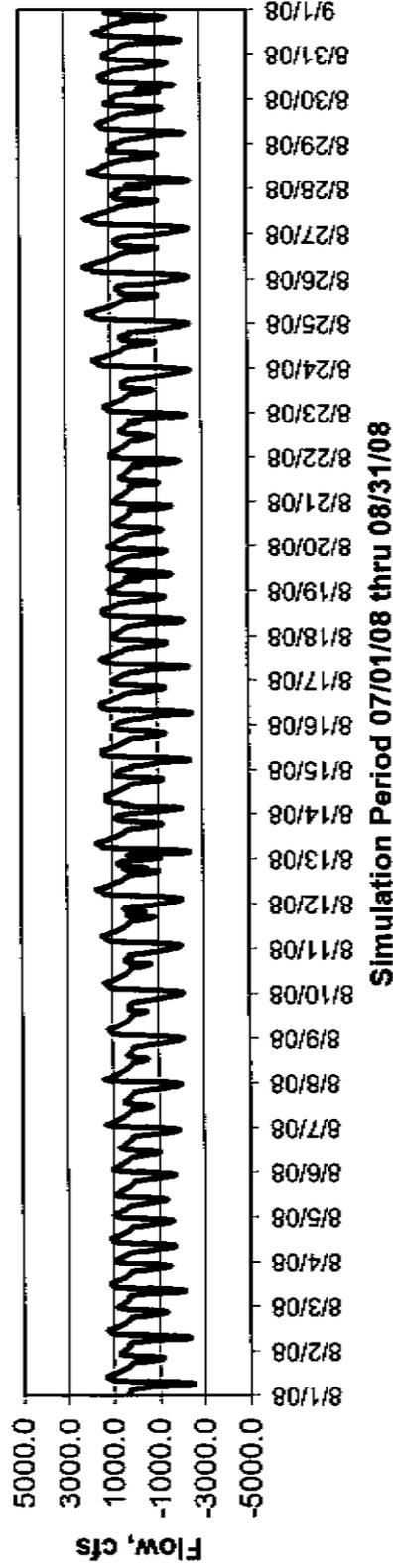


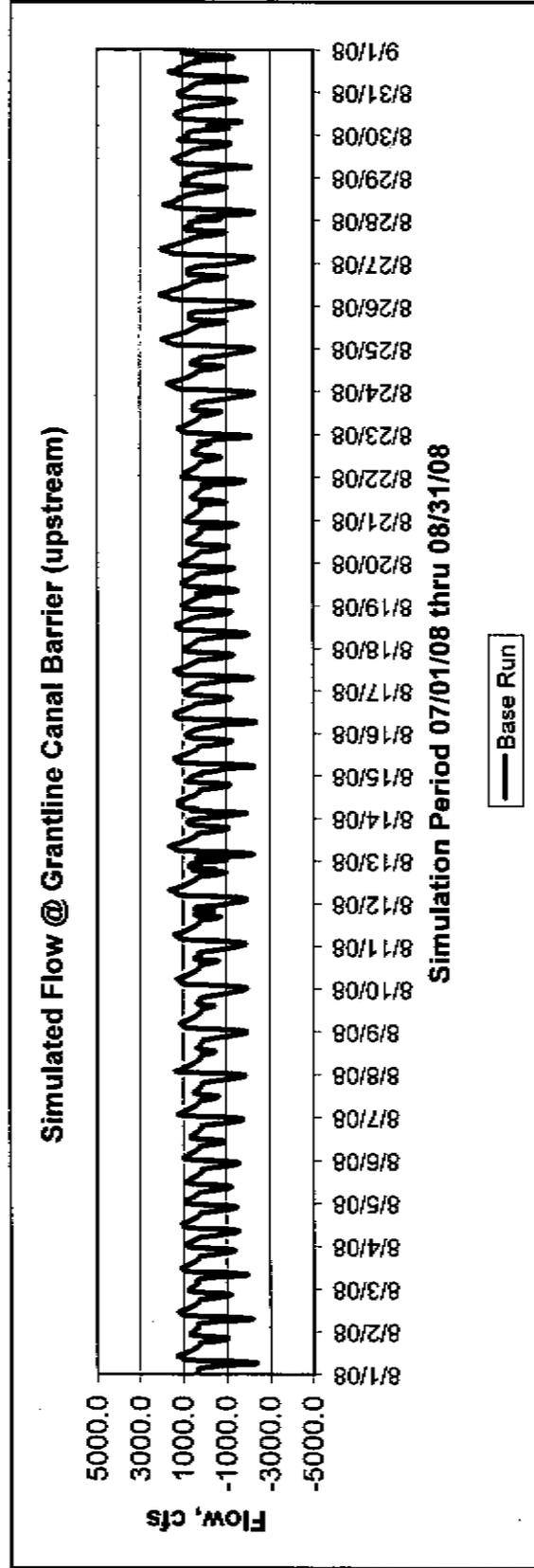
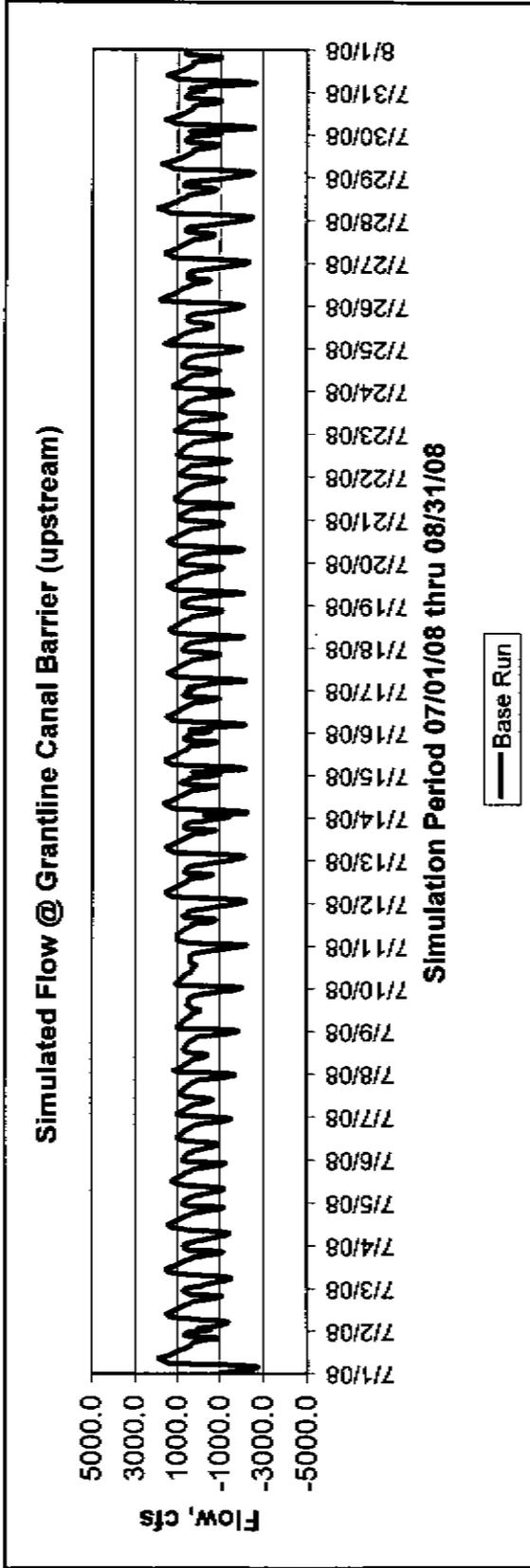


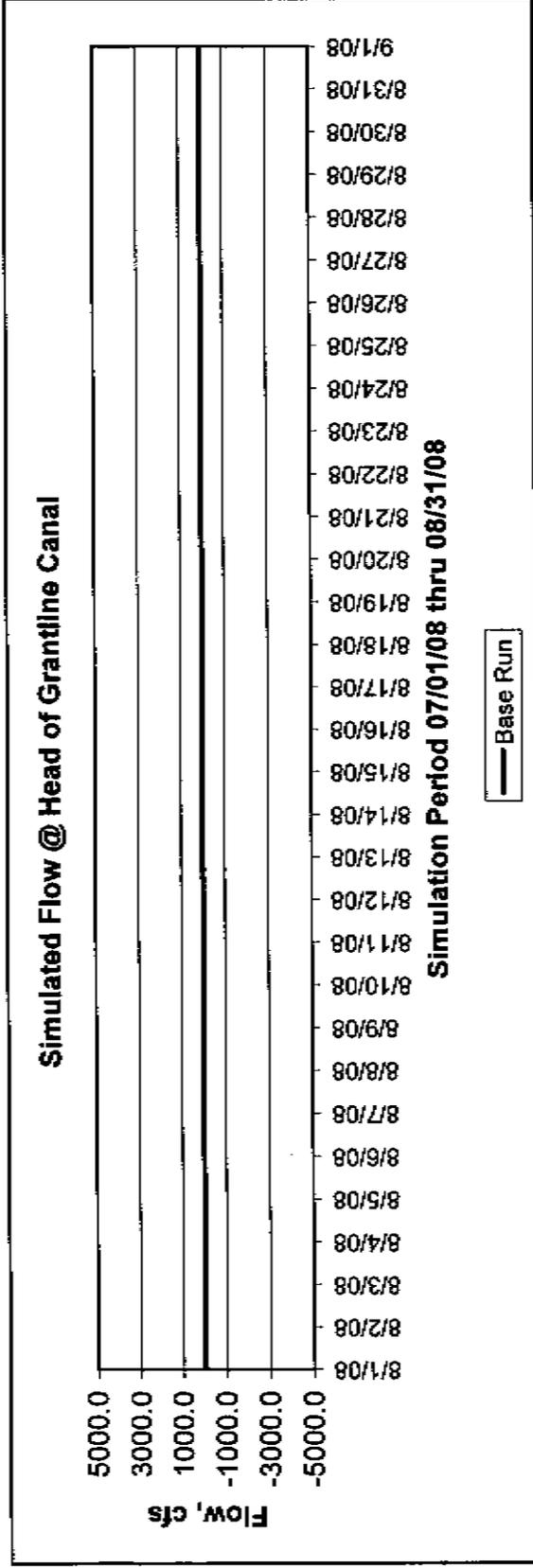
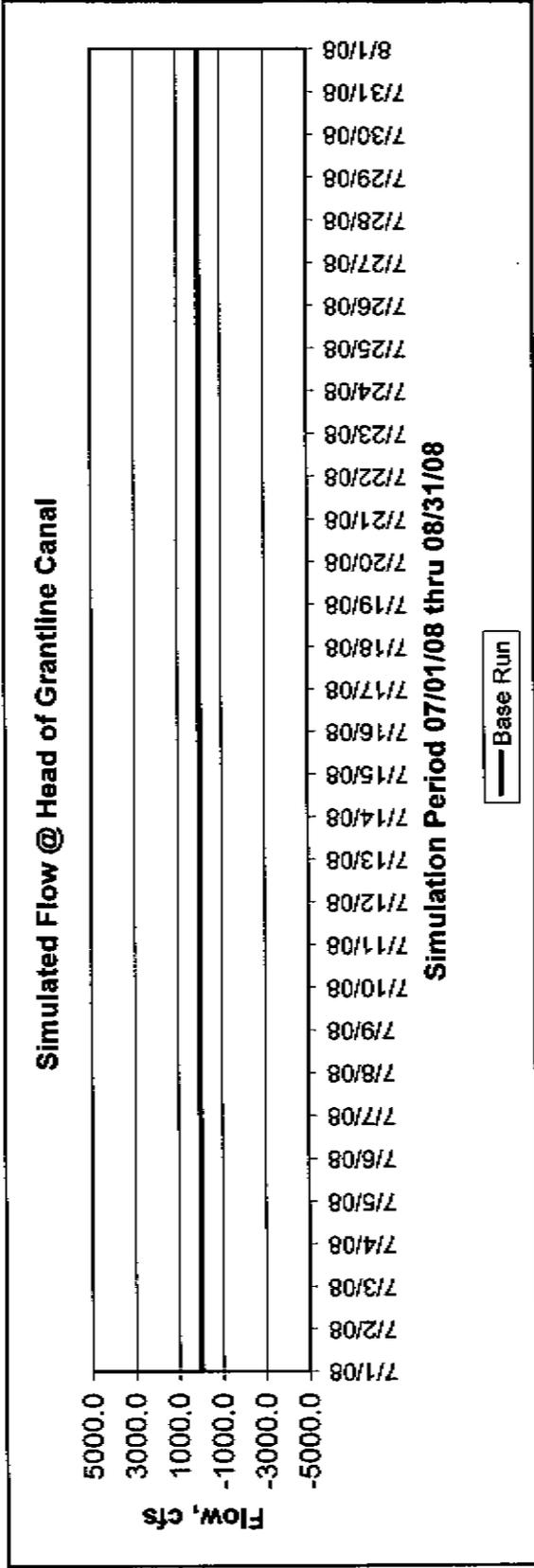
Simulated Flow @ Grantline Canal downstream of Barrier (East Position)

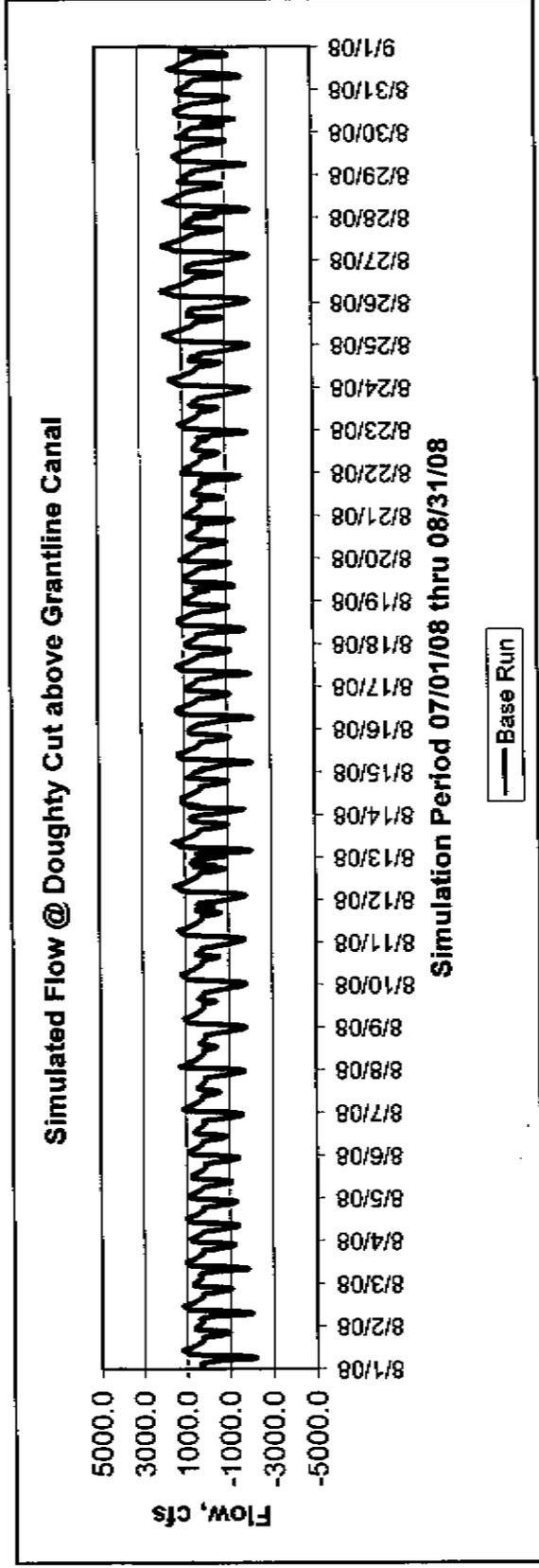
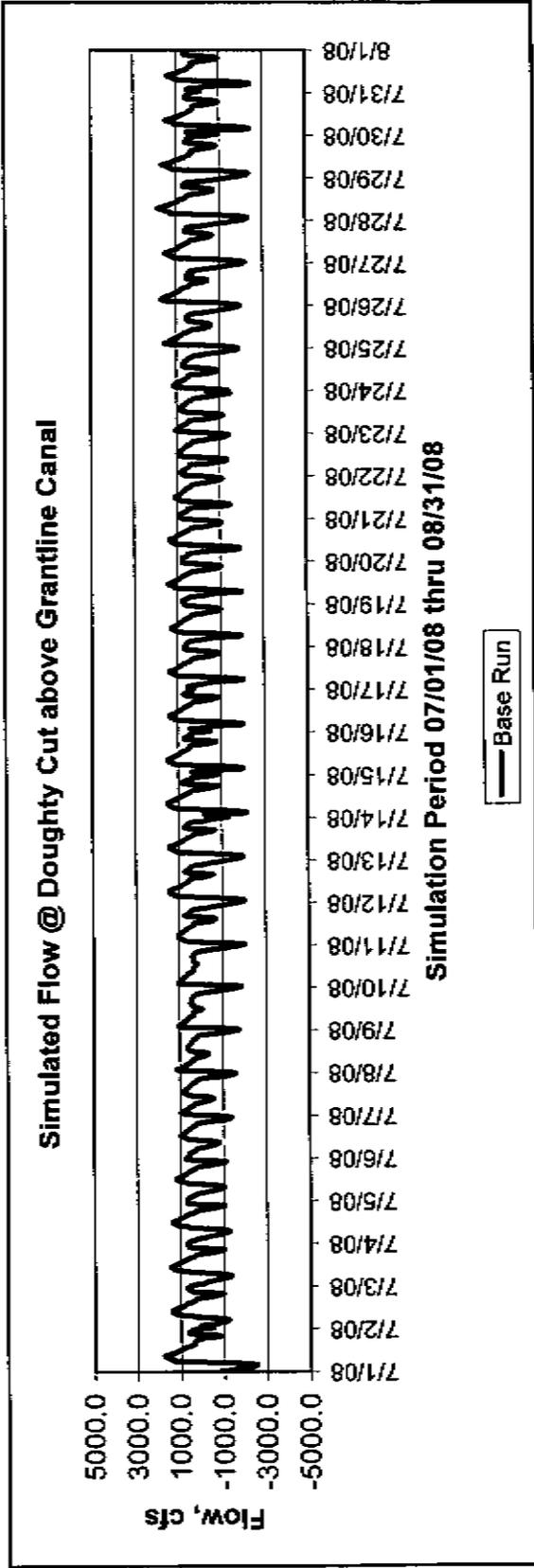


Simulated Flow @ Grantline Canal downstream of Barrier (East Position)



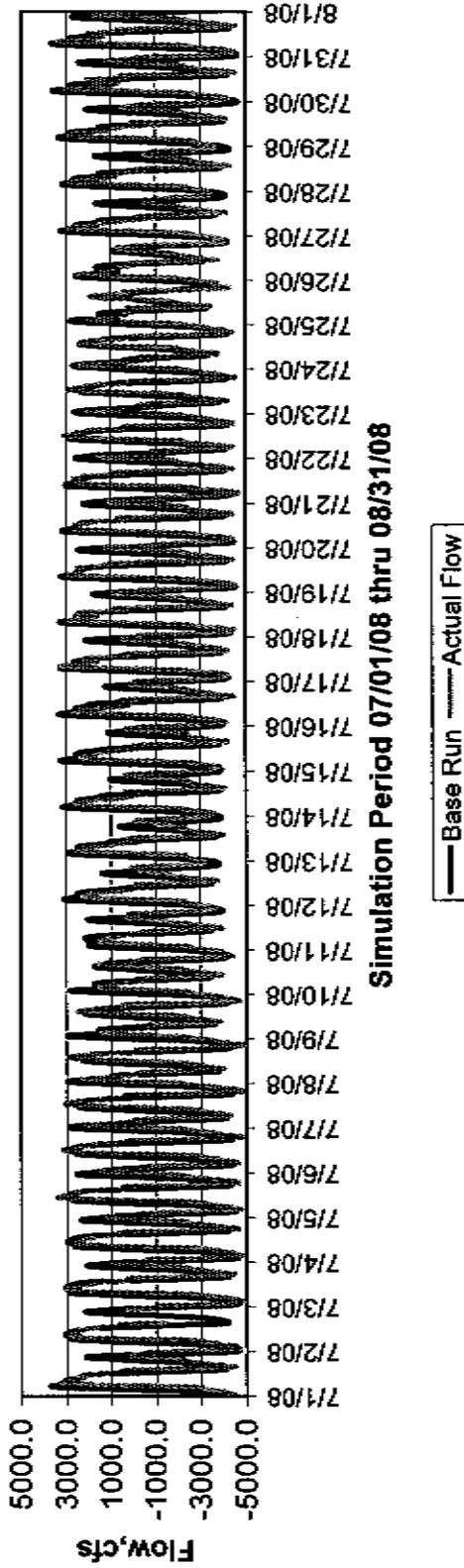




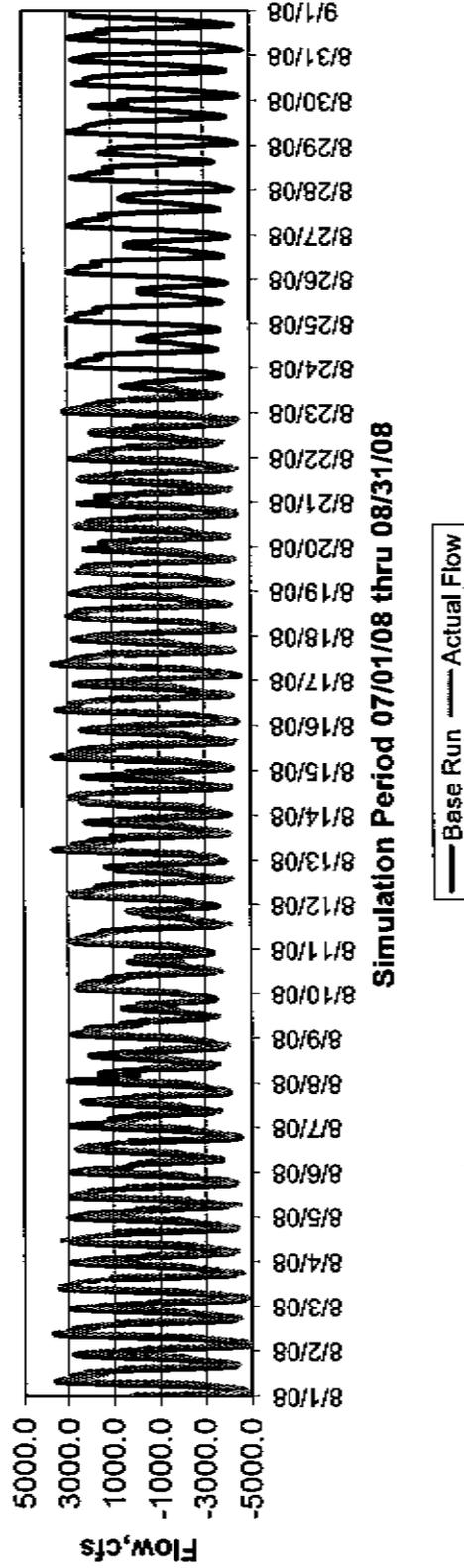


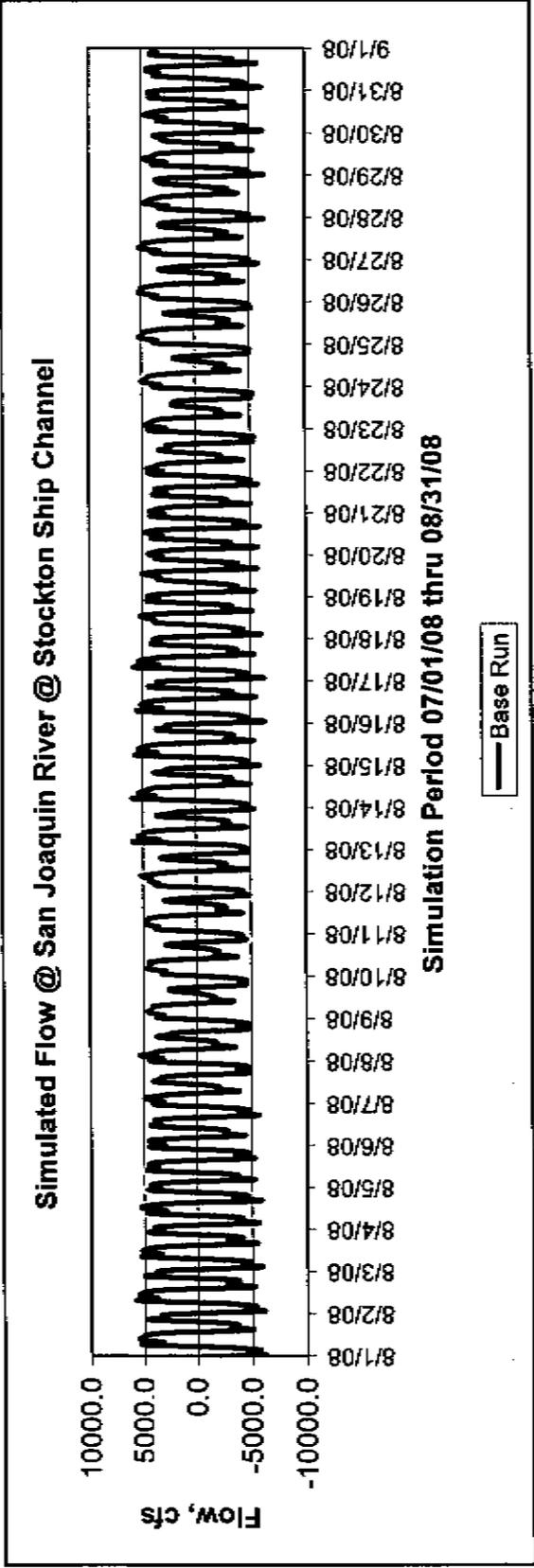
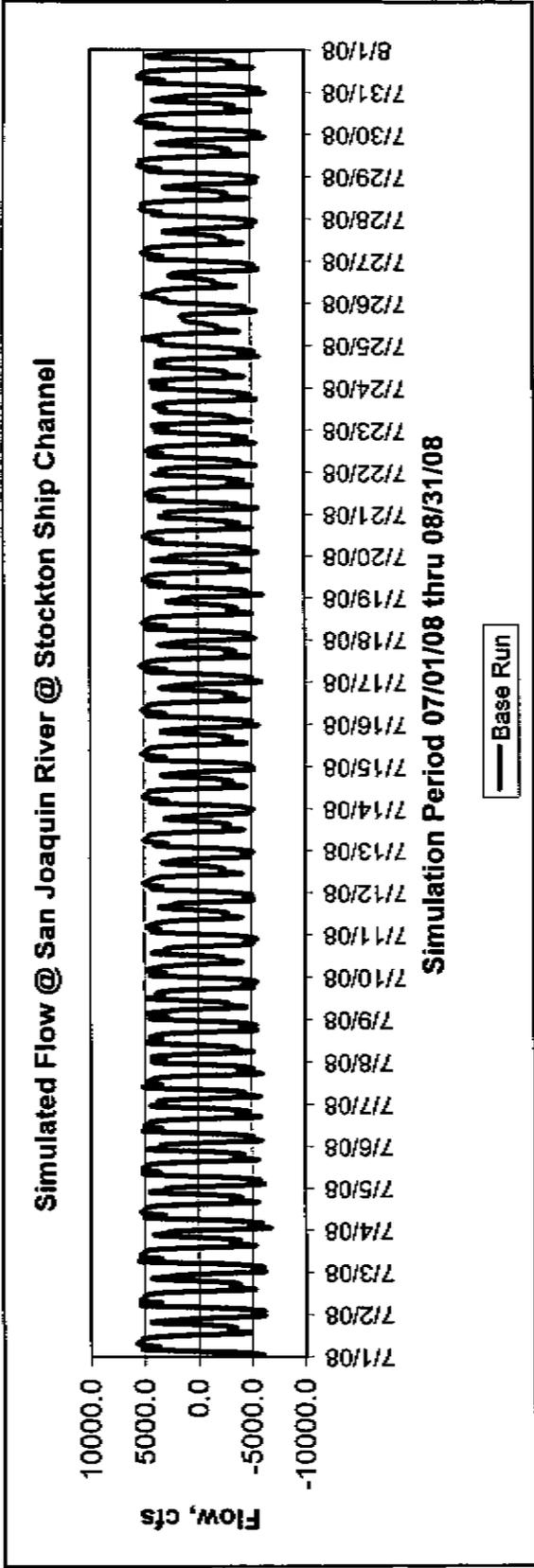
SAN JOAQUIN RIVER - FLOW

Simulated Flow @ Turner Cut near holt (downstream of 172)

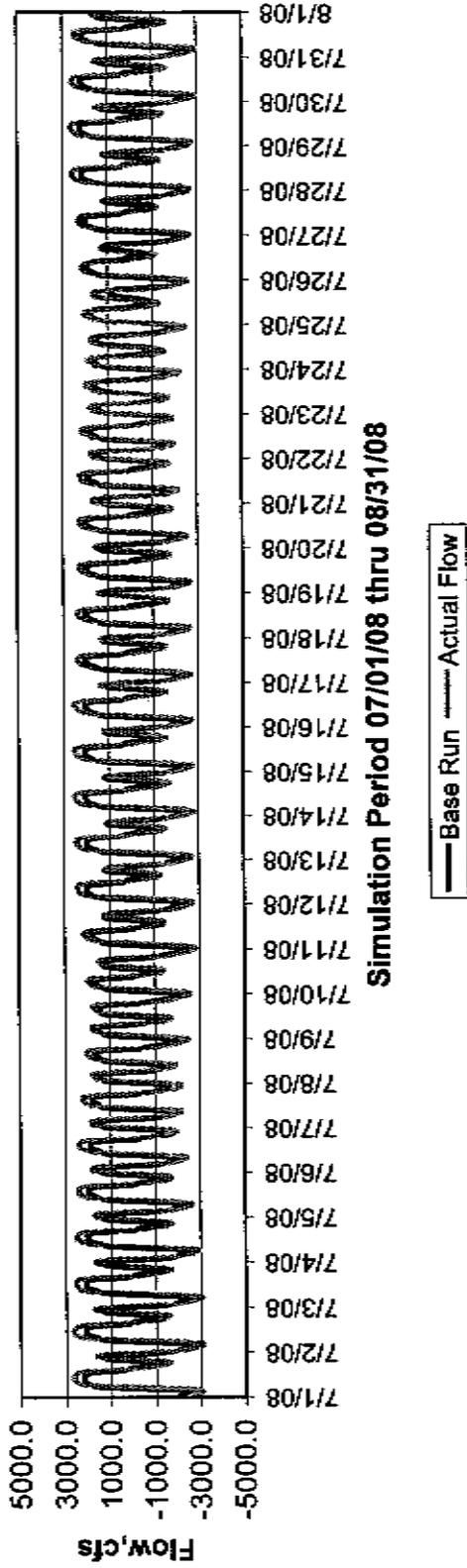


Simulated Flow @ Turner Cut near holt (downstream of 172)

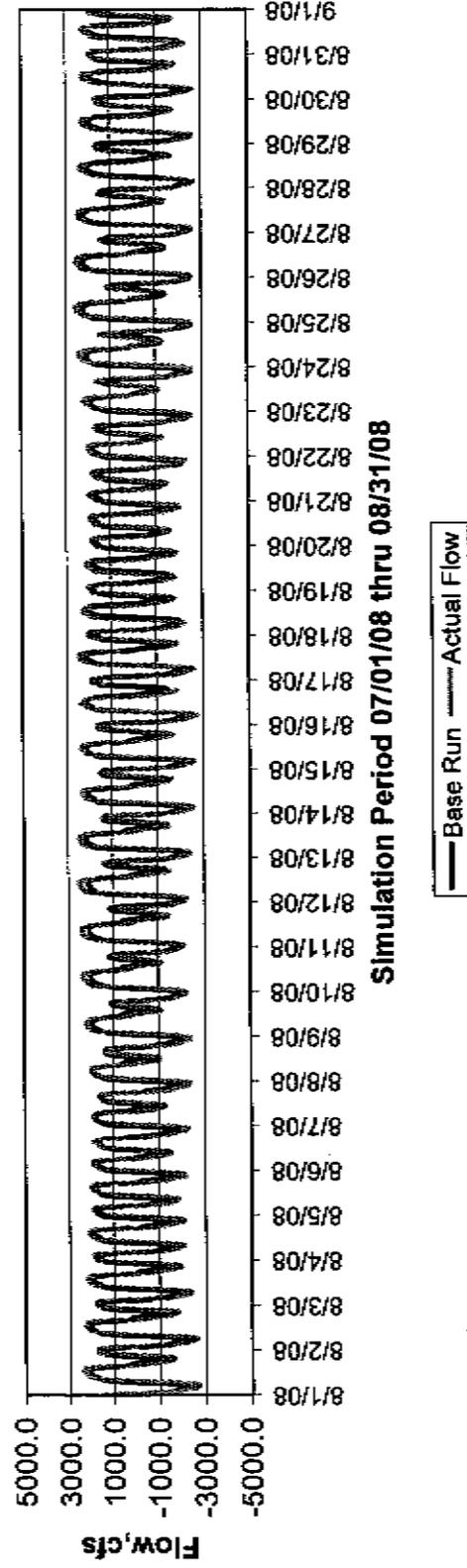


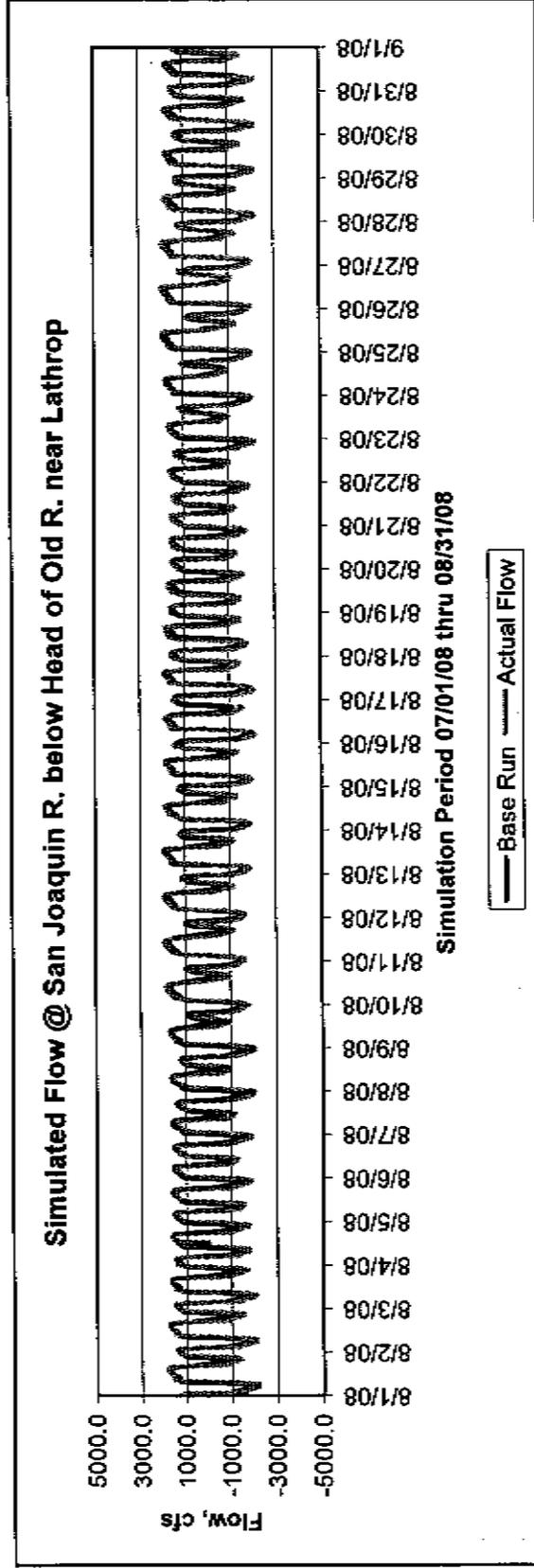
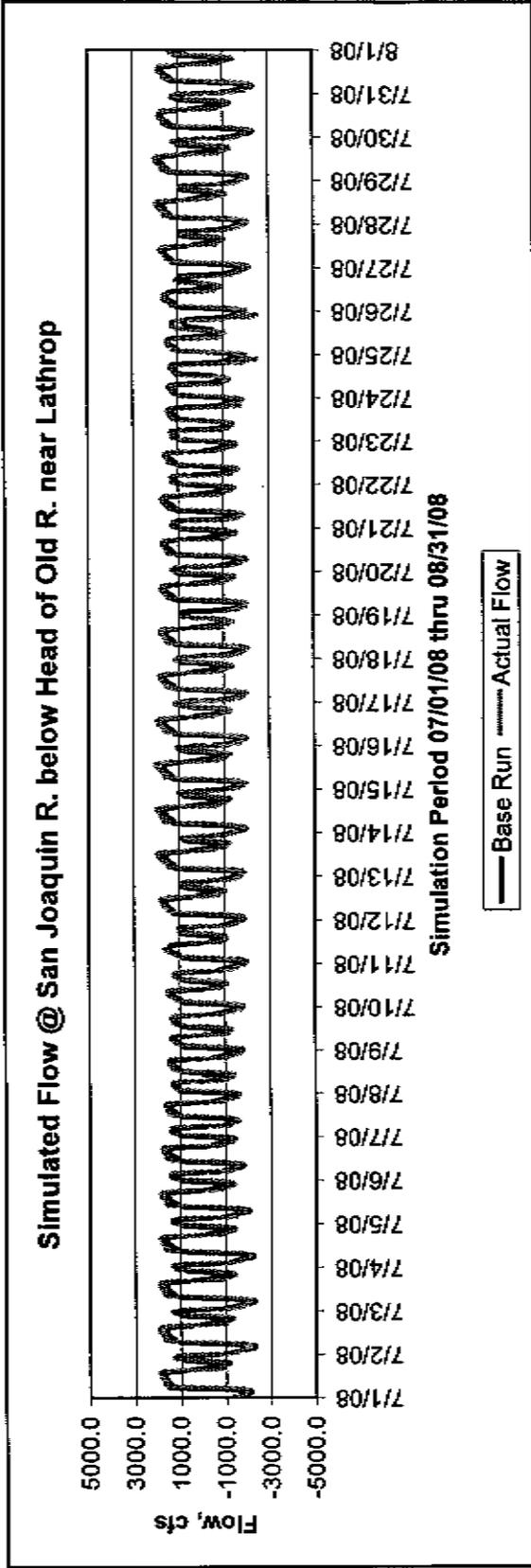


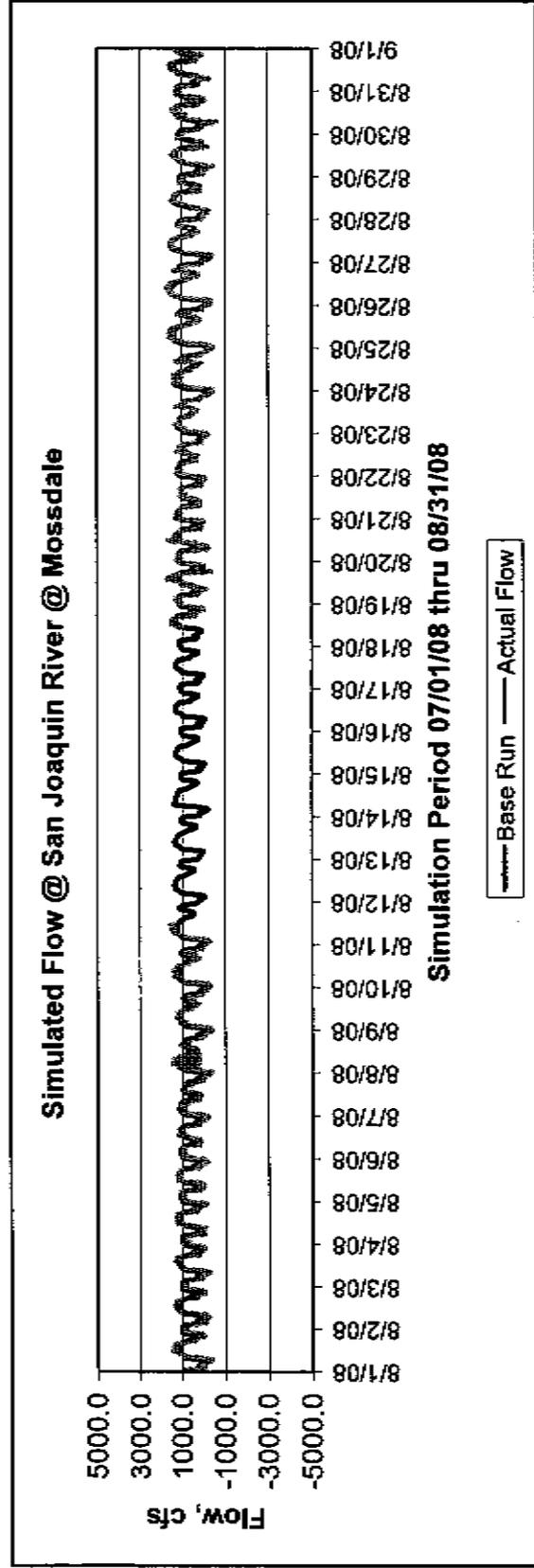
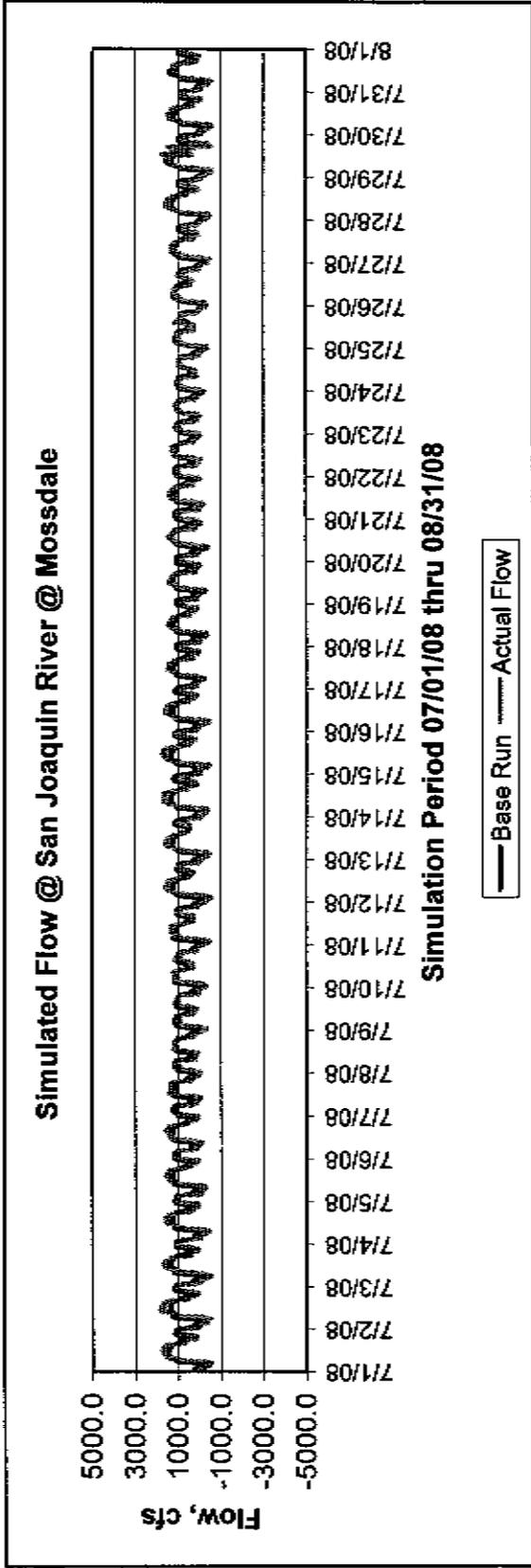
Simulated Flow @ San Joaquin River @ Brandt Bridge



Simulated Flow @ San Joaquin River @ Brandt Bridge







SOUTH DELTA WATER AGENCY

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Counsel & Manager:
John Herrick

January 10, 2006

Via Fax (916) 341-5620

Ms. Selica Potter
Acting Clerk to the Board
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812-0100

Re: Comment Letter – 01/13/06 Board Meeting Item Number 4
Draft Order Regarding Cease and Desist Orders Nos. 262.31-16 &
262.31-17 and Reconsideration of Approval of Water Quality Response Plan
These Comments are Submitted on Behalf of Central Delta Water
Agency, R. C. Farms, Inc., Curt Sharp, and Rudy Mussi, South Delta
Water Agency, and Lafayette Ranch

Dear Ms. Potter:

The Draft Order (“DO”) for the above matters draws lines through the participating party’s positions in an apparent effort to give everyone something. The result however is legally deficient, contrary to the evidence, and frustrates the protections of water quality in the Delta.

Both with regard to the Cease and Desist Orders and the Water Quality Response Plan, the Draft Order clearly and unequivocally changes D-1641. This is not only illegal under the California Environmental Quality Act but constitutes a poor policy choice by the Board. These comments will address the legal flaws of the DO and also suggest changes to other portions of the text.

1. The DO changes D-1641’s implementation of the 1995 Water Quality Control Plan Water Quality Objectives for Agricultural Beneficial Uses in the Southern Delta.

The 1995 Water Quality Control Plan provides that the Southern Delta Water Quality Objectives at Old River near Middle River, Old River at Tracy Road Bridge, and San Joaquin River at Brandt Bridge shall be 0.7 EC from April through August and 1.0 EC from September to March. These objectives were implemented over time through D-1641. As stated in footnote

SDWA Exhibit 4

5 to Table 2 of D-1641: "The 0.7 EC objective becomes effective on April 1, 2005. The DWR and the USBR shall meet 1.0 EC at these stations year round until April 1, 2005." D-1641 was supported by an extensive Environmental Impact Report. As stated in that EIR,

[A]s required by the California Environmental Quality Act, the SWRCB prepared environmental documents on the impact of adopting the (1995 Water Quality Control) Plan. . . This Draft Environmental Impact Report ("EIR") analyzes the impacts of implementing the 1995 Plan. Many of the actions to implement one group of objectives are independent of actions to implement other groups of objectives. As a result, there are many combinations of actions that could be taken to implement the Plan.

The staged implementation of the Southern Delta objectives was examined through the EIR process which identified potential negative impacts and set forth mitigation measures.

In the DO, the Board states on page 30:

2. Within 60 days from the date of this Order, DWR and USBR shall submit a detailed plan and schedule to the Executive Director for compliance with the conditions mentioned above, including plan completion dates for key events leading to full compliance with the 0.7 EC objective at station C-6, C-8, and P-12 *by July 1, 2009.* (Emphasis added.)

The situation could not be more clear. Through this CDO process, the SWRCB proposes to change the staged implementation schedule set forth in D-1641. This proposed change to the implementation date is accompanied by no environmental review for such changes. The DO itself recognizes that such changes would require accompanying environmental review on page 9 of the DO. In discussing the DWR and USBR's Petition for Long-Term Change to their Water Permits submitted on February 18, 2005, the Board notes that those projects requested "to change the effective date of the 0.7 EC objective for the interior Southern Delta stations from April 1, 2005, to December 31, 2008." The Board goes on to state, "The State Water Board cannot continue processing the Petition until DWR completes its California Environmental Quality Act compliance." If changing the implementation of the 0.7 EC objective at the three interior southern Delta stations pursuant to a Petition by DWR and USBR requires accompanying environmental documents, then so too does a change of the implementation date of the 0.7 EC objective for the three interior southern Delta stations through a CDO process also require such environmental documentation. The Board should note that its own comments to DWR's initial study and proposed Negative Declaration supporting the Petition pointed out shortcomings indicating that the Negative Declaration was insufficient to support the proposed changes.

2. The DO changes D-1641's approval of JPOD without the appropriate environmental review.

In D-1641, the Board approved JPOD with certain conditions and limitations. In addition to deferring JPOD's water level and water quality effects to further review through response plans approved by the Executive Director, D-1641 required that JPOD was to be conditioned upon compliance with all other permit/licenses of the projects. As stated above, the EIR supporting D-1641 and thus JPOD was an environmental analysis of the effects of such additional pumping and included necessary findings and mitigation.

In the DO, the SWRCB changes D-1641's requirement of compliance with existing permit/licenses and allows Stage 1 JPOD if the three South Delta salinity objectives are violated. Such a change to a government action that can have a significant effect on the environment requires environmental review. Such review is absent in this case, and therefore the DO is legally deficient.

It must be pointed out that the DO recognizes "minimal, historic uses of JPOD under Stage 1." These uses include supplying the Cross-Valley Contractors (et al.) with water. The Board should take note of its own records and see that this historic use was historically illegal as DWR was delivering water to the CVP service area in violation of its permits until D-1641 made it legal.

The other "historic" use cited by the DO deals with makeup pumping. In support of the DO, the Board refers to previous makeup pumping to recover losses due to actions taken to protect stripped bass. Stripped bass populations are now at all time lows. Current makeup pumping is taken to protect (generally) salmon and smelt and includes makeup pumping for exports lost during the pulse flow time frame. During that time frame, D-1641 allows exports to equal 100 percent of the San Joaquin River flow notwithstanding the Biological Opinions which require that exports be much lower than those flows. Hence, this "historic" use is a method by which the Board tries to make sure that if the projects must protect fish, it does not cost them any water.

To use these two "beneficial uses" as justification for water quality violations is not just bizarre, it is the Board obligating its violations to protect the waters of the State.

3. Other proposed changes to the Draft Order.

A. In paragraph 1, page 29 of the DO, DWR and USBR are ordered to insure compliance with the 0.7 EC objective (from April through August) at the three South Delta compliance locations as of April 1, 2005. As stated above, paragraph 2 on page 30 does not require "full compliance" until "July 1, 2009."

The DO is therefore inconsistent in that on the one hand it requires compliance with the 0.7 standard by April 1, 2005, and on the other hand requires full compliance with that same standard by July 1, 2009.

B. Paragraph 2 of the Draft Order provides for a “plan” by which the 0.7 EC objective shall be met, but that the plan may include means which are equivalent to that of barriers. The Draft Order requires that “if DWR and USBR decide to implement the permanent barrier project or equivalent measures, DWR and USBR shall submit a schedule to the Chief of the Division of Water Rights for developing an operations plan that will reasonably protect southern Delta agriculture.” This too is confusing and contradictory as it suggests that “equivalent measures” must be geared to meet the 0.7 EC objective as that is the purpose of the plan required in paragraphs 2 and 3. However, as per footnote 5 of Table 2 of D-1641, “equivalent measures” to barriers “with an acceptable operations plan” is one method of avoiding the 0.7 objective as the footnote allows the objective to revert back to 1.0 once barriers or equivalent measures are in place. The DO however seems to indicate “equivalent measures” may be one way of eventually attaining full compliance.

C. Paragraph 4 of the DO lists various other measures DWR and USBR can take as “corrective actions” if they anticipate violations of the South Delta objectives. The DO lists releases, export reductions, recirculation, purchases, exchanges, transfers, modifications to temporary barrier operations, and drainage reductions. Since these are the methods by which a projected violation can be avoided, and the Board thinks they should be undertaken to avoid such violation, the DO should simply require compliance with the standards. There is no logical reason to give DWR and USBR until 2009 to reach “full compliance” with the standard while at the same time expecting they can undertake any of the large number of options available to avoid a violation in any particular instance. By confusing the issue, the Board is insuring that DWR and USBR will not plan ahead and secure the appropriate approvals or expenditures in order that they may undertake some of these items and avoid water quality violations.

D. Paragraph 5 of the DO requests DWR and USBR provide certain information in the event of a violation. The information includes the “amount of water bypassed or released from project supplies, the net reduction in exports, and the measured quantity of other actions. . .” It also seeks the “supplies remaining for beneficial uses following corrective actions.” There would appear to be no valid reason to request such information. The request/requirement appears to be a method by which DWR and USBR can justify a violation by arguing the corrective action taken results in an unreasonable use of water. Since DWR gave no evidence or testimony to suggest such an argument, the Board should not give its implicit support for one. If DWR and USBR believe that releasing 50,000 acre-feet of water to meet water quality obligations is an unreasonable use of water while they are exporting 5 million or more acre-feet, they can make that argument if they so choose. It is not the SWRCB’s function to conserve and protect any specific export levels.

E. Page 5 of the Do lists conditions and actions which affect water conditions in the southern Delta. Instead of such a list, the DO should reference the Board's findings set forth in D-1641 which led it to assign responsibility for the water quality objectives to DWR and the Bureau.

F. Page 7 of the Do describes the development of the water quality standards as being to protect two salt sensitive crops in the South Delta, beans and alfalfa. This incorrectly describes the previous analysis and decisions of the Board. The Board is directed to pages VI - 18 to VI - 19 of the 1978 Water Quality Control Plan which used beans and alfalfa as indicators to protect various crops. The current language of the DO appears to be setting the groundwork for an argument that a decrease in bean farming would justify a lessening of the standard. The Board should not be party to actions that will preclude southern Delta farmers from being able to grow any crop they choose if it is otherwise economically feasible.

G. Page 7 of the DO incorrectly attributes delays in the implementation of the standards to previous negotiations between SDWA and DWR and USBR. The Board is directed to pages VI - 22 and VI - 23 of the 1978 Plan, and the relevant portions in the 1991 and 1995 plans and D-1641. To the contrary, the standards were proposed for early implementation in case those negotiations were not successful.

H. Page 18 of the DO refers to DWR's assertion that changes in the SWP exports do not effectively control water quality in the South Delta, and the Board's analysis and refutation of that position. The text should include references to SDWA testimony showing numerous ways in which SWP operations do affect salinity in the South Delta and how the DWR presented no evidence as to how it would jointly operate with the USBR to meet the objectives.

I. Pages 19 - 20 of the DO deal with DWR's assertion that 1.0 EC is protective of agricultural beneficial uses and the Board's analysis and refutation of that position. The text should include references to the rebuttal testimony of SDWA's witness Terry Prichard who pointed out a number of unreasonable/incorrect assumptions in Dr. Letey's analysis, which incorrect assumptions were not contested by DWR or any other party. In addition, the text should not refer to other evidence for "potential" harm when the evidence showed actual harm and how increasing salt concentrations in irrigation water will result in further harm.

J. Page 20 confuses the issue of a water quality objective for agricultural beneficial uses by making reference to irrigation water salinity being one factor in crop production. The existence of other factors that affect crop production is irrelevant to what water quality is needed. The fact that a farmer may lose crop production due to other causes does not mean that water quality is unimportant or can be adjusted depending on what the eventual crop production in the year actually will be. For example, the amount of flow to protect fisheries on the San Joaquin River does not become less if in any particular year offshore fishing radically increases the mortality of that fishery.

Ms. Selica Potter
January 10, 2006
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4. Conclusion.

The Draft Order incorrectly changes provisions of D-1641 without adequate environmental review. The Board should amend the Draft Order to simply require compliance with existing standards and not make any extensions of implementation dates for water quality standards. The parties hereto also request their previous recommendations for provisions to be included in the final Order.

Please call me if you have any questions or comments.

Very truly yours,

JOHN HERRICK

JH/dd

PROOF OF SERVICE BY E-MAIL AND MAIL

I declare as follows:

I am over eighteen years of age and not a party to the within entitled action. My business address is the Law Office of John Herrick, 4255 Pacific Avenue, Suite 2, Stockton, California, 95207. I am employed in San Joaquin County, California. Based on an agreement of the parties to accept service by e-mail or electronic transmission, on January 10, 2006, at approximately 4:50 p.m., I caused the Comment Letter – 01/13/06 Board Meeting Item Number 4 Draft Order Regarding Cease and Desist Orders Nos. 262.31-16 & 262.31-17 and Reconsideration of Approval of Water Quality Response Plan These Comments are Submitted on Behalf of Central Delta Water Agency, R. C. Farms, Inc., Curt Sharp, and Rudy Mussi, South Delta Water Agency, and Lafayette Ranch to be sent to the persons at the e-mail addresses listed below. I did not receive, within a reasonable time after the transmission, any electronic message or other indication that the transmission was unsuccessful.

commentletters@waterboards.ca.gov	Selica Potter
Jmccue@waterboards.ca.gov	Jean McCue
crothers@water.ca.gov	Cathy Crothers
jstruebing@mp.usbr.gov	Amy L. Aufdemberge
emahaney@waterboards.ca.gov	Erin K. L. Mahaney
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dguy@norcalwater.org	David J. Guy
agodwin@mrgb.org	Arthur F. Godwin
tcannon@dfg.ca.gov	Tina R. Cannon
WrHearing@waterboards.ca.gov	SWRCB

I am readily familiar with the practice of the Law Office of John Herrick for collection and processing of correspondence for mailing with the United States Postal Service. In the ordinary course of business of the Law Office of John Herrick, correspondence is deposited with the United States Postal Service the same day as it is collected and processed. On January 10, 2006, I served Comment Letter – 01/13/06 Board Meeting Item Number 4 Draft Order Regarding Cease and Desist Orders Nos. 262.31-16 & 262.31-17 and Reconsideration of Approval of Water Quality Response Plan. These Comments are Submitted on Behalf of Central Delta Water Agency, R. C. Farms, Inc., Curt Sharp, and Rudy Mussi, South Delta Water Agency, and Lafayette Ranch on the following individuals by placing a true copy thereof enclosed in a sealed envelope with postage thereon fully prepaid, and placed for collection and mailing on said date to be deposited with the United States Postal Service following ordinary business practices at Stockton, California, addressed as follows:

Gary Bobker, Program Director
The Bay Institute
500 Palm Drive, Suite 200
Novato, CA 94949

Patrick Porgans
Patrick Porgans & Assoc., Inc.
P. O. Box 60940
Sacramento, CA 95860

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

EXECUTED on January 10, 2006, at Stockton, California.

Dayle Daniels

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May 10, 2007

Via Fax (916) 341-5621

Ms. Dorothy R. Rice
Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Re: Department of Water Resources' Notice of Potential Violations of Permit Terms Under Cease and Desist Order WR 2006-006

Dear Ms Rice:

The South Delta Water Agency submits this letter as its response to the Department of Water Resources' ("DWR") letter of April 24, 2007. That letter notifies the SWRCB of potential violations of the water quality objectives for Agricultural Beneficial Uses in the Southern Delta. Compliance with those objectives is required under the permits held by DWR and the United States Bureau of Reclamation ("USBR") as specified in D-1641.

In a telephone conference on Thursday, May 3, 2007, the DWR informed SDWA that violations were actually occurring at one or more of the compliance locations for the objectives. Per D-1641, such violations require DWR and USBR to prepare a report for the Executive Director of the SWRCB. To our knowledge, neither DWR or USBR has done so notwithstanding the announced water quality violations.

Any response to the April 24, 2007 letter ("Notice") must begin with a number of observations. The first is that the Notice contains numerous factual errors. For example statements in the Notice include; all three tidal barriers were installed and operating on April 22, 2007 (the onset of VAMP); Tom Paine Slough discharges to Old River; and local and Southern Delta agricultural drainage contains indigenous salts from the soils. Each of these is incorrect.

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Second, DWR and USBR are attempting to rewrite history and D-1641 by now arguing that local factors other than the effects of the projects (flows, circulation and San Joaquin River water quality) are the cause of the violations and they are therefore excused from compliance. Their argument turns the language of D-1641 upside down and gives it a new meaning in order that they may avoid their responsibilities. D-1641 allows the Executive Director to determine if the violations are "the result of actions beyond the control" of the projects. DWR and USBR now assert this language means they are not responsible for the standards if other factors affect salinity concentrations. The two are clearly not the same.

Third, DWR and USBR tellingly omit any reference to recent SDWA communications to them which anticipated the violations and suggested possible actions to avoid or lessen the violations. In response to those communications, DWR and USBR chose not to respond at all. Thus, rather than investigate possible actions to meet the objectives and attempt feasible ones, DWR and USBR did nothing except wait until the violations occurred; then plead not guilty. By choosing not to act, the projects preclude the Executive Director from finding the violations are "beyond the control" of the projects.

The premise of the Notice is that activities other than the current, immediate operations of the projects are causing the violations, and so they are not responsible. This theory was first presented at the hearings which result in WR 2006-006 (the Cease and Desist Order, or "CDO") and was rejected therein. Under the theory, if there are contributing factors to salinity concentrations, DWR and USBR are not required to undertake any actions to meet the three internal Southern Delta standards. Put another way, the projects assert that if the Vernalis standard is met, then they have no responsibility to meet the three downstream standards because, (they argue), the quality of water at Vernalis should remain at the level of the standard as it travels downstream unless some other user or use adversely affects the salinity concentration.

If this theory were correct, it would have to be reflected in D-1641 (and the record thereof) and be considered as something "beyond the control" of the projects. The opposite however, is the case.

The Bay-Delta hearings were initiated to implement the 1995 Water Quality Control Plan for that region. Phase 5 therein sought to implement the Water Quality Objectives for Agricultural Beneficial Uses in the Southern Delta. This issue and the conclusions and decision made by the SWRCB are contained on pages 79-89 of D-1641. In those hearings, DWR recommended that

... with regard to the Southern Delta salinity objectives in the Water Quality Control Plan ... the Board recognize and accept DWR's efforts to implement the South Delta barriers program as the appropriate water quality implementation

Ms. Dorothy R. Rice

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measures for the State Water Project and the Central Valley Project to contribute to the achievement of water quality objectives in the South Delta. (Transcript page 3678.)¹

Hence, DWR asked the Board to not assign it the obligation to meet the Southern Delta standards, rather to only “accept DWR’s efforts” to install and operate the permanent barriers. Further, DWR informed the Board that permanent barriers alone were not enough to meet the standards.

The second point is that barrier operations cannot guarantee compliance with the South Delta salinity objectives, which the Board has proposed -- or has adopted since the barriers cannot address the other factors addressing salinity in the South Delta. (Transcript at page 3677.)

Instead of accepting DWR’s recommendation and with full knowledge that permanent barriers were insufficient to meet the standards, the Board through D-1641 stated:

This permit (sic) is conditioned on implementation of the water quality objectives for agricultural beneficial uses in the southern Delta, as specified in Table 2, attached, at the following locations in the southern Delta:

- a. . . . Brandt Bridge . . .
- b. . . . Old River near Middle River . . .
- c. . . . Old River at Tracy Road Bridge . . .” (D-1641 at pages 159, 161, 163)

The only conclusion that can be drawn from this is that *instead* of only assigning DWR (and USBR) the responsibility of installing and operating the permanent barriers (and controlling salinity to the degree the barriers can), the SWRCB assigned the projects the responsibility of meeting the standards. [It should be noted that the permanent barrier program, or SDIP, has been delayed once again, extending the time by which barriers will be installed and operating to 2011 at the earliest. Even under DWR’s view of D-1641, they have failed to meet first, the April 2005 deadline for the barriers, second, will not meet the 2009 deadline anticipated in the CDO, and third, can only estimate they will comply with their perceived obligation by 2011. Hardly a reasonable or legal implementation of a water quality objective.]

¹ References to “Transcripts” herein are to the Official Record of the *State Water Resources Control Board Cases*, Sacramento County Superior Court case No. 644385-6, Third District Court of Appeal case No. CO 44714, and specifically refer to CD No. 2, PDF file No. 3315.

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As stated in the CDO hearing, repeated at the SWRCB salinity workshops and referenced in the Notice, DWR and USBR assert that the SWRCB somehow forgot in the Bay-Delta hearings to address the issue of downstream actions and activities which can contribute to Southern Delta salinity concentrations. Once again, the record in D-1641 shows that assertion to be false. D-1641 explicitly referenced the various causes of such concentrations, which include "San Joaquin River inflow; tidal action; diversions of water by the SWP, CVP, and local water users; agricultural return flows; and channel capacity." (D-1641 at page 86).

In addition, the testimony of a DWR witness at the Bay-Delta hearings shows that the other contributing factors were not only known, but reviewed and discussed in the hearings;

Q: And of the return flows that are pumped back into the Delta, typically, are saline, is that correct:

A. Correct. (Transcript at page 3704.)

Q: And the recirculation within the South Delta by agricultural water users further degrades water quality in the South Delta; is that correct?

A: That would be correct.

Q: Is it also correct that urban runoff, particularly from the City of Stockton, contributes to degraded water quality in the South Delta?

A: Yes. (Transcript pages 3706 - 3707.)

Q: And then you went on to say that water quality in the area is affected by the following factors, and one of those factors that you cite is local agricultural drainage returns.

A. Correct.

Q: Local agricultural drainage returns then would include drainage returns from the South Delta Water District (sic) area?

A: Yes it would. (Transcript at page 3717.)

A: I know the department has collected some data on drainage water quality. And I know that some of it was done through our municipality water quality investigation. . . . (Transcript at page 3717.)

Q: Since this phase of the Water Board proceeding involves the South Delta salinity, in your view wouldn't it be important to present the South Delta drainage values to the Board in connection with your testimony?

A: I don't have an opinion on that.

Q: Okay. Let me ask it this way: Can you get your hand on the values that were assigned to South Delta's discharge in connection with the simulation model that resulted in Figure 8-B?

A: Yes we can. (Transcript pages 3718 - 3719.)

Q: My question then is: Since your testimony is that salinity problems in the Delta are due, at least in part, due to the dominant influence of local land derived salts, my question is: Has DWR in its model accounted for this influence and if so, what are those values and how have you accounted for them?

A: We have accounted for them. I don't know the specific values. And we can make them available if the Board wants them. (Transcript at page 3720 - 3721.)

[The Board discussed and acknowledged that the information referenced by the DWR witness would soon thereafter be made available and become part of the record, see Transcript pages 3721 - 3722.]

From this very brief sampling of the multi-volume record of the Bay-Delta hearings, we see that DWR was fully aware of other contributing factors to Southern Delta salinity concentrations. What they knew was provided to the SWRCB and therefore available to the Board when it made its decision allocating responsibility for the objectives. With that information before it, the Board specifically assigned DWR and USBR the obligation to meet the standards. The Board did not state that the obligation was "only to the degree that barriers improve the quality." The Board did not state that the obligation was "only to the degree that San Joaquin inflow affected the quality." The Board did not state that the obligation "didn't cover the effects of municipal discharges." The Board did not state that the obligation "didn't cover the effects of local concentrations due to the consumptive use of water." The Board did not state that the obligation "was only related to the projects' ability to control local discharges or municipal discharges." The Board did not state that the obligation "was only to the degree that operations of export pumping or reservoir releases directly affect the standards."

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Rather, the Board fully assigned the obligations except to the degree (in some circumstances) meeting them was beyond their control. [As previously noted by SDWA, those circumstances might include drought, levee breaches or other such crises or acts of God.] Adjusting barrier operations, increased releases from reservoirs, purchasing additional supplies and recirculating DMC water are all things *within the control* of the projects which can improve water quality in the Southern Delta, and result in meeting the standards. The projects failed to investigate or implement any of these measures, and thus, cannot reasonably argue the violations are beyond their control.

In light of the recent decision in the SWRCB cases (challenging D-1641), the SWRCB is obligated to fully implement water quality obligations in compliance with the controlling water quality control plan. Partial implementation (as different from a staged implementation) is not allowed.² This was the reasoning which precluded D-1641 from authorizing the interior standards to "revert back to the 1.0 EC level" after permanent barriers were installed. Hence, DWR and USBR's assertion that the SWRCB only implemented the standards to the extent that operation of temporary barriers, exports and New Melones releases (to meet the Vernalis standard) affect the interior standards is contrary to the law. The projects are asserting that the SWRCB forgot or failed to implement the standards during the time the projects are not

² As stated in the Third Appellate Court's decision: We do find merit, however, in the narrower argument that the Board failed to adequately implement the southern Delta salinity objectives at the three locations downstream of Vernalis by delaying implementation of the 0.7 EC objective at those locations. The 1995 Bay-Delta Plan specified that implementation of the 0.7 EC objective at the two locations on Old River would be phased in so that full compliance would be achieved by the end of 1997. No delayed implementation was provided for the San Joaquin River at the Brandt Bridge site. In this water rights proceeding, however, the Board extended the delayed implementation at the Old River sites by more than seven years, to April 1, 2005, and authorized this same delayed implementation for the Brandt Bridge site. Furthermore, Decision 1641 specified that the 0.7 EC objective would be "replaced" by the 1.0 EC objective after April 1, 2005, "if permanent barriers are constructed, or equivalent measures are implemented, in the southern Delta and an operations plan that reasonably protects southern Delta agriculture is prepared by the [Department] and the [Bureau] and approved by the Executive Director of the [Board]."

There is nothing in the 1995 Bay-Delta Plan that allowed the Board to further delay implementation of the 0.7 EC objective at the two Old River sites, or that allowed the Board to delay implementation of that objective at the Brandt Bridge site, or that allowed the Board to replace that objective with a different objective under any circumstances. In taking these actions, the Board failed to adequately implement the 1995 Bay-Delta Plan and instead effectively amended the 1995 Bay-Delta Plan without complying with the procedural requirements for amending a water quality control plan." (Decision at pages 87 - 88.)

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responsible. This leaves a huge gap in implementation which the Court's Decision precludes. Per California law, a regulation must be interpreted to comply with the controlling law.

Even worse, SDWA raised this issue and gave the projects warning that their normal operations would result in violations this summer (see SDWA letter dated December 28, 2006, attached hereto). Neither DWR or USBR responded to the letter. Next, SDWA sent the projects a letter dated February 9, 2007, (attached hereto) which outlined possible actions which could be undertaken to address the anticipated water quality violations. Neither the DWR or USBR responded to the letter. [In discussions with DWR and USBR staff during monthly teleconferences regarding ongoing operations, these issues were also raised. DWR staff proposed to investigate changes in barrier operations, but were either not allowed, or failed to get the necessary equipment/materials to implement physical changes to the barriers to promote net flow in the channels.]

The Executive Director should take notice of the specifics of HR 2828, now Public Law 108-361. This federal statute requires the USBR to (a) develop and initiate implementation of a program to *meet all existing water quality standards and objectives* for which the Central Valley Project has responsibility, (b) incorporate into the program to meet standards recirculation to decrease salinity concentrations in the San Joaquin River and reduce reliance on New Melones, (c) acquire water to dilute saline discharges to the River to reduce the use of New Melones water, and (d) update the operations plan of New Melones. (See PL 108-361, Section 103 (d) (2) (D) (i) - (vii) respectively. We see the Bureau was ordered to purchase water, do recirculation, etc. to meet the interior standards. Instead of complying with this federal directive, DWR and USBR have decided to *not* meet the standards and refuse to do what was required.

Given the above, it is clear that DWR and USBR cannot escape responsibility for meeting the interior Southern Delta standards. The projects' view that they are only responsible for meeting the Vernalis standard is unsupported by the law, the record of D-1641, and common usage of the English language. Notwithstanding this, SDWA will now also explain the reasons why the SWRCB ascribed these responsibilities to the projects, and not to any other party.

DWR/USBR operations do cause the violations of salinity standards

Bay salt is brought into the western Delta by tidal flows. CVP and SWP operations then combine to cause an unnatural north-south flow of water in Delta channels. This entrains some of this Bay salt and takes it to their intakes in the South Delta. About one half million to one million tons of this salt is then imported each year into the San Joaquin watershed in most years via the DMC.

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This salt in the DMC is diluted, primarily with Sacramento water. The water is then delivered to farms and wetlands in the CVP westside service area in the southern San Joaquin Valley. The crops and wetland plants consume most of the delivered water. The water users do not add a significant amount of salt, but the plant roots reject the salt in the consumed water so that the salinity (salt concentration) of drainage water can be as much as ten times the salinity in the DMC. Several hundred thousand tons of this concentrated salt then drains into the San Joaquin River.

Releases from New Melones are used to dilute this salt to comply with the Vernalis standard, but the salt is still there. Because of this unnatural salt load there can be no consumptive use of water downstream of Vernalis without again concentrating the salt just as it was concentrated by consumptive use of water in the CVP service area. Prior to CVP operations there was no salinity problem. The salinity and salt load at Vernalis was so low that there was enough assimilative capacity to allow for the effect of downstream consumptive use of water. It is important to realize that by just meeting the standard at Vernalis, the projects have used up all of the assimilative capacity of the River to the detriment of all downstream users.

The Regional Water Quality Control Board issues permits for the discharge of city wastewater that add salt loads which enter South Delta channels at concentrations above the standards. However, recent modeling indicates that the added salt load is a very small percentage of the imported salt load described above. There has been no analysis of whether these city discharges would cause violations of salinity standards if there were no salt load imported by the projects.

The Notice alleges that a cause of salinity standard violations is salt originating from "heavily mineralized resident soils originating from eroded Diablo Range marine sedimentary rock." The letter presents no evidence that these salts are being leached during the times (typically dry weather) that standards are violated. The letter presents no evidence that such salts are conveyed to the river at those times, and no evidence that conveyance to the channels at those times would occur if there were no releases of DMC water such as to the City of Tracy and other nearby CVP contractors. Also, there is no evidence that the quantity of concentrated salt, if any, in South Delta channels from this source is significant.

The Notice refers only to salinity compliance at monitoring points, but the SWRCB has clarified that standards apply throughout the area.

It seems clear that the CVP and SWP cause the violations of salinity standards.

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Effective Measures to Avoid Salinity Violations

As stated above, there are measures by which the standards can be met; measures which SDWA suggested to the projects. However, the Notice again cites the modeling of the effects of Folsom releases to show that the DWR/USBR can not avoid violations of salinity violations. This analysis merely proves the obvious and is irrelevant. It is like proving that one can't flush a toilet by releasing water through the kitchen sink. There is no analysis of potentially viable options. The letter includes no evidence that more realistic measures can't be implemented.

The project operations have also distorted circulation flows. Basically, there must be sufficient inflow to each main South Delta channel (San Joaquin, Middle River, Grant Line, and Old River) so that a net daily unidirectional flow is maintained in each channel. There must not be any stagnant reaches where salinity and dissolved oxygen can't be controlled. Furthermore, the inflow to each channel must be of low enough salinity so that the exit water from each channel does not exceed the standard.

This can be done by restoring inflow at Vernalis and bringing lower salinity water into Old River and Middle River. This can be accomplished by recirculating water as was done in August of 2004, (and required by PL 108 - 361) and by using low lift pumps to augment the inflow at the Old River and/or Middle River barriers. These pumps would bring low salinity water into the channel network. These are technically viable proposals. It is therefore not true that there are no viable solutions.

The efficiency of these measures can be improved by altering the relative elevation of the temporary barriers and by modifying the design and operation of the barriers as requested in SDWA's February 9, 2007 letter to Rodgers and Snow. The Notice asserts that this can't be done because it "would not be consistent with those (barrier) permits". However, the suggested changes are minor and may not have any perceived adverse effects which affect permit conditions. At the very least, the projects could have made an effort to get any additional permitting authorization *in order to meet water quality standards*. They made no such effort either with or without SDWA participation.

DWR and USBR have apparently made no effort to analyze measures that would allow them to meet the standards, instead they analyzed measures that they knew would not work. They should not be allowed to avoid compliance with the salinity standard by refusing to analyze and implement measures that could lead to compliance, or at least a reduction in non-compliance.

Consequently, SDWA strongly recommends that the Executive Director of the SWRCB reject DWR and USBR's assertion that they are not responsible for the ongoing and anticipated

Ms. Dorothy R. Rice

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violations of the Southern Delta water quality standards. Compliance with the standards is not "beyond the control" of the projects, except to the degree they have simply chosen to take no action. Violations necessarily mean that agricultural users are being harmed. The Executive Director should therefore recommend an action to compel compliance with existing permit conditions and seek the appropriate penalties.

Please call me if you have any questions or comments.

Very truly yours,

JOHN HERRICK

JH/dd

Enclosures

cc: Senator Michael Machado
Assembly Person Cathleen Galgiani
Mr. Lester Snow (DWR)
Mr. Kirk Rodgers (DWR)
Dante J. Nomellini, Esq. (CDWA)
San Joaquin County Board of Supervisors
Mr. Ralph A. Torres (DWR)
Mr. Gerald E. Johns (DWR)
Mr. Carl Torgersen (DWR)
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Ms. Gita Kapahi (SWRCB)

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John Herrick

July 17, 2007

Via Fax (916) 341-5621

Ms. Dorothy Rice
Executive Director
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000

Re: Water Quality Objectives for Agricultural Beneficial Uses in the Southern Delta Requirements of D-1641 and WRO 2006-0006 ("CDO")

Dear Ms. Rice:

This letter is in response to the July 11, 2007, letter to you from DWR and USBR signed by Ronald Milligan of USBR and David H. Roose of DWR. That letter was notification to you of existing violations of water quality objectives or standards and other expected violations.

As you know there has been an ongoing issue as to what is meant by the language in D-1641 (and therefore in the permits of DWR and USBR) of "actions beyond the control" of DWR and USBR with regard to their efforts to meet the water quality objectives at Vernalis and the other three Southern Delta compliance locations.

Briefly, the projects' position is that if USBR is meeting the Vernalis standard, the temporary barriers are operating, and that modeling indicates that a decrease or cessation of export pumping does not substantially improve quality, then they have done everything "reasonable" and are thus not obligated to do anything further to meet the standards.

SDWA previously responded to that argument as follows. D-1641 does not allow the projects to determine what is "beyond their control," that is for you as Executive Officer to determine. "Beyond their control" means that non-operations events such as drought, levee failure, etc. prevent any reasonable method of meeting the standards. Purchases and recirculation of water (as required by both D-1641 and HR 2828) are within the projects ability to control, yet

Ms. Dorothy Rice
July 17, 2007
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have not been pursued or implemented. Changes in barrier operations can alter Southern Delta flow patterns and result in net flows which improve quality. Finally, the projects interpretation of D-1641 means that the SWRCB failed to fully implement the pertinent standards as no one else is responsible for meeting them during those times the projects believe they are excused. A recent Appellate decision makes that position illegal.

Subsequent to this issue being argued, the projects now claim by their letter of July 11 that they are allowed conduct JPOD/transfers even if the standards are not being met. Their letter quotes the provisions of the CDO which allow JPOD if they are "in compliance with all of the conditions on their water right permits and license including, if it is still a condition of their water rights, meeting the 0.7 EC objective for the protection of agricultural beneficial uses" for the Southern Delta objectives. Although not fully stated, the projects are asserting that if it is unreasonable or "beyond their control" to meet the standards, then they can increase exports under JPOD.

For anyone who participated in the CDO hearing, such a position is contrary to both the language and intent of the CDO. Staff's clarification of its position of the obligations in the Order was made very clear at the time and relied upon by the Board when it adopted the Order. To argue that the violations may occur while exports increase means that the projects can enjoy the benefits of their permits without being bound by their obligations. It is important to note that the increased exports for JPOD and EWA are "necessary" because the projects were forced to decrease exports to protect smelt because a state court found DWR had no take permit under CESA and a federal court found that the federal Biological Opinions were not based on current science and unlawful. Hence, the projects seek to recover water to which they had no right to export in the first place as the state and federal ESA requirements have not been met.

D-1641 requires you to evaluate the projects' report of violations and decide whether to make a recommendation that the Board institute an enforcement action. Your decision is guided by the language in dispute; "actions beyond the control." Currently, SDWA, DWR and USBR are negotiating a set of actions which seek to (i) recirculate water through the San Joaquin River and the DMC, and (ii) alter tidal barrier gate operations to produce net flows in Old River. The combination of these actions is anticipated to cause net flows in Old River (including the area with the P-12 station) which will improve water quality in that and other areas. It is not known yet if this will result in compliance with the standards, but will improve quality.

Hence, before you decide if there are no more actions within the control of the projects to meet the standards, you must consider that the projects are at this very moment investigating and preparing to undertake actions to improve water quality. When this is combined with the fact that HR 2828 authorized/directed USBR to purchase water to meet the standards, and that both D-1641 and HR 2828 require recirculation to be investigated and implemented as necessary,

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July 17, 2007
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there is only one conclusion. The projects have not complied with their permit terms and conditions, JPOD cannot proceed, and an enforcement action would seem appropriate.

Of course, SDWA continues to be willing to work with the projects to institute all realistic actions to meet the standards. If all such actions have been exhausted, it would be appropriate for the involved parties to discuss what should and should not be done. Until that time, the protection of beneficial uses in the Southern Delta would be seriously impaired if you decided meeting the standards were beyond the control of the projects and allowed exports to increase. We hope you will not make that decision.

It has taken approximately 20 years for the necessary standards to be implemented. For the first time the projects are being forced to undertake the burden of meeting those standards. This is not a time to excuse such obligations, rather it is a time for requiring the projects to comply with their permits as all other permittees must do.

Please call me if you have any questions or comments.

Very truly yours,

JOHN HERRICK

cc: Mr. Ronald Milligan (USBR)
Mr. David H. Roose (DWR)
Mr. Gerald E. Johns (DWR)
Cathy Crothers, Esq. (DWR)
Amy L. Aufdemberge, Esq.
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Thomas J. Shephard, Sr., Esq. (S.J.Co.)
Carl P.A. Nelson (CCWD)
Mr. Greg Gartrell (CCWD)
Michael Jackson, Esq. (CSPA)
Mr. Ryan Broddrick (DFG)
Mr. David Harlow (USFWS)
Mr. Bruce Oppenheim (NMFS)

From: John Herrick

Date: 11-13-07

Dear Kathy and Ron:

As you know, the water quality objective measured at the Tracy Blvd. Bridge compliance location was exceeded/violated for most of the summer. There has been ongoing correspondence between your agencies and the SWRCB regarding this situation under the obligations set forth in your permits pursuant to D-1641 and the CDO. It is my understanding that the SWRCB has taken the position that notwithstanding the arguments/reasoning you have asserted, the exceedences were violations of permit conditions and precluded JPOD during such violations.

During the summer, we were in discussion with you (DWR and USBR) about this situation, and about the need for a recirculation project (and altered flapgate operations) in order to improve, if not meet water quality standards. During the summer, I represented to you that we would not at that time file any complaint with the SWRCB about the violations in order to facilitate our work towards getting the recirculation going. I also made it clear that the decision to not bring a complaint at that time would have no effect on our respective positions, and that we would continue to assert DWR and USBR's responsibility for meeting all the Southern Delta water quality standards.

Now that the summer is past, I want to give you forewarning that SDWA will begin to raise the issue with the SWRCB in order that the issue will be resolved, hopefully before next summer.

JOHN HERRICK
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Jack Alvarez
Mary Hildebrand

Engineer:

Alex Hildebrand
Counsel & Manager:
John Herrick

December 21, 2007

Via E-Mail

Ms. Dorothy Rice
Executive Director
State Water Resources Control Board
P. O. Box 2000
Sacramento, CA 95812-2000

Dear Ms. Rice:

I am in receipt of your letter and memorandum dated November 28, 2007, ("letters") to DWR and USBR (respectively) regarding the violations of water quality objectives which are conditions contained in the projects' permits. In addition, your letters reference that the JPOD operations during those times when the water quality standards were exceeded were also permit violations. Unfortunately, your letters state that you decline to recommend to the SWRCB any enforcement action.

I request your reconsider your decision to not recommend any enforcement action.¹ This request is based on a number of reasons.

First, as you know DWR and USBR were the subject of a recent CDO (WRO 2004-0004). That Order resulted from a threat that water quality violations might occur. DWR (USBR chose not to participate) asserted that the threat did not exist, and/or that it was not

¹ I do not believe your decision to not recommend an enforcement action is controlled by Title 23 section 769 of California Code of Regulations as it does not constitute a "decision" by the Board. This is based on the fact that the Board did not delegate any decision on such enforcement action to you under D-1641, rather it directed you to make a recommendation to it about taking such action.

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obligated to meet the standards, however, the Board found to the contrary. The CDO therefore was issued *to force DWR and USBR to undertake the necessary actions to avoid the threat*. As we have seen, actions were not undertaken or were not sufficient and the objectives were indeed violated over a significant time frame. It is important to note that the CDO hearing uncovered the fact that a prior violation had occurred, and was never reported (the violation was of the 1.0 EC standard, not the more restrictive 0.7 EC standard). The Board staff chose not to recommend, and the Board chose not to undertake any enforcement action on that violation, I assume because the CDO was to insure it did not happen again.

Second, our prior communications with DWR, USBR and the SWRCB indicated that there were a number of actions that could be undertaken in order to avoid or lessen the expected violations. These communication began in the latter part of 2006, although we have been raising the issue and the "solution" for years before that. We suggested that the projects cooperate in a recirculation project in order to provide additional dilution flows into the Delta. Not only is such a project mandated in D-1641 and in PL 108-361 (both of which the USBR is apparently in violation), but D-1641 actually emphasizes the use of dilution water to address the San Joaquin salinity concentrations. In response, the projects made absolutely no effort to begin such a recirculation project to address the expected violations. [I believe both USBR and DWR predicted violations to begin sometime around July 1 of 2007.]

SDWA continued to press the issue as the summer progressed. *USBR staff actually declined* to pass on our suggestion/request/demand for recirculation to the Bureau's regional director. Thereafter, I personally contacted the regional director's office and scheduled a meeting. That meeting resulted in a minimal recirculation project which lasted for 36 days, with flows between (approximately) 29 - 207 cfs, though only rarely going over 100 cfs (see attached). The program did improve water quality and could have been used much earlier for a much greater effect. Sadly, during this time the projects were illegally diverting an additional 500 cfs under JPOD which could have been better (i.e. legally) used improving water quality and complying with permit conditions.

Third, SDWA recommended that barrier flap gates be operated (in conjunction with other actions such as recirculation) to improve circulation, especially in Old River. Such operations have the consequence of affecting water levels, requiring real-time monitoring and potential mitigation. Again, DWR expressed no interest in such alternate operations until well into the summer and the Bureau never expressed any interest. Only after SDWA requested/demanded action be taken were such operations begun on approximately July 13. During these operations, water level concerns did arise in Tom Paine Slough. There were times when diversions were affected which resulted in the parties agreeing to suspend all or some of the changed flap gate

operations. Requests to mitigate this by installing temporary pumps to mitigate Slough water levels went unanswered.²

Fourth, not taking action indicates an "unequal" application of Board obligations and responsibilities. The Board actively and aggressively pursued three South Delta diverters who were allegedly diverting in violation of their licenses (Term 91). Neither DWR nor USBR filed a complaint against the Term 91 diverters even though they were the only two interests potentially harmed. Those alleged violations were at most 9 cfs during times when the projects were exporting up to 10,000 cfs. In the Board's decision on the Term 91 ACL it specifically wanted to send a message ". . . to make it clear that unauthorized diversion or use of water is more expensive than authorized diversion." (WRO 2004-0004 at page 34). It is hard to imagine why the Board would expend hundreds of thousands of dollars to preserve 9 cfs and then turning a blind eye to an illegal diversion of 500 cfs. [500 cfs equates to approximately 30,000 acre feet per month. 9 cfs equates to approximately 570 acre feet per month.] One would assume DWR and USBR are better able to pay a penalty than the three small Delta diverters are. A 1,000 acre feet diversion per day (500 cfs) should easily support a \$500 per day penalty.

Further, North San Joaquin Water Conservation District was pursued by the Board for having failed to comply with its permit conditions (installation of a fish screen and releases of water for fishery purposes). The Board staff filed a complaint and an ACL hearing was conducted. At the same time DWR was operating the SWP export pumps without any take permit issued by the DFG (see *Watershed Enforcers (CalSPA) v. DWR et al.* Alameda Superior Court Case No. RGO6292124), while USBR was operating the CVP export pumps under Biological Opinions later voided for various reasons (see *NRDC v. DOI, et al.*, United States District Court, Eastern District of California case No. 1:05-CV-01207 OWW (TAW)). Inexplicably, SWRCB staff has chosen to not pursue violations by permit holders when those permit holders have recently been found to be also violating state and federal law. Its as if a police man decides to not arrest someone for stealing because the criminal already has enough problems due to a recent murder charge.

The water quality standards in the South Delta were first developed approximately 25 years ago. They were supposed to be fully implemented no later than December 31, 1997 (see 1995 WQCP), but were not until April of 2005. Thereafter, the system experienced two wet years which all but insured compliance without any effort/actions by DWR and USBR. Soon thereafter, the SWRCB conducted a hearing resulting in the Cease and Desist Order directing the

² DWR believes Tom Paine Slough water levels are not a function of export activities, but are due to siltation in the channel. DWR also concluded that the change in flap gate operations would not result in Slough levels dropping below a certain point. The former is disputed by SDWA, the latter has not yet been resolved. USBR is apparently uninterested,

Ms. Dorothy Rice
December 21, 2007
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projects to take the actions necessary to insure compliance with the standards. Thereafter, the projects undertook no actions in preparation for, or in order to avoid or lessen projected violations, until violations occurred. During those violations, DWR and USBR, in further violation of their permits, exported additional water from the Delta under JPOD, continuing even after being notified by staff that such exports were contrary to permit conditions.

The water delivery/shortage problems facing DWR and USBR, and their various contractors are certainly daunting. However, they are of their own making. DWR has known for approximately 30 years that 5 million acre feet of its planned supply would not be available for export. Yet during that entire time, DWR undertook no effort to increase the supply by any other method and undertook no actions to decrease the dependence on the now non-existing supply. Tens of thousands of acreage in the state and federal projects' service areas have been planted with permanent crops notwithstanding that their contractual water supplies were contingent on there being a surplus to other needs and that the 5 million acre feet was never developed. In addition, we now know that at no time did DWR apply for or receive a "take permit" under California ESA, yet has been killing endangered and threatened species since their designation as such.

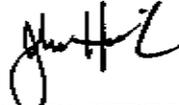
USBR has been the major cause of the destruction of the San Joaquin River, failing to build and operate a valley drain (required under the authorizing statutes) and turning the River into a salt drain of diminished flow. It has taken federal court action to address its unlawful take of endangered species. Never having objected to the salinity standards set in the Southern Delta when they were adopted, applied to their permits or finally made effective, the projects undertook absolutely no efforts to even attempt compliance until violations occurred. Then, as the violations continued, they illegally diverted even more water from the Delta.

It is difficult to imagine a more persuasive set of circumstances for enforcement of permit conditions. It is clear that without sanctions, the projects will continue to operate as they choose, notwithstanding their obligations under their permits and the law. Any failure by the SWRCB to act in this circumstance suggests an explicit bias in favor of exports, and indicates the Board is not serious in performing its regulatory obligations. I urge you to recommend the Board take an immediate enforcement action against DWR and USBR for their multiple and serious permit violations.

Ms. Dorothy Rice
December 21, 2007
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Please call me if you have any questions or comments.

Very truly yours,



JOHN HERRICK

Attachment

cc: Senator Michael Machado
Mr. Jerry Johns (DWR)
Mr. Ron Milligan (USBR)
Dante J. Nomellini, Esq. (CDWA)
Mr. Mel Lytle (S. J. Co.)
Karna Harrigfeld (NSJWCD)

**Pilot Recirculation Study
Flow Measurements at Newman Wasteway Headworks**

August		M.P. 1.14
Date	Time	CFS
7-Aug	1130	31.42
	1500	87.32
8/8/2007	0830	61.28
8/15/2007	815	46.49
	0915	34.99
8/17/2007	0930	28.85
	1030	37.02
20-Aug	0700	29.30
	0845	33.87
21-Aug	0730	35.45
22-Aug	0720	173.95
	0915	147.44
	1905	86.60
	2015	94.19
23-Aug	0715	43.68
	0810	48.77
24-Aug	0730	47.21
27-Aug	0730	47.15
28-Aug	0720	47.36
29-Aug	0715	48.00
30-Aug	0820	49.71
31-Aug	0610	52.38
September		
4-Sep	0700	207.43
5-Sep	0700	92.27
	0825	94.37
	0810	87.24
6-Sep	0915	91.24
	1000	96.70
	0820	51.08
10-Sep	0745	46.61
11-Sep	0730	47.09
12-Sep	0725	47.16

Flow measured at bridge crossing at MP 1.14 just downstream of the headworks of the wasteway.

Flow measured by San Luis & Delta-Mendota Water Authority utilizing current meter measurements.

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December 5, 2008

Via E-Mail

Ms. Dorothy Rice
Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Re: Quarterly Status Report, November 2008
Cease and Desist Order WR 2006-006

Dear Ms. Rice:

I am in receipt of the above referenced Status Report from the Department of Water Resources. The Report gives an update on the current regulatory progress under which DWR and USBR seek to install and operate the permanent tidal gates in the South Delta under the SDIP program. As per the Report and previous ones, progress has been delayed due to ongoing reconsultation for OCAP by the federal fishery agencies.

However, I believe the purpose of the status reports required under the CDO was to monitor and make sure that DWR and USBR were making best efforts investigating and pursuing all practical or reasonable methods by which they might avoid threatened water quality/permit violations. If that is the case, this most recent report, and the prior ones are incomplete.

Per previous communications to your office and other SWRCB staff members (which include Mr. Mark Gowdy's participation via teleconference), DWR, USBR and SDWA are conducting ongoing discussions, evaluations and modeling of actions which might improve water quality in the southern Delta during times when the temporary barriers are installed. This process has determined that relatively simple alterations to the barriers may establish net flows in channels of concern. Establishing such net flows will allow for some level of control of the CVP salts in the channels, which will improve water quality perhaps to the point where the

Ms. Dorothy R. Rice
December 5, 2008
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standards/permit conditions are met.¹ The initial modeling results indicate that the net flows established are of sufficient magnitude to accomplish the above goals, though further modeling is pending.

The alterations to the barriers change the relative elevations so that water flowing in on the tide will be directed to create outflow on Old River. The specific changes include raising the Middle River barrier and possibly adding additional culverts to it; raising the Grant Line Canal barrier or decreasing the width of its "weir;" and lowering the Old River barrier and/or keeping the flap gates on its culverts tied open. I have written DWR and USBR to encourage them to start the process to determine if additional permitting is necessary for these changes, and if so to immediately begin the necessary efforts. To date I have received no response from them.

It is SDWA's position that the current Status Report is inadequate and not in compliance with the CDO as it not only fails to mention the possibility of actions which can improve water quality and perhaps meet the standards, but inexplicably fails to mention that they are currently pursuing such actions.

In light of this situation, I request that the SWRCB take action itself. Since the CDO was adopted, neither the Board or its staff has taken any action in furtherance of the intent and specifics of that Order. The CDO was meant to prevent water quality violations; yet since its effective date, violations have occurred each year while a deafening silence issues from the Board. Without any threat of enforcement there is little likelihood that sufficient effort or action will occur, and violations will continue. Such a situation simply cannot be the policy of the SWRCB.

Ignoring for the moment SDWA's Complaint for Water Quality and Permit Violations pending before the Board and SDWA's Request for Reconsideration of the Urgency Permit Changes also pending,² it is well within your authority to notify DWR and USBR that we are all aware of reasonable actions that they can take to avoid the violations, and if they do not take them you will initiate either an enforcement action, charge them with violating the CDO, or both. I realize there are other pressures being exerted upon the Board and its staff seeking to prevent enforcement of the standards. Rather than succumb to those pressures, they should be exposed to the light of day so that the rest of us can address them directly.

¹ The parties are not modeling the anticipated EC resulting from the actions because they are in agreement that current models do not accurately predict salinity. Instead, the modeling is evaluating/predicting resulting flows in the channels which will flush out the accumulated CVP salts.

² The Complaint was filed on August 13, 1008, and the Request for Reconsideration was filed on July 18, 2008. To date, not only have I received no confirmation that either document was received and no action has been taken, my subsequent written inquiries about the status of the documents have elicited no response. Central to my inquires is an explanation as to why the Request for Reconsideration was not acted upon until the issues became moot for 2008.

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The time is well past to take the necessary actions to protect water quality. It has been over four years since SDWA's engineer proposed the above actions as measures to improve the water quality; actions which were fully explained and recommended by him at the CDO hearing. Yet, here we now stand still waiting for action, still waiting for enforcement. After two years of constant violations during the summer season it is clear that the "restrictions and obligations" put in place by the CDO to "avoid future violations" have become empty threats. Please take the necessary actions to protect water quality.

Very truly yours,



JOHN HERRICK

cc (via e-mail):

Assemblywoman Lois Wolk
Gary Wolff P.E. Ph.D. (SWRCB)
Amy L. Aufdemberge, Esq. (USBR)
Mr. Donald R. Glaser (USBR)
Mr. Ron Milligan (USBR)
Mr. Lester Snow (DWR)
Mr. Jerry Johns (DWR)
Dante J. Nomellini, Esq. (CDWA)
Carl P. A. Nelson, Esq. (CCWD)
Mr. Greg Gartrell (CCWD)
Thomas J. Shephard, Sr., Esq. (SJCo.)
Dr. Mel Lytle (SJCo.)
Michael Jackson, Esq. (CSPA)
Clifford W. Schulz, Esq. (SWC)
Tina R. Cannon, Esq. (Dept. F&G)
Dan Nomellini, Esq.
Tim O. Laughlin, Esq.
Jon D. Rubin, Esq.
Debra Corbett, Esq.
Dean Ruiz, Esq.
Mr. Bill Jennings (Delta Keeper)
Mr. Mike Taugher

PUBLIC HEARING
STATE OF CALIFORNIA
WATER RESOURCES CONTROL BOARD
DIVISION OF WATER RIGHTS

JOE SERNA JR., CALEPA HEADQUARTERS BUILDING
1001 I STREET
BYRON SHER AUDITORIUM
SACRAMENTO, CALIFORNIA

FRIDAY, NOVEMBER 18, 2005

9:00 A.M.

JAMES F. PETERS, CSR, RPR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 10063

PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345

1 A Yes. They maintain the water level, but they shift
2 around the location of the null zones. But we still have
3 null zones.

4 Q And those null zones generally -- excuse me. Let me
5 start over.

6 Mr. Hildebrand, is it typical for those null
7 zones to exist somewhere around the Tracy Old River Bridge
8 on Old River and upstream of the Middle River Bridge on
9 Middle River?

10 A That's correct.

11 Q And that's a direct result of the temporary barrier
12 project; is that correct?

13 A Yeah. Well, a combination of the temporary barrier
14 project and on this importation of salt that I mentioned.

15 Q Thank you, Mr. Hildebrand.

16 We also heard testimony that DWR's operation of
17 the temporary barrier project is doing what it does for
18 water quality and it cannot be -- and nothing else can be
19 done which would improve water quality further. Do you
20 recall that?

21 A Yes.

22 Q And by nothing else, I meant nothing else with regard
23 to the temporary barriers.

24 A Yes.

25 Q Mr. Hildebrand, would it be possible to alter the

1 height of the temporary barriers such to increase the
2 amount of net unidirectional flow in some of those
3 channels?

4 A Yes. As I think I mentioned in my direct testimony,
5 you could redesign the temporary barrier in Middle River
6 to make it somewhat higher, increase the number of
7 culverts so that you could bring in more water and spill
8 less water back. You could then install a low-lift pump
9 there and pump enough water in through Middle River so
10 that it went all the way up through Middle River and into
11 Old River, and thereby provided the circulation that you
12 need and the water quality you need in those other
13 channels.

14 Q To your knowledge, has DWR investigated doing that as
15 a method of meeting the 0.7 standard at the three interior
16 South Delta stations?

17 A It's the best of my understanding they have not.

18 Q Okay. Thank you.

19 Mr. Hildebrand, are you familiar with -- are you
20 familiar with Bulletin No. 141, which is the California
21 State Water Project Water Supply Contracts?

22 A Not in detail.

23 Q But you've reviewed it for this hearing?

24 A I have reviewed it. But I wouldn't be able to quote
25 from it from my memory.

PUBLIC HEARING
STATE OF CALIFORNIA
WATER RESOURCES CONTROL BOARD
DIVISION OF WATER RIGHTS

JOE SERNA JR., CALEPA HEADQUARTERS BUILDING
1001 I STREET
COASTAL HEARING ROOM
SACRAMENTO, CALIFORNIA

MONDAY, NOVEMBER 7, 2005
9:00 A.M.

JAMES F. PETERS, CSR, RPR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 10063

PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345

1 could be combined in various ways at various times to meet
2 the .7 EC requirement, even while using temporary
3 barriers.

4 None of these measures are beyond USBR and DWR
5 control, and none would involve an unreasonable use of
6 water. For example, recirculation of the Delta-Mendota
7 Canal water, such as was done in August of last year, can
8 provide .7 EC water at Brandt Bridge and in Old River at
9 the Head of Middle River in July, August and September.
10 Those are 2 of the 3 compliance points we've discussed.

11 If the salinity in Old River at Tracy Boulevard
12 would then still exceed .7 EC, the Middle River barrier
13 can be redesigned and provided with a fish-friendly
14 low-lift pump to force high quality water up through
15 Middle River and into Old River. That would enable
16 compliance with all 3 of the internal periods.

17 Now, in other months than June -- than July
18 August, and September fishery considerations make preclude
19 the recycling of DMC water. But there are various
20 potentials however to purchase tributary water or to make
21 exchanges such as the release of water from westside
22 storage or from -- when there are concurrent deliveries to
23 storage, they could instead be put in the river. And in
24 any other case, that water then can be replaced during
25 July, August and September when recirculation can take