APPENDIX H

Sediment Loading Analysis

Task Order No. 8—Sediment Loading Analysis and Allocation for the Lower Boise River TMDL

PREPARED FOR: Lower Boise River Water Quality Plan

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DATE: July 27, 1998

Objectives

This technical memorandum (TM) was prepared to partially fulfill the requirements of Task Order 8 under CH2M HILL's contract with the Lower Boise River Water Quality Plan (LBRWQP). The objective of this task was to develop load allocations and wasteload allocations for sediment for the lower Boise River watershed. A companion TM has been prepared for bacteria allocation.

Background

This memorandum describes the loading analysis and allocation of sediment for the lower Boise River from Lucky Peak Dam to the mouth. For this analysis, "sediment" is expressed as total suspended sediment (TSS) in terms of mass per unit volume (mg/L). A quantitative assessment of sediment-related water column (TSS and turbidity) and substrate (percent embeddedness and pebble count) data for the lower Boise River is described in the "Sediment Problem Assessment for the Lower Boise River TMDL" (Miller 1998a).

Parameter Selection

TSS was selected as the basis for the lower Boise River sediment load analysis for the following reasons:

- Based on the relationship between turbidity and TSS data collected in the Boise River at Parma, the existing numeric water quality standard for turbidity was found to be unprotective of aquatic biota, at least in the vicinity of Parma (see Miller 1998a).
- Setting a load capacity for TSS will reduce the sediment influx to the river, which contributes to substrate embeddedness from Middleton downstream.
- The largest sample size, longest period of record, and most frequently sampled sediment-related parameter for the TMDL study area is TSS.

Instream TSS Targets

Because Idaho does not have a numeric water quality standard for TSS, the narrative water quality standard was translated into measurable water quality targets shown in Table 1. A complete description of the literature review and analyses used to establish these targets is presented in "Selection of a Total Suspended Sediment (TSS) Target Concentration for the Lower Boise River TMDL" (Miller 1998b).

TABLE 1
Instream TSS Targets

Concentration (mg/L)	Averaging Statistic	Averaging Period (days)
50	Geometric Mean	60
80	Geometric Mean	14

Hydrologic Seasons

A description of the regulated flow regime of the lower Boise River is included in the "DRAFT Subbasin Assessment for the Lower Boise River" (IDEQ 1998). In general, there are three predominant hydrologic flow seasons based on main stem river conditions. These seasons are listed in Table 2.

TABLE 2
Hydrologic Seasons

Season Name	Time Period
High-Flow	February 15 – June 14
Irrigation Flow	June 15 – October 14
Low-Flow	October 15 – February 14

It is important to realize that the seasonal names and time periods listed in Table 2 are meant to describe the dominant flow regime in the main stem Boise River during a typical year. It should be recognized, however, that the flow characteristics of the system will change somewhat from year-to-year in response to varying snowmelt or drought conditions, for example.

With this in mind, from approximately February 15 through June 14, main stem flow releases from Lucky Peak Dam are governed predominately by flood control—although demands for irrigation begin as early as April 1. Thus, irrigation diversions occur during approximately the last 63 percent of the high-flow season. During the drought of 1992 there were no flood control releases.

During a typical irrigation flow season defined in Table 2, main stem flows are governed predominately by irrigation demands. However, there have been wet years such as 1996 when flood flow releases occur beyond June 15 and diversions occur prior to April 1 to provide additional capacity in the main stem river for flood control.

Description of Available Data

Flow and TSS data sources and sampling locations are described in Miller (1998a) and Idaho Division of Environmental Quality (IDEQ 1998). Additional information is provided below for further detail.

Flow

Main Stem Boise River. Daily average flows were obtained from published U.S. Geological Survey (USGS) records for the gages located at each of the four main stem water quality sampling stations (Miller 1998a). A description of the available data is presented in Table 3.

TABLE 3
USGS Flow Data Available for the Lower Boise River at the Four Main Stem Water Quality Sampling Stations

Gaging Station Name	Station Number	Period of Record	Missing Days
Boise River below Diversion Dam	13203510	October 29, 1986, through September 30, 1994	0
Boise River at Glenwood Bridge near Boise	13206000	March 2, 1982, through November 2, 1997	0
Boise River near Middleton	13210050	December 10, 1974, through September 31, 1990 (low-flow periods only)	1598
		October 1, 1990, through October 13, 1997	351
Boise River near Parma	13213000	August 26, 1971, through October 8, 1997	0

Daily average flows from the USGS gage near Middleton were correlated with concurrent data recorded near Parma for the period of August 26, 1971, through October 8, 1997. The correlation is shown in Appendix A. The modeled daily average flows were used for the 351 missing days of record at Middleton, which occurred primarily from January through June of 1996 and 1997, respectively.

Drains and Diversions. Historical daily average flows for the tributaries, drains, and diversions were obtained from the Idaho Department of Water Resources (IDWR). Period of records typically go back as far as 1977; however, the most complete data are from 1990 through 1997. With the exception of water year 1997, the coverage of data within each year is from April 1 through October 31—consistent with the irrigation diversion period. For water year 1997, daily average flows are available for some of the major tributaries and drains during the low-flow months. A list of the names, IDWR station numbers, and approximate river mile for all the tributaries, drains, and diversions is included with the mass balance described below (see Appendices B through E). A schematic showing the relative locations of the drains and diversions is included in IDEQ (1998).

Point Sources. The three major wastewater treatment facilities (WWTFs) that discharge directly to the Boise River are Boise's Lander Street and West Boise WWTFs and Caldwell's

WWTF. Daily average effluent flows from the time periods listed in Table 4 were used to compute the existing, seasonal average WWTF effluent flows.

TABLE 4
Period of Analyses for WWTF Effluent Flow

WWTF	Period of Record Analyzed
Lander Street WWTF	February 1, 1993 – November 20, 1996
West Boise WWTF	January 1, 1993 – November 20, 1996
Caldwell WWTF	January 1, 1993 – December 31, 1996

TSS

Monitoring locations, sampling dates, measured TSS values, and sample sizes for all main stem locations and major tributaries and drains are described in Miller (1998a). For the point sources, daily average TSS effluent concentrations from the time periods listed in Table 5 were used to compute seasonal average TSS concentrations.

TABLE 5
Period of Analyses for WWTF Effluent TSS

WWTF	Period of Record Analyzed
Lander Street WWTF	February 1, 1993 – November 25, 1996
West Boise WWTF	January 1, 1993 – November 23, 1996
Caldwell WWTF	January 1, 1993 – December 31, 1996

TSS Load Capacities for Middleton and Parma Control Points

Analysis of Low, Median, and High-Flow Years

USGS flow records for the Boise River near Boise gage (USGS station number 13202000), which represents flow from Lucky Peak Dam, were analyzed to select a low, median, and high-flow water year (WY). Based on the total annual discharge, the low-flow WY is 1992. The high-flow WY is 1996. WY 1995 was selected as the typical year for the following reasons: 1) based on total annual discharge for WY 1928 through WY 1996, WY 1995 is within 5 (out of 69 total) years of the actual median WY; 2) based on post-Lucky Peak Dam flows (WY 1955-1996), WY 1995 is within 3 years of the actual median WY; 3) WY 1995 is more current and therefore more representative of the current watershed conditions than the actual median years of 1948 and 1964 for cases 1 and 2 above, respectively; and 4) water quality monitoring for the lower Boise River TMDL was ongoing during WY 1995.

Figures 1 and 2 illustrate the median and average flows, respectively, at the mouths of the major tributaries and drains during the high-flow season of 1992, 1995, and 1996. Figures 3 and 4 illustrate similar data for the main stem Boise River. Based on average and median flows during the high-flow season, these figures illustrate that, for the selected years, the flows at a given location can vary substantially. Although the main stem river experiences a proportionately larger range in flow variation than do the tributaries and drains, the range of flow in the tributaries and drains is substantial. For example, for the 11 tributaries and drains shown in Figure 1, the difference between the 1996 and 1992 median flows, expressed as a percent of the 1995 median flow, averages 56 percent. Because flow conditions in the main stem, tributaries and drains can vary substantially between two different years, load capacities were calculated for the low-, median-, and high-flow years.

Seasonal Critical Flows and Load Capacities

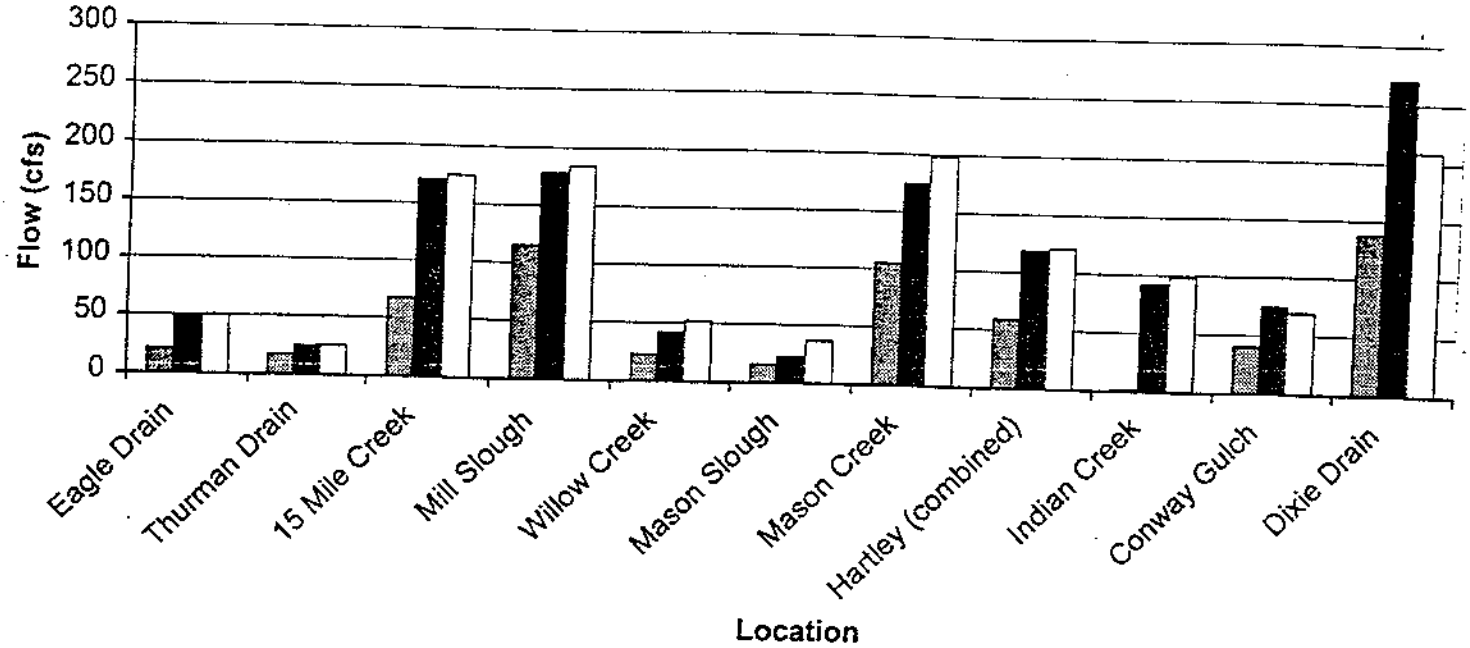
As described in Miller (1998a), there is a poor relationship between TSS concentration and discharge in the lower Boise River. The only fairly consistent relationship between TSS and discharge is the occurrence of a "first flush" effect (i.e., a TSS spike concurrent with a significant rising limb of the hydrograph). Because TSS data were collected roughly once every 2 months, or monthly at best, it is difficult to determine the duration of the elevated TSS concentrations.

Because of the high degree of scatter in the TSS versus discharge rating curve, determination of the seasonal critical flow conditions included consideration of the different land uses, land management practices, and timing of these practices such as irrigation. All of these factors were related to the seasonal TSS data and hydrologic regime of the watershed. Only the high and irrigation flow seasons were analyzed because the TSS concentrations in the Boise River did not indicate a need for a low-flow season TSS allocation (see Miller 1998a). The critical flow condition for any given year during either the high or irrigation flow season was determined to be a low-flow condition in the main stem river with contributing flows from the irrigation return drains. This scenario results in a full contribution of TSS from the major source—irrigation return drains—and the least available water for transport and dilution in the main stem river.

For the lower Boise River, the critical flows are defined as the minimum 30-day and 7-day average flows within each season. This definition is based on the fact that the primary impact of TSS in the lower Boise River is on the aquatic biota; thus, the seasonal critical flows are based on one-half of the averaging periods associated with each of the TSS target concentrations (Table 1). Recall that the TSS target concentration averaging periods are based on analyses of duration-of-exposure of aquatic organisms and habitat to TSS (Miller 1998b).

One-half of the averaging periods are used because the minimum 30- or 7-day average flow period during the irrigation flow season could follow immediately after the respective 30- or 7-day average flow period of the high-flow season. If this should ever occur, the combined duration of the two seasonal critical flow periods would not exceed the duration of the TSS target averaging period.

The seasonal load capacities are computed by multiplying the minimum 30- and 7-day average flows by the 50 and 80 mg/L TSS target concentrations, respectively. Table 6 lists



1992 High Flow Season
1995 High Flow Season
1996 High Flow Season

FIGURE 1
Comparison of Median Flows at Major Tributaries and Drains During the High Flow Season

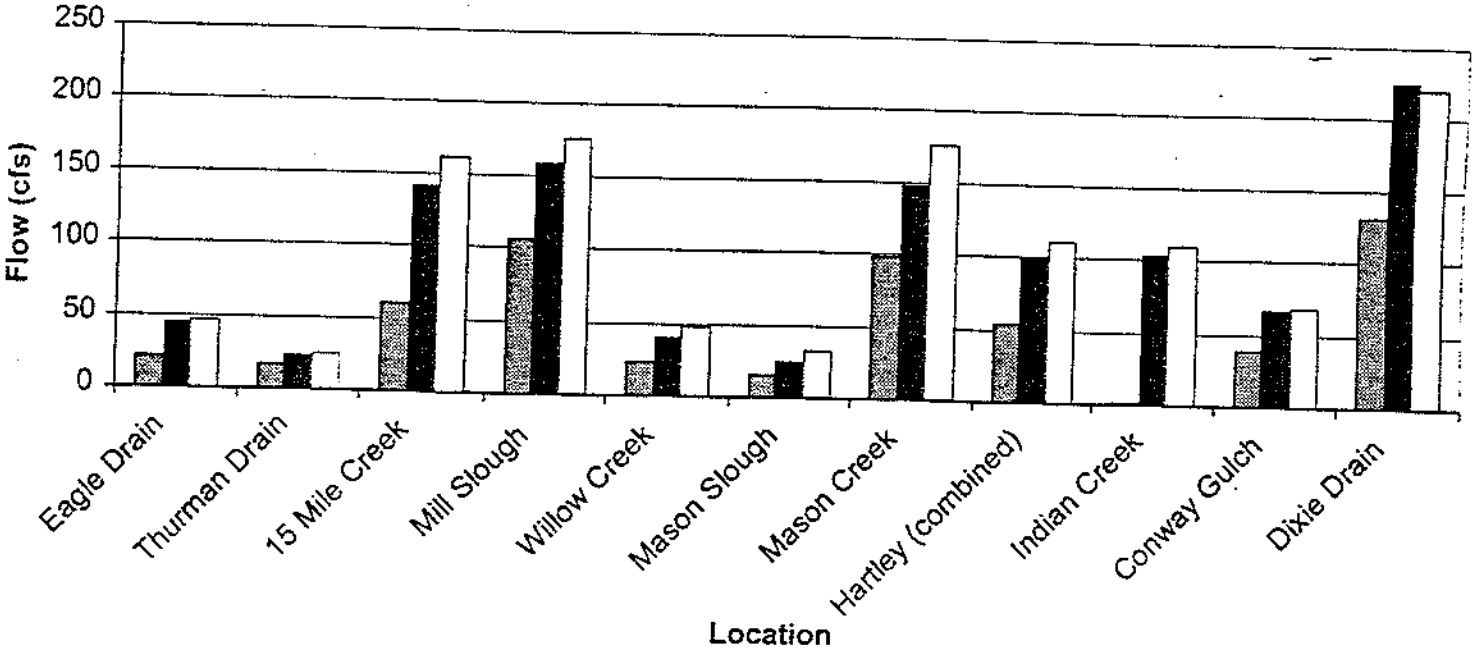


FIGURE 2
Comparison of Average Flows at Major Tributaries and Drains During the High Flow Season

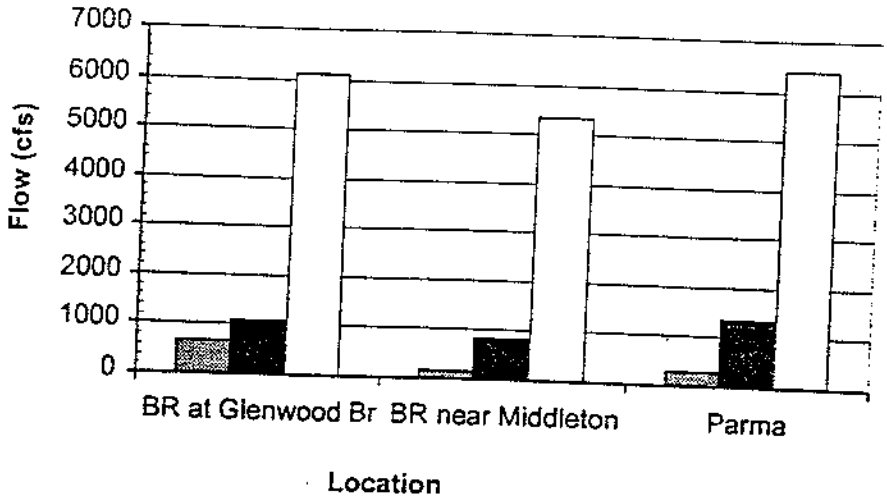
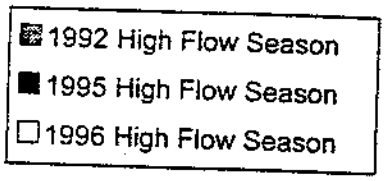


FIGURE 3
Comparison of Median Flows at Boise River Main Stem Stations During the High Flow Season



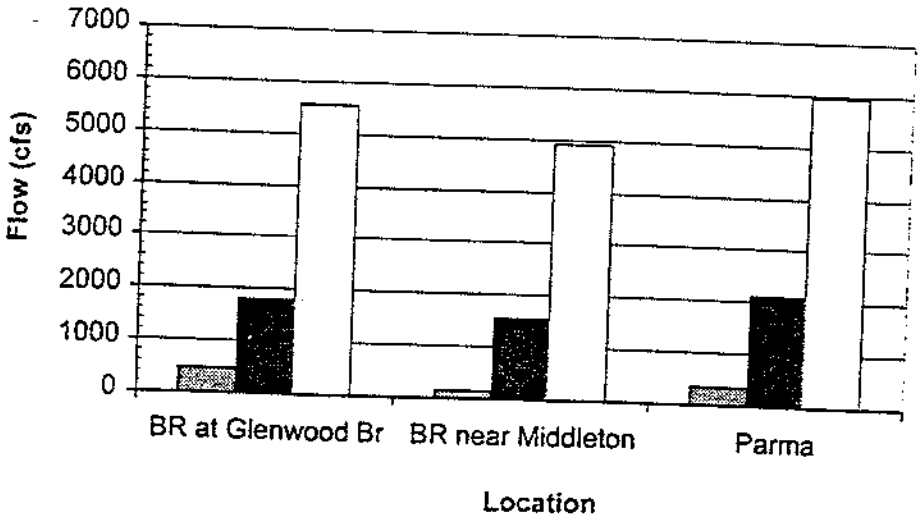


FIGURE 4
Comparison of Average Flows at Boise River Main Stem Stations During High Flow Season

the critical flows and load capacities computed for the high and irrigation flow seasons for each of the low, median, and high-flow years at Middleton and Parma.

TABLE 6
Seasonal Critical Flows and Chronic and Acute TSS Load Capacities for Middleton and Parma

	Middleton						Parma					
	High-flow Season			Irrigation Flow Season			High-flow Season			Irrigation Flow Season		
	1992	1995	1996	1992	1995	1996	1992	1995	1996	1992	1995	1996
Chronic Target												
Critical Flow (cfs)	152	257	2498	151	380	299	233	667	3990	160	968	1038
Load Capacity (T/day)	20	35	337	20	51	40	31	90	538	22	131	140
Acute Target												
Critical Flow (cfs)	121	237	1298	133	348	207	167	577	2710	113	852	789
Load Capacity (T/day)	26	51	280	29	75	45	36	124	585	24	184	170

By analyzing the system on a seasonal basis, the critical flow and load capacity calculations are more sensitive to the seasonal characteristics of the watershed. In addition, since the critical flows represent low-flow scenarios, this ensures the resulting allocations consider aquatic life and beneficial uses under a low-flow river condition.

Existing and Critical Conditions Analyses

Mass Balance Development

A main stem TSS mass balance was developed to evaluate TSS sources; TSS fate in the river system; instream, longitudinal TSS concentrations and loads; quantification of TSS load reduction scenarios; and sensitivity analysis. Twelve different mass balances were developed—one for each TSS target condition (i.e., 50 mg/L and 80 mg/L chronic and acute targets, respectively) for both the high and irrigation flow seasons for 1992, 1995, and 1996.

Flow Period. In order to achieve, or approach a good flow balance, and thus mass balance, it was necessary to analyze the system synoptically. It was found that the critical flows at the main stem stations did not occur over the same 30-or 7-day period; it was necessary to define a specific period of interest to be analyzed so that a synoptic flow balance could be achieved. Because the Parma location exhibits the highest (i.e, most critical) river TSS concentrations, the occurrence of the Parma critical flow period was used to define the periods to be analyzed in the mass balances. Table 7 lists the start dates of the critical flow periods at Parma. The seasonal flow values for all locations in the mass balance except the

three WWTFs are the 30-day (chronic conditions) or 7-day (acute conditions) average flows concurrent with the critical, or minimum 30- or 7-day average flow at Parma, respectively.

TABLE 7
Start Dates of the Critical Flow Periods at Parma

Year	Season	Start Date of Occurrence	
		Min. 30-day Average	Min. 7-day Average
1992	High-Flow	March 24	March 30
	Irrigation Flow	August 21	August 29
1995	High-Flow	March 12	April 2
	Irrigation Flow	August 19	August 22
1996	High-Flow	April 18	May 4
	Irrigation Flow	June 28	June 29

Point Sources. For the point sources, flows were based on the arithmetic mean of the daily average effluent flows computed by season during the time periods listed in Table 4. The TSS concentrations for the point sources were based the arithmetic mean of the daily TSS effluent concentrations computed by season during the time periods listed in Table 5.

Tributaries, Drains, Main Stem Stations, and Diversions. For all tributaries, drains, and main stem stations (which are essentially calibration points), the 1990s geometric mean TSS concentrations were used in the mass balances. Because of the sample sizes, it was not feasible to use data from only one individual year and season. For a detailed description of the tributary, drain, and main stem TSS data, refer to Miller (1998a).

Field-measured TSS data were available for 14 of the 18 tributaries, drains, and point sources. TSS data were not available for: Drainage District No. 3, Star Feeder, Long Feeder, and Watts Creek. Because all of these drains are located within the Boise River subbasin (see Figure 8 in IDEQ [1998]), surrogate TSS concentrations were computed based on the average TSS concentration of the three other monitored drains from the same subbasin: Eagle Drain, Thurman Drain, and Mason Slough. Other means of establishing surrogate TSS concentrations for these four drains were explored, such as relationships between TSS concentration and land use or subbasin area, but none resulted in a consistent and meaningful relationship that was applicable. The TSS concentrations for the diversions were based on the mass balance-computed river concentration at the point of diversion.

Groundwater. With the exceptions described below, median seasonal groundwater inflows as determined by Smith (1998) were used in the mass balances. Smith (1998) computed main stem seasonal groundwater inflows per reach using data from October 1989 through September 1997. For the mass balance analyses, the seasonal median values were distributed proportionally by river mile along each reach defined by Smith (1998).

The groundwater inflows used for the 1992 high-flow season, chronic and acute mass balances, and the 1995 high-flow season chronic mass balance were based on a refinement of

Smith's (1998) results to improve the accuracy of the mass balances. These balances were refined because the associated critical flow periods at Parma occurred prior to April 1 when no diversions were occurring. Because the magnitude of groundwater inflows during these critical periods would be expected to be different from seasonal groundwater contributions computed over a number of years—the same methodology that Smith (1998) used to compute the seasonal groundwater inflows was used to compute the groundwater contribution on a reach-by-reach basis specific to the critical 30- or 7-day period. This was especially important for 1992 since it was a severe drought year.

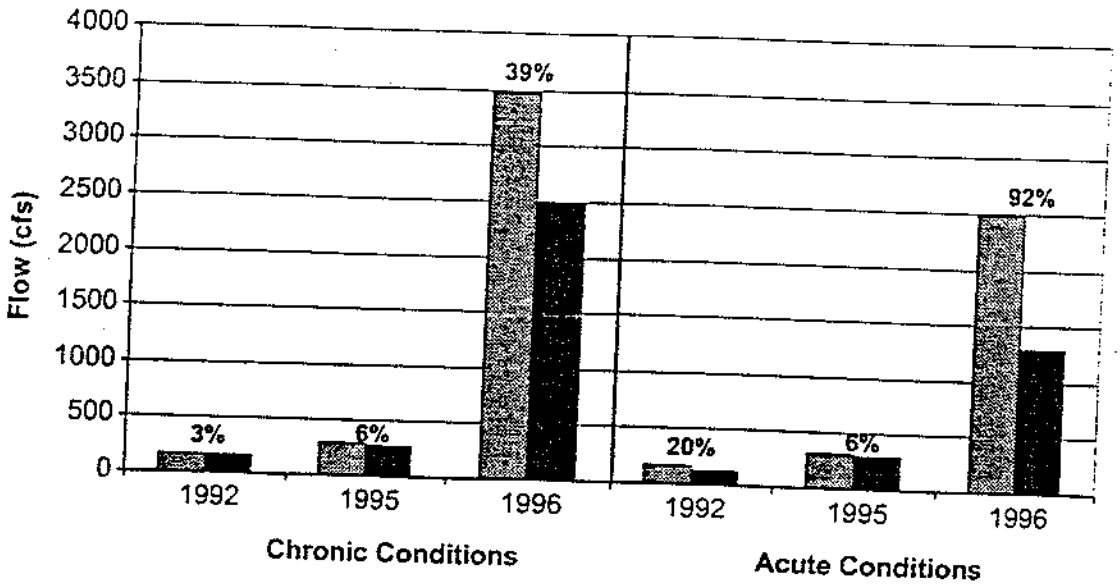
Mass Balance Setup and Structure. Appendices B and C contain the existing conditions mass balances for 1992, 1995, and 1996 high-flow season using the chronic (50 mg/L) and acute (80 mg/L) TSS targets, respectively. Appendices D and E contain the existing conditions mass balances for 1992, 1995, and 1996 irrigation flow seasons using the chronic and acute TSS targets, respectively.

For the Parma station, the mass balance column titled "Measured Flow (cfs)" is the seasonal critical flow (defined above) for each target condition (chronic or acute). For all other locations, it is the average flow computed for either the 30- or 7-day period during which the respective critical flow period occurred at Parma. The bold-bordered cells in the "Concentration (mg/L)" column are based on the measured TSS data described above. The TSS concentrations for the diversions are based on the mass balance-computed river concentration (see "River Concentration (mg/L)" column) at the point of diversion. The "Incremental Daily Mass Load (T/day)" column is the TSS load computed for each main stem gaging location, tributary, drain, or diversion. The "Incremental Groundwater Flow (cfs)" is the local groundwater inflow (computed as described above) that enters the main stem river between the location for which it is listed and the previous upstream location. The "Groundwater Concentration (mg/L)" refers to the groundwater TSS concentration that was assumed to be zero. The next three columns in the mass balance spreadsheet are the computed river flow, TSS concentration, and TSS load in the main stem river at each location. The final column is percent reductions applied to the tributaries, drains, and point sources. The percent reductions are zero for the existing conditions.

The main stem gaging locations are shaded on the mass balance spreadsheet because these are the calibration points along the river. The unbordered values in the shaded row immediately below each main stem gaging location represent the difference in the mass balance-computed flows and loads compared to the measured values at that location. The associated, unbordered TSS concentration (in the "Concentration (mg/L)" column) is back-calculated from the differential flow and load. The bordered river flow, concentration, and load on the right side of the shaded row immediately below each main stem gaging location allows values to be reset so that the error at the calibration point is not carried downstream in the calculations.

Mass Balance Analyses and Results

Seasonal Mass Balance Analyses for 1992, 1995, and 1996. To use the mass balance as a tool for analyzing TSS loads in the river, the flows must be reasonably balanced. Figures 5 and 6 show a comparison of the mass balance-computed flows and the measured flows at the USGS gage near Middleton for the high and irrigation flow seasons, respectively. Figures 7 and 8 illustrate the same data for the flows at the USGS gage near Parma. The difference



Computed
Measured
x% = Difference as a percent of measured

FIGURE 5
Middleton Mass Balance-Computed and Measured River Flows During the High Flow Season

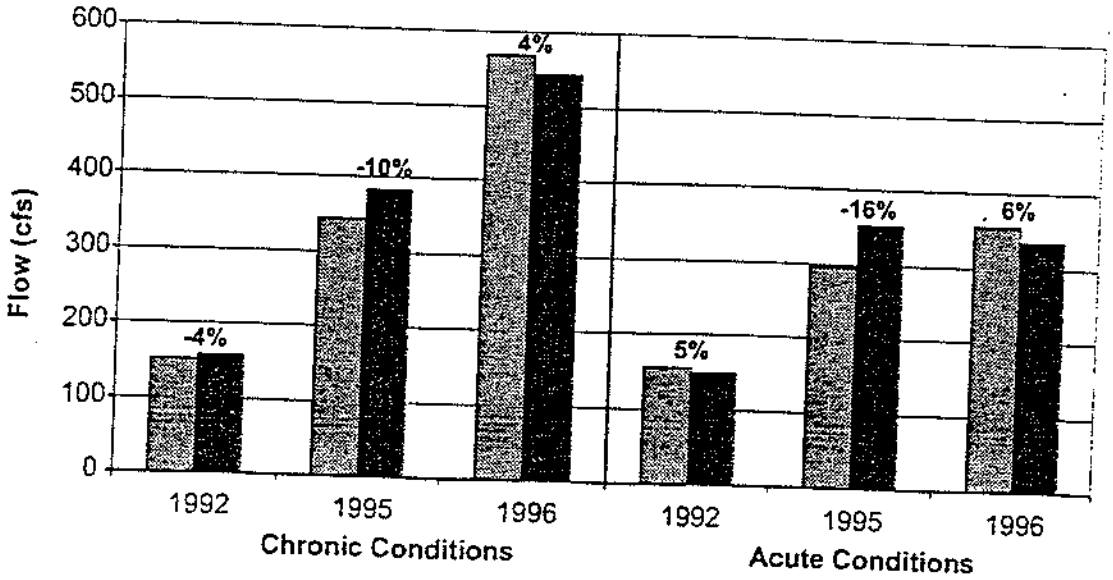
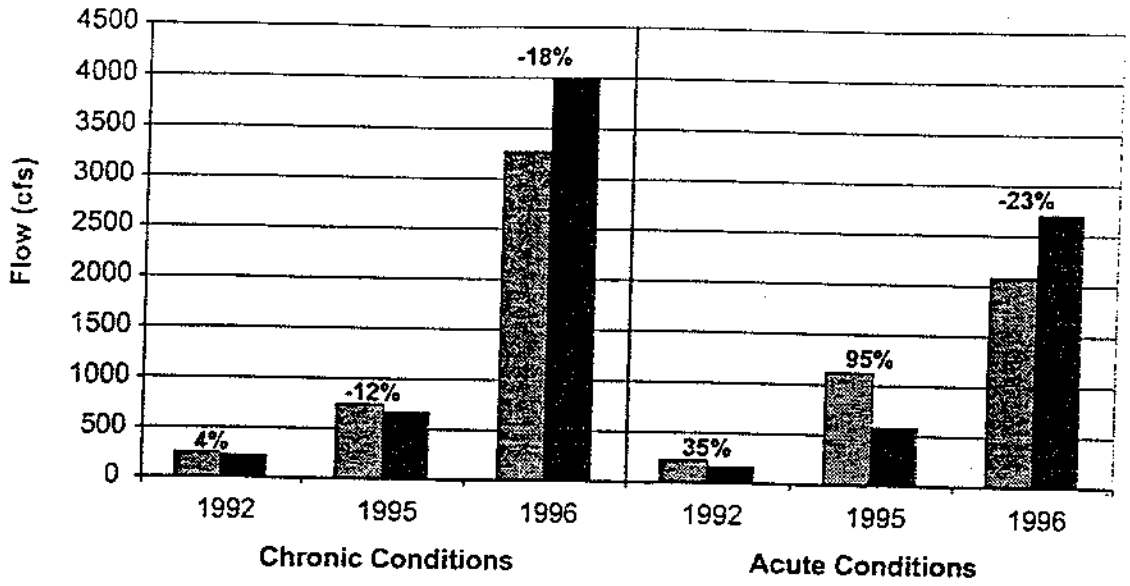


FIGURE 6
Middleton Mass Balance–Computed and Measured River Flows During the Irrigation Flow Season



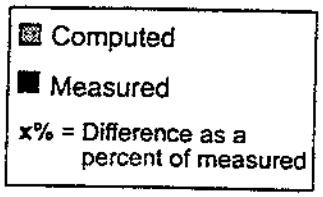


FIGURE 7
Parma Mass Balance–Computed and Measured River Flows During the High Flow Season

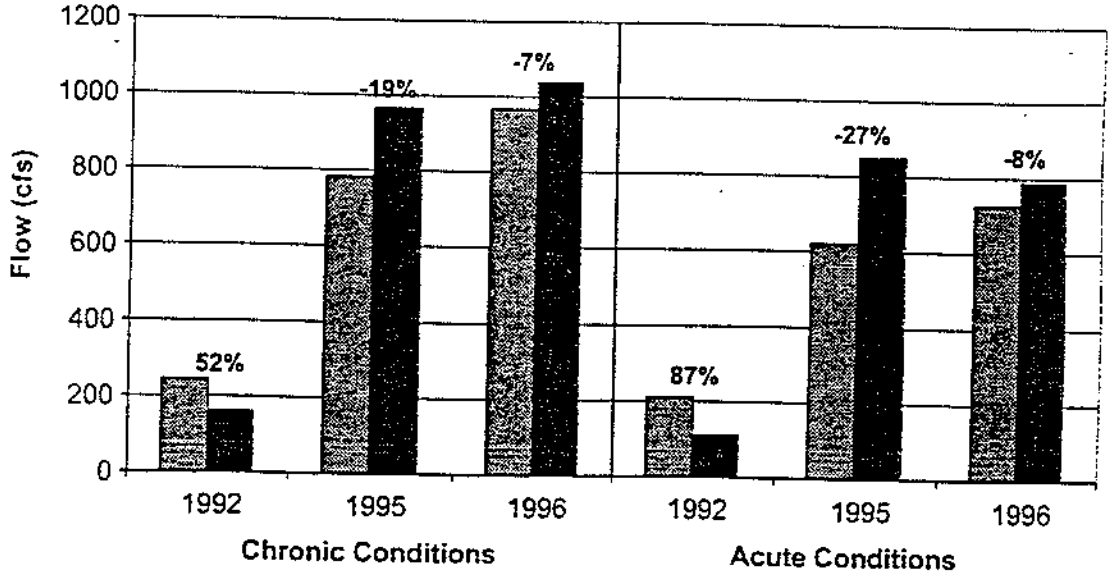


FIGURE 8
Parma Mass Balance–Computed and Measured River Flows During the Irrigation Flow Season

between the computed and measured flows is shown on the figures as a percentage of the measured flow.

Figures 9 through 12 show the seasonal mass balance-computed TSS loads, measured TSS loads, and TSS load capacities from Table 6. As Figures 9 and 10 illustrate, neither the mass balance-computed loads nor the measured loads at Middleton exceed their respective load capacities for any year, season, or target condition. There are, however, load capacity exceedances during the high and irrigation flow seasons at Parma. Differences between the mass balance-computed loads and measured loads are discussed below.

Measured versus Mass Balance-Computed Flows and Loads. To use the mass balance analysis as an effective tool for investigating the TSS loads in the river, the computed flows should balance at least reasonably well to the measured flows. This will ensure that the difference between the computed and measured loads is not attributable to a flow imbalance. Having the flows balanced also helps to define the seasonal scour and depositional cycles in the river.

As mentioned above, only during the 1992 and 1995 high-flow season did the computed loads at Parma exceed the load capacities (Figure 11). However, when considering the magnitude of the flow imbalance for the 1995 high-flow season acute target conditions, the computed loads for this scenario should not be relied upon (see Figure 7). Similarly, for the 1992 high-flow season acute target conditions, there is a 35 percent error in the flow balance at Parma. This, coupled with a computed river TSS concentration 60 percent greater than the measured, resulted in a computed load 115 percent larger than the measured load. Because of these discrepancies, the mass balance for that scenario was considered unreliable for decision-making.

The mass balance-computed river flows for the 1995 high-flow season chronic target conditions at Parma were 77 cfs greater than the measured flows (12 percent error). The measured TSS concentration at Parma was 26 mg/L less than computed. The resulting computed load at Parma was 62 percent greater than the measured load (Figure 11).

The mass balance scenario that resulted in the smallest flow imbalance during the high-flow season at Parma was the 1992 chronic target conditions (Figure 7). For this scenario there was a 9 cfs difference between the computed and measured flows at Parma (4 percent error). There was a 14 mg/L difference between the computed and measured TSS concentrations, and a 25 percent difference between the computed and measured loads. This scenario represents the lowest, or most stringent load capacity, and a low-flow main stem river condition during which significant irrigation return flows were occurring.

The measured load based on the chronic target conditions during the 1996 high-flow season exceeded the load capacity by 16 percent (Figure 11). However, the respective computed load was well below the load capacity. These results suggest a scour condition since the measured load exceeded the computed load. Thus, this exceedance was due to resuspension of in-channel sediment in addition to the tributary and drain contributions during the season. These conditions are indicative of what might be expected in the main stem river during an early season high-flow event. Indications of scour and depositional cycles are explored below.

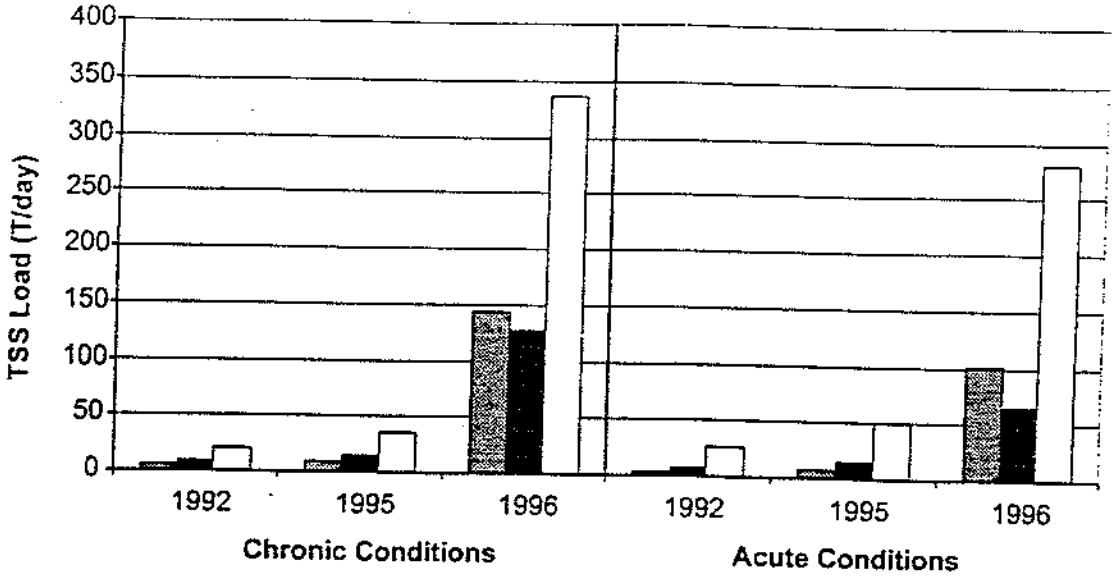
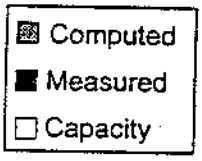


FIGURE 9
Middleton Mass Balance–Computed and Measured River TSS Loads versus Capacities During the High Flow Season



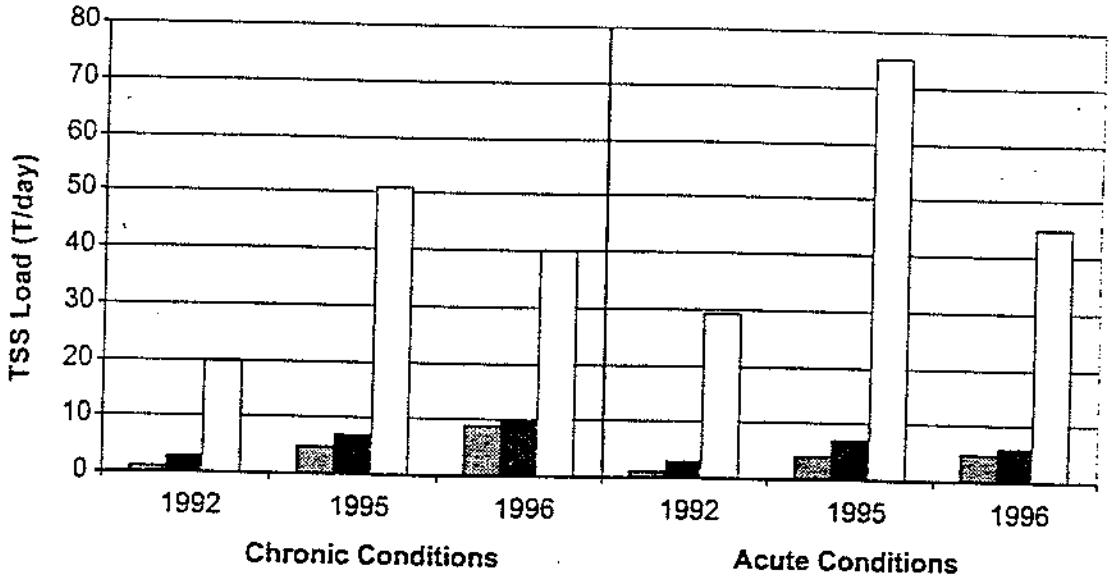


FIGURE 10
Middleton Mass Balance–Computed and Measured River TSS Loads versus Capacities During the Irrigation Flow Season

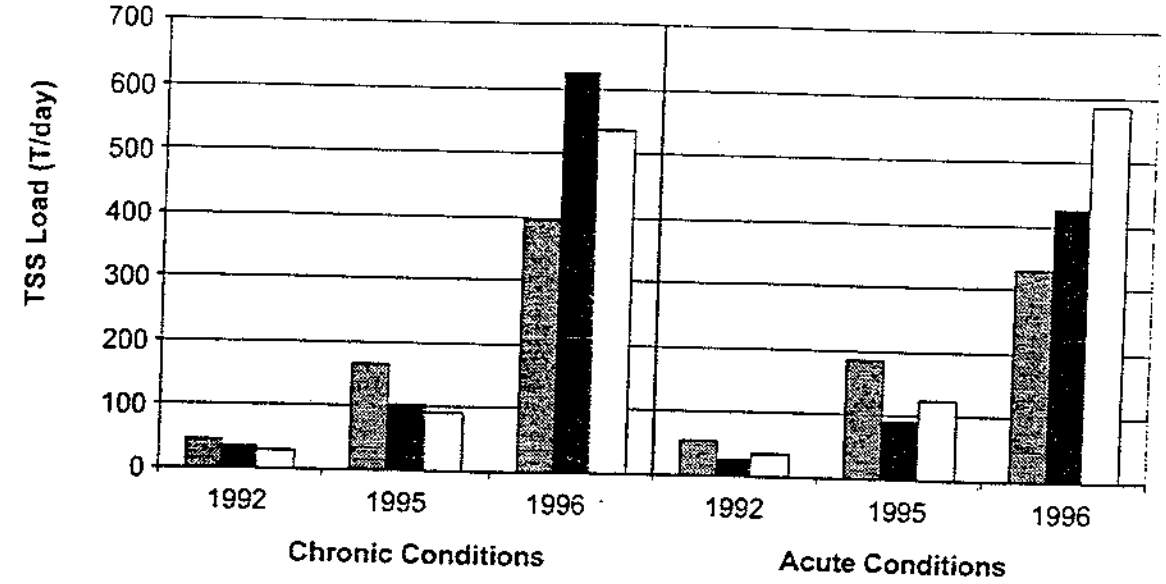
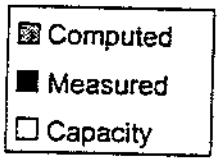


FIGURE 11
Parma Mass Balance–Computed and Measured River TSS Loads versus Capacities During the High Flow Season



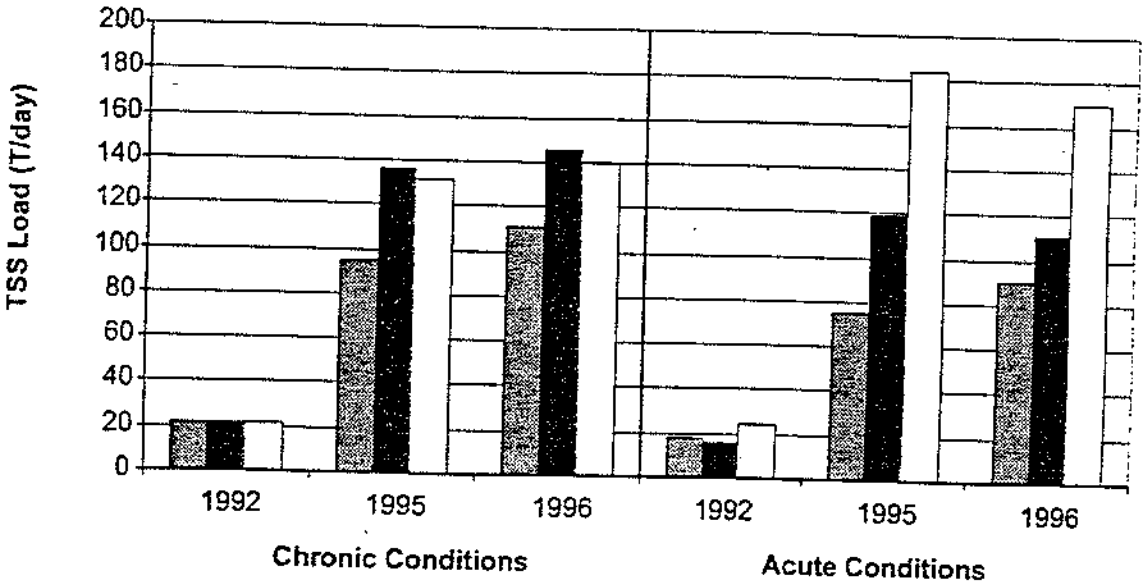


FIGURE 12
Parma Mass Balance–Computed and Measured River TSS Loads versus Capacities During the Irrigation Flow Season

Scour and Depositional Cycles. The difference between the mass balance-computed TSS loads and the measured loads is likely due to the natural scour and depositional cycles of the river, so long as the analysis is based on balanced flows. Higher computed than measured TSS loads for the 1992 high-flow season chronic target condition (when flows were balanced well) indicates sediment deposition. Because 1992 was a drought year, deposition would be expected under the conditions that existed in the lower Boise River watershed during 1992. For example, May 1992 was the driest month on record for rainfall at Boise (IDWR undated). Also during 1992, warm temperatures early in the growing season resulted in very high irrigation demands (IDWR undated). Heavy irrigation over dry soils during a low-flow condition in the main stem river comprises a condition conducive to deposition.

Because scour and depositional trends would be expected to vary over the short term, the mass balance was applied to each of the three seasons over the most recent 8-year (longer term) period (water years 1990 through 1997). The purpose of the analysis was to see if the scour and depositional trends would indicate channel equilibrium, deposition, or aggradation. This somewhat "gross" analysis suggested that the low-flow and high-flow seasons were depositional seasons, and the irrigation flow season was a scour season. The net effect of the three seasons averaged over the 8-year period indicated a slight depositional trend at Parma. This result is consistent with the findings of Thomas and Dion (1974) who stated that the channel in the Boise River Valley has aggraded.

Determination of the Critical Condition Based on Required Reductions. The percent reductions from the measured and mass balance-computed loads at Parma necessary to meet the appropriate load capacities were presented above. Recall from Figures 9 and 10 that for all 3 years, seasons, and target conditions analyzed, the load capacities at Middleton were not exceeded; thus, meeting the load capacity at Parma is the main issue. This section describes the analyses used to determine the reductions in loads from the various tributaries, drains, and point sources required to achieve the load capacity at Parma. Two methods of reductions were investigated using the mass balance analysis: equal percent reduction and equal concentration discharge.

The first method required an equal percent reduction from all tributaries and drains so that the load capacity was not exceeded at Parma. The second method required all tributaries and drains with existing TSS concentrations above a certain level to discharge at an equal, but lower, concentration until the load capacity at Parma was not exceeded. These reductions were investigated for all 12 mass balance scenarios presented earlier. The 1992 high-flow season chronic condition was determined to be the most critical condition based on the results and discussion presented in the previous three sections; the required reductions from the tributaries, drains, and point sources; and because it represents the most stringent load capacity and hydrologic conditions.

Based on the equal percent reduction method, a 34 percent reduction would be required to meet the load capacity at Parma for the 1992 high-flow chronic condition scenario. Based on the equal concentration discharge method, Fifteen Mile Creek, Mason Creek, Conway Gulch, and Dixie Drain would have to discharge at a TSS concentration of no more than 77 mg/L. Reducing their existing concentrations to 77 mg/L equates to the following percent reductions for these tributaries and drains: 46 percent (Fifteen Mile Creek);

51 percent (Mason Creek); 36 percent (Conway Gulch); and 36 percent (Dixie Drain). The mass balance reduction analyses for these scenarios are included as Appendix F.

Although the 34 percent equal reduction, or maximum TSS concentration of 77 mg/L, would result in load capacity compliance at Parma, the in-river chronic TSS target concentration would be exceeded by a maximum of 3 mg/L over an approximately 2.5 mile reach downstream of Dixie Drain. This is illustrated in Figure 13, which shows the mass balance-computed in-river TSS concentration from Middleton (river mile 31.2) to Parma (river mile 3.5).

In order to achieve an in-river TSS concentration less than or equal to 50 mg/L everywhere, the equal percent reduction requirement would be 37 percent. Likewise, the equal concentration discharge would require the same tributaries and drains listed above to discharge at no more than 73 mg/L. This would equate to the following percent reductions: 48 percent (Fifteen Mile Creek); 54 percent (Mason Creek); 39 percent (Conway Gulch); and 39 percent (Dixie Drain).

Sensitivity Analyses. The 1992 high-flow season chronic condition mass balance was slightly adjusted, or balanced, so that the computed flows and loads equaled those measured at Glenwood and Middleton. In short, this meant using the measured load at Glenwood and adding a balancing load of 2.6 T/day at Middleton. The measured load at Glenwood was used because the computed load significantly underestimated the measured value—5 T/day computed versus 21 T/day measured (see Appendix B). Reductions from sources upstream of Glenwood (i.e., Drainage District #3 and the Lander Street WWTF) were subtracted from the measured load of 21 T/day. This adjustment, in addition to adding the small balancing load at Middleton resulted in a longitudinal TSS mass balance that was used for analyzing a variety of reduction and loading scenarios. These sensitivity analyses are summarized in Table 8.

For the sensitivity analyses, the equal percent reductions were applied to all the tributaries and drains from the Diversion Dam to Parma. The percent reductions shown in Table 8 result in the load capacity at Parma being met. The various point source load reductions are defined in the table for each case. Appendix G provides a summary of the point source data used in the sensitivity analyses.

A significant finding of the sensitivity analyses is that the relative location of the sources, diversions, and groundwater input to one another and the control points are very important. For example, the influence of Fifteen Mile Creek and Dixie Drain on meeting the load capacity at Parma is different largely because Dixie Drain is only approximately 6 miles upstream of Parma, whereas Fifteen Mile Creek is approximately 24.5 miles upstream. The primary result is the TSS load from Fifteen Mile Creek is diminished more than the load from Dixie Drain because of the greater quantity of diverted TSS loads between the relative sources and Parma.

Another important result of the sensitivity analyses is that TSS sources upstream of Middleton have very little, perhaps negligible, effect on loads and needed reductions in the river downstream of Middleton.

Figure 13. Lower Boise River Mass Balance-Computed TSS Concentration from Middleton to Parma

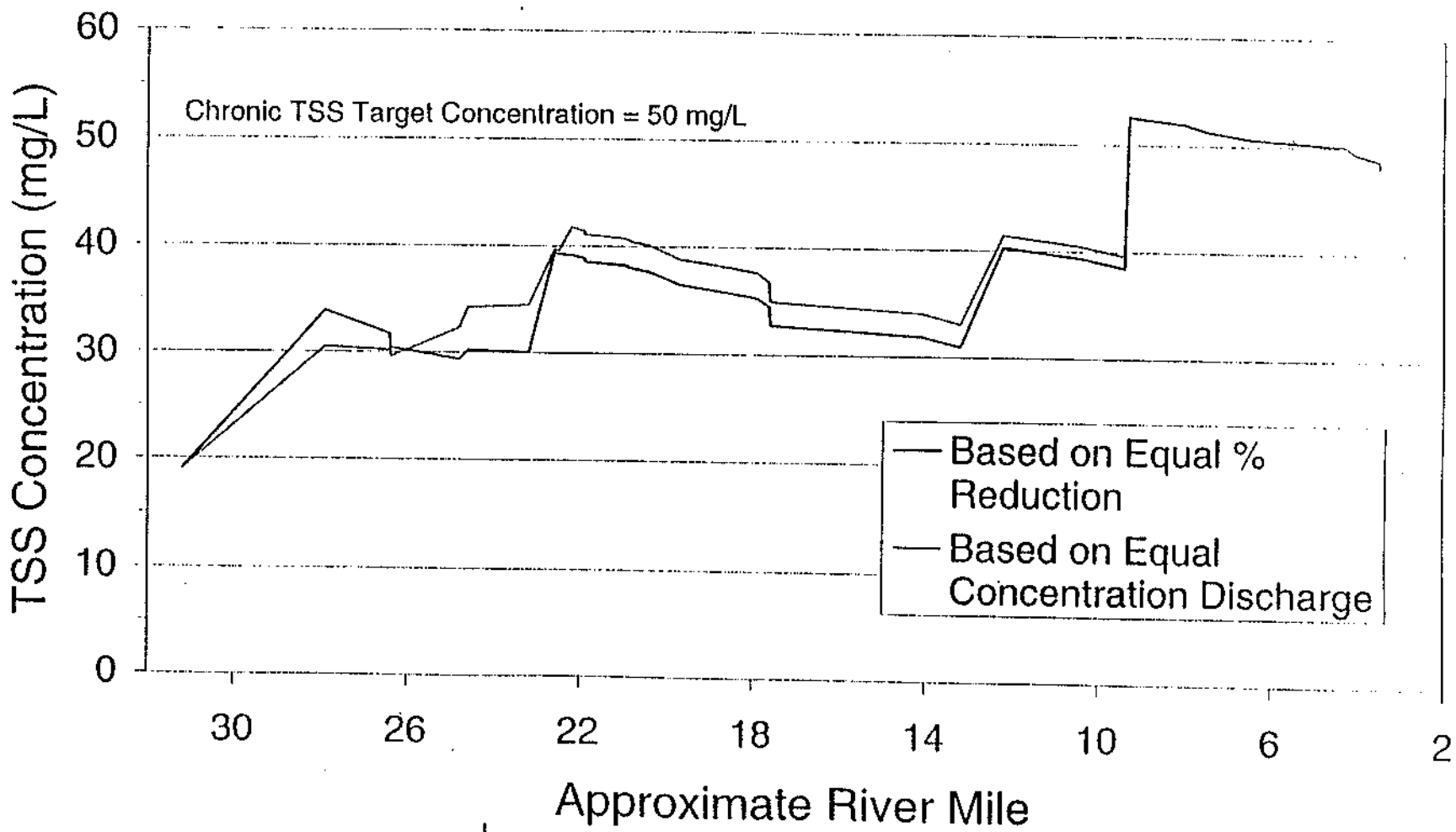


TABLE 8
Sensitivity Analyses Based on the Critical Condition and Equal Percent Reduction Scenarios

Case Number	Scenario	Equal Percent Reduction from All Tribs and Drains Required to Meet the Load Capacity at Parma
1	All point sources at zero load	34%
2	All non-point sources upstream of Middleton at zero load (and point sources at existing loads)	34%
3	Boise City WWTF loads at current permitted loads; other point sources (basinwide) at buildout loads added to tributaries to which they discharge	38%
4	Same as Case 3 except decrease non-point sources upstream of Middleton by only 10%	38%
5	a. Same as Case 3 and reduce 50 mg/L target by 10%	45%
	b. Same as Case 4 and reduce 50 mg/L target by 10%	45%
6	Same as Case 3 except no reduction upstream of Middleton	38%
7	Same as Case 3 except in-river TSS concentration at Middleton set at:	
	a. 28.5 mg/L (50% increase above existing measured concentration)	39%
	b. 38 mg/L (100% increase above existing measured concentration)	41%
	c. 45 mg/L (137% increase above existing measured concentration)	42%
8	Same as existing conditions except Middleton set at:	
	a. 28.5 mg/L	36%
	b. 38 mg/L	37%
	c. 45 mg/L	38%
	d. 50 mg/L	39%

Recommended Lower Boise River TSS Load Allocation

Margin of Safety

An implicit margin of safety is appropriate for the Lower Boise River TMDL TSS allocation for the following reasons:

- Reasonably extensive and reliable flow and sediment data are available.
- The TSS target concentrations are derived from the best available scientific literature.
- The flow and TSS data used for the TMDL analyses encompass the lowest, highest, and typical flow conditions in the historical record for the lower Boise River.
- The seasonal analyses are more representative of the changing climatic and hydrologic conditions compared to characterizations based on annual averages.
- Additional conservatism was gained by computing the Middleton and Parma load capacities using flows computed from averaging periods of only one-half of the recommended TSS target concentration averaging periods (resulting in lower flows and therefore more conservative load capacities).
- The required TSS load reductions are conservative since the point sources, which were included in the analyses, are likely discharging very little total suspended sediment and more total suspended solids in the form of biomass that likely degrade relatively quickly and are not as persistent as inorganic particles.

Background

The high flow season background TSS concentration at Diversion Dam, the upstream monitoring location in the watershed, is 5 mg/L. Similarly, the background TSS concentration for the irrigation flow season is 3 mg/L. These background concentrations and associated loads are inputs to the mass balance analyses used to compute the required TSS load reductions and allocations. Because of the extensive diversions, background TSS loads can only be handled in the mass balance analyses rather than as a subtracted load from the allocations (as implied by the TMDL equation). This is demonstrated by the fact that the TSS load at Diversion Dam, or background load, exceeds the TSS load at Middleton during the 1992 high flow season chronic conditions. Even though the TSS concentration at Middleton exceeds that at Diversion Dam for this particular scenario, the flow below the Diversion Dam is much greater than at Middleton.

Reserve for Growth and TSS Allocations

Three allocation workshops and several technical and watershed advisory group (WAG) meetings were conducted to discuss the TMDL requirements, results of the mass balance and sensitivity analyses, and various load reduction alternatives. During the June 11, 1998 WAG meeting, the WAG reached consensus on the following issues:

- The initial (excluding reserve for growth) wasteload TSS allocations for the point sources should be set equivalent to the existing peak month flow times the permitted TSS concentration.

- A set-aside for growth for all the municipal point sources in the watershed should be computed by multiplying the expected 20-year increase in the peak monthly flows times the existing permitted TSS concentration. This set-aside will be a lumped allocation to be shared among all the point sources in the watershed. Increased growth in agricultural sources of TSS is not anticipated.

- The equal percent reduction method should be applied to the tributaries and drains downstream of Middleton. The resulting loads should be discrete rather than a total load to be shared amongst the numerous tributaries and drains; but trading mechanisms should be allowed to achieve cost-effective overall load reductions.

No consensus was reached at the June 11 WAG meeting regarding whether or not the equal percent reductions should apply to the tributaries and drains upstream of Middleton.

Even though the lower Boise River is regulated, it is subject to relatively significant changes in flow from year to year primarily due to drought and snowmelt conditions. Because load capacities are computed from flows, they are subject to significant yearly variation. Thus, meeting load capacities derived from a drought year like 1992 would be impractical during extreme high flow years such as 1996. Thus, to establish the load allocations, the 34 percent (equal) reduction required to meet the load capacity at Parma based on the 1992 high flow season chronic target conditions (i.e., critical conditions) is applied to the 1995 non-point source loads. The 1995 non-point source loads are those computed for the high flow season chronic conditions analysis (i.e., the seasonal geometric mean TSS concentration times the 30-day average flow concurrent to the minimum 30-day average flow at Parma for the season). Table 9 lists the load allocations for the non-point sources assuming the 34 percent reduction would be applied to all the tributaries and drains including those upstream of Middleton. It is understood that the WAG did not reach consensus on how to address non-point sources upstream of Middleton, and the sensitivity analyses summarized in Table 8 show that these upstream sources do not substantially affect the percent load reductions downstream of Middleton. Thus, the calculations in Table 9 should not be viewed as an endorsement of any particular method of load allocation upstream of Middleton.

Note from Table 9 that although 1992 and 1995 were two considerably different hydrologic years, the tributary and drain loads were comparable. This is because the tributaries and drains are influenced predominantly by irrigation demands during both the typical and low (dry) flow years, as opposed to the larger loads that result during a high flow year like 1996. In fact, some of the tributaries and drains had lower actual loads in 1995 than in 1992. Also, the sum of the allocated loads (derived from 1995 loads) is less than the sum of the 1992 loads—which are loads associated with the extreme low-flow year. Recall also that the actual loads are loads computed from a low flow scenario—the 30 day average flow concurrent with the minimum 30-day average flow at Parma. Thus, although 1995 is a typical year, the equal percent reduction applied to the actual 1995 tributary and drain loads results in a conservative load allocation.

As shown in Table 9, the 1992 actual load computed for Indian Creek was a result of nearly all of the flow being diverted out of the creek. This should be taken into consideration when comparing the magnitude of the 1992, 1995, and allocated loads presented in Table 9. Even

with the extremely low load in Indian Creek during 1992, the sum of the allocated loads is still less than that for the 1992 actual loads.

TABLE 9
Lower Boise River TSS Non-point Source
Load Allocation Assuming Equal Percentage Reduction to all Tributaries and Drains

	Actual TSS Load (T/day)		
Tributary/Drain	**1992**	**1995**	**Load Allocation (T/day)Computed from 34% Reduction of 1995 Load**
Drainage District #3	0.41	0.35	**0.23**
Eagle Drain @ Eagle	1.01	1.61	**1.06**
Thurman Drain	0.31	0.34	**0.22**
Fifteen Mile Drain	17.40	28.60	**18.88**
Star Feeder	2.84	2.75	**1.82**
Long Feeder	0.75	0.56	**0.37**
Watts Creek	0.48	0.45	**0.29**
Mill Slough	10.68	11.24	**7.42**
Willow Creek @ Middleton	3.78	3.62	**2.39**
Mason Slough	1.95	1.91	**1.26**
Mason Creek	26.10	34.10	**22.50**
Hartley (combined)	6.62	8.43	**5.57**
Indian Creek	0.16	9.11	**6.01**
Conway Gulch @ Notus	11.67	11.34	**7.48**
Dixie Drain Near Wilder	32.20	41.12	**27.14**
Sum (excluding Indian Cr.)	116.19	146.42	96.64
Sum (including Indian Cr.)	116.35	155.53	102.65

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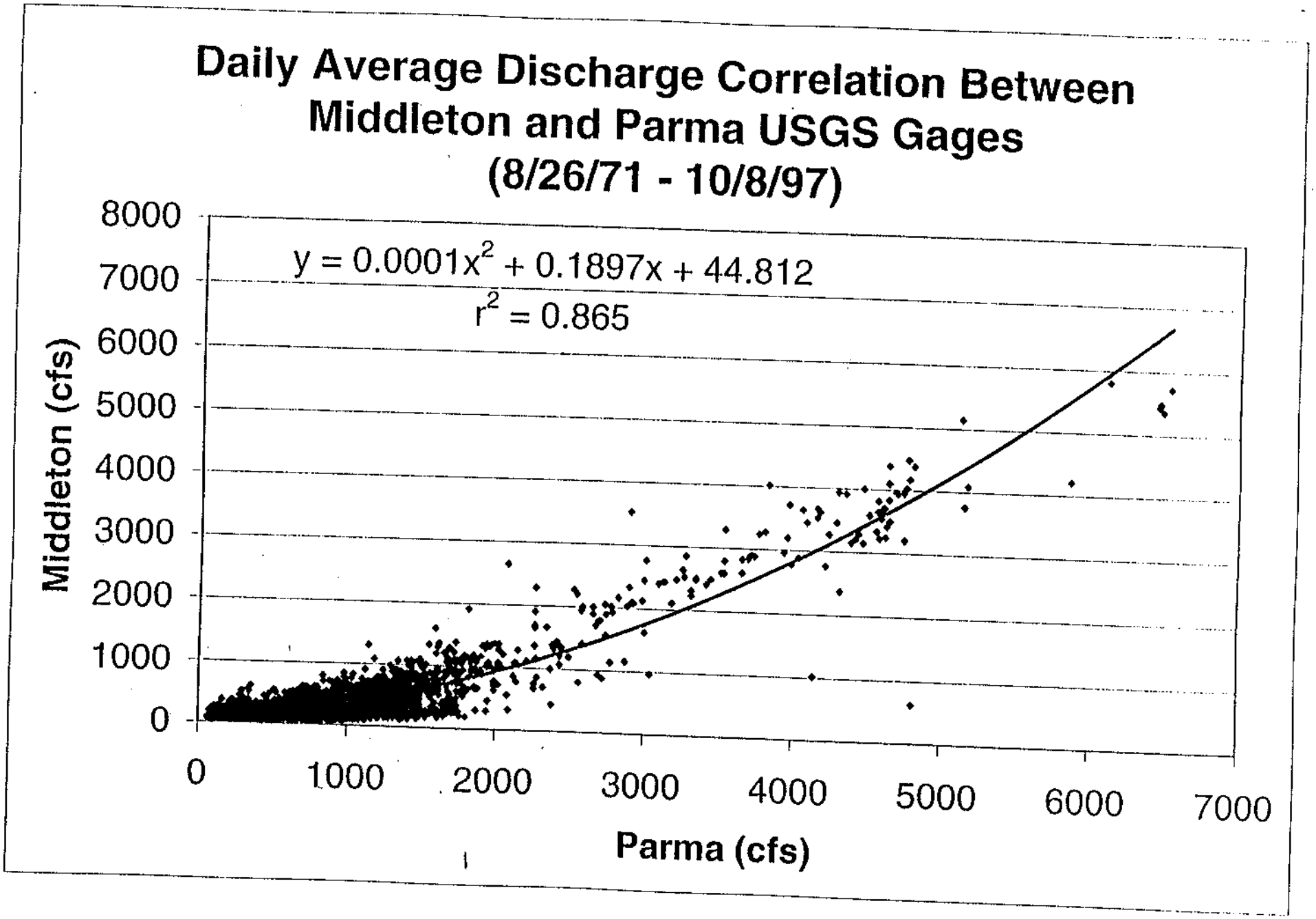
Appendix A

Daily Average Discharge Correlation Between Middleton and Parma USGS Gages (8/26/71 – 10/8/97)



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Appendix B

High-Flow Season Mass Balances—Existing Conditions Based on the Critical 30-Day (Chronic) Flow Period at Parma for: 1992, 1995, and 1996

Table D-2

Seasonal Relationships for Estimating Geometric Mean and 90th Percentile Concentrations for Tributaries with Seasonal Sample Sizes < 4

	Geometric Mean Percent of NSS (TSS mg/L)				90th Percentile Percent of NSS (TSS mg/L)			
Location	HF	IF	LF	NSS	HF	IF	LF	NSS
Eagle Drain	0.99			1.00	1.22			1.00
Thurman Dr	0.95			1.00	1.19			1.00
15-Mile Cr	2.50	1.63	0.22	1.00	1.15	0.56	0.09	1.00
Mill Slough	1.48			1.00	1.33			1.00
Willow Cr	1.70		0.43	1.00	0.90		0.69	1.00
Mason Slough	0.71			1.00	0.63			1.00
Mason Cr	1.69	1.21	0.37	1.00	1.47	0.62	0.26	1.00
E. Hartley Dr	1.23		0.70	1.00	1.40		0.51	1.00
W. Hartley Gulch	1.63		0.37	1.00	1.34		0.22	1.00
Indian Cr	1.19	0.82	0.87	1.00	1.14	0.74	0.98	1.00
Conway Gulch	1.31	1.52	0.45	1.00	1.59	0.85	0.27	1.00
Dixie Dr	1.77	0.76	0.49	1.00	1.43	0.59	0.34	1.00
Hartley (combined)	1.23			1.00	1.39		0.36	1.00
AVG	**1.41**	**1.19**	**0.49**		**1.25**	**0.67**	**0.41**	
STD	**0.46**	**0.40**	**0.21**		**0.26**	**0.12**	**0.28**	
CV	**0.33**	**0.33**	**0.43**		**0.21**	**0.18**	**0.67**	

Notes:

NSS = No Seasonal Split

HF = High Flow

IF = Irrigation Flow

LF = Low Flow

Table D-1

TSS Concentration Data: Sample Sizes, Geometric Mean Concentrations, and 90th Percentile Concentrations

Location	Sample Size TSS Concentration				Geometric Mean TSS Concentration (mg/L)				90th Percentile TSS Concentration (mg/L)			
	HF	IF	LF	NSS	HF	IF	LF	NSS	HF	IF	LF	NSS
Below Div. Dam	17	7	9	33	5	3	7	5	15	7	24	15
Glenwood	25	13	12	50	16	7	6	10	45	22	24	37
Middleton	16	7	7	30	19	7	6	12	68	12	17	40
Parma	23	11	14	48	58	52	22	43	122	127	42	108
Eagle Drain	4	0	2	6	27	32	13	27	142	78	48	117
Thurman Dr	4	0	2	6	9	12	5	10	27	15	9	22
15-Mile Cr	9	5	7	21	141	92	12	57	322	157	26	279
Mill Slough	4	2	2	8	41	33	14	28	81	41	25	61
Willow Cr	10	2	7	19	74	52	19	44	210	156	160	233
Mason Slough	4	0	2	6	57	96	39	80	134	143	87	213
Mason Cr	10	4	6	20	158	113	34	93	523	222	93	356
E. Hartley Dr	10	1	7	18								
W. Hartley Gulch	10	2	7	19								
Indian Cr	10	4	7	21	58	40	42	49	117	75	101	103
Conway Gulch	10	5	6	21	120	139	41	92	546	290	91	344
Dixie Dr	10	5	6	21	120	51	33	68	281	115	66	196
Hartley (combined)	10	1	4	15	59	57	29	48	181	87	47	130

Notes:

Bold borders indicate estimated TSS concentrations based on the following relationship (see Table D-2):

Geometric Mean:
Sample Size < 4
IF = 1.19 * NSS
LF = 0.49 * NSS

90th Percentile:
Sample Size < 4
IF = 0.67 * NSS
LF = 0.41 * NSS

NSS = No Seasonal Split
HF = High Flow
IF = Irrigation Flow
LF = Low Flow

Appendix D

TSS Concentration Data: Sample Sizes, Geometric Mean Concentrations, and 90th Percentile Concentrations

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Lognormal Distributions
Lower Boise River - Tributaries (Low Flow)

	Mason Creek		E Hartley Drain		W Hartley Gulch		Indian Creek		Conway Gulch		Dixie Drain	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	17	2.83321334	55	4.00733319	3	1.09861229	17	2.83321334	31	3.4339872	50	3.91202301
Value 2	28	3.33220451	41	3.71357207	10	2.30258509	36	3.58351894	23	3.13549422	20	2.99573227
Value 3	81	4.39444915	46	3.8286414	15	2.7080502	47	3.8501476	22	3.09104245	30	3.40119738
Value 4	12	2.48490665	21	3.04452244	11	2.39789527	58	4.06044301	111	4.7095302	25	3.21887582
Value 5	47	3.8501476	35	3.55534806	6	1.79175947	30	3.40119738	58	4.06044301	22	3.09104245
Value 6	73	4.29045944	52	3.95124372	18	2.89037176	33	3.49650756	48	3.87120101	79	4.36944785
Value 7			15	2.7080502	33	3.49650756	150	5.01063529				
Value 8												
Value 9												

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	6	6	7	7	7	7	7	7	6	6	6	6
Mean	43.0000	3.5309	37.8571	3.5441	13.7143	2.3837	53.0000	3.7480	48.8333	3.7169	37.6667	3.4961
Standard Deviation	29.0586	0.7804	15.1924	0.4897	9.8947	0.7756	44.6915	0.6770	33.6298	0.6224	22.9666	0.5359
C.V.	0.6758	0.2210	0.4013	0.1382	0.7215	0.3254	0.8432	0.1806	0.6887	0.1674	0.6097	0.1532
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	60	93	57	65	26	29	110	101	92	91	67	66
10th Percentile	7	13	19	19	1	4	-2	18	7	19	9	17
Geometric Mean		34		35		11		42		41		33
$\exp^{(\text{Standard Deviation})}$		2		2		2		2		2		2

Note: Data presented here were only used if sample sizes were ≥ 4.

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Log-normal Distributions
Lower Boise River - Tributaries (Low Flow)

	Eagle Drain		Thurman Drain		15-Mile Creek		Mill Slough		Willow Creek		Mason Slough	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	12	2.48490665	11	2.39789527	9	2.19722458	23	3.13549422	3	1.09861229	202	5.3082677
Value 2	64	4.15888308	11	2.39789527	8	2.07944154	29	3.36729583	13	2.56494936	128	4.85203026
Value 3					13	2.56494936			11	2.39789527		
Value 4					23	3.13549422			190	5.24702407		
Value 5					5	1.60943791			10	2.30258509		
Value 6					20	2.99573227			5	1.60943791		
Value 7					20	2.99573227			196	5.27811466		
Value 8												
Value 9												

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	2	2	2	2	7	7	2	2	7	7	2	2
Mean	38.0000	3.3219	11.0000	2.3979	14.0000	2.5111	26.0000	3.2514	61.1429	2.9284	165.0000	5.0801
Standard Deviation	36.7696	1.1837	0.0000	0.0000	7.0238	0.5716	4.2426	0.1639	90.1581	1.6728	52.3259	0.3226
C.V.	0.9676	0.3563	0.0000	0.0000	0.5017	0.2276	0.1632	0.0504	1.4745	0.5712	0.3171	0.0635
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	85	126	11	11	23	26	31	32	177	160	232	243
10th Percentile	-8	6	11	11	5	6	21	21	-51	2	100	106
Geometric Mean		28		11		12		26		19		161
exp^(Standard Deviation)		3		1		2		1		5		1

Note: Data presented here were only used if sample sizes were ≥ 4.

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Log-normal Distributions
Lower Boise River - Tributaries (Irrigation Flow)

	Mason Creek		E Hartley Drain		W Hartley Gulch		Indian Creek		Conway Gulch		Dixie Drain	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	191	5.25227343	75	4.31748811	66	4.18965474	75	4.31748811	144	4.9698133	39	3.66356165
Value 2	116	4.75359019			114	4.73619845	26	3.25809654	68	4.21950771	21	3.04452244
Value 3	135	4.90527478					47	3.8501476	160	5.07517382	91	4.51085951
Value 4	55	4.00733319					28	3.33220451	321	5.77144112	97	4.57471098
Value 5									104	4.6443909	48	3.87120101
Value 6												
Value 7												

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	4	4	1	1	2	2	4	4	5	5	5	5
Mean	124.2500	4.7296	75.0000	4.3175	90.0000	4.4629	44.0000	3.6895	159.4000	4.9361	59.2000	3.9330
Standard Deviation	56.0796	0.5248	#DIV/0!	#DIV/0!	33.9411	0.3865	22.7303	0.4946	97.1792	0.5738	33.2896	0.6347
C.V.	0.4513	0.1110	#DIV/0!	#DIV/0!	0.3771	0.0866	0.5166	0.1341	0.6097	0.1162	0.5623	0.1614
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	196	222	#DIV/0!	#DIV/0!	134	142	73	75	284	290	102	115
10th Percentile	55	59	#DIV/0!	#DIV/0!	48	54	16	22	39	68	18	23

Geometric Mean	113	75	87	40	139	51
$\exp^{(\text{Standard Deviation})}$	2	#DIV/0!	1	2	2	2

Note: Data presented here were only used if sample sizes were ≥ 4.

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Lognormal Distributions
Lower Boise River - Tributaries (Irrigation Flow)

	Eagle Drain		Thurman Drain		15-Mile Creek		Mill Slough		Willow Creek		Mason Slough	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1					133	4.89034913	17	2.83321334	50	3.91202301		
Value 2					100	4.60517019	11	2.39789527	68	4.21950771		
Value 3					56	4.02535169						
Value 4					139	4.93447393						
Value 5					65	4.17438727						
Value 6												
Value 7												

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	0	0	0	0	5	5	2	2	2	2	0	0
Mean	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	98.6000	4.5259	14.0000	2.6156	59.0000	4.0658	#DIV/0!	#DIV/0!
Standard Deviation	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	37.9513	0.4124	4.2426	0.3078	12.7279	0.2174	#DIV/0!	#DIV/0!
C.V.	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.3849	0.0911	0.3030	0.1177	0.2157	0.0535	#DIV/0!	#DIV/0!
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	147	157	19	20	75	77	#DIV/0!	#DIV/0!
10th Percentile	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	52	55	9	9	43	45	#DIV/0!	#DIV/0!

Geometric Mean		#DIV/0!		#DIV/0!		92		14		58		#DIV/0!
$\exp^{(\text{Standard Deviation})}$		#DIV/0!		#DIV/0!		2		1		1		#DIV/0!

Note: Data presented here were only used if sample sizes were ≥ 4.

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Log-normal Distributions
Lower Boise River - Tributaries (High Flow)

	Mason Creek		E Hartley Drain		W Hartley Gulch		Indian Creek		Conway Gulch		Dixie Drain	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	335	5.81413053	157	5.05624581	84	4.4308168	101	4.61512052	295	5.68697536	111	4.7095302
Value 2	21	3.04452244	14	2.63905733	8	2.07944154	101	4.61512052	39	3.66356165	140	4.94164242
Value 3	122	4.80402104	56	4.02535169	17	2.83321334	45	3.80666249	140	4.94164242	102	4.62497281
Value 4	116	4.75359019	60	4.09434456	49	3.8918203	41	3.71357207	219	5.38907173	60	4.09434456
Value 5	131	4.87519732	91	4.51085951	248	5.51342875	42	3.73766962	248	5.51342875	126	4.83628191
Value 6	84	4.4308168	14	2.63905733	16	2.77258872	36	3.58351894	9	2.19722458	41	3.71357207
Value 7	263	5.57215403	91	4.51085951	67	4.20469262	57	4.04305127	49	3.8918203	134	4.8978398
Value 8	525	6.26339826	133	4.89034913	93	4.53259949	176	5.170484	174	5.1590553	223	5.40717177
Value 9	407	6.00881319	70	4.24849524			42	3.73766962	217	5.37989735	460	6.13122649
Value 10	159	5.0689042	87	4.46590812	77	4.34380542	34	3.52636052	425	6.05208917	88	4.47733681
Value 11					68	4.21950771						
Value 12												
Value 13												
Value 14												
Value 15												

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	10	10	10	10	10	10	10	10	10	10	10	10
Mean	216.3000	5.0636	77.3000	4.1061	72.7000	3.8822	67.5000	4.0549	181.5000	4.7875	148.5000	4.7834
Standard Deviation	160.9314	0.9328	45.6364	0.8371	68.6441	1.0218	45.6442	0.5531	128.5217	1.1825	120.1797	0.6659
C.V.	0.7440	0.1842	0.5904	0.2038	0.9442	0.2632	0.6762	0.1364	0.7081	0.2470	0.8093	0.1392
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	423	523	136	178	161	180	126	117	346	546	303	281
10th Percentile	17	50	21	22	-12	14	11	29	22	28	-1	52

Geometric Mean	158	61	49	56	120	120
exp(Standard Deviation)	3	2	3	2	3	2

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Lognormal Distributions
Lower Boise River - Tributaries (High Flow)

	Eagle Drain		Thurman Drain		15-Mile Creek		Mill Slough		Willow Creek		Mason Slough	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	74	4.30406509	20	2.99573227	192	5.25749537	48	3.87120101	102	4.62497281	112	4.71849887
Value 2	7	1.94591015	12	2.48490665	196	5.27811466	62	4.12713439	124	4.82028157	55	4.00733319
Value 3	90	4.49980967	11	2.39789527	152	5.02388052	51	3.93182563	71	4.26267988	73	4.29045944
Value 4	11	2.39789527	3	1.09861229	67	4.20469262	19	2.94443898	162	5.08759634	23	3.13549422
Value 5					518	6.24997524			42	3.73766962		
Value 6					111	4.7095302			36	3.58351894		
Value 7					167	5.11799381			357	5.87773578		
Value 8					65	4.17438727			25	3.21887582		
Value 9					95	4.55387689			68	4.21950771		
Value 10									38	3.63758616		
Value 11												
Value 12												
Value 13												
Value 14												
Value 15												

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	4	4	4	4	9	9	4	4	10	10	4	4
Mean	45.5000	3.2869	11.5000	2.2443	173.6667	4.9522	45.0000	3.7187	102.5000	4.3070	65.7500	4.0379
Standard Deviation	42.6810	1.3031	6.9522	0.8080	138.3908	0.6420	18.3485	0.5276	99.5571	0.8117	37.1248	0.8689
C.V.	0.9380	0.3965	0.6045	0.3600	0.7969	0.1296	0.4077	0.1419	0.9713	0.1885	0.5646	0.1657
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	100	142	20	27	351	322	69	81	230	210	113	134
10th Percentile	-7	5	3	3	2	64	22	21	-21	27	20	25
Geometric Mean		27		9		141		41		74		57
$\exp^{(\text{Standard Deviation})}$		4		2		2		2		2		2

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Log-normal Distributions
Lower Boise River - Tributaries (No Seasonal Split)

	Mason Creek		E Hartley Drain		W Hartley Gulch		Indian Creek		Conway Gulch		Dixie Drain	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	335	5.81413053	157	5.05624581	84	4.4308168	101	4.61512052	295	5.68697536	111	4.7095302
Value 2	17	2.83321334	55	4.00733319	3	1.09861229	17	2.83321334	31	3.4339872	50	3.91202301
Value 3	21	3.04452244	14	2.63905733	8	2.07944154	101	4.61512052	39	3.66356165	140	4.94164242
Value 4	122	4.80402104	56	4.02535169	17	2.83321334	45	3.80666249	140	4.94164242	102	4.62497281
Value 5	116	4.75359019	60	4.09434456	49	3.8918203	41	3.71357207	219	5.38907173	60	4.09434456
Value 6	191	5.25227343	91	4.51085951	248	5.51342875	42	3.73766962	248	5.51342875	126	4.83628191
Value 7	116	4.75359019	75	4.31748811	66	4.18965474	75	4.31748811	144	4.9698133	39	3.66356165
Value 8	28	3.33220451	41	3.71357207	10	2.30258509	36	3.58351894	23	3.13549422	20	2.99573227
Value 9	81	4.39444915	46	3.8286414	15	2.7080502	47	3.8501476	22	3.09104245	30	3.40119738
Value 10	131	4.87519732	21	3.04452244	11	2.39789527	58	4.06044301	9	2.19722458	41	3.71357207
Value 11	84	4.4308168	14	2.63905733	16	2.77258872	36	3.58351894	49	3.8918203	134	4.8978398
Value 12	263	5.57215403	91	4.51085951	67	4.20469262	57	4.04305127	174	5.1590553	223	5.40717177
Value 13	525	6.26339826	133	4.89034913	93	4.53259949	176	5.170484	217	5.37989735	460	6.13122849
Value 14	407	6.00881319	70	4.24849524	77	4.34380542	42	3.73766962	425	6.05208917	88	4.47733681
Value 15	12	2.48490665			114	4.73619845	26	3.25809654	68	4.21950771	21	3.04452244
Value 16	47	3.8501476	35	3.55534806	6	1.79175947	30	3.40119738	111	4.7095302	25	3.21887582
Value 17	73	4.29045944	52	3.95124372	18	2.89037176	33	3.49650756	58	4.06044301	22	3.09104245
Value 18	159	5.0689042	15	2.7080502	33	3.49650756	150	5.01063529	48	3.87120101	79	4.36944785
Value 19	135	4.90527478	87	4.46590812	68	4.21950771	34	3.52636052	160	5.07517382	91	4.51085951
Value 20	55	4.00733319					47	3.8501476	321	5.77144112	97	4.57471098
Value 21							28	3.33220451	104	4.6443909	48	3.87120101
Value 22												
Value 23												

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	20	20	18	18	19	19	21	21	21	21	21	21
Mean	145.9000	4.5370	61.8333	3.9004	52.7895	3.3912	58.1905	3.8830	138.3333	4.5170	95.5714	4.2137
Standard Deviation	137.9767	1.0437	39.6444	0.7372	58.4851	1.1778	41.3190	0.5835	114.2376	1.0317	97.9299	0.8292
C.V.	0.9457	0.2300	0.6411	0.1890	1.1079	0.3473	0.7101	0.1503	0.8258	0.2284	1.0247	0.1968
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	323	356	113	127	128	134	111	103	285	344	221	196
10th Percentile	-25	26	13	20	-20	7	7	24	-3	25	-26	24
Geometric Mean		93		49		30		49		92		68
exp^(Standard Deviation)		3		2		3		2		3		2

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Lognormal Distributions
Lower Boise River - Tributaries (No Seasonal Split)

	Eagle Drain		Thurman Drain		15-Mile Creek		Mill Slough		Willow Creek		Mason Slough	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	74	4.30406509	20	2.99573227	192	5.25749537	48	3.87120101	102	4.62497281	112	4.71849887
Value 2	12	2.48490665	11	2.39789527	9	2.19722458	23	3.13549422	3	1.09861229	202	5.3082677
Value 3	7	1.94591015	12	2.48490665	196	5.27811466	62	4.12713439	124	4.82028157	55	4.00733319
Value 4	64	4.15888308	11	2.39789527	152	5.02388052	29	3.36729583	71	4.26267988	128	4.85203026
Value 5	90	4.49980967	11	2.39789527	67	4.20469262	51	3.93182563	162	5.08759634	73	4.29045944
Value 6	11	2.39789527	3	1.09861229	133	4.89034913	19	2.94443898	42	3.73766962	23	3.13549422
Value 7					100	4.60517019	17	2.83321334	50	3.91202301		
Value 8					8	2.07944154	11	2.39789527	13	2.56494936		
Value 9					13	2.56494936			11	2.39789527		
Value 10					23	3.13549422			190	5.24702407		
Value 11					518	6.24997524			36	3.58351894		
Value 12					111	4.7095302			357	5.87773578		
Value 13					167	5.11799381			25	3.21887582		
Value 14					65	4.17438727			68	4.21950771		
Value 15					56	4.02535169			68	4.21950771		
Value 16					5	1.60943791			10	2.30258509		
Value 17					20	2.99573227			5	1.60943791		
Value 18					20	2.99573227			196	5.27811466		
Value 19					95	4.55387689			38	3.63758616		
Value 20					139	4.93447393						
Value 21					65	4.17438727						
Value 22												
Value 23												

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	5	6	6	6	21	21	8	8	19	19	6	6
Mean	43.0000	3.2986	11.3333	2.2955	102.5714	4.0370	32.5000	3.3261	82.6842	3.7737	98.8333	4.3853
Standard Deviation	37.1268	1.1399	5.3914	0.6309	113.9643	1.2444	18.8701	0.6087	90.1955	1.3078	63.2564	0.7809
C.V.	0.8634	0.3456	0.4757	0.2748	1.1111	0.3082	0.5745	0.1830	1.0908	0.3465	0.6400	0.1735
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	91	117	18	22	249	279	56	61	198	233	180	213
10th Percentile	-3	7	5	5	-39	12	9	13	-29	9	20	31
Geometric Mean		27		10		57		28		44		80
$\exp^{(\text{Standard Deviation})}$		3		2		3		2		4		2

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Lognormal Distributions
Lower Boise River - Main Stem (Low Flow)

	Diversion Dam		Glenwood		Middleton		Parma (Historical)		Parma (1990s)	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	8	2.07944154	4	1.38629436	11	2.39789527	71	4.26267988	30	3.40119738
Value 2	3	1.09861229	3	1.09861229	5	1.60943791	28	3.33220451	15	2.7080502
Value 3	6	1.79175947	5	1.60943791	4	1.38629436	18	2.89037176	46	3.8286414
Value 4	27	3.29583687	4	1.38629436	4	1.38629436	664	6.49828215	61	4.11087386
Value 5	5	1.60943791			28	3.33220451	20	2.99573227	26	3.25809654
Value 6	4	1.38629436	2	0.69314718	4	1.38629436	147	4.99043259	18	2.89037176
Value 7	6	1.79175947	3	1.09861229	4	1.38629436	9	2.19722458	15	2.7080502
Value 8	2	0.69314718	5	1.60943791			22	3.09104245	12	2.48490665
Value 9	38	3.63758616	4	1.38629436			467	6.14632926		
Value 10			67	4.20469262			18	2.89037176	15	2.7080502
Value 11			3	1.09861229			17	2.83321334	15	2.7080502
Value 12			3	1.09861229			32	3.4657359	18	2.89037176
Value 13			53	3.97029191			28	3.33220451	18	2.89037176
Value 14							35	3.55534806	14	2.63905733
Value 15							53	3.97029191	47	3.8501476
Value 16							54	3.98898405		
Value 17							60	4.09434456		
Value 18							16	2.77258872		
Value 19							30	3.40119738		
Value 20							12	2.48490665		
Value 21							30	3.40119738		
Value 22							15	2.7080502		
Value 23							46	3.8286414		
Value 24							61	4.11087386		
Value 25							26	3.25809654		
Value 26							18	2.89037176		
Value 27							15	2.7080502		
Value 28							12	2.48490665		
Value 29										
Value 30							15	2.7080502		
Value 31							15	2.7080502		
Value 32							18	2.89037176		
Value 33							18	2.89037176		
Value 34							14	2.63905733		
Value 35							47	3.8501476		

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	9	9	12	12	7	7	34	34	14	14
Mean	11.0000	1.9315	13.0000	1.7200	8.5714	1.8407	63.2647	3.4197	25.0000	3.0769
Standard Deviation	12.6194	0.9657	22.1729	1.1360	8.9416	0.7544	132.3140	0.9597	15.4023	0.5234
C.V.	1.1472	0.5000	1.7056	0.6604	1.0432	0.4098	2.0914	0.2806	0.6161	0.1701
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	27	24	41	24	20	17	233	105	45	42
10th Percentile	-5	2	-15	1	-3	2	-101	9	6	11
Geometric Mean		7		6		6		31		22
$\exp^{(\text{Standard Deviation})}$		3		3		2		3		2

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Lognormal Distributions
Lower Boise River - Main Stem (Irrigation Flow)

	Diversion Dam		Glenwood		Middleton		Parma (Historical)		Parma (1990s)	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	4	1.38629436	8	2.07944154	8	2.07944154	154	5.0369526	48	3.87120101
Value 2	3	1.09861229	5	1.60943791	6	1.79175947	76	4.33073334	39	3.66356165
Value 3	8	2.07944154	6	1.79175947	5	1.60943791	47	3.8501476	91	4.51085951
Value 4	1	0	7	1.94591015	6	1.79175947	84	4.4308168	107	4.67282883
Value 5	3	1.09861229			6	1.79175947	102	4.62497281	41	3.71357207
Value 6	3	1.09861229	4	1.38629436	17	2.83321334	483	6.18001665	40	3.68887945
Value 7	3	1.09861229	83	4.41884061	8	2.07944154	40	3.68887945	20	2.99573227
Value 8			6	1.79175947			84	4.4308168	245	5.50125821
Value 9			4	1.38629436			112	4.71849887	51	3.93182563
Value 10			16	2.77258872			74	4.30406509	34	3.52636052
Value 11			12	2.48490665			43	3.76120012		
Value 12			4	1.38629436			20	2.99573227	32	3.4657359
Value 13			4	1.38629436			72	4.27666612		
Value 14							33	3.49650756		
Value 15			4	1.38629436			19	2.94443898		
Value 16							8	2.07944154		
Value 17							61	4.11087386		
Value 18							42	3.73766962		
Value 19							45	3.80666249		
Value 20							25	3.21887582		
Value 21							95	4.55387689		
Value 22							66	4.18965474		
Value 23							48	3.87120101		
Value 24							39	3.66356165		
Value 25							91	4.51085951		
Value 26							107	4.67282883		
Value 27							41	3.71357207		
Value 28							40	3.68887945		
Value 29							20	2.99573227		
Value 30							245	5.50125821		
Value 31							51	3.93182563		
Value 32							34	3.52636052		
Value 33										
Value 34							32	3.4657359		

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	7	7	13	13	7	7	33	33	11	11
Mean	3.5714	1.1229	12.5385	1.9866	8.0000	1.9967	76.7576	4.0094	68.0000	3.9583
Standard Deviation	2.1492	0.6120	21.4772	0.8569	4.1231	0.4061	86.0966	0.7805	64.1701	0.6914
C.V.	0.6018	0.5451	1.7129	0.4314	0.5154	0.2034	1.1217	0.1947	0.9437	0.1747
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218	-1.2410218

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	6	7	40	22	13	12	187	150	150	127
10th Percentile	1	1	-14	3	3	4	-30	21	-12	22

Geometric Mean	3	7	7	55	52
exp(Standard Deviation)	2	2	2	2	2

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Lognormal Distributions
Lower Boise River - Main Stem (High Flow)

	Diversion Dam		Glenwood		Middleton		Parma (Historical)		Parma (1990s)	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	3	1.09861229	7	1.94591015	11	2.39789527	57	4.04305127	22	3.09104245
Value 2	3	1.09861229	20	2.99573227	15	2.7080502	39	3.66356165	148	4.99721227
Value 3	4	1.38629436	7	1.94591015	71	4.26267988	56	4.02535169	48	3.87120101
Value 4	3	1.09861229	11	2.39789527	30	3.40119738	46	3.8286414	120	4.78749174
Value 5	4	1.38629436	7	1.94591015	29	3.36729583	52	3.95124372	27	3.29583687
Value 6	41	3.71357207	8	2.07944154	10	2.30258509	26	3.25809654	57	4.04305127
Value 7	2	0.69314718	6	1.79175947	15	2.7080502	66	4.18965474	33	3.49650756
Value 8	28	3.33220451	120	4.78749174	30	3.40119738	111	4.7095302	63	4.14313473
Value 9	6	1.79175947	14	2.63905733	211	5.35185813	145	4.97673374	83	4.41884061
Value 10	2	0.69314718	36	3.58351894	18	2.89037175	32	3.4657359	89	4.48863637
Value 11	2	0.69314718	32	3.4657359	7	1.94591015	23	3.13549422	34	3.52636052
Value 12	5	1.60943791	30	3.40119738	17	2.83321334	102	4.62497281	164	5.09986643
Value 13	7	1.94591015	4	1.38629436	2	0.69314718	23	3.13549422	163	5.0937502
Value 14	4	1.38629436	12	2.48490665	15	2.7080502	129	4.8598124	37	3.61091791
Value 15	5	1.60943791	23	3.13549422	24	3.17805383	54	3.98898405	59	4.07753744
Value 16	9	2.19722458	52	3.95124372	14	2.63905733	145	4.97673374	70	4.24849524
Value 17	6	1.79175947	24	3.17805383			31	3.4339872	58	4.06044301
Value 18			5	1.60943791			52	3.95124372	43	3.76120012
Value 19			22	3.09104245			101	4.61512052	89	4.48863637
Value 20			17	2.83321334			71	4.26267988	46	3.8286414
Value 21			25	3.21887582			22	3.09104245	26	3.25809654
Value 22			20	2.99573227			148	4.99721227	47	3.8501476
Value 23			20	2.99573227			48	3.87120101	47	3.8501476
Value 24			27	3.29583687			120	4.78749174		
Value 25			10	2.30258509			27	3.29583687		
Value 26							57	4.04305127		
Value 27							33	3.49650756		
Value 28							63	4.14313473		
Value 29							83	4.41884061		
Value 30							89	4.48863637		
Value 31							34	3.52636052		
Value 32							164	5.09986643		
Value 33							163	5.0937502		
Value 34							37	3.61091791		
Value 35							59	4.07753744		
Value 36							70	4.24849524		
Value 37							58	4.06044301		
Value 38							43	3.76120012		
Value 39							89	4.48863637		
Value 40							46	3.8286414		
Value 41							26	3.25809654		
Value 42							47	3.8501476		
Value 43							47	3.8501476		

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	17	17	25	25	16	16	43	43	23	23
Mean	7.8824	1.6191	22.3600	2.7783	32.4375	2.9243	68.2326	4.0578	66.3913	4.0603
Standard Deviation	10.4516	0.8430	23.3662	0.7967	50.1344	1.0076	40.9813	0.5794	42.6793	0.5773
C.V.	1.3259	0.5206	1.0451	0.2868	1.5456	0.3446	0.6006	0.1428	0.6240	0.1422
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	21	15	52	45	97	88	121	122	123	122
10th Percentile	-5	2	-7	6	-30	5	17	28	15	28

Geometric Mean	5	16	19	58	58
exp[illegible]	2	2	3	2	2

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Lognormal Distributions
Lower Boise River - Main Stem (No Seasonal Split)

	Diversion Dam		Glenwood		Middleton		Parma (Historical)		Parma (1990s)	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 69							46	3.8286414		
Value 70							48	3.87120101		
Value 71							120	4.78749174		
Value 72							91	4.51085951		
Value 73							107	4.67282883		
Value 74							61	4.11087386		
Value 75							26	3.25809654		
Value 76							27	3.29583687		
Value 77							57	4.04305127		
Value 78							41	3.71357207		
Value 79							18	2.89037176		
Value 80							15	2.7080502		
Value 81							33	3.49650756		
Value 82							63	4.14313473		
Value 83							40	3.68887945		
Value 84							12	2.48490665		
Value 85										
Value 86							83	4.41884061		
Value 87							89	4.48863637		
Value 88							20	2.99573227		
Value 89							15	2.7080502		
Value 90							34	3.52636052		
Value 91							164	5.09986643		
Value 92							163	5.0937502		
Value 93							37	3.61091791		
Value 94							59	4.07753744		
Value 95							245	5.50125821		
Value 96							51	3.93182563		
Value 97							15	2.7080502		
Value 98							18	2.89037176		
Value 99							70	4.24849524		
Value 100							58	4.06044301		
Value 101							43	3.76120012		
Value 102							89	4.48863637		
Value 103							46	3.8286414		
Value 104							34	3.52636052		
Value 105							18	2.89037176		
Value 106							14	2.63905733		
Value 107							47	3.8501476		
Value 108							26	3.25809654		
Value 109							47	3.8501476		
Value 110							47	3.8501476		
Value 100							32	3.4657359		

	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Number of Values	33	33	50	50	30	30	110	110	48	48
Mean	7.8182	1.5991	17.5600	2.3185	21.1667	2.4550	69.2545	3.8460	55.6458	3.7501
Standard Deviation	10.1040	0.8600	22.6789	1.0026	38.3452	0.9697	90.2898	0.8182	46.7904	0.7251
C.V.	1.2924	0.5378	1.2915	0.4324	1.8116	0.3950	1.3037	0.2127	0.8409	0.1933
Z90	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876	1.28172876
Z10	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181	-1.24102181

	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution	Normal Distribution	Log-Normal Distribution
90th Percentile	21	15	47	37	70	40	185	134	116	108
10th Percentile	-5	2	-11	3	-26	3	-43	17	-2	17
Geometric Mean		5		10		12		47		43
exp(Standard Deviation)		2		3		3		2		2

Calculation of Geometric Means, 90th and 10th Percentiles of TSS Conc. Data Set for Normal and Lognormal Distributions
Lower Boise River - Main Stem (No Seasonal Split)

	Diversion Dam		Glenwood		Middleton		Parma (Historical)		Parma (1990s)	
	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)	Value	ln(value)
Value 1	8	2.07944154	4	1.38629436	11	2.39789527	71	4.26267988	30	3.40119738
Value 2	3	1.09861229	7	1.94591015	11	2.39789527	57	4.04305127	22	3.09104245
Value 3	3	1.09861229	20	2.99573227	15	2.7080502	154	5.0369526	148	4.99721227
Value 4	4	1.38629436	8	2.07944154	8	2.07944154	76	4.33073334	48	3.87120101
Value 5	4	1.38629436	5	1.60943791	71	4.26267988	47	3.8501476	39	3.66356165
Value 6	3	1.09861229	3	1.09861229	30	3.40119738	28	3.33220451	15	2.7080502
Value 7	4	1.38629436	7	1.94591015	29	3.36729583	18	2.89037176	46	3.8286414
Value 8	3	1.09861229	11	2.39789527	6	1.79175947	664	6.49828215	48	3.87120101
Value 9	3	1.09861229	6	1.79175947	10	2.30258509	20	2.99573227	120	4.78749174
Value 10	41	3.71357207	5	1.60943791	5	1.60943791	39	3.66356165	91	4.51085951
Value 11	2	0.69314718	7	1.94591015	15	2.7080502	56	4.02535169	107	4.67282883
Value 12	8	2.07944154	8	2.07944154	30	3.40119738	46	3.8286414	61	4.11087386
Value 13	6	1.79175947	7	1.94591015	211	5.35185813	52	3.95124372	26	3.25809654
Value 14	28	3.33220451	4	1.38629436	18	2.89037176	84	4.4308168	27	3.29583687
Value 15	6	1.79175947			7	1.94591015	102	4.62497281	57	4.04305127
Value 16	2	0.69314718	6	1.79175947	5	1.60943791	483	6.18001665	41	3.71357207
Value 17	2	0.69314718	120	4.78749174	6	1.79175947	40	3.68887945	18	2.89037176
Value 18	1	0	14	2.63905733	4	1.38629436	147	4.99043259	15	2.7080502
Value 19	27	3.29583687	36	3.58351894	4	1.38629436	9	2.19722458	33	3.49650756
Value 20	5	1.60943791	32	3.4657359	28	3.33220451	22	3.09104245	63	4.14313473
Value 21	4	1.38629436			17	2.83321334	467	6.14632928	40	3.68887945
Value 22	5	1.60943791	4	1.38629436	2	0.69314718	26	3.25809654	12	2.48490665
Value 23	7	1.94591015	83	4.41884061	15	2.7080502	66	4.18965474		
Value 24	4	1.38629436	2	0.69314718	24	3.17805383	111	4.7095302	83	4.41884061
Value 25	5	1.60943791	30	3.40119738	6	1.79175947	145	4.97673374	89	4.48863637
Value 26	3	1.09861229	4	1.38629436	4	1.38629436	84	4.4308168	20	2.99573227
Value 27	6	1.79175947	6	1.79175947	4	1.38629436	112	4.71849887	15	2.7080502
Value 28	2	0.69314718	3	1.09861229	14	2.63905733	74	4.30406509	34	3.52636052
Value 29	38	3.63758616	12	2.48490665	17	2.83321334	43	3.76120012	164	5.09986643
Value 30	9	2.19722458	23	3.13549422	8	2.07944154	20	2.99573227	163	5.0937502
Value 31	6	1.79175947	52	3.95124372			18	2.89037176	37	3.61091791
Value 32	3	1.09861229	24	3.17805383			17	2.83321334	59	4.07753744
Value 33	3	1.09861229	5	1.60943791			32	3.4657359	245	5.50125821
Value 34			4	1.38629436			28	3.33220451	51	3.93182563
Value 35			16	2.77258872			32	3.4657359	15	2.7080502
Value 36			5	1.60943791			23	3.13549422	18	2.89037176
Value 37			4	1.38629436			102	4.62497281	70	4.24849524
Value 38			67	4.20469262			23	3.13549422	58	4.06044301
Value 39			22	3.09104245			72	4.27666612	43	3.76120012
Value 40			17	2.83321334			33	3.49650756	89	4.48863637
Value 41			25	3.21887582			19	2.94443898	46	3.8286414
Value 42			20	2.99573227			8	2.07944154	34	3.52636052
Value 43			12	2.48490665			129	4.8598124	18	2.89037176
Value 44			4	1.38629436			35	3.55534806	14	2.63905733
Value 45			4	1.38629436			53	3.97029191	47	3.8501476
Value 46			3	1.09861229			54	3.98898405	26	3.25809654
Value 47			3	1.09861229			145	4.97673374	47	3.8501476
Value 48			53	3.97029191			61	4.11087386	47	3.8501476
Value 49			20	2.99573227			42	3.73766962		
Value 50			27	3.29583687			54	3.98898405	32	3.4657359
Value 51			10	2.30258509			60	4.09434456		
Value 52							31	3.4339872		
Value 53			4	1.38629436			52	3.95124372		
Value 54							45	3.80666249		
Value 55							25	3.21887582		
Value 56							16	2.77258872		
Value 57							30	3.40119738		
Value 58							101	4.61512052		
Value 59							71	4.26267988		
Value 60							95	4.55387689		
Value 61							66	4.18965474		
Value 62							12	2.48490665		
Value 63							30	3.40119738		
Value 64							22	3.09104245		
Value 65							148	4.99721227		
Value 66							48	3.87120101		
Value 67							39	3.66356165		
Value 68							15	2.7080502		

Appendix C

Normal and Lognormal Statistics for TSS Concentration Data

1992 High Flow Season - Existing Conditions with No Reductions

30 day Avg. Minimum at Parma (start date 3/24/92)

To input target concentration goto --> Cell BS1

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	1	(1 = HF; 2 = IF; 3 = LF)	High Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	1	(1 = HF; 2 = IF; 3 = LF, 4=All)	High Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reducton	Tons/day with 99999999.0 mg/L	Load Ca at 50mg
Glenwood U.S.		7	
Glenwood Control pt.		21	
Middleton U.S.		6	
Middleton Control pt.		9	
Parma U.S.		47	
Parm Control Pt.		36	

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reductic
BR Below Diversion Dam	13203510	n/a	61.2		749.17	5	10.1	0	0	749	5	10	0
Ridenbaugh	13203760	-	58.3		-175.8	5	-2.4	1	0	575	5	8	
Bubb	13204005	-	57.5		0.0	5	0.0	1	0	576	5	8	
Meeves	13204020	-	56.8		-0.2	5	0.0	1	0	577	5	8	
Rossi Mill	13204060	-	56.4		-1.6	5	0.0	1	0	577	5	8	
River Run	13204070	-	56.1		-13.2	5	-0.2	1	0	565	5	8	
Boise City	13204190	-	56.0		-4.2	5	-0.1	1	0	562	5	7	
Boise Water Corp.	200	-	55.9		-1.5	5	0.0	1	0	562	5	7	
Settlers	13205515	-	52.0		-74.7	5	-1.0	1	0	489	5	6	
Davis	13205517	-	52.0		-1.2	5	0.0	1	0	489	5	6	
Boise City Parks	13205613	-	51.5		-0.1	5	0.0	1	0	490	5	6	
Drainage District #3*	13205617	+	51.0		4.9	31	0.4	1	0	497	5	7	0
Thurman Mill	13205622	-	51.0		-5.2	5	-0.1	1	0	493	5	7	
Farmers Union	13205640	-	50.4		-32.1	5	-0.4	1	0	462	5	6	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	1	0	477	5	7	
BR At Glenwood Bridge	13206000	n/a	47.4		475	16	20.5	4	0	481	5	7	0
				Difference:	5	-949	14		Reset:	475	16	21	
Boise Valley	41	-			-23.4	16	-1.0	0.43	0	452	16	19	
Capitol View	43	-			-3.033	16	-0.1	0.43	0	450	16	19	
New Dry Creek	13206090	-	46.0		-19.793	16	-0.9	0.43	0	430	16	19	
New Union	92	-			-3.9	16	-0.2	0.43	0	427	16	18	
Lemp Ditch	13206205	-	45.4		-1.1	16	0.0	0.43	0	426	16	18	
Warm Springs Ditch	13206220	-	44.8		-2.7	16	-0.1	0.43	0	424	16	18	
Graham-Gilbert	13206260	-	44.2		-0.213	16	0.0	0.43	0	424	16	18	
Ballentyne	13206265	-	43.6		-2.77	16	-0.1	0.43	0	422	16	18	
Conway-Hamming	13206270	-	43.0		-0.6	16	0.0	0.43	0	422	16	18	
Eagle Island Park	13206274	-	42.4		-0.07	16	0.0	0.43	0	422	16	18	
Aiken, Thomas	13206290	-	41.8		-1	16	0.0	0.43	0	421	16	18	
Mace-Catlin	13206292	-	41.2		-2.827	16	-0.1	0.43	0	419	16	18	
Mace & Mace	13206295	-	41.1		0	16	0.0	0.43	0	419	16	18	
West Boise WWTF	2	+	40.9		19.998	9	0.5	0.43	0	440	15	18	
Wroten, Jon Pump	13206308	-	40.8		0	15	0.0	3.91	0	444	15	18	
Eagle Drain @ Eagle	13206400	+	40.7		13.998	27	1.0	3.91	0	462	16	19	0.
Hart-Davis	13208450	-	40.5		-5.3	16	-0.2	1.09	0	458	16	19	
Middleton Irrigation	13208710	-	40.4		-66.733	16	-2.8	1.09	0	392	15	16	
Barber Pumps	13208738	-	40.4		-0.023	15	0.0	1.09	0	393	15	16	
Seven Suckers	13208740	-	40.4		-0.44	15	0.0	1.09	0	394	15	16	
Thurman Drain	13209450	+	40.0		12.086	9	0.3	1.09	0	407	15	17	0.
Phyliss	13209480	-	39.2		-153.46	15	-6.3	4.74	0	258	15	10	
Eureka #1	82	-			-22	15	-0.9	4.74	0	241	15	9	
Little Pioneer	13209630	-	38.0		-16.23	15	-0.6	4.74	0	229	14	9	
Canyon County	13209990	-	32.9		-43.44	14	-1.7	4.74	0	191	14	7	
Caldwell High Line	13210005	-	32.4		-22.41	14	-0.8	4.74	0	173	14	6	
BR At Middleton	50	n/a	31.2		172	19	8.8	5	0	178	13	6	0.
				Difference:	62	-166	2		Reset:	172	19	9	
Fifteen Mile Drain	13210810	+	27.9		45.6	141	17.4	4.76	0	222	44	26	0.
Star Feeder*	13210826	+	26.4		33.957	31	2.8	3.07	0	259	42	29	0.
Long Feeder*	13210828	+	26.4		8.967	31	0.7	3.07	0	272	41	30	0.
Watts Creek*	13210829	+	26.4		5.727	31	0.5	3.07	0	200	40	30	0.
Mill Slough	24	+	24.8		96.157	41	10.7	3.07	0	380	40	41	0.
Willow Creek @ Middleton	13210835	+	24.6		18.907	74	3.8	0.79	0	399	42	45	0.
Mason Slough	13210849	+	23.2		12.763	57	2.0	5.55	0	418	41	47	0.
Mason Creek	13210980	+	22.5		61.197	158	26.1	2.77	0	482	56	73	0.
Riverside	13210984	-	22.6		-160.6	56	-24.3	0.59	0	322	56	49	
Hartley (combined)	87	+	22.2		41.587	59	6.6	0.59	0	364	56	55	0.
Sebree	13210992	-	21.9		-145.67	56	-22.1	1.65	0	220	56	33	
Campbell	13210993	-	21.9		-13.713	56	-2.1	1.65	0	208	55	31	
Siebenberg	13210994	-	21.0		-5.4	55	-0.8	1.65	0	204	55	30	
Shipley Pumps	13211001	-	20.8		-0.2	55	0.0	1.65	0	205	54	30	
Wagner Pumps	13211003	-	20.4		-0.2	54	0.0	1.65	0	207	54	30	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	1.65	0	216	52	30	
Indian Creek	13211445	+	18.8		1	58	0.2	3.57	0	220	51	31	0.
Simplot Pumps	13211603	-	17.9		-0.6	51	-0.1	3.74	0	224	50	30	
Eureka No.2	13211725	-	17.6		-71.21	50	-9.7	3.74	0	156	49	21	
Upper Center Point	13211735	-	17.6		-12.713	49	-1.7	3.74	0	147	48	19	
McManus-Teater	13211745	-	17.6		-1.413	48	-0.2	3.74	0	149	47	19	
Lower Center Point	13211825	-	13.2		-13.58	47	-1.7	3.74	0	140	46	17	
Bowman & Swisher	13212548	-	14.1		-8.163	46	-1.0	3.74	0	135	44	16	
Conway Gulch @ Notus	13212550	+	12.2		36.07	120	11.7	3.74	0	175	59	26	0.
Baxter	13212645	-	10.4		-5.677	59	-0.9	3.83	0	173	58	27	
Andrews Ditch	13212832	-	9.4		-5.567	58	-0.9	3.83	0	171	56	26	
Dixie Drain Near Wilder	90	+	9.3		99.937	120	32.2	3.83	0	275	79	58	0.
Mammon Pumps	13212896	-	8.0		-1.95	79	-0.4	3.28	0	276	78	58	
Hass	13212938	-	7.5		-7.323	78	-1.5	3.28	0	272	77	56	
Parma Ditch	13212954	-	6.5		-14.97	77	-3.1	3.28	0	261	76	53	
Island High Line	13212966	-	4.3		-12.723	76	-2.6	3.28	0	251	75	51	
Crawforth Pumps	13212992	-	4.1		0	75	0.0	3.28	0	255	74	51	
McConnel Island	13212994	-	3.5		-19.43	74	-3.9	3.28	0	238	73	47	
BR Near Parma	13213000	n/a	3.5		233	58	36.4	3	0	242	72	47	0.0
				Difference:	-9	427	-10		Measured:	233	58	36	

Notes:

* Surrogate TSS, average of Thurman Drain, Eagle Drain, Mason Slough.

Eagle Drain @ Eagle	13206400	27
Thurman Drain	13209450	9
Mason Slough	13210849	57
	average	31

1995 High Flow Season - Existing Conditions with No Reductions

30 day Avg. Minimum at Parma - (start date 3/12/95)

To input target concentration goto --> Cell BS1

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	1	(1 = HF; 2 = IF; 3 = LF)	High Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	1	(1 = HF; 2 = IF; 3 = LF, 4=All)	High Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day with 9999999.0 mg/L	Load Cap. at 50mg/L
Glenwood U.S.		0	
Glenwood Control pt.		8	22
Middleton U.S.		10	
Middleton Control pt.		15	35
Parma U.S.		168	
Parm Control Pt.		104	90

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam**	13203510	n/a	61.2		0	5	0.0	0	0	0	5	0	0.0
Ridenbaugh	13203760	-	58.3		-26.4	5	-0.4	1	0	-25	5	0	
Bubb	13204005	-	57.5		0.0	5	0.0	1	0	-24	6	0	
Meeves	13204020	-	56.8		0.0	6	0.0	1	0	-22	6	0	
Rossi Mill	13204060	-	56.4		0.0	6	0.0	1	0	-21	6	0	
River Run	13204070	-	56.1		-6.0	6	-0.1	1	0	-25	7	0	
Boise City	13204190	-	56.0		0.0	7	0.0	1	0	-24	7	0	
Boise Water Corp.	200	-	55.9		-1.5	7	0.0	1	0	-24	8	0	
Settlers	13205515	-	52.0		0.0	8	0.0	1	0	-23	8	0	
Davis	13205517	-	52.0		0.0	8	0.0	1	0	-21	8	0	
Boise City Parks	13205613	-	51.5		0.0	8	0.0	1	0	-20	9	0	
Drainage District #3*	13205617	-	51.0		4.2	31	0.4	1	0	-14	3	0	0.0
Thurman Mill	13205622	-	51.0		0.0	3	0.0	1	0	-13	4	0	
Farmers Union	13205640	-	50.4		0.0	4	0.0	1	0	-11	4	0	
Lander Street WWTF	1	-	49.9		13.3	10	0.4	1	0	3	27	0	
BR At Glenwood Bridge	13206000	n/a	47.4		183	16	7.9	4	0	8	11	0	0.0
				Difference:	176	16	8		Reset:	183	16	8	
Boise Valley	41	-			0	16	0.0	0.65	0	184	16	8	
Capitol View	43	-			0	16	0.0	0.65	0	185	16	8	
New Dry Creek	13206090	-	46.0		0	16	0.0	0.65	0	185	16	8	
New Union	92	-			0	16	0.0	0.65	0	186	16	8	
Lemp Ditch	13206205	-	45.4		0	16	0.0	0.65	0	186	16	8	
Warm Springs Ditch	13206220	-	44.8		0	16	0.0	0.65	0	187	16	8	
Graham-Gilbert	13206260	-	44.2		0	16	0.0	0.65	0	188	16	8	
Ballentyne	13206265	-	43.6		0	16	0.0	0.65	0	188	16	8	
Conway-Hamming	13206270	-	43.0		0	16	0.0	0.65	0	189	16	8	
Eagle Island Park	13206274	-	42.4		0	16	0.0	0.65	0	190	15	8	
Aiken, Thomas	13206290	-	41.8		0	15	0.0	0.65	0	190	15	8	
Mace-Catlin	13206292	-	41.2		0	15	0.0	0.65	0	191	15	8	
Mace & Mace	13206295	-	41.1		0	15	0.0	0.65	0	192	15	8	
West Boise WWTF	2	-	40.9		19.998	9	0.5	0.65	0	212	15	8	
Wroten, Jon Pump	13206308	-	40.8		0	15	0.0	5.96	0	218	14	8	
Eagle Drain @ Eagle	13206400	-	40.7		22.36	27	1.6	5.96	0	247	15	10	0.0
Hart-Davis	13208450	-	40.5		0	15	0.0	1.67	0	248	15	10	
Middleton Irrigation	13206710	-	40.4		0	15	0.0	1.67	0	250	15	10	
Barber Pumps	13206738	-	40.4		0	15	0.0	1.67	0	252	15	10	
Seven Suckers	13206740	-	40.4		0	15	0.0	1.67	0	253	15	10	
Thurman Drain	13209450	+	40.0		13.38	9	0.3	1.67	0	268	14	10	0.0
Phyliss	13209480	-	39.2		-6.667	14	-0.3	7.22	0	269	14	10	
Eureka #1	82	-			0	14	0.0	7.22	0	276	14	10	
Little Pioneer	13209630	-	38.0		0	14	0.0	7.22	0	283	13	10	
Canyon County	13209990	-	32.9		0	13	0.0	7.22	0	291	13	10	
Caldwell High Line	13210005	-	32.4		-1.033	13	0.0	7.22	0	297	13	10	
BR At Middleton	50	n/a	31.2		286	19	14.7	7	0	304	12	10	0.0
				Difference:	-18	-95	-5		Reset:	286	19	15	
Fifteen Mile Drain	13210810	-	27.9		74.968	141	28.6	-7.25	0	354	45	43	0.0
Star Feeder*	13210826	-	26.4		32.933	31	2.8	-4.68	0	382	45	46	0.0
Long Feeder*	13210828	-	26.4		6.725	31	0.6	-4.68	0	384	45	47	0.0
Watts Creek*	13210829	-	26.4		5.348	31	0.4	-4.68	0	385	45	47	0.0
Mill Slough	24	-	24.8		101.115	41	11.2	-4.68	0	481	45	58	0.0
Willow Creek @ Middleton	13210835	-	24.6		18.054	74	3.6	-1.21	0	499	46	62	0.0
Mason Slough	13210849	-	23.2		12.512	57	1.9	-8.45	0	502	47	64	0.0
Mason Creek	13210980	-	22.5		79.955	158	34.1	-4.23	0	576	63	96	0.0
Riverside	13210984	-	22.0		0	63	0.0	-0.91	0	577	63	96	
Hartley (combined)	87	-	22.2		53.017	59	8.4	-0.91	0	629	63	105	0.0
Sebree	13210992	-	21.9		-0.19	63	0.0	-2.52	0	626	63	105	
Campbell	13210993	-	21.9		0	63	0.0	-2.52	0	624	63	106	
Siebenberg	13210994	-	21.0		0	63	0.0	-2.52	0	621	63	105	
Shipley Pumps	13211001	-	20.8		-0.2	63	0.0	-2.52	0	619	64	105	
Wagner Pumps	13211003	-	20.4		0	64	0.0	-2.52	0	616	64	105	
Caldwell WWTF	3	-	19.7		7.403	12	0.2	-2.52	0	621	64	105	
Indian Creek	13211445	-	18.8		58.552	58	9.1	-5.43	0	674	64	116	0.0
Simplot Pumps	13211603	-	17.9		-0.2	64	0.0	-5.69	0	668	64	116	
Eureka No.2	13211725	-	17.6		0	64	0.0	-5.69	0	662	65	116	
Upper Center Point	13211735	-	17.6		0	65	0.0	-5.69	0	657	65	116	
McManus-Teater	13211745	-	17.6		0	65	0.0	-5.69	0	651	66	116	
Lower Center Point	13211825	-	15.2		0	66	0.0	-5.69	0	645	66	116	
Bowman & Swisher	13212548	-	14.1		0	66	0.0	-5.69	0	640	67	116	
Conway Gulch @ Notus	13212550	-	12.2		35.039	120	11.3	-5.69	0	669	70	127	0.0
Baxter	13212645	-	10.4		0	70	0.0	-5.84	0	663	71	127	
Andrews Ditch	13212632	-	9.8		0	71	0.0	-5.84	0	657	72	127	
Dixie Drain Near Wilder	90	-	9.5		127.603	120	41.1	-5.84	0	779	80	169	0.0
Mammon Pumps	13212898	-	8.0		0	80	0.0	-5.00	0	774	80	169	
Hass	13212938	-	7.5		0	80	0.0	-5.00	0	769	81	169	
Parma Ditch	13212954	-	6.5		0	81	0.0	-5.00	0	764	82	169	
Island High Line	13212966	-	5.3		0	82	0.0	-5.00	0	759	82	169	
Crawforth Pumps	13212992	-	4.1		0	82	0.0	-5.00	0	754	83	169	
McConnel Island	13212994	-	3.5		0	83	0.0	-5.00	0	749	83	169	
BR Near Parma	13213000	n/a	3.5		667	58	104.4	-5	0	744	84	169	0.0
				Difference:	-77	309	-64		Measured:	667	58	104	

Notes:

* Surrogate TSS average of Thurman Drain, Eagle Drain, Mason Slough.

** No flow data available for USGS station Boise River Below Diversion Dam

Eagle Drain @ Eagle	13206400	27
Thurman Drain	13209450	9
Mason Slough	13210849	57
	average	31

1996 High Flow Season - Existing Conditions with No Reductions

30 day Avg. Minimum at Parma (start date April 18)

To input target concentration goto --> Cell BS1

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	1	(1 = HF; 2 = IF; 3 = LF)	High Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	1	(1 = HF; 2 = IF; 3 = LF, 4=All)	High Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day with 9999999.0 mg/L	Load Cap. at 50mg/L
Glenwood U.S.		-8	
Glenwood Control pt.		170	[illegible]
Middleton U.S.		144	
Middleton Control pt.		128	[illegible]
Parma U.S.		395	
Parm Control Pt.		624	[illegible]

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam**	13203510	n/a	61.2		0	5	0.0	0	0	0	5	0	0.0
Ridenbaugh	13203760	-	58.3		-376.4	5	-5.1	2	0	-376	5	-5	
Hubb	13204005	-	57.5		-8.2	5	-0.1	2	0	-382	5	-5	
Meeves	13204020	-	56.8		-0.2	5	0.0	2	0	-380	5	-5	
Rossi Mill	13204060	-	56.4		-6.5	5	-0.1	2	0	-384	5	-5	
River Run	13204070	-	56.1		-18.0	5	-0.2	2	0	-400	5	-6	
Boise City	13204190	-	56.0		-26.1	5	-0.4	2	0	-423	5	-6	
Boise Water Corp.	200	-	55.9		-2.4	5	0.0	2	0	-423	5	-6	
Settlers	13205515	-	52.0		-83.3	5	-1.2	2	0	-504	5	-7	
Davis	13205517	-	52.0		-2.7	5	0.0	2	0	-505	5	-7	
Boise City Parks	13205613	-	51.5		-0.2	5	0.0	2	0	-503	5	-7	
Drainage District #3*	13205617	+	51.0		7.6	31	0.6	2	0	-493	5	-7	0.0
Thurman Mill	13205622	-	51.0		-24.2	5	-0.3	2	0	-515	5	-7	
Farmers Union	13205640	-	50.4		-108.3	5	-1.4	2	0	-621	5	-8	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	2	0	-605	5	-8	
BR At Glenwood Bridge	13206000	n/a	47.4		3933	16	169.7	7	0	-598	5	-8	0.0
				Difference:	4530	15	178		Reset:	3933	16	170	
Boise Valley	41	-			-54	16	-2.3	1.49	0	3880	16	167	
Capitol View	43	-			-7	16	-0.3	1.49	0	3875	16	167	
New Dry Creek	13206090	-	46.0		-19.563	16	-0.8	1.49	0	3857	16	166	
New Union	92	-			-9	16	-0.4	1.49	0	3849	16	166	
Lemp Ditch	13206205	-	45.4		-0.917	16	0.0	1.49	0	3850	16	166	
Warm Springs Ditch	13206220	-	44.8		-1.84	16	-0.1	1.49	0	3849	16	166	
Graham-Gilbert	13206250	-	44.2		-0.467	16	0.0	1.49	0	3850	16	166	
Ballentyne	13206265	-	43.6		-10.243	16	-0.4	1.49	0	3842	16	165	
Conway-Hamming	13206270	-	43.0		-1.4	16	-0.1	1.49	0	3842	16	165	
Eagle Island Park	13206274	-	42.4		-0.3	16	0.0	1.49	0	3843	16	165	
Aiken, Thomas	13206290	-	41.8		-2.19	16	-0.1	1.49	0	3842	16	165	
Mace-Catlin	13206292	-	41.2		-5.463	16	-0.2	1.49	0	3838	16	165	
Mace & Mace	13206295	-	41.1		0	16	0.0	1.49	0	3840	16	165	
West Boise WWTF	2	+	40.9		19.998	9	0.5	1.49	0	3861	16	165	
Wroten, Jon Pump	13206308	-	40.8		-0.067	16	0.0	13.61	0	3875	16	165	
Eagle Drain @ Eagle	13206400	+	40.7		46.59	27	3.4	13.61	0	3935	16	169	0.0
Hart-Davis	13208450	-	40.5		-5.727	16	-0.2	3.81	0	3933	16	168	
Middleton Irrigation	13206710	-	40.4		-95.343	16	-4.1	3.81	0	3841	16	164	
Barber Pumps	13208738	-	40.4		-0.513	16	0.0	3.81	0	3845	16	164	
Seven Suckers	13208740	-	40.4		-1.143	16	0.0	3.81	0	3847	16	164	
Thurman Drain	13209450	+	40.0		26.77	9	0.7	3.81	0	3878	16	165	0.0
Phyliss	13209480	-	39.2		-355.32	16	-15.1	16.48	0	3539	16	150	
Eureka #1	82	-			-30	16	-1.3	16.48	0	3526	16	149	
Little Pioneer	13209630	-	38.0		-23.097	16	-1.0	16.48	0	3519	16	148	
Canyon County	13209990	-	32.9		-44.31	16	-1.9	16.48	0	3491	15	146	
Caldwell High Line	13210005	-	32.4		-49.173	15	-2.1	16.48	0	3458	15	144	
BR At Middleton	50	n/a	31.2		2498	19	128.0	16	0	3475	15	144	0.0
				Difference:	-977	8	-16		Reset:	2498	19	128	
Fifteen Mile Drain	13210810	+	27.9		176.567	141	67.4	5.44	0	2680	27	195	0.0
Star Feeder*	13210826	+	26.4		68.93	31	5.8	3.51	0	2752	27	201	0.0
Long Feeder*	13210828	+	26.4		14.057	31	1.2	3.51	0	2770	27	202	0.0
Watts Creek*	13210829	+	26.4		20.383	31	1.7	3.51	0	2794	27	204	0.0
Mill Slough	24	+	24.8		166.183	41	18.5	3.51	0	2963	28	222	0.0
Willow Creek @ Middleton	13210835	+	24.6		55.343	74	11.1	0.91	0	3019	29	233	0.0
Mason Slough	13210849	+	23.2		31.357	57	4.8	6.34	0	3057	29	238	0.0
Mason Creek	13210980	+	22.5		188.303	158	80.3	3.17	0	3249	36	315	0.0
Riverside	13210984	-	22.6		-200.073	36	-19.6	0.68	0	3049	36	299	
Hartley (combined)	67	+	22.2		113.36	59	18.0	0.68	0	3163	37	317	0.0
Sebree	13210992	-	21.9		-154.307	37	-15.5	1.89	0	3011	37	302	
Campbell	13210993	-	21.9		-15.04	37	-1.5	1.89	0	2998	37	300	
Siebenberg	13210994	-	21.0		-6.327	37	-0.6	1.89	0	2993	37	299	
Shipley Pumps	13211001	-	20.8		-0.2	37	0.0	1.89	0	2995	37	299	
Wagner Pumps	13211003	-	20.4		-0.4	37	0.0	1.89	0	2998	37	299	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	1.89	0	3006	37	300	
Indian Creek	13211445	+	18.8		121.043	58	18.8	4.08	0	3131	38	318	0.0
Simplot Pumps	13211603	-	17.9		-0.6	38	-0.1	4.27	0	3135	38	318	
Eureka No.2	13211725	-	17.6		-90.07	38	-9.1	4.27	0	3049	38	309	
Upper Center Point	13211735	-	17.6		-15.023	38	-1.5	4.27	0	3038	38	308	
McManus-Teater	13211745	-	17.6		-1.053	38	-0.1	4.27	0	3041	38	308	
Lower Center Point	13211825	-	13.2		-20.037	38	-2.0	4.27	0	3025	37	305	
Bowman & Swisher	13212548	-	14.1		-7.82	37	-0.8	4.27	0	3022	37	305	
Conway Gulch @ Notus	13212550	+	12.2		76.953	120	24.9	4.27	0	3103	39	330	0.0
Baxter	13212645	-	10.4		-9.51	39	-1.0	4.36	0	3095	39	329	
Andrews Ditch	13212832	-	9.4		-14.977	39	-1.6	4.36	0	3057	39	327	
Dixie Drain Near Wilder	90	+	9.3		243.557	120	78.5	4.36	0	3335	45	406	0.0
Mammon Pumps	13212896	-	8.0		-0.933	45	-0.1	3.75	0	3338	45	405	
Hass	13212938	-	7.5		-5.337	45	-0.6	3.75	0	3337	45	405	
Parma Ditch	13212954	-	6.5		-22.533	45	-2.7	3.75	0	3318	45	402	
Island High Line	13212966	-	4.3		-40.523	45	-4.9	3.75	0	3281	45	397	
Crawforth Pumps	13212992	-	4.1		-0.453	45	-0.1	3.75	0	3284	45	397	
McConnel Island	13212994	-	3.5		-15.83	45	-1.9	3.75	0	3272	45	395	
BR Near Parma	13213000	n/a	3.5		3990	58	624.1	4	0	3276	45	395	0.0
				Difference:	714	119	229		Measured:	3990	58	624	

Notes:

* Surrogate TSS average of Thurman Drain, Eagle Drain, Mason Slough.

** No flow data available for USGS station Boise River Below Diversion Dam.

Eagle Drain @ Eagle	13206400	27
Thurman Drain	13209450	9
Mason Slough	13210849	57
	average	31

Appendix C

High-Flow Season Mass Balances—Existing Conditions Based on the Critical 7-Day (Acute) Flow Period of Parma for: 1992, 1995, and 1996

1992 High Flow Season - Existing Conditions with No Reductions

7-day Avg. Minimum at Parma (start date 3/30/92)
Acute TSS Target Concentration of 80 mg/L.

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	1	(1 = HF; 2 = IF; 3 = LF)	High Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	1	(1 = HF; 2 = IF; 3 = LF, 4=All)	High Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reducton	Tons/day 0.0 Percent Red.	Load Cap. at 80mg/L
Glenwood U.S.		4	
Glenwood Control pt.		9	
Middleton U.S.		4	
Middleton Control pt.		7	26
Parma U.S.		56	
Parm Control Pt.		26	38

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	
BR Below Diversion Dam	13203510	n/a	61.2		235	5	3.2	0	0	235	5	3	
Ridenbaugh	13203760	-	58.3		0.0	5	0.0	0	0	235	5	3	
Bubb	13204005	-	57.5		0.0	5	0.0	0	0	236	5	3	
Meeves	13204020	-	56.8		0.0	5	0.0	0	0	236	5	3	
Rossi Mill	13204060	-	56.4		0.0	5	0.0	0	0	237	5	3	
River Run	13204070	-	56.1		-12.9	5	-0.2	0	0	225	5	3	
Boise City	13204190	-	56.0		0.0	5	0.0	0	0	225	5	3	
Boise Water Corp.	200	-	55.9		-1.4	5	0.0	0	0	224	5	3	
Settlers	13205515	-	52.0		0.0	5	0.0	0	0	225	5	3	
Davis	13205517	-	52.0		0.0	5	0.0	0	0	225	5	3	
Boise City Parks	13205613	-	51.5		0.0	5	0.0	0	0	226	5	3	
Drainage District #3*	13205617	+	51.0		4.2	31	0.3	0	0	230	5	3	0
Thurman Mill	13205622	-	51.0		0.0	5	0.0	0	0	231	5	3	
Farmers Union	13205640	-	50.4		0.0	5	0.0	0	0	231	5	3	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	0	0	245	6	4	
BR At Glenwood Bridge	13206000	n/a	47.4		217	16.0	9.3	2	0	247	6	4	0
				Difference:	-30	-70	-6		Reset:	217	16	9	
Boise Valley	41	-			0	16	0.0	0.83	0	218	16	9	
Capitol View	43	-			0	16	0.0	0.83	0	218	16	9	
New Dry Creek	13206090	-	46.0		0	16	0.0	0.83	0	219	16	9	
New Union	92	-			0	16	0.0	0.83	0	220	16	9	
Lemp Ditch	13206205	-	45.4		0	16	0.0	0.83	0	221	16	9	
Warm Springs Ditch	13206220	-	44.8		0	16	0.0	0.83	0	222	16	9	
Graham-Gilbert	13206260	-	44.2		-0.286	16	0.0	0.83	0	222	16	9	
Ballentyne	13206265	-	43.6		0	16	0.0	0.83	0	223	16	9	
Conway-Hamming	13206270	-	43.0		-0.857	16	0.0	0.83	0	223	15	9	
Eagle Island Park	13206274	-	42.4		0	15	0.0	0.83	0	224	15	9	
Aiken, Thomas	13206290	-	41.8		0	15	0.0	0.83	0	225	15	9	
Mace-Catlin	13206292	-	41.2		-0.857	15	0.0	0.83	0	225	15	9	
Mace & Mace	13206295	-	41.1		0	15	0.0	0.83	0	226	15	9	
West Boise WWTF	2	+	40.9		19.998	9	0.5	0.83	0	246	15	10	
Wroten, Jon Pump	13206308	-	40.8		0	15	0.0	7.62	0	254	14	10	
Eagle Drain @ Eagle	13206400	+	40.7		14.009	27	1.0	7.62	0	276	14	11	0
Hart-Davis	13208450	-	40.5		-2	14	-0.1	2.13	0	276	14	11	
Middleton Irrigation	13208710	-	40.4		-31.429	14	-1.2	2.13	0	246	14	9	
Barber Pumps	13208738	-	40.4		0	14	0.0	2.13	0	249	14	9	
Seven Suckers	13208740	-	40.4		0	14	0.0	2.13	0	251	14	9	
Thurman Drain	13209450	+	40.0		10.746	9	0.3	2.13	0	264	14	10	0
Phyliss	13209480	-	39.2		-66.071	14	-2.4	9.23	0	207	13	7	
Eureka #1	82	-			-21.429	13	-0.8	9.23	0	195	12	7	
Little Pioneer	13209630	-	38.0		-14.529	12	-0.5	9.23	0	189	12	6	
Canyon County	13209990	-	32.9		-36.571	12	-1.2	9.23	0	162	11	5	
Caldwell High Line	13210005	-	32.4		-18.743	11	-0.6	9.23	0	152	11	4	
BR At Middleton	50	n/a	31.2		135	19	6.9	9	0	162	10	4	0
				Difference:	-26	-37	-3		Reset:	135	19	7	
Fifteen Mile Drain	13210810	+	27.9		22.098	141	8.4	-3.34	0	154	37	15	0
Star Feeder*	13210826	+	26.4		20.934	31	1.7	-2.16	0	173	37	17	0
Long Feeder*	13210828	+	26.4		5.757	31	0.5	-2.16	0	176	37	18	0
Watts Creek*	13210829	+	26.4		1.106	31	0.1	-2.16	0	175	37	18	0
Mill Slough	24	+	24.8		72.6	41	8.1	-2.16	0	246	39	26	0
Willow Creek @ Middleton	13210835	+	24.6		11.557	74	2.3	-0.56	0	257	41	28	0
Mason Slough	13210849	+	23.2		10.66	57	1.6	-3.90	0	264	42	30	0
Mason Creek	13210980	+	22.5		37.354	158	15.9	-1.95	0	299	57	46	0
Riverside	13210984	-	22.6		-122.7	57	-18.7	-0.42	0	176	57	27	
Hartley (combined)	87	+	22.2		23.27	59	3.7	-0.42	0	199	57	31	0
Sebree	13210992	-	21.9		0	57	0.0	-1.16	0	198	57	31	
Campbell	13210993	-	21.9		0	57	0.0	-1.16	0	196	58	31	
Siebenberg	13210994	-	21.0		0	58	0.0	-1.16	0	195	58	31	
				Difference:	-26	-37	-3		Reset:	135	19	7	
Fifteen Mile Drain	13210810	+	27.9		22.098	141	8.4	-3.34	0	154	37	15	0
Star Feeder*	13210826	+	26.4		20.934	31	1.7	-2.16	0	173	37	17	0
Long Feeder*	13210828	+	26.4		5.757	31	0.5	-2.16	0	176	37	18	0
Watts Creek*	13210829	+	26.4		1.106	31	0.1	-2.16	0	175	37	18	0
Mill Slough	24	+	24.8		72.6	41	8.1	-2.16	0	246	39	26	0
Willow Creek @ Middleton	13210835	+	24.6		11.557	74	2.3	-0.56	0	257	41	28	0
Mason Slough	13210849	+	23.2		10.66	57	1.6	-3.90	0	264	42	30	0
Mason Creek	13210980	+	22.5		37.354	158	15.9	-1.95	0	299	57	46	0
Riverside	13210984	-	22.6		-122.7	57	-18.7	-0.42	0	176	57	27	
Hartley (combined)	87	+	22.2		23.27	59	3.7	-0.42	0	199	57	31	0
Sebree	13210992	-	21.9		0	57	0.0	-1.16	0	198	57	31	
Campbell	13210993	-	21.9		0	57	0.0	-1.16	0	196	58	31	
Siebenberg	13210994	-	21.0		0	58	0.0	-1.16	0	195	58	31	
Shipley Pumps	13211001	-	20.8		-0.143	58	0.0	-1.16	0	194	58	31	
Wagner Pumps	13211003	-	20.4		0	58	0.0	-1.16	0	193	59	31	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	-1.16	0	199	57	31	
Indian Creek	13211445	+	18.8		0.837	58	0.1	-2.50	0	197	58	31	0
Simplot Pumps	13211603	-	17.9		-0.429	58	-0.1	-2.62	0	194	59	31	
Eureka No.2	13211725	-	17.6		-14.286	59	-2.3	-2.62	0	177	60	29	
Upper Center Point	13211735	-	17.6		0	60	0.0	-2.62	0	175	61	29	
McManus-Teater	13211745	-	17.6		0	61	0.0	-2.62	0	172	62	29	
Lower Center Point	13211825	-	13.2		0	62	0.0	-2.62	0	170	63	29	
Bowman & Swisher	13212548	-	14.1		-1.429	63	-0.2	-2.62	0	165	64	28	
Conway Gulch @ Notus	13212550	+	12.2		25.751	120	8.3	-2.62	0	189	72	37	0
Baxter	13212645	-	10.4		0	72	0.0	-2.69	0	186	73	37	
Andrews Ditch	13212832	-	9.4		0	73	0.0	-2.69	0	183	74	37	
Dixie Drain Near Wilder	90	+	9.3		60.18	120	19.4	-2.69	0	241	86	56	0
Mammon Pumps	13212896	-	8.0		0	86	0.0	-2.31	0	238	87	56	
Hass	13212938	-	7.5		0	87	0.0	-2.31	0	236	88	56	
Parma Ditch	13212954	-	6.5		0	88	0.0	-2.31	0	234	89	56	
Island High Line	13212966	-	5.3		0	89	0.0	-2.31	0	231	90	56	
Crawforth Pumps	13212992	-	4.1		0	90	0.0	-2.31	0	229	91	56	
McConnel Island	13212994	-	3.5		0	91	0.0	-2.31	0	227	92	56	
BR Near Parma	13213000	n/a	3.5		167	58	26.2	-2	0	225	93	56	0
				Difference:	-57	194	-30		Measured:	167	58	26	

Notes:

* Surrogate TSS, average of Thurman Drain, Eagle Drain, Mason Slough.

Eagle Drain @ Eagle	13206400	27
Thurman Drain	13209450	9
Mason Slough	13210849	57
	average	31

1995 High Flow Season - Existing Conditions with No Reductions

7-day Avg. Minimum at Parma (start date 4/2/95)

Acute TSS Target Concentration of 80 mg/L

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	1	(1 = HF; 2 = IF; 3 = LF)	High Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	1	(1 = HF; 2 = IF; 3 = LF, 4=All).	High Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day with 9999999.0 mg/L	Load Cap. at 80mg/L
Glenwood U.S.		0	
Glenwood Control pt.		8	33
Middleton U.S.		7	
Middleton Control pt.		15	61
Parma U.S.		185	
Parm Control Pt.		90	124

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Measured Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam**	13203510	n/a	61.2		0	5	0.0	0	0	0	5	0	0.0
Ridenbaugh	13203760	-	58.3		-64.6	5	-0.9	2	0	-62	5	-1	
Bubb	13204005	-	57.5		0.0	5	0.0	2	0	-60	5	-1	
Meeves	13204020	-	56.8		0.0	5	0.0	2	0	-58	6	-1	
Rossi Mill	13204060	-	56.4		0.0	6	0.0	2	0	-55	6	-1	
River Run	13204070	-	56.1		-18.0	6	-0.3	2	0	-71	6	-1	
Boise City	13204190	-	56.0		0.0	6	0.0	2	0	-69	6	-1	
Boise Water Corp.	200	-	55.9		-4.6	6	-0.1	2	0	-71	6	-1	
Settiers	13205515	-	52.0		0.0	6	0.0	2	0	-68	7	-1	
Davis	13205517	-	52.0		0.0	7	0.0	2	0	-66	7	-1	
Boise City Parks	13205613	-	51.5		0.0	7	0.0	2	0	-64	7	-1	
Drainage District #3*	13205617	+	51.0		6.0	31	0.5	2	0	-55	5	-1	0.0
Thurman Mill	13205622	-	51.0		0.0	5	0.0	2	0	-53	5	-1	
Farmers Union	13205640	-	50.4		0.0	5	0.0	2	0	-51	5	-1	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	2	0	-35	4	0	
BR At Glenwood Bridge	13206000	n/a	47.4		193	16	8.3	7	0	-28	5	0	0.0
				Difference:	220	15	9		Reset:	193	16	8	
Boise Valley	41	-			-54	16	-2.3	1.49	0	140	16	6	
Capitol View	43	-			-7	16	-0.3	1.49	0	135	16	6	
New Dry Creek	13206090	-	46.0		0	16	0.0	1.49	0	136	15	6	
New Union	92	-			-9	15	-0.4	1.49	0	129	15	5	
Lemp Ditch	13206205	-	45.4		0	15	0.0	1.49	0	130	15	5	
Warm Springs Ditch	13206220	-	44.8		0	15	0.0	1.49	0	132	15	5	
Graham-Gilbert	13206260	-	44.2		0	15	0.0	1.49	0	133	15	5	
Ballentyne	13206265	-	43.6		0	15	0.0	1.49	0	134	15	5	
Conway-Hamming	13206270	-	43.0		0	15	0.0	1.49	0	136	14	5	
Eagle Island Park	13206274	-	42.4		0	14	0.0	1.49	0	137	14	5	
Aiken, Thomas	13206290	-	41.8		0	14	0.0	1.49	0	139	14	5	
Mace-Catlin	13206292	-	41.2		0	14	0.0	1.49	0	140	14	5	
Mace & Mace	13206295	-	41.1		0	14	0.0	1.49	0	142	14	5	
West Boise WWTF	2	+	40.9		19.998	9	0.5	1.49	0	163	13	6	
Wroten, Jon Pump	13206308	-	40.8		0	13	0.0	13.61	0	177	12	6	
Eagle Drain @ Eagle	13206400	+	40.7		23.3	27	1.7	13.61	0	214	13	7	0.0
Hart-Davis	13208450	-	40.5		0	13	0.0	3.81	0	218	13	7	
Middleton Irrigation	13208710	-	40.4		0	13	0.0	3.81	0	222	12	7	
Barber Pumps	13208738	-	40.4		0	12	0.0	3.81	0	225	12	7	
Seven Suckers	13208740	-	40.4		0	12	0.0	3.81	0	229	12	7	
Thurman Drain	13209450	+	40.0		18.529	9	0.5	3.81	0	252	12	8	0.0
Phyliss	13209480	-	39.2		0	12	0.0	16.48	0	268	11	8	
Eureka #1	82	-			-30	11	-0.9	16.48	0	254	10	7	
Little Pioneer	13209630	-	38.0		0	10	0.0	16.48	0	271	10	7	
Canyon County	13209990	-	32.9		0	10	0.0	16.48	0	287	9	7.0	
Caldwell High Line	13210005	-	32.4		0	9	0.0	16.48	0	304	8.6	7.05	
BR At Middleton	50	n/a	31.2		301	19	15.4	16	0	320	8.2	7.05	0.0
				Difference:	19	-164	6.8		Reset:	301	19	15	
Fifteen Mile Drain	13210810	+	27.9		72.8	141	27.8	5.44	0	380	42	43	0.0
Star Feeder*	13210826	+	26.4		42.857	31	3.6	3.51	0	426	41	47	0.0
Long Feeder*	13210828	+	26.4		10.414	31	0.9	3.51	0	440	40	48	0.0
Watts Creek*	13210829	+	26.4		0	31	0.0	3.51	0	443	40	48	0.0
Mill Slough	24	+	24.8		145.6	41	16.2	3.51	0	593	40	64	0.0
Willow Creek @ Middleton	13210835	+	24.6		14.857	74	3.0	0.91	0	608	41	67	0.0
Mason Slough	13210849	+	23.2		13.429	57	2.1	6.34	0	628	41	69	0.0
Mason Creek	13210980	+	22.5		85.657	158	36.5	3.17	0	717	55	105	0.0
Riverside	13210984	-	22.6		0	55	0.0	0.68	0	718	54	105	
Hartley (combined)	67	+	22.2		53.086	59	8.4	0.68	0	771	55	114	0.0
Sebree	13210992	-	21.9		0	55	0.0	1.89	0	773	55	114	
Campbell	13210993	-	21.9		0	55	0.0	1.89	0	775	54	114	
Siebenberg	13210994	-	21.0		0	54	0.0	1.89	0	777	54	114	
Shipley Pumps	13211001	-	20.8		-0.6	54	-0.1	1.89	0	778	54	114	
Wagner Pumps	13211003	-	20.4		0	54	0.0	1.89	0	780	54	114	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	1.89	0	790	54	114	
Indian Creek	13211445	+	18.8		77.243	58	12.0	4.08	0	871	54	126	0.0
Simplot Pumps	13211603	-	17.9		-0.6	54	-0.1	4.27	0	875	53	126	
Eureka No.2	13211725	-	17.6		0	53	0.0	4.27	0	879	53	126	
Upper Center Point	13211735	-	17.6		0	53	0.0	4.27	0	883	53	126	
McManus-Teater	13211745	-	17.6		0	53	0.0	4.27	0	887	53	126	
Lower Center Point	13211825	-	13.2		0	53	0.0	4.27	0	892	52	126	
Bowman & Swisher	13212548	-	14.1		0	52	0.0	4.27	0	896	52	126	
Conway Gulch @ Notus	13212550	+	12.2		39.114	120	12.7	4.27	0	939	55	139	0.0
Baxter	13212645	-	10.4		0	55	0.0	4.38	0	944	54	139	
Andrews Ditch	13212832	-	9.4		0	54	0.0	4.38	0	948	54	139	
Dixie Drain Near Wilder	90	+	9.3		145.143	120	46.8	4.38	0	1098	63	185	0.0
Mammon Pumps	13212896	-	8.0		0	63	0.0	3.75	0	1101	62	185	
Hass	13212938	-	7.5		0	62	0.0	3.75	0	1105	62	185	
Parma Ditch	13212954	-	6.5		0	62	0.0	3.75	0	1109	62	185	
Island High Line	13212966	-	4.3		0	62	0.0	3.75	0	1113	62	185	
Crawforth Pumps	13212992	-	4.1		0	62	0.0	3.75	0	1116	62	185	
McConnel Island	13212994	-	3.5		0	62	0.0	3.75	0	1120	61	185	
BR Near Parma	13213000	n/a	3.5		577	58	90.2	4	0	1124	61	185	0.0
				Difference:	-547	64	-95		Measured:	577	58	90	

Notes:

* Surrogate TSS, average of Thurman Drain, Eagle Drain, Mason Slough.

** No flow data available for USGS station Boise River Below Diversion Dam.

Eagle Drain @ Eagle	13206400	27
Thurman Drain	13209450	9
Mason Slough	13210849	57
	average	31

1996 High Flow Season - Existing Conditions with No Reductions

7-day Avg. Minimum at Parma (start date 5/4/96)
Acute TSS Target Concentration of 80 mg/L

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	1	(1 = HF; 2 = IF; 3 = LF)	High Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	1	(1 = HF; 2 = IF; 3 = LF, 4=All)	High Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day with 9999999.0 mg/L	Load Cap. at 80mg/L
Glenwood U.S.		-10	
Glenwood Control pt.		129	639
Middleton U.S.		101	
Middleton Control pt.		66	280
Parma U.S.		331	
Parm Control Pt.		424	585

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Daily Mass Load (T/day)	Incremental Flow (cfs)	Incremental Groundwater Concentration (mg/L)	Groundwater Flow (cfs)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam**	13203510	n/a	61.2		0	5	0.0	0	0	0	0	5	0	0.0
Ridenbaugh	13203760	-	58.3		-432.3	5	-5.8	2	0	-430	-430	5	-6	
Bubb	13204005	-	57.5		-7.5	5	-0.1	2	0	-435	-435	5	-6	
Meeves	13204020	-	56.8		-0.7	5	0.0	2	0	-434	-434	5	-6	
Rossi Mill	13204060	-	56.4		-6.1	5	-0.1	2	0	-437	-437	5	-6	
River Run	13204070	-	56.1		-16.0	5	-0.2	2	0	-453	-453	5	-6	
Boise City	13204190	-	56.0		-29.0	5	-0.4	2	0	-480	-480	5	-7	
Boise Water Corp.	200	-	55.9		-2.7	5	0.0	2	0	-480	-480	5	-7	
Settlers	13205515	-	52.0		-114.9	5	-1.6	2	0	-592	-592	5	-8	
Davis	13205517	-	52.0		-6.0	5	-0.1	2	0	-596	-596	5	-8	
Boise City Parks	13205613	-	51.5		-0.2	5	0.0	2	0	-594	-594	5	-8	
Drainage District #3*	13205617	+	51.0		7.2	31	0.6	2	0	-584	-584	5	-8	0.0
Thurman Mill	13205622	-	51.0		-25.5	5	-0.3	2	0	-608	-608	5	-8	
Farmers Union	13205640	-	50.4		-129.7	5	-1.7	2	0	-735	-735	5	-10	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	2	0	-719	-719	5	-10	
BR At Glenwood Bridge	13206000	n/a	47.4		2997	16	129.3	7	0	-712	-712	5	-10	0.0
				Difference:	3709	14	139		Reset:		2997	16	129	
Boise Valley	41	-			-54	16	-2.3	1.49	0	2945	2945	16	127	
Capitol View	43	-			-7	16	-0.3	1.49	0	2939	2939	16	127	
New Dry Creek	13206090	-	46.0		-22.714	16	-1.0	1.49	0	2918	2918	16	126	
New Union	92	-			-9	16	-0.4	1.49	0	2910	2910	16	125	
Lemp Ditch	13206205	-	45.4		-1.529	16	-0.1	1.49	0	2910	2910	16	125	
Warm Springs Ditch	13206220	-	44.8		-3.186	16	-0.1	1.49	0	2909	2909	16	125	
Graham-Gilbert	13206260	-	44.2		-0.8	16	0.0	1.49	0	2909	2909	16	125	
Ballentyne	13206265	-	43.6		-12.971	16	-0.6	1.49	0	2898	2898	16	125	
Conway-Hamming	13206270	-	43.0		-2.386	16	-0.1	1.49	0	2897	2897	16	124	
Eagle Island Park	13206274	-	42.4		-0.3	16	0.0	1.49	0	2898	2898	16	124	
Aiken, Thomas	13206290	-	41.8		-0.243	16	0.0	1.49	0	2899	2899	16	124	
Mace-Catlin	13206292	-	41.2		-6.114	16	-0.3	1.49	0	2895	2895	16	124	
Mace & Mace	13206295	-	41.1		0	16	0.0	1.49	0	2896	2896	16	124	
West Boise WWTF	2	+	40.9		19.998	9	0.5	1.49	0	2918	2918	16	125	
Wroten, Jon Pump	13206308	-	40.8		0	16	0.0	13.61	0	2931	2931	16	125	
Eagle Drain @ Eagle	13206400	+	40.7		49.886	27	3.6	13.61	0	2995	2995	16	128	0.0
Hart-Davis	13208450	-	40.5		-7.643	16	-0.3	3.81	0	2991	2991	16	128	
Middleton Irrigation	13206710	-	40.4		-123.8	16	-5.3	3.81	0	2871	2871	16	123	
Barber Pumps	13206738	-	40.4		-0.5	16	0.0	3.81	0	2874	2874	16	123	
Seven Suckers	13206740	-	40.4		-1.2	16	-0.1	3.81	0	2877	2877	16	123	
Thurman Drain	13209450	+	40.0		26.057	9	0.7	3.81	0	2907	2907	16	123	0.0
Phyliss	13209480	-	39.2		-359.914	16	-15.3	16.48	0	2563	2563	16	108	
Eureka #1	82	-			-30	16	-1.3	16.48	0	2550	2550	16	107	
Little Pioneer	13209630	-	38.0		-26.029	16	-1.1	16.48	0	2540	2540	15	106	
Canyon County	13209990	-	32.9		-53.143	15	-2.2	16.48	0	2504	2504	15	103.4	
Caldwell High Line	13210005	-	32.4		-47.743	15	-2.0	16.48	0	2472	2472	15.2	101.39	
BR At Middleton	50	n/a	31.2		1298	19	66.5	16	0	2489	1298	15.1	101.39	0.0
				Difference:	-1191	11	-35		Reset:		1298	19	66	
Fifteen Mile Drain	13210810	+	27.9		206	141	78.6	5.44	0	1509	1509	36	145	0.0
Star Feeder*	13210826	+	26.4		66.829	31	5.6	3.51	0	1579	1579	35	151	0.0
Long Feeder*	13210828	+	26.4		14.629	31	1.2	3.51	0	1598	1598	35	152	0.0
Watts Creek*	13210829	+	26.4		20.886	31	1.7	3.51	0	1622	1622	35	154	0.0
Mill Slough	24	+	24.8		174.771	41	19.4	3.51	0	1800	1800	36	173	0.0
Willow Creek @ Middleton	13210835	+	24.6		58.857	74	11.8	0.91	0	1860	1860	37	185	0.0
Mason Slough	13210849	+	23.2		36.286	57	5.5	6.34	0	1903	1903	37	190	0.0
Mason Creek	13210980	+	22.5		201.229	158	85.8	3.17	0	2107	2107	49	276	0.0
Riverside	13210984	-	22.6		-200.771	49	-26.3	0.68	0	1907	1907	49	250	
Hartley (combined)	87	+	22.2		124	59	19.7	0.68	0	2032	2032	49	270	0.0
Sebree	13210992	-	21.9		-207.571	49	-27.5	1.89	0	1826	1826	49	242	
Campbell	13210993	-	21.9		-14.971	49	-2.0	1.89	0	1813	1813	49	240	
Siebenberg	13210994	-	21.0		-9	49	-1.2	1.89	0	1806	1806	49	239	
Shipley Pumps	13211001	-	20.8		-0.2	49	0.0	1.89	0	1807	1807	49	239	
Wagner Pumps	13211003	-	20.4		-0.4	49	-0.1	1.89	0	1809	1809	49	239	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	1.89	0	1816	1816	49	239	
Indian Creek	13211445	+	18.8		129	58	20.1	4.08	0	1951	1951	49	259	0.0
Simplot Pumps	13211603	-	17.9		-0.6	49	-0.1	4.27	0	1955	1955	49	259	
Eureka No.2	13211725	-	17.6		-94.714	49	-12.5	4.27	0	1865	1865	49	246	
Upper Center Point	13211735	-	17.6		-18.286	49	-2.4	4.27	0	1851	1851	49	244	
McManus-Teater	13211745	-	17.6		-2.686	49	-0.4	4.27	0	1852	1852	49	244	
Lower Center Point	13211825	-	15.2		-27.086	49	-3.6	4.27	0	1829	1829	49	240	
Bowman & Swisher	13212548	-	14.1		-9.586	49	-1.3	4.27	0	1824	1824	49	239	
Conway Gulch @ Notus	13212550	+	12.2		80.957	120	26.2	4.27	0	1909	1909	51	265	0.0
Baxter	13212645	-	10.4		-10.414	51	-1.4	4.38	0	1903	1903	51	264	
Andrews Ditch	13212832	-	9.4		-17.586	51	-2.4	4.38	0	1890	1890	51	261	
Dixie Drain Near Wilder	90	+	9.3		269.771	120	86.9	4.38	0	2164	2164	60	348	0.0
Mammon Pumps	13212896	-	8.0		-1.429	60	-0.2	3.75	0	2166	2166	60	348	
Hass	13212936	-	7.5		-5.114	60	-0.8	3.75	0	2165	2165	59	347	
Parma Ditch	13212954	-	6.5		-28.086	59	-4.5	3.75	0	2141	2141	59	343	
Island High Line	13212966	-	4.5		-47.814	59	-7.7	3.75	0	2097	2097	59	335	
Crawforth Pumps	13212992	-	4.1		-0.8	59	-0.1	3.75	0	2100	2100	59	335	
McConnel Island	13212994	-	3.5		-26.157	59	-4.2	3.75	0	2077	2077	59	331	
BR Near Parma	13213000	n/a	13.5		2710	58	423.8	4	0	2081	2710	58	424	0.0
				Difference:	629	55	93		Measured:		2710	58	424	

Notes:

* Surrogate TSS, average of Thurman Drain, Eagle Drain, Mason Slough.
** No flow data available for USGS station Boise River Below Diversion Dam.

Eagle Drain @ Eagle	13206400	27
Thurman Drain	13209450	9
Mason Slough	13210849	57
	average	31

Appendix D

Irrigation Flow Season Mass Balances—Existing Conditions Based on the Critical 30-Day (Chronic) Flow Period at Parma for: 1992, 1995, and 1996

1992 Irrigation Flow Season - Existing Conditions with No Reductions

30-day Avg. Minimum at Parma (start date 8/21/92)

To input target concentration goto --> Cell BS1

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	2	(1 = HF; 2 = IF; 3 = LF)	Irrigation Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	2	(1 = HF; 2 = IF; 3 = LF, 4=All)	Irrigation Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reducton	Tons/day with 9999999.0 mg/L	Load Cap. at 50mg/L
Glenwood U.S.		3	
Glenwood Control pt.		5	27
Middleton U.S.		1	
Middleton Control pt.		3	20
Parma U.S.		22	
Parm Control Pt.		22	22

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam	13203510	n/a	61.2		414	3	3.3	0	0	414	3	3	0.0
Ridenbaugh	13203760	-	58.3		0.0	3	0.0	4	0	417	3	3	
Bubb	13204005	-	57.5		-3.0	3	0.0	4	0	418	3	3	
Meeves	13204020	-	56.8		-0.8	3	0.0	4	0	421	3	3	
Rossi Mill	13204060	-	56.4		-6.0	3	0.0	4	0	419	3	3	
River Run	13204070	-	56.1		-18.0	3	-0.1	4	0	404	3	3	
Boise City	13204190	-	56.0		0.0	3	0.0	4	0	408	3	3	
Boise Water Corp.	200	-	55.9		-2.0	3	0.0	4	0	410	3	3	
Settlers	13205515	-	52.0		0.0	3	0.0	4	0	413	3	3	
Davis	13205517	-	52.0		-2.2	3	0.0	4	0	415	3	3	
Boise City Parks	13205613	-	51.5		-0.2	3	0.0	4	0	418	3	3	
Drainage District #3*	13205617	+	51.0		4.0	47	0.5	4	0	426	3	4	0.0
Thurman Mill	13205622	-	51.0		-19.6	3	-0.2	4	0	410	3	3	
Farmers Union	13205640	-	50.4		-97.0	3	-0.8	4	0	317	3	3	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	4	0	334	3	3	
BR At Glenwood Bridge	13206000	n/a	47.4		290	7	5.5	11	0	345	3	3	0.0
				Difference:	-55	17	-2		Reset:	290	7	5	
Boise Valley	41	-			-46	7	-0.9	1.92	0	246	7	5	
Capitol View	43	-			-7	7	-0.1	1.92	0	241	7	4	
New Dry Creek	13206090	-	46.0		-31.133	7	-0.6	1.92	0	212	7	4	
New Union	92	-			-9	7	-0.2	1.92	0	205	7	4	
Lemp Ditch	13206205	-	45.4		-2.3	7	0.0	1.92	0	205	7	4	
Warm Springs Ditch	13206220	-	44.8		-3.25	7	-0.1	1.92	0	203	7	4	
Graham-Gilbert	13206260	-	44.2		-0.317	7	0.0	1.92	0	205	7	4	
Ballentyne	13206265	-	43.6		-9.583	7	-0.2	1.92	0	197	7	3	
Conway-Hamming	13206270	-	43.0		-0.817	7	0.0	1.92	0	198	6	3	
Eagle Island Park	13206274	-	42.4		-0.263	6	0.0	1.92	0	200	6	3	
Aiken, Thomas	13206290	-	41.8		-2.3	6	0.0	1.92	0	200	6	3	
Mace-Catlin	13206292	-	41.2		-6.217	6	-0.1	1.92	0	195	6	3	
Mace & Mace	13206295	-	41.1		0	6	0.0	1.92	0	197	6	3	
West Boise WWTF	2	+	40.9		19.998	9	0.5	1.92	0	219	6	4	
Wroten, Jon Pump	13206308	-	40.8		0	6	0.0	17.54	0	237	6	4	
Eagle Drain @ Eagle	13206400	+	40.7		21.71	32	1.9	17.54	0	276	8	6	0.0
Hart-Davis	13208450	-	40.5		-7.943	8	-0.2	4.91	0	273	7	6	
Middleton Irrigation	13208710	-	40.4		-76.017	7	-1.5	4.91	0	202	7	4	
Barber Pumps	13208738	-	40.4		-0.513	7	0.0	4.91	0	206	7	4	
Seven Suckers	13208740	-	40.4		-1.2	7	0.0	4.91	0	210	7	4	
Thurman Drain	13209450	+	40.0		18.467	12	0.6	4.91	0	233	7	5	0.0
Phyliss	13209480	-	39.2		-90.353	7	-1.8	21.24	0	164	6	3	
Eureka #1	82	-			-29	6	-0.5	21.24	0	156	5	2	
Little Pioneer	13209630	-	38.0		-18.763	5	-0.3	21.24	0	159	5	2	
Canyon County	13209990	-	32.9		-49.52	5	-0.6	21.24	0	131	4	1	
Caldwell High Line	13210005	-	32.4		-20.777	4	-0.2	21.24	0	131	3	1	
BR At Middleton	50	n/a	31.2		159	7	3.0	21	0	152	3	1	0.0
				Difference:	7	102	2		Reset:	159	7	3	
Fifteen Mile Drain	13210810	+	27.9		10.86	92	2.7	11.06	0	181	12	6	0.0
Star Feeder*	13210826	+	26.4		49.617	47	6.2	7.14	0	238	19	12	0.0
Long Feeder*	13210828	+	26.4		6	47	0.8	7.14	0	251	19	13	0.0
Watts Creek*	13210829	+	26.4		6.75	47	0.8	7.14	0	265	19	14	0.0
Mill Slough	24	+	24.8		96.173	33	8.6	7.14	0	368	22	22	0.0
Willow Creek @ Middleton	13210835	+	24.6		3.317	52	0.5	1.84	0	373	22	23	0.0
Mason Slough	13210849	+	23.2		12.343	96	3.2	12.91	0	398	24	26	0.0
Mason Creek	13210980	+	22.5		55.177	113	16.8	6.45	0	460	34	43	0.0
Riverside	13210984	-	22.6		-183.99	34	-17.0	1.38	0	277	34	26	
Hartley (combined)	87	+	22.2		57.027	57	8.8	1.38	0	336	38	34	0.0
Sebree	13210992	-	21.9		-199.573	35	-20.4	3.84	0	140	37	14	
Campbell	13210993	-	21.9		-22.577	37	-2.2	3.84	0	121	36	12	
Siebenberg	13210994	-	21.0		-8.753	36	-0.8	3.84	0	117	35	11	
Shipley Pumps	13211001	-	20.8		-0.2	35	0.0	3.84	0	120	33	11	
Wagner Pumps	13211003	-	20.4		-0.4	33	0.0	3.84	0	124	32	11	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	3.84	0	135	30	11	
Indian Creek	13211445	+	18.8		2.817	40	0.3	8.30	0	146	29	11	0.0
Simplot Pumps	13211603	-	17.9		-0.6	29	0.0	8.69	0	154	27	11	
Eureka No.2	13211725	-	17.6		-58.783	27	-4.3	8.69	0	104	25	7	
Upper Center Point	13211735	-	17.6		-14.717	25	-1.0	8.69	0	98	23	6	
McManus-Teater	13211745	-	17.6		-1	23	-0.1	8.69	0	106	21	6	
Lower Center Point	13211825	-	13.2		-15	21	-0.8	8.69	0	99	19	5	
Bowman & Swisher	13212548	-	14.1		-9.8	19	-0.5	8.69	0	98	17	5	
Conway Gulch @ Notus	13212550	+	12.2		23.763	139	8.9	8.69	0	131	38	14	0.0
Baxter	13212645	-	10.4		-7.85	38	-0.8	8.91	0	132	36	13	
Andrews Ditch	13212832	-	9.4		-7.917	36	-0.8	8.91	0	133	33	12	
Dixie Drain Near Wilder	90	+	9.3		126.967	51	17.5	8.91	0	269	41	29	0.0
Mammon Pumps	13212896	-	8.0		-5.483	41	-0.6	7.64	0	271	39	29	
Hass	13212938	-	7.5		-6.057	39	-0.6	7.64	0	272	38	28	
Parma Ditch	13212954	-	6.5		-16.86	38	-1.7	7.64	0	263	37	26	
Island High Line	13212966	-	4.3		-21.85	37	-2.2	7.64	0	249	36	24	
Crawforth Pumps	13212992	-	4.1		-0.8	36	-0.1	7.64	0	256	35	24	
McConnel Island	13212994	-	2.5		-27.717	35	-2.6	7.64	0	236	34	22	
BR Near Parma	13213000	n/a	3.5		160	52	22.4	8	0	243	33	22	0.0
				Difference:	-84	4	1		Measured:	160	52	22	

Notes:

* Surrogate TSS, average of Thurman Drain, Eagle Drain, Mason Slough.

Eagle Drain @ Eagle	13206400	32
Thurman Drain	13209450	12
Mason Slough	13210849	96
	average	47

1995 Irrigation Flow Season - Existing Conditions with No Reductions

30-day Avg. Minimum at Parma (start 8/19/95)

To input target concentration goto --> Cell BS1

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	2	(1 = HF; 2 = IF; 3 = LF)	Irrigation Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	2	(1 = HF; 2 = IF; 3 = LF, 4=All)	Irrigation Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day with 9999999.0 mg/L	Load Cap. at 50mg/L
Glenwood U.S.		-6	
Glenwood Control pt.		16	[illegible] 64
Middleton U.S.		5	
Middleton Control pt.		7	[illegible] 54
Parma U.S.		95	
Parm Control Pt.		136	[illegible] 131

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam**	13203510	n/a	61.2		0	3	0.0	0	0	0	3	0	0.0
Ridenbaugh	13203760	-	58.3		-443.4	3	-3.6	4	0	-440	3	-4	
Hubb	13204005	-	57.5		-7.3	3	-0.1	4	0	-443	3	-4	
Meeves	13204020	-	56.8		-0.6	3	0.0	4	0	-440	3	-4	
Rossi Mill	13204060	-	56.4		-6.0	3	0.0	4	0	-443	3	-4	
River Run	13204070	-	56.1		-18.0	3	-0.2	4	0	-457	3	-4	
Boise City	13204190	-	56.0		-25.7	3	-0.2	4	0	-479	3	-4	
Boise Water Corp.	200	-	55.9		-3.9	3	0.0	4	0	-479	3	-4	
Settlers	13205515	-	52.0		-148.5	3	-1.3	4	0	-624	3	-5	
Davis	13205517	-	52.0		-6.7	3	-0.1	4	0	-627	3	-5	
Boise City Parks	13205613	-	51.5		-0.2	3	0.0	4	0	-623	3	-5	
Drainage District #3*	13205617	+	51.0		6.0	47	0.8	4	0	-614	3	-5	0.0
Thurman Mill	13205622	-	51.0		-23.5	3	-0.2	4	0	-633	3	-5	
Farmers Union	13205640	-	50.4		-175.0	3	-1.3	4	0	-805	3	-6	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	4	0	-788	3	-6	
BR At Glenwood Bridge	13206000	n/a	47.4		827	7	15.6	11	0	-776	3	-6	0.0
				Difference:	1603	5	21		Reset:	827	7	16	
Boise Valley	41	-			-46	7	-0.9	1.92	0	783	7	15	
Capitol View	43	-			-7	7	-0.1	1.92	0	778	7	15	
New Dry Creek	13206090	-	46.0		-38.767	7	-0.7	1.92	0	741	7	14	
New Union	92	-			-9	7	-0.2	1.92	0	734	7	14	
Lemp Ditch	13206205	-	45.4		-2.75	7	-0.1	1.92	0	733	7	14	
Warm Springs Ditch	13206220	-	44.8		-4	7	-0.1	1.92	0	731	7	14	
Graham-Gilbert	13206260	-	44.2		-1	7	0.0	1.92	0	732	7	14	
Ballentyne	13206265	-	43.6		-13.933	7	-0.3	1.92	0	720	7	13	
Conway-Hamming	13206270	-	43.0		-2.3	7	0.0	1.92	0	720	7	13	
Eagle Island Park	13206274	-	42.4		-0.257	7	0.0	1.92	0	721	7	13	
Aiken, Thomas	13206290	-	41.8		-2.733	7	-0.1	1.92	0	720	7	13	
Mace-Catlin	13206292	-	41.2		-6.317	7	-0.1	1.92	0	716	7	13	
Mace & Mace	13206295	-	41.1		0	7	0.0	1.92	0	718	7	13	
West Boise WWTF	2	+	40.9		19.998	9	0.5	1.92	0	740	7	14	
Wroten, Jon Pump	13206308	-	40.8		-0.8	7	0.0	17.54	0	757	7	14	
Eagle Drain @ Eagle	13206400	+	40.7		27.5	32	2.4	17.54	0	802	7	16	0.0
Hart-Davis	13208450	-	40.5		-7.217	7	-0.1	4.91	0	799	7	16	
Middleton Irrigation	13208710	-	40.4		-111.237	7	-2.2	4.91	0	693	7	14	
Barber Pumps	13208738	-	40.4		-0.413	7	0.0	4.91	0	698	7	14	
Seven Suckers	13205740	-	40.4		-1.2	7	0.0	4.91	0	701	7	14	
Thurman Drain	13209450	+	40.0		22.167	12	0.7	4.91	0	728	7	14	0.0
Phyliss	13209480	-	39.2		-357.85	7	-7.0	21.24	0	392	7	7	
Eureka #1	82	-			-29	7	-0.5	21.24	0	384	6	7	
Little Pioneer	13209630	-	38.0		-24.543	6	-0.4	21.24	0	381	6	6	
Canyon County	13209990	-	32.9		-57.723	6	-1.0	21.24	0	344	6	5	
Caldwell High Line	13210005	-	32.4		-43.88	6	-0.7	21.24	0	322	5	5	
BR At Middleton	50	n/a	31.2		382	7	7.2	21	0	343	5	5	0.0
				Difference:	40	24	3		Reset:	382	7	7	
Fifteen Mile Drain	13210810	+	27.9		146.55	92	36.5	11.06	0	540	30	44	0.0
Star Feeder*	13210826	+	26.4		59.027	47	7.4	7.14	0	606	31	51	0.0
Long Feeder*	13210828	+	26.4		11.933	47	1.5	7.14	0	625	31	53	0.0
Watts Creek*	13210829	+	26.4		19.1	47	2.4	7.14	0	652	31	55	0.0
Mill Slough	24	+	24.8		147.873	33	13.2	7.14	0	807	31	66	0.0
Willow Creek @ Middleton	13210835	+	24.6		23.833	52	3.3	1.84	0	832	32	72	0.0
Mason Slough	13210849	+	23.2		16.75	96	4.3	12.91	0	862	33	76	0.0
Mason Creek	13210980	+	22.5		144.833	113	44.2	6.45	0	1013	44	120	0.0
Riverside	13210984	-	22.6		-259.967	44	-30.8	1.38	0	755	44	89	
Hartley (combined)	87	+	22.2		81.223	57	12.5	1.38	0	837	45	102	0.0
Sebree	13210992	-	21.9		-230.803	45	-28.1	3.84	0	610	45	74	
Campbell	13210993	-	21.9		-22.1	45	-2.7	3.84	0	592	45	71	
Siebenberg	13210994	-	21.0		-6.283	45	-0.8	3.84	0	590	44	70	
Shipley Pumps	13211001	-	20.8		-0.6	44	-0.1	3.84	0	593	44	70	
Wagner Pumps	13211003	-	20.4		-0.4	44	0.0	3.84	0	596	44	70	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	3.84	0	607	43	70	
Indian Creek	13211445	+	18.8		40.657	40	4.4	8.30	0	656	42	75	0.0
Simplot Pumps	13211603	-	17.9		-0.6	42	-0.1	8.69	0	665	42	75	
Eureka No.2	13211725	-	17.6		-103.743	42	-11.7	8.69	0	569	41	63	
Upper Center Point	13211735	-	17.6		-22.477	41	-2.5	8.69	0	556	40	61	
McManus-Teater	13211745	-	17.6		-2.733	40	-0.3	8.69	0	562	40	60	
Lower Center Point	13211825	-	13.2		-27.38	40	-2.9	8.69	0	543	39	57	
Bowman & Swisher	13212548	-	14.1		-16.673	39	-1.8	8.69	0	535	39	56	
Conway Gulch @ Notus	13212550	+	12.2		65.057	139	24.4	8.69	0	609	49	80	0.0
Baxter	13212645	-	10.4		-14.933	49	-2.0	8.91	0	603	48	78	
Andrews Ditch	13212832	-	9.4		-16.207	48	-2.1	8.91	0	595	47	76	
Dixie Drain Near Wilder	90	+	9.3		242.307	51	33.4	8.91	0	847	46	109	0.0
Mammon Pumps	13212896	-	8.0		-4.743	48	-0.6	7.64	0	850	47	109	
Hass	13212938	-	7.5		-7.373	47	-0.9	7.64	0	850	47	108	
Parma Ditch	13212954	-	6.5		-21.677	47	-2.7	7.64	0	836	47	105	
Island High Line	13212966	-	4.3		-42.427	47	-5.3	7.64	0	801	46	100	
Crawforth Pumps	13212992	-	4.1		-0.653	46	-0.1	7.64	0	808	46	100	
McConnel Island	13212994	-	3.5		-38.107	46	-4.7	7.64	0	777	45	95	
BR Near Parma	13213000	n/a	3.5		968	52	135.8	8	0	785	45	95	0.0
				Difference:	183	83	41		Measured:	968	52	135	

Notes:

* Surragate TSS, average of Thurman Drain, Eagle Drain, Mason Slough.

** No flow data available for USGS station Boise River Below Diversion Dam.

Eagle Drain @ Eagle	13206400	32
Thurman Drain	13209450	12
Mason Slough	13210849	96
	average	47

1996 Irrigation Flow Season - Existing Conditions with No Reductions

30-day Avg. Minimum at Parma (start date 6/28/96)
To input target concentration goto --> Cell BS1

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	2	(1 = HF; 2 = IF; 3 = LF)	Irrigation Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	2	(1 = HF; 2 = IF; 3 = LF, 4=All)	Irrigation Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day with 9999999.0 mg/L	Load Cap. at 50mg/L
Glenwood U.S.		-7	
Glenwood Control pt.		23	[illegible]
Middleton U.S.		9	
Middleton Control pt.		10	[illegible]
Parma U.S.		111	
Parm Control Pt.		146	[illegible]

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam**	13203510	n/a	61.2		0	3	0.0	0	0	0	3	0	0.0
Ridenbaugh	13203760	-	58.5		-497.6	3	-4.0	4	0	-494	3	-4	
Bubb	13204005	-	57.5		-7.5	3	-0.1	4	0	-498	3	-4	
Meeves	13204020	-	56.8		-0.6	3	0.0	4	0	-495	3	-4	
Rossi Mill	13204060	-	56.4		-6.2	3	-0.1	4	0	-497	3	-4	
River Run	13204070	-	56.1		-18.0	3	-0.1	4	0	-511	3	-4	
Boise City	13204190	-	56.0		-27.7	3	-0.2	4	0	-535	3	-5	
Boise Water Corp.	200	-	55.9		-7.3	3	-0.1	4	0	-539	3	-5	
Settlers	13205515	-	52.0		-170.7	3	-1.5	4	0	-706	3	-6	
Davis	13205517	-	52.0		-7.3	3	-0.1	4	0	-710	3	-6	
Boise City Parks	13205613	-	51.5		-0.2	3	0.0	4	0	-706	3	-6	
Drainage District #3*	13205617	+	51.0		6.2	47	0.8	4	0	-696	3	-5	0.0
Thurman Mill	13205622	-	51.0		-29.4	3	-0.2	4	0	-722	3	-6	
Farmers Union	13205640	-	50.4		-191.6	3	-1.5	4	0	-910	3	-7	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	4	0	-893	3	-7	
BR At Glenwood Bridge	13206000	n/a	47.4		1239	7	23.4	11	0	-881	3	-7	0.0
				Difference:	2121	5	30		Reset:	1239	7	23	
Boise Valley	41	-			-46	7	-0.9	1.92	0	1195	7	23	
Capitol View	43	-			-7	7	-0.1	1.92	0	1190	7	22	
New Dry Creek	13206090	-	46.0		-46.603	7	-0.9	1.92	0	1145	7	22	
New Union	92	-			-9	7	-0.2	1.92	0	1138	7	21	
Lemp Ditch	13206205	-	45.4		-3	7	-0.1	1.92	0	1137	7	21	
Warm Springs Ditch	13206220	-	44.8		-4	7	-0.1	1.92	0	1135	7	21	
Graham-Gilbert	13206260	-	44.2		-1	7	0.0	1.92	0	1136	7	21	
Ballentyne	13206265	-	43.6		-16.933	7	-0.3	1.92	0	1121	7	21	
Conway-Hamming	13206270	-	43.0		-3	7	-0.1	1.92	0	1120	7	21	
Eagle Island Park	13206274	-	42.4		-0.283	7	0.0	1.92	0	1121	7	21	
Aiken, Thomas	13206290	-	41.8		-3.767	7	-0.1	1.92	0	1120	7	21	
Mace-Catlin	13206292	-	41.2		-6.94	7	-0.1	1.92	0	1115	7	21	
Mace & Mace	13206295	-	41.1		0	7	0.0	1.92	0	1117	7	21	
West Boise WWTF	2	+	40.9		19.998	9	0.5	1.92	0	1138	7	21	
Wroten, Jon Pump	13206308	-	40.8		-1	7	0.0	17.54	0	1155	7	21	
Eagle Drain @ Eagle	13206400	+	40.7		34.073	32	3.0	17.54	0	1207	7	24	0.0
Hart-Davis	13208450	-	40.5		-8.933	7	-0.2	4.91	0	1203	7	24	
Middleton Irrigation	13208710	-	40.4		-158.637	7	-3.1	4.91	0	1049	7	21	
Barber Pumps	13206738	-	40.4		-0.517	7	0.0	4.91	0	1053	7	21	
Seven Suckers	13206740	-	40.4		-1.2	7	0.0	4.91	0	1057	7	21	
Thurman Drain	13209450	+	40.0		21.393	12	0.7	4.91	0	1083	7	21	0.0
Phyliss	13209480	-	39.2		-455.833	7	-9.0	21.24	0	649	7	12	
Eureka #1	82	-			-29	7	-0.6	21.24	0	641	7	12	
Little Pioneer	13209630	-	38.0		-25.867	7	-0.5	21.24	0	636	7	11	
Canyon County	13209990	-	32.9		-74.93	7	-1.3	21.24	0	583	6	10	
Caldwell High Line	13210005	-	32.4		-57.517	6	-1.0	21.24	0	546	6	9	
BR At Middleton	50	n/a	31.2		545	7	10.3	21	0	568	6	9	0.0
				Difference:	-22	-21	-1		Reset:	545	7	10	
Fifteen Mile Drain	13210810	+	27.9		154.923	92	38.6	11.06	0	711	25	49	0.0
Star Feeder*	13210826	+	26.4		62.737	47	7.9	7.14	0	781	27	57	0.0
Long Feeder*	13210828	+	26.4		10.477	47	1.3	7.14	0	799	27	58	0.0
Watts Creek*	13210829	+	26.4		21.78	47	2.7	7.14	0	828	27	61	0.0
Mill Slough	24	+	24.8		201.797	33	18.0	7.14	0	1037	28	79	0.0
Willow Creek @ Middleton	13210835	+	24.6		23.167	52	3.2	1.84	0	1062	29	82	0.0
Mason Slough	13210849	+	23.2		29.37	96	7.6	12.91	0	1104	30	90	0.0
Mason Creek	13210980	+	22.5		160.343	113	49.0	6.45	0	1271	40	139	0.0
Riverside	13210984	-	22.6		-239.95	40	-26.2	1.38	0	1032	40	112	
Hartley (combined)	87	+	22.2		91.693	57	14.1	1.38	0	1125	42	127	0.0
Sebree	13210992	-	21.9		-272.85	42	-30.7	3.84	0	856	42	96	
Campbell	13210993	-	21.9		-25.793	42	-2.9	3.84	0	834	41	93	
Siebenberg	13210994	-	21.0		-10.307	41	-1.1	3.84	0	828	41	92	
Shipley Pumps	13211001	-	20.8		-0.2	41	0.0	3.84	0	831	41	92	
Wagner Pumps	13211003	-	20.4		-0.4	41	0.0	3.84	0	835	41	92	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	3.84	0	846	40	92	
Indian Creek	13211445	+	18.8		48.37	40	5.2	8.30	0	903	40	97	0.0
Simplot Pumps	13211603	-	17.9		-0.6	40	-0.1	8.69	0	911	40	97	
Eureka No.2	13211725	-	17.6		-112.063	40	-12.0	8.69	0	808	39	85	
Upper Center Point	13211735	-	17.6		-25.523	39	-2.7	8.69	0	791	39	83	
McManus-Teater	13211745	-	17.6		-3	39	-0.3	8.69	0	796	38	82	
Lower Center Point	13211825	-	13.2		-33.467	38	-3.5	8.69	0	772	38	79	
Bowman & Swisher	13212548	-	14.1		-14.83	38	-1.5	8.69	0	765	37	77	
Conway Gulch @ Notus	13212550	+	12.2		66.52	139	25.0	8.69	0	841	45	102	0.0
Baxter	13212645	-	10.4		-11.277	45	-1.4	8.91	0	836	45	101	
Andrews Ditch	13212832	-	9.4		-16.663	45	-2.0	8.91	0	831	44	99	
Dixie Drain Near Wilder	90	+	9.3		205.12	51	28.2	8.91	0	1045	45	127	0.0
Mammon Pumps	13212896	-	8.0		-7	45	-0.9	7.64	0	1045	45	126	
Hass	13212938	-	7.5		-8.227	45	-1.0	7.64	0	1045	44	125	
Parma Ditch	13212954	-	6.5		-28.123	44	-3.4	7.64	0	1024	44	122	
Island High Line	13212966	-	4.3		-39.857	44	-4.7	7.64	0	992	44	117	
Crawforth Pumps	13212992	-	4.1		-0.783	44	-0.1	7.64	0	999	43	117	
McConnel Island	13212994	-	3.5		-47.177	43	-5.5	7.64	0	959	43	111	
BR Near Parma	13213000	n/a	3.5		1038	52	145.5	8	0	967	43	111	0.0
				Difference:	71	178	34		Measured:	1038	52	146	

Notes:

* Surrogate TSS, average of Thurman Drain, Eagle Drain, Mason Slough.
** No flow data for USGS station Boise River Below Diversion Dam.

Eagle Drain @ Eagle	13206400	32
Thurman Drain	13209450	12
Mason Slough	13210849	96
	average	4[illegible]

Appendix E

Irrigation Flow Season Mass Balances—Existing Conditions Based on the Critical 7-Day (Acute) Flow Period at Parma for: 1992, 1995, and 1996

1992 Irrigation Flow Season - Existing Conditions with No Reductions

7-day Avg. Minimum at Parma (start date 8/29/92)
Acute TSS Target Concentration of 80 mg/L.

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	2	(1 = HF; 2 = IF; 3 = LF)	Irrigation Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	2	(1 = HF; 2 = IF; 3 = LF, 4=All)	Irrigation Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day with 9999999.0 mg/L	Load Cap. at 80mg/L
Glenwood U.S.		3	
Glenwood Control pt.		6	30
Middleton U.S.		1	
Middleton Control pt.		3	25
Parma U.S.		18	
Parm Control Pt.		16	24

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Incremental Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam	13203510	n/a	61.2		444	3	3.6	0	0	444	3	4	0.0
Ridenbaugh	13203760	-	58.3		0.0	3	0.0	4	0	447	3	4	
Bubh	13204005	-	57.5		-3.0	3	0.0	4	0	448	3	4	
Meeves	13204020	-	56.8		-0.5	3	0.0	4	0	451	3	4	
Rossi Mill	13204060	-	56.4		-6.0	3	0.0	4	0	449	3	4	
River Run	13204070	-	56.1		-18.0	3	-0.1	4	0	435	3	3	
Boise City	13204190	-	56.0		0.0	3	0.0	4	0	436	3	3	
Boise Water Corp.	200	-	55.9		-2.0	3	0.0	4	0	440	3	3	
Settlers	13205515	-	52.0		0.0	3	0.0	4	0	444	3	3	
Davis	13205517	-	52.0		-1.4	3	0.0	4	0	446	3	3	
Boise City Parks	13205613	-	51.5		-0.2	3	0.0	4	0	449	3	3	
Drainage District #3*	13205617	+	51.0		4.0	47	0.5	4	0	457	3	4	0.0
Thurman Mill	13205622	-	51.0		-19.9	3	-0.2	4	0	441	3	4	
Farmers Union	13205640	-	50.4		-100.6	3	-0.8	4	0	344	3	3	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	4	0	361	3	3	
BR At Glenwood Bridge	13206000	n/a	47.4		306	7	5.8	11	0	372	3	3	0.0
				Difference:	-66	-14	-2.3		Reset:	306	7	6	
Boise Valley	41	-			-46	7	-0.9	1.92	0	262	7	5	
Capitol View	43	-			-7	7	-0.1	1.92	0	257	7	5	
New Dry Creek	13206090	-	46.0		-31.5	7	-0.6	1.92	0	227	7	4	
New Union	92	-			-9	7	-0.2	1.92	0	220	7	4	
Lemp Ditch	13206205	-	45.4		-2.571	7	0.0	1.92	0	220	7	4	
Warm Springs Ditch	13206220	-	44.8		-3.071	7	-0.1	1.92	0	218	7	4	
Graham-Gilbert	13206260	-	44.2		0	7	0.0	1.92	0	220	7	4	
Ballentyne	13206265	-	43.6		-10.214	7	-0.2	1.92	0	212	7	4	
Conway-Hamming	13206270	-	43.0		-0.214	7	0.0	1.92	0	214	6	4	
Eagle Island Park	13206274	-	42.4		-0.257	6	0.0	1.92	0	215	6	4	
Aiken, Thomas	13206290	-	41.8		-2.571	6	0.0	1.92	0	215	6	4	
Mace-Catlin	13206292	-	41.2		-6.071	6	-0.1	1.92	0	211	6	4	
Mace & Mace	13206295	-	41.1		0	6	0.0	1.92	0	213	6	4	
West Boise WWTF	2	+	40.9		19.998	9	0.5	1.92	0	234	6	4	
Wroten, Jon Pump	13206308	-	40.8		0	6	0.0	17.54	0	252	6	4	
Eagle Drain @ Eagle	13206400	+	40.7		22.143	32	1.9	17.54	0	292	8	6	0.0
Hart-Davis	13208450	-	40.5		-8	8	-0.2	4.91	0	289	7	6	
Middleton Irrigation	13208710	-	40.4		-87.429	7	-1.8	4.91	0	206	7	4	
Barber Pumps	13208738	-	40.4		-0.5	7	0.0	4.91	0	210	7	4	
Seven Suckers	13208740	-	40.4		-1.2	7	0.0	4.91	0	214	7	4	
Thurman Drain	13209450	+	40.0		18	12	0.6	4.91	0	237	7	5	0.0
Phyliss	13209480	-	39.2		-86.714	7	-1.7	21.24	0	170	6	3	
Eureka #1	82	-			-29	6	-0.5	21.24	0	162	5	2	
Little Pioneer	13209630	-	38.0		-19	5	-0.3	21.24	0	164	5	2	
Canyon County	13209990	-	32.9		-51.429	5	-0.7	21.24	0	134	4	1	
Caldwell High Line	13210005	-	32.4		-20.286	4	-0.2	21.24	0	135	3	1	
BR At Middleton	50	n/a	31.2		149	7	2.8	21	0	156	3	1	0.0
				Difference:	-8	-78	-2		Reset:	149	7	3	
Fifteen Mile Drain	13210810	+	27.9		8.643	92	2.2	11.06	0	168	11	5	0.0
Star Feeder*	13210826	+	26.4		49.286	47	6.2	7.14	0	225	18	11	0.0
Long Feeder*	13210828	+	26.4		6	47	0.8	7.14	0	236	19	12	0.0
Watts Creek*	13210829	+	26.4		7	47	0.9	7.14	0	252	19	13	0.0
Mill Slough	241	+	24.8		93	33	8.3	7.14	0	352	22	21	0.0
Willow Creek @ Middleton	13210835	+	24.6		3	52	0.4	1.84	0	357	22	21	0.0
Mason Slough	13210849	+	23.2		10.214	96	2.6	12.91	0	380	24	24	0.0
Mason Creek	13210980	+	22.5		45.786	113	14.0	6.45	0	432	33	36	0.0
Riverside	13210984	-	22.6		-186.714	33	-16.5	1.38	0	247	33	22	
Hartley (combined)	67	+	22.2		55.571	57	8.6	1.38	0	304	37	30	0.0
Schree	13210992	-	21.9		-201	37	-20.0	3.84	0	107	36	10	
Campbell	13210993	-	21.9		-23.429	36	-2.2	3.84	0	87	34	8	
Siebenberg	13210994	-	21.0		-6.786	34	-0.8	3.84	0	82	32	7	
Shipley Pumps	13211001	-	20.8		-0.2	32	0.0	3.84	0	86	31	7	
Wagner Pumps	13211003	-	20.4		-0.4	31	0.0	3.84	0	89	30	7	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	3.84	0	101	27	7	
Indian Creek	13211445	+	18.8		2.143	40	0.2	8.30	0	111	25	8	0.0
Simplot Pumps	13211603	-	17.9		-0.6	25	0.0	8.69	0	119	24	8	
Eureka No.2	13211725	-	17.6		-42.571	24	-2.8	8.69	0	84	21	5	
Upper Center Point	13211735	-	17.6		-13.543	21	-0.8	8.69	0	79	19	4	
McManus-Teater	13211745	-	17.6		-2.214	19	-0.1	8.69	0	86	17	4	
Lower Center Point	13211825	-	13.2		-13.943	17	-0.6	8.69	0	81	15	3	
Bowman & Swisher	13212548	-	14.1		-5.471	15	-0.4	8.69	0	80	13	3	
Conway Gulch @ Notus	13212550	+	12.2		23.629	139	8.9	8.69	0	112	39	12	0.0
Baxter	13212645	-	10.4		-7.471	39	-0.8	8.91	0	114	36	11	
Andrews Ditch	13212832	-	9.4		-6.957	36	-0.7	8.91	0	116	33	10	
Dixie Drain Near Wilder	90	+	9.3		101.886	51	14.0	8.91	0	226	40	24	0.0
Mammon Pumps	13212896	-	8.0		-7	40	-0.8	7.64	0	227	39	24	
Hass	13212938	-	7.5		-5.757	39	-0.6	7.64	0	229	37	23	
Parma Ditch	13212954	-	6.5		-16.043	37	-1.6	7.64	0	220	36	21	
Island High Line	13212966	-	4.3		-20.314	36	-2.0	7.64	0	208	35	19	
Crawforth Pumps	13212992	-	4.1		-0.8	35	-0.1	7.64	0	215	33	19	
McConnel Island	13212994	-	3.5		-19.029	33	-1.7	7.64	0	203	32	18	
BR Near Parma	13213000	n/a	3.5		113	52	15.9	6	0	211	31	18	0.0
				Difference:	-97	-7	-2		Measured:	113	52	16	

Notes:

* Surrogate TSS, average of Thurman Drain, Eagle Drain, Mason Slough.

Eagle Drain @ Eagle	13206400	32
Thurman Drain	13209450	12
Mason Slough	13210849	96
	average	47

1995 Irrigation Flow Season - Existing Conditions with No Reductions

7-day Avg. Minimum at Parma (start date 8/22/95)

Acute TSS Target Concentration of 80 mg/L.

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	2	(1 = HF; 2 = IF; 3 = LF)	Irrigation Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	2	(1 = HF; 2 = IF; 3 = LF, 4=All)	Irrigation Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day with 9999999.0 mg/L	Load Cap. at 80mg/L
Glenwood U.S.		-6	
Glenwood Control pt.		16	113
Middleton U.S.		4	
Middleton Control pt.		7	75
Parma U.S.		75	
Parm Control Pt.		119	164

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam**	13203510	n/a	61.2		0	3	0.0	0	0	0	3	0	0.0
Ridenbaugh	13203760	-	58.3		-452.0	3	-3.7	4	0	-448	3	-4	
Bubb	13204005	-	57.5		-7.5	3	-0.1	4	0	-452	3	-4	
Meeves	13204020	-	56.8		-0.5	3	0.0	4	0	-449	3	-4	
Rossi Mill	13204060	-	56.4		-6.0	3	0.0	4	0	-451	3	-4	
River Run	13204070	-	56.1		-18.0	3	-0.2	4	0	-466	3	-4	
Boise City	13204190	-	56.0		-26.5	3	-0.2	4	0	-488	3	-4	
Boise Water Corp.	200	-	55.9		-4.6	3	0.0	4	0	-489	3	-4	
Settlers	13205515	-	52.0		-156.0	3	-1.3	4	0	-642	3	-6	
Davis	13205517	-	52.0		-7.0	3	-0.1	4	0	-645	3	-6	
Boise City Parks	13205613	-	51.5		-0.2	3	0.0	4	0	-641	3	-6	
Drainage District #3*	13205617	+	51.0		6.0	47	0.8	4	0	-632	3	-5	0.0
Thurman Mill	13205622	-	51.0		-23.5	3	-0.2	4	0	-652	3	-5	
Farmers Union	13205640	-	50.4		-180.8	3	-1.4	4	0	-829	3	-6	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	4	0	-812	3	-6	
BR At Glenwood Bridge	13206000	n/a	47.4		843	7	15.9	11	0	-800	3	-6	0.0
				Difference:	1843	5	22		Reset:	843	7	16	
Boise Valley	41	-			-46	7	-0.9	1.92	0	799	7	15	
Capitol View	43	-			-7	7	-0.1	1.92	0	794	7	15	
New Dry Creek	13206090	-	46.0		-43	7	-0.8	1.92	0	753	7	14	
New Union	92	-			-9	7	-0.2	1.92	0	746	7	14	
Lemp Ditch	13206205	-	45.4		-3	7	-0.1	1.92	0	745	7	14	
Warm Springs Ditch	13206220	-	44.8		-4	7	-0.1	1.92	0	743	7	14	
Graham-Gilbert	13206260	-	44.2		-1	7	0.0	1.92	0	743	7	14	
Ballentyne	13206265	-	43.6		-12	7	-0.2	1.92	0	733	7	14	
Conway-Hamming	13206270	-	43.0		-3	7	-0.1	1.92	0	732	7	14	
Eagle Island Park	13206274	-	42.4		-0.2	7	0.0	1.92	0	734	7	14	
Aiken, Thomas	13206290	-	41.8		-4	7	-0.1	1.92	0	732	7	13	
Mace-Catlin	13206292	-	41.2		-6.5	7	-0.1	1.92	0	727	7	13	
Mace & Mace	13206295	-	41.1		0	7	0.0	1.92	0	729	7	13	
West Boise WWTF	2	+	40.9		19.998	9	0.5	1.92	0	751	7	14	
Wroten, Jon Pump	13206308	-	40.8		-1	7	0.0	17.54	0	768	7	14	
Eagle Drain @ Eagle	13206400	+	40.7		23.5	32	2.0	17.54	0	809	7	16	0.0
Hart-Davis	13208450	-	40.5		-7.5	7	-0.1	4.91	0	806	7	16	
Middleton Irrigation	13208710	-	40.4		-116.143	7	-2.3	4.91	0	695	7	13	
Barber Pumps	13208738	-	40.4		-0.5	7	0.0	4.91	0	699	7	13	
Seven Suckers	13208740	-	40.4		-1.2	7	0.0	4.91	0	703	7	13	
Thurman Drain	13209450	+	40.0		19.5	12	0.6	4.91	0	727	7	14	0.0
Phyliss	13209480	-	39.2		-397.714	7	-7.7	21.24	0	351	7	6	
Eureka #1	82	-			-29	7	-0.5	21.24	0	343	6	6	
Little Pioneer	13209630	-	38.0		-24.643	6	-0.4	21.24	0	340	6	5	
Canyon County	13209990	-	32.9		-59.357	6	-0.9	21.24	0	302	5	4	
Caldwell High Line	13210005	-	32.4		-47.286	5	-0.7	21.24	0	276	5	4	
BR At Middleton	50	n/a	31.2		353	7	6.7	21	0	297	5	4	0.0
				Difference:	56	19	3		Reset:	353	7	7	
Fifteen Mile Drain	13210810	+	27.9		132.429	92	33.0	11.06	0	497	30	40	0.0
Star Feeder*	13210826	+	26.4		56.786	47	7.1	7.14	0	561	31	47	0.0
Long Feeder*	13210828	+	26.4		12	47	1.5	7.14	0	580	31	48	0.0
Watts Creek*	13210829	+	26.4		20	47	2.5	7.14	0	607	31	51	0.0
Mill Slough	24	+	24.8		132.571	33	11.8	7.14	0	747	31	63	0.0
Willow Creek @ Middleton	13210835	+	24.6		15.857	52	2.2	1.84	0	764	31	65	0.0
Mason Slough	13210849	+	23.2		16	96	4.1	12.91	0	793	32	69	0.0
Mason Creek	13210980	+	22.5		143.929	113	44.0	6.45	0	944	44	113	0.0
Riverside	13210984	-	22.6		-255.429	44	-30.6	1.38	0	690	44	82	
Hartley (combined)	67	+	22.2		74.857	57	11.5	1.38	0	766	45	94	0.0
Senree	13210992	-	21.9		-202.143	45	-32.1	3.84	0	508	45	62	
Campbell	13210993	-	21.9		-23.214	45	-2.8	3.84	0	488	45	59	
Siebenberg	13210994	-	21.0		-6.529	45	-0.8	3.84	0	486	44	58	
Shipley Pumps	13211001	-	20.8		-0.6	44	-0.1	3.84	0	489	44	58	
Wagner Pumps	13211003	-	20.4		-0.4	44	0.0	3.84	0	492	44	58	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	3.84	0	503	43	58	
Indian Creek	13211445	+	18.8		27.5	40	3.0	8.30	0	539	42	61	0.0
Simplot Pumps	13211603	-	17.9		-0.6	42	-0.1	8.69	0	547	41	61	
Eureka No.2	13211725	-	17.6		-107.514	41	-12.0	8.69	0	449	41	49	
Upper Center Point	13211735	-	17.6		-24.186	41	-2.7	8.69	0	433	40	46	
McManus-Teater	13211745	-	17.6		-2.929	40	-0.3	8.69	0	439	39	46	
Lower Center Point	13211825	-	13.2		-29.186	39	-3.1	8.69	0	418	38	43	
Bowman & Swisher	13212548	-	14.1		-17.714	38	-1.8	8.69	0	409	37	41	
Conway Gulch @ Notus	13212550	-	12.2		60.986	139	22.9	8.69	0	479	50	64	0.0
Baxter	13212645	-	10.4		-15.471	50	-2.1	8.91	0	472	49	62	
Andrews Ditch	13212632	-	9.4		-17.771	49	-2.3	8.91	0	464	48	60	
Dixie Drain Near Wilder	90	-	9.3		211.7	51	29.1	8.91	0	684	48	89	0.0
Mammon Pumps	13212896	-	8.0		-6.829	48	-0.9	7.64	0	685	48	86	
Hass	13212938	-	7.5		-7.486	48	-1.0	7.64	0	685	47	87	
Parma Ditch	13212954	-	6.5		-21.243	47	-2.7	7.64	0	672	47	84	
Island High Line	13212966	-	4.3		-43.429	47	-5.5	7.64	0	636	46	79	
Crawforth Pumps	13212992	-	4.1		-0.6	46	-0.1	7.64	0	643	45	79	
McConnel Island	13212994	-	3.5		-34.529	45	-4.2	7.64	0	616	45	75	
BR Near Parma	13213000	n/a	3.5		852	52	119.5	8	0	624	44	75	0.0
				Difference:	229	73	45		Measured:	852	52	119	

Notes:

* Surrogate TSS, average of Thurman Drain, Eagle Drain, Mason Slough.

** No flow data available for USGS station Boise River Below Diversion Dam.

Eagle Drain @ Eagle	13206400	32
Thurman Drain	13209450	12
Mason Slough	13210849	96
	average	47

1996 Irrigation Flow Season - Existing Conditions with No Reductions

7-day Avg. Minimum at Parma (start date 6/29/96)
Acute TSS Target Concentration of 80 mg/L.

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	2	(1 = HF; 2 = IF; 3 = LF)	Irrigation Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	2	(1 = HF; 2 = IF; 3 = LF, 4=All)	Irrigation Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day with 9999999.0 mg/L	Load Cap. at 80mg/L
Glenwood U.S.		-7	
Glenwood Control pt.		19	114
Middleton U.S.		5	
Middleton Control pt.		6	45
Parma U.S.		90	
Parm Control Pt.		111	170

Mainstem Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam**	13203510	n/a	61.2		0	3	0.0	0	0	0	3	0	0.0
Ridenbaugh	13203760	-	58.3		-495.7	3	-4.0	4	0	-492	3	-4	
Bubb	13204005	-	57.5		-7.5	3	-0.1	4	0	-496	3	-4	
Meeves	13204020	-	56.8		-0.9	3	0.0	4	0	-493	3	-4	
Rossi Mill	13204060	-	56.4		-6.8	3	-0.1	4	0	-496	3	-4	
River Run	13204070	-	56.1		-18.0	3	-0.2	4	0	-510	3	-4	
Boise City	13204190	-	56.0		-30.3	3	-0.3	4	0	-537	3	-5	
Boise Water Corp.	200	-	55.9		-6.8	3	-0.1	4	0	-540	3	-5	
Settlers	13205515	-	52.0		-169.0	3	-1.4	4	0	-706	3	-6	
Davis	13205517	-	52.0		-7.9	3	-0.1	4	0	-710	3	-6	
Boise City Parks	13205613	-	51.5		-0.2	3	0.0	4	0	-706	3	-6	
Drainage District #3*	13205617	+	51.0		6.7	47	0.8	4	0	-696	3	-5	0.0
Thurman Mill	13205622	-	51.0		-30.2	3	-0.2	4	0	-722	3	-5	
Farmers Union	13205640	-	50.4		-200.6	3	-1.5	4	0	-919	3	-7	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	4	0	-902	3	-7	
BR At Glenwood Bridge	13206000	n/a	47.4		1010	7	19.1	11	0	-891	3	-7	0.0
				Difference:	1900	5	26		Reset:	1010	7	19	
Boise Valley	41	-			-46	7	-0.9	1.92	0	965	7	18	
Capitol View	43	-			-7	7	-0.1	1.92	0	960	7	18	
New Dry Creek	13206090	-	46.0		-43.614	7	-0.8	1.92	0	919	7	17	
New Union	92	-			-9	7	-0.2	1.92	0	912	7	17	
Lemp Ditch	13206205	-	45.4		-3	7	-0.1	1.92	0	911	7	17	
Warm Springs Ditch	13206220	-	44.8		-4	7	-0.1	1.92	0	908	7	17	
Graham-Gilbert	13206260	-	44.2		-1	7	0.0	1.92	0	909	7	17	
Ballentyne	13206265	-	43.6		-18	7	-0.3	1.92	0	893	7	17	
Conway-Hamming	13206270	-	43.0		-3	7	-0.1	1.92	0	892	7	17	
Eagle Island Park	13206274	-	42.4		-0.3	7	0.0	1.92	0	894	7	17	
Aiken, Thomas	13206290	-	41.8		-4	7	-0.1	1.92	0	892	7	16	
Mace-Catlin	13206292	-	41.2		-7.657	7	-0.1	1.92	0	886	7	16	
Mace & Mace	13206295	-	41.1		0	7	0.0	1.92	0	886	7	16	
West Boise WWTF	2	+	40.9		19.998	9	0.5	1.92	0	910	7	17	
Wroten, Jon Pump	13206308	-	40.8		-1	7	0.0	17.54	0	926	7	17	
Eagle Drain @ Eagle	13206400	+	40.7		35.786	32	3.5	17.54	0	984	8	20	0.0
Hart-Davis	13208450	-	40.5		-9	8	-0.2	4.91	0	980	8	20	
Middleton Irrigation	13205710	-	40.4		-157.1	8	-3.2	4.91	0	827	8	17	
Barber Pumps	13208738	-	40.4		-0.5	8	0.0	4.91	0	832	7	17	
Seven Suckers	13208740	-	40.4		-1.2	7	0.0	4.91	0	836	7	17	
Thurman Drain	13209450	+	40.0		23.257	12	0.7	4.91	0	864	8	18	0.0
Phyliss	13209480	-	39.2		-463.243	8	-9.4	21.24	0	422	7	8	
Eureka #1	82	-			-29	7	-0.6	21.24	0	414	7	8	
Little Pioneer	13209630	-	38.0		-26.743	7	-0.5	21.24	0	409	6	7	
Canyon County	13209990	-	32.9		-74.329	6	-1.3	21.24	0	355	6	6	
Caldwell High Line	13210005	-	32.4		-43.214	6	-0.7	21.24	0	333	6	5	
BR At Middleton	50	n/a	31.2		334	7	6.3	21	0	355	5	5	0.0
				Difference:	20	-22	-1		Reset:	334	7	6	
Fifteen Mile Drain	13210810	+	27.9		153.514	92	38.2	11.06	0	499	33	45	0.0
Star Feeder*	13210825	+	26.4		60.6	47	7.6	7.14	0	567	34	52	0.0
Long Feeder*	13210826	+	26.4		11.543	47	1.4	7.14	0	585	34	54	0.0
Watts Creek*	13210829	-	26.4		21.114	47	2.6	7.14	0	614	34	58	0.0
Mill Slough	24	-	24.8		193.571	33	17.3	7.14	0	814	33	74	0.0
Willow Creek @ Middleton	13210835	+	24.6		23.514	52	3.3	1.84	0	840	34	77	0.0
Mason Slough	13210849	+	22.2		32.143	96	8.3	12.91	0	885	36	85	0.0
Mason Creek	13210980	+	22.5		168.971	113	51.6	6.45	0	1060	48	137	0.0
Riverside	13210904	-	22.6		-236.657	46	-30.5	1.38	0	825	48	106	
Hartley (combined)	67	-	22.2		92.257	57	14.2	1.38	0	918	49	120	0.0
Sebree	13210992	-	21.9		-290.029	49	-38.0	3.84	0	632	48	82	
Campbell	13210993	-	21.9		-25.3	48	-3.3	3.84	0	611	48	79	
Siebenberg	13210994	-	21.0		-9.971	48	-1.3	3.84	0	605	48	78	
Shipley Pumps	13211001	-	20.8		-0.2	48	0.0	3.84	0	608	47	78	
Wagner Pumps	13211003	-	20.4		-0.4	47	-0.1	3.84	0	612	47	78	
Caldwell WWTF	3	-	19.7		7.403	12	0.2	3.84	0	623	46	78	
Indian Creek	13211445	-	18.8		43.143	40	4.7	8.30	0	674	45	83	0.0
Simplot Pumps	13211603	-	17.9		-0.6	45	-0.1	8.69	0	683	45	83	
Eureka No.2	13211725	-	17.6		-101.857	45	-12.3	8.69	0	589	44	70	
Upper Center Point	13211735	-	17.6		-26.429	44	-3.1	8.69	0	572	44	67	
McManus-Teater	13211745	-	17.6		-3	44	-0.4	8.69	0	577	43	67	
Lower Center Point	13211825	-	15.2		-35.186	43	-4.1	8.69	0	551	42	63	
Bowman & Swisher	13212548	-	14.1		-15.129	42	-1.7	8.69	0	544	42	61	
Conway Gulch @ Notus	13212550	-	12.2		63.014	139	23.7	8.69	0	616	51	85	0.0
Baxter	13212645	-	10.4		-11.757	51	-1.6	8.91	0	613	50	83	
Andrews Ditch	13212832	-	9.4		-16.229	50	-2.2	8.91	0	606	49	81	
Dixie Drain Near Wilder	90	-	9.3		192.129	51	26.5	8.91	0	807	49	107	0.0
Mammon Pumps	13212896	-	8.0		-7	49	-0.9	7.64	0	808	49	106	
Hass	13212938	-	7.5		-9.7	49	-1.3	7.64	0	806	48	105	
Parma Ditch	13212954	-	6.5		-28.186	48	-3.7	7.64	0	785	46	101	
Island High Line	13212966	-	4.3		-42.714	48	-5.5	7.64	0	750	47	96	
Crawforth Pumps	13212992	-	4.1		-0.8	47	-0.1	7.64	0	757	47	96	
McConnel Island	13212994	-	3.5		-45.614	47	-5.8	7.64	0	719	46	90	
BR Near Parma	13213000	n/a	3.5		789	52	110.7	8	0	726	46	90	0.0
				Difference:	63	122	21		Measured:	789	52	111	

Notes:

* Surrogate TSS, average of Thurman Drain, Eagle Drain, Mason Slough.
** No flow data available for USGS station Boise River Below Diversion Dam.

Eagle Drain @ Eagle	13206400	32
Thurman Drain	13209450	12
Mason Slough	13210849	96
	average	47

Appendix F

1992 High Flow Season—Reduced Conditions Based on the Critical 30-Day (Chronic) Flow Period at Parma (Equal Percent Reduction and Equal Concentration Discharge)

1992 High Flow Season - Equal Percent Reduction

30 day Avg. Minimum at Parma (start date 3/24/92)

To input target concentration goto --> Cell BS1

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	1	(1 = HF; 2 = IF; 3 = LF)	High Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	1	(1 = HF; 2 = IF; 3 = LF, 4=All)	High Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day 34.0 Percent Red.	Load Cap. at 50mg/L
Glenwood U.S.		7	
Glenwood Control pt.		21	31
Middleton U.S.		6	
Middleton Control pt.		9	20
Parma U.S.		31	
Parm Control Pt.		36	31

Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	
BR Below Diversion Dam	13203510	n/a	61.2		749	5	10.1	0	0	749	5	10	
Ridenbaugh	13203760	-	58.3		-175.8	5	-2.4	1	0	575	5	8	
Bubb	13204005	-	57.5		0.0	5	0.0	1	0	576	5	8	
Meeves	13204020	-	56.8		-0.2	5	0.0	1	0	577	5	8	
Rossi Mill	13204060	-	56.4		-1.6	5	0.0	1	0	577	5	8	
River Run	13204070	-	56.1		-13.2	5	-0.2	1	0	565	5	8	
Boise City	13204190	-	56.0		-4.2	5	-0.1	1	0	562	5	7	
Boise Water Corp.	200	-	55.9		-1.5	5	0.0	1	0	562	5	7	
Settlers	13205515	-	52.0		-74.7	5	-1.0	1	0	489	5	6	
Davis	13205517	-	52.0		-1.2	5	0.0	1	0	489	5	6	
Boise City Parks	13205613	-	51.5		-0.1	5	0.0	1	0	490	5	6	
Drainage District #2*	13205617	+	51.0		4.9	20	0.3	1	0	497	5	7	34
Thurman Mill	13205622	-	51.0		-5.2	5	-0.1	1	0	493	5	7	
Farmers Union	13205640	-	50.4		-32.1	5	-0.4	1	0	462	5	6	
Lander Street WWTF	1	+	49.9		13.3	10	0.4	1	0	477	5	7	
BR At Glenwood Bridge	13206000	n/a	47.4		475	16.0	20.5	4	0	481	5	7	0
					-5	-957	-14			475	16	21	
Boise Valley	41	-			-23.4	16	-1.0	0.43	0	452	16	19	
Capitol View	43	-			-3.033	16	-0.1	0.43	0	450	16	19	
New Dry Creek	13206090	-	46.0		-19.793	16	-0.9	0.43	0	430	16	19	
New Union	92	-			-3.9	16	-0.2	0.43	0	427	16	18	
Lemp Ditch	13206205	-	45.4		-1.1	16	0.0	0.43	0	426	16	18	
Warm Springs Ditch	13206220	-	44.8		-2.7	16	-0.1	0.43	0	424	16	18	
Graham-Gilbert	13206260	-	44.2		-0.213	16	0.0	0.43	0	424	16	18	
Ballentyne	13206265	-	43.6		-2.77	16	-0.1	0.43	0	422	16	18	
Conway-Hamming	13206270	-	43.0		-0.6	16	0.0	0.43	0	422	16	18	
Eagle Island Park	13206274	-	42.4		-0.07	16	0.0	0.43	0	422	16	18	
Aiken, Thomas	13206290	-	41.8		-1	16	0.0	0.43	0	421	16	18	
Mace-Catlin	13206292	-	41.2		-2.827	16	-0.1	0.43	0	419	16	18	
Mace & Mace	13206295	-	41.1		0	16	0.0	0.43	0	419	16	18	
West Boise WWTF	2	+	40.9		19.998	9	0.5	0.43	0	440	15	18	
Wroten, Jon Pump	13206308	-	40.8		0	15	0.0	3.91	0	444	15	18	
Eagle Drain @ Eagle	13206400	+	40.7		13.998	18	0.7	3.91	0	462	15	19	34
Hart-Davis	13208450	-	40.5		-5.3	15	-0.2	1.09	0	458	15	19	
Middleton Irrigation	13208710	-	40.4		-66.733	15	-2.7	1.09	0	392	15	16	
Barber Pumps	13208738	-	40.4		-0.023	15	0.0	1.09	0	393	15	16	
Seven Suckers	13208740	-	40.4		-0.44	15	0.0	1.09	0	394	15	16	
Thurman Drain	13209450	+	40.0		12.086	6	0.2	1.09	0	407	15	16	34
Phyliss	13209480	-	39.2		-153.46	15	-6.1	4.74	0	258	15	10	
Eureka #1	82	-			-22	15	-0.9	4.74	0	241	14	9	
Little Pioneer	13209630	-	38.0		-16.23	14	-0.6	4.74	0	229	14	9	
Canyon County	13209990	-	32.9		-43.44	14	-1.6	4.74	0	191	14	7	
Caldwell High Line	13210005	-	32.4		-22.41	14	-0.8	4.74	0	173	13	6	
BR At Middleton	50	n/a	31.2		172	19	8.8	5	0	178	13	6	0
					-6	-176	-3			172	19	9	
Fifteen Mile Drain	13210810	+	27.9		45.6	93	11.5	4.76	0	222	34	20	34
Star Feeder*	13210826	+	26.4		33.957	20	1.9	3.07	0	259	32	22	34
Long Feeder*	13210828	+	26.4		8.967	20	0.5	3.07	0	272	31	23	34
Watts Creek*	13210829	+	26.4		5.727	20	0.3	3.07	0	280	30	23	34
Mill Slough	24	+	24.8		96.157	27	7.1	3.07	0	380	29	30	34
Willow Creek @ Middleton	13210835	+	24.6		18.907	49	2.5	0.79	0	399	30	33	34
Mason Slough	13210849	+	23.2		12.763	37	1.3	5.55	0	418	30	34	34
Mason Creek	13210980	+	22.5		61.197	104	17.2	2.77	0	482	39	51	34
Riverside	13210984	-	22.6		-160.6	39	-17.0	0.59	0	322	39	34	
Hartley (combined)	67	+	22.2		41.587	39	4.4	0.59	0	364	39	36	34
Sebree	13210992	-	21.9		-145.67	39	-15.4	1.65	0	220	39	23	
Campbell	13210993	-	21.9		-13.713	39	-1.4	1.65	0	205	39	22	
Siebenberg	13210994	-	21.0		-5.4	39	-0.6	1.65	0	204	38	21	
Shipley Pumps	13211001	-	20.8		-0.2	38	0.0	1.65	0	205	38	21	
Wagner Pumps	13211003	-	20.4		-0.2	38	0.0	1.65	0	207	38	21	
Caldwell WWTF	3	+	19.7		7.403	12	0.2	1.65	0	216	38	21	
Indian Creek	13211445	+	18.8		1	38	0.1	3.57	0	220	38	21	34
Simplot Pumps	13211603	-	17.9		-0.6	36	-0.1	3.74	0	224	35	21	
Eureka No.2	13211725	-	17.6		-71.21	35	-6.8	3.74	0	156	34	14	
Upper Center Point	13211735	-	17.6		-12.713	34	-1.2	3.74	0	147	34	13	
McManus-Teater	13211745	-	17.6		-1.413	34	-0.1	3.74	0	149	33	13	
Lower Center Point	13211825	-	13.2		-12.58	33	-1.2	3.74	0	140	32	12	
Bowman & Swisher	13212548	-	14.1		-8.163	32	-0.7	3.74	0	135	31	11	
Conway Gulch @ Notus	13212550	+	12.2		36.07	79	7.7	3.74	0	175	40	19	34
Baxter	13212645	-	10.4		-5.677	40	-0.6	3.83	0	173	39	18	
Andrews Ditch	13212832	-	9.4		-5.567	39	-0.6	3.83	0	171	38	18	
Dixie Drain Near Wilder	90	+	9.3		99.937	79	21.3	3.83	0	275	53	39	34
Mammon Pumps	13212896	-	8.0		-1.95	53	-0.3	3.28	0	276	52	39	
Hass	13212938	-	7.5		-7.323	52	-1.0	3.28	0	272	51	38	
Parma Ditch	13212954	-	6.5		-14.97	51	-2.1	3.28	0	261	51	36	
Island High Line	13212966	-	4.3		-12.723	51	-1.7	3.28	0	251	50	34	
Crawforth Pumps	13212992	-	4.1		0	50	0.0	3.28	0	255	49	34	
McConnel Island	13212994	-	3.5		-19.43	49	-2.6	3.28	0	238	49	31	
BR Near Parma	13213000	n/a	3.5		233	58	36.4	3	0	242	48	31	0
					-9	-209	5			233	58	36	

Notes:

TSS Concentrations for point source are based on permit limit discharge (single value for all seasons)

* Surragate TSS. Average of (Thurman Drain, Eagle Drain, Mason Slough)

Eagle Drain @ Eagle	13206400	27
Thurman Drain	13209450	9
Mason Slough	13210849	57
	average	31

1992 High Flow Season - Equal Concentration Discharge

30 day Avg. Minimum at Parma (start date 3/24/92)
To input target concentration goto --> Cell BS1

INPUT:		CHOICES:	
TSS Concentration Table:	1	(1 = Measured; 2 = Target (see cell BS1))	Measured
Flow Season:	1	(1 = HF; 2 = IF; 3 = LF)	High Flow
Flow Magnitude:	2	(1 = 10% exceeds; 2 = Median; 3 = 90% exceeds; 4 = Mean)	Median
Conc. Season	1	(1 = HF; 2 = IF; 3 = LF, 4=All)	High Flow
Conc. Magnitude:	1	(1 = Geometric Mean; 2 = 90th Percentile)	Geometric Me

	Tons/day No Reduction	Tons/day with 77.0 mg/L	Load Cap. at 50mg/L
Glenwood U.S.		7	
Glenwood Control pt.		21	15
Middleton U.S.		6	
Middleton Control pt.		9	20
Parma U.S.		31	
Parm Control Pt.		36	31

Gaging Location	Station No.	Inflow or Outflow -/+	River Mile	Basin	Measured Flow (cfs)	Concentration (mg/L)	Incremental Daily Mass Load (T/day)	Incremental Groundwater Flow (cfs)	Groundwater Concentration (mg/L)	River Flow (cfs)	River Concentration (mg/L)	River Load (T/day)	Percent Reduction
BR Below Diversion Dam	13203510	n/a	61.2		749	5	10.1	0	0	749	5	10	0.0
Ridenhaugh	13203760	-	58.3		-175.8	5	-2.4	1	0	575	5	8	
Bubb	13204005	-	57.5		0.0	5	0.0	1	0	576	5	8	
Meeves	13204020	-	56.8		-0.2	5	0.0	1	0	577	5	8	
Rossi Mill	13204060	-	56.4		-1.6	5	0.0	1	0	577	5	8	
River Run	13204070	-	56.1		-13.2	5	-0.2	1	0	565	5	8	
Boise City	13204190	-	56.0		-4.2	5	-0.1	1	0	562	5	7	
Boise Water Corp.	200	-	55.9		-1.5	5	0.0	1	0	562	5	7	
Settlers	13205515	-	52.0		-74.7	5	-1.0	1	0	489	5	6	
Davis	13205517	-	52.0		-1.2	5	0.0	1	0	489	5	6	
Boise City Parks	13205613	-	51.5		-0.1	5	0.0	1	0	490	5	6	
Drainage District #3*	13205617	-	51.0		4.9	31	0.4	1	0	497	5	7	0.0
Thurman Mill	13205622	-	51.0		-5.2	5	-0.1	1	0	493	5	7	
Farmers Union	13205640	-	50.4		-32.1	5	-0.4	1	0	462	5	6	
Lander Street WWTF	1	-	49.9		13.3	10	0.4	1	0	477	5	7	
BR At Glenwood Bridge	13206000	n/a	47.4		475	16	20.5	4	0	481	5	7	0.0
					4-5	949	14			475	16	21	
Boise Valley	41	-			-23.4	16	-1.0	0.43	0	452	16	19	
Capitol View	43	-			-3.023	16	-0.1	0.43	0	450	16	19	
New Dry Creek	13206090	-	46.0		-19.793	16	-0.9	0.43	0	430	16	19	
New Union	92	-			-3.9	16	-0.2	0.43	0	427	16	18	
Lemp Ditch	13206205	-	45.4		-1.1	16	0.0	0.43	0	426	16	18	
Warm Springs Ditch	13206220	-	44.8		-2.7	16	-0.1	0.43	0	424	16	18	
Graham-Gilbert	13206260	-	44.2		-0.213	16	0.0	0.43	0	424	16	18	
Ballentyne	13206265	-	43.6		-2.77	16	-0.1	0.43	0	422	16	18	
Conway-Hamming	13206270	-	43.0		-0.6	16	0.0	0.43	0	422	16	18	
Eagle Island Park	13206274	-	42.4		-0.07	16	0.0	0.43	0	422	16	18	
Aiken, Thomas	13206290	-	41.8		-1	16	0.0	0.43	0	421	16	18	
Mace-Catlin	13206292	-	41.2		-2.827	16	-0.1	0.43	0	419	16	18	
Mace & Mace	13206295	-	41.1		0	16	0.0	0.43	0	419	16	18	
West Boise WWTF	2	+	40.9		19.998	9	0.5	0.43	0	440	15	18	
Wroten, Jon Pump	13206308	-	40.8		0	15	0.0	3.91	0	444	15	18	
Eagle Drain @ Eagle	13206400	-	40.7		13.998	27	1.0	3.91	0	462	16	19	0.0
Hart-Davis	13208450	-	40.5		-5.3	16	-0.2	1.09	0	458	16	19	
Middleton Irrigation	13208710	-	40.4		-66.733	16	-2.8	1.09	0	392	15	16	
Barber Pumps	13208738	-	40.4		-0.023	15	0.0	1.09	0	393	15	16	
Seven Suckers	13208740	-	40.4		-0.44	15	0.0	1.09	0	394	15	16	
Thurman Drain	13209450	+	40.0		12.086	9	0.3	1.09	0	407	15	17	0.0
Phyliss	13209480	-	39.2		-153.46	15	-6.3	4.74	0	258	15	10	
Eureka #1	82	-			-22	15	-0.9	4.74	0	241	15	9	
Little Pioneer	13209630	-	38.0		-16.23	15	-0.6	4.74	0	229	14	9	
Canyon County	13209990	-	32.9		-43.44	14	-1.7	4.74	0	191	14	7	
Caldwell High Line	13210005	-	32.4		-22.41	14	-0.8	4.74	0	173	14	6	
BR At Middleton	50	n/a	31.2		172	19	8.8	5	0	178	13	6	0.0
					6	166	2			172	19	9	
Fifteen Mile Drain	13210810	+	27.9		45.6	77	9.5	4.76	0	222	30	18	45.6
Star Feeder*	13210826	-	26.4		33.957	31	2.8	3.07	0	259	30	21	0.0
Long Feeder*	13210828	-	26.4		8.967	31	0.7	3.07	0	272	30	22	0.0
Watts Creek*	13210829	-	26.4		5.727	31	0.5	3.07	0	280	30	22	0.0
Mill Slough	24	-	24.8		96.157	41	10.7	3.07	0	380	32	33	0.0
Willow Creek @ Middleton	13210835	-	24.6		18.907	74	3.8	0.79	0	399	34	37	0.0
Mason Slough	13210849	-	23.2		12.763	57	2.0	5.55	0	418	34	39	0.0
Mason Creek	13210980	-	22.5		61.197	77	12.7	2.77	0	482	40	51	51.3
Riverside	13210984	-	22.6		-160.6	40	-17.2	0.59	0	322	40	34	
Hartley (combined)	87	-	22.2		41.587	59	6.6	0.59	0	364	42	41	0.0
Senree	13210992	-	21.9		-145.67	42	-16.4	1.65	0	220	41	25	
Campbell	13210993	-	21.9		-13.713	41	-1.5	1.65	0	208	41	23	
Siebenberg	13210994	-	21.0		-5.4	41	-0.6	1.65	0	204	41	22	
Shipley Pumps	13211001	-	20.8		-0.2	41	0.0	1.65	0	205	40	22	
Wagner Pumps	13211003	-	20.4		-0.2	40	0.0	1.65	0	207	40	22	
Caldwell WWTF	3	-	19.7		7.403	12	0.2	1.65	0	216	39	23	
Indian Creek	13211445	-	18.8		1	58	0.2	3.57	0	220	38	23	0.0
Simplot Pumps	13211603	-	17.9		-0.6	38	-0.1	3.74	0	224	38	23	
Eureka No.2	13211725	-	17.6		-71.21	38	-7.2	3.74	0	156	37	15	
Upper Center Point	13211735	-	17.6		-12.713	37	-1.3	3.74	0	147	36	14	
McManus-Teater	13211745	-	17.6		-1.413	36	-0.1	3.74	0	149	35	14	
Lower Center Point	13211825	-	13.2		-13.58	35	-1.3	3.74	0	140	34	13	
Bowman & Swisher	13212548	-	14.1		-8.163	34	-0.7	3.74	0	135	33	12	
Conway Gulch @ Notus	13212550	-	12.2		36.07	77	7.5	3.74	0	175	41	20	35.8
Baxter	13212645	-	10.4		-5.677	41	-0.6	3.83	0	173	40	19	
Andrews Ditch	13212832	-	9.4		-5.567	40	-0.6	3.83	0	171	40	18	
Dixie Drain Near Wilder	90	+	9.3		99.937	77	20.7	3.83	0	275	53	39	35.6
Mammon Pumps	13212896	-	8.0		-1.95	53	-0.3	3.28	0	276	52	39	
Hass	13212938	-	7.5		-7.323	52	-1.0	3.28	0	272	51	38	
Parma Ditch	13212954	-	6.5		-14.97	51	-2.1	3.28	0	261	51	36	
Island High Line	13212966	-	4.3		-12.723	51	-1.7	3.28	0	251	50	34	
Crawforth Pumps	13212992	-	4.1		0	50	0.0	3.28	0	255	49	34	
McConnel Island	13212994	-	3.5		-19.43	49	-2.6	3.28	0	236	49	31	
BR Near Parma	13213000	n/a	3.5		233	58	36.4	3	0	242	48	31	0.0
					-9	-209	5			233	58	36	

Notes:
TSS Concentrations for point source are based on permit limit discharge (single value for all seasons)
* Surrogate TSS, Average of (Thurman Drain, Eagle Drain, Mason Slough)

Eagle Drain @ Eagle	13206400	27
Thurman Drain	13209450	9
Mason Slough	13210849	57
	average	31

Appendix G

Summary of Point Source Data for the Sensitivity Analyses

Summary of Point Source Data for the LBRWQP

Municipal Facilities

Point Source Name	Permit No	Discharge Duration	Receiving Waters	Existing Permit Flow Volume (mgd)	Existing Permit Flow Volume (cfs)	Permit TSS Limit (mg/L)	Permit Existing Load (lb/day)	Permit Existing Load (T/day)	Permit Averaging Conditions	Calculated Permitted Load (T/day)	Buildout Year	Buildout Flow Volume (mgd)	Buildout Flow Volume (cfs)	Buildout TSS Conc (mg/L)	Buildout Load (lb/day)	Buildout Load (T/day)	Buildout Condition
City of Mountain - WWTP	ID0020192	cont	5 Mile Creek	2.820	4.37	30	705	0.353	monthly	0.353	2015	8	12.38	30.00	2004	1.002	max month
						45	1058	0.529	weekly	0.530							
City of Wilder - WWTP	ID0020265	cont	Boise R. via Wilder Ditch Drain	0.075	0.12	70	--	--	monthly	0.022	2007	0.16	0.25	70	93	0.047	peak month
						105	--	--	weekly	0.033							
Boise City - Lander St WWTP	ID0020443	cont	Boise River	15.000	23.22		3400	1.7	peak month			15.000	23.22	27.15	3400	1.7	peak month
City of Notus - WWTP	ID0021016	intermit	Conway Gulch	0.065	0.10	70	--	--	monthly	0.019							
						105	--	--	weekly	0.028							
City of Caldwell - WWTP	ID0021504	cont	Indian Creek	7.780	12.04	30	1125	0.563	monthly	0.974	2015	11.3	17.49	30	2830	1.415	peak month
						45	1690	0.845	weekly	1.461							
City of Parma - WWTP	ID0021776	intermit	Snake River via Sand Hollow	0.310	0.48												
City of Middleton - WWTP	ID0021831	cont	Boise River just d/s of Mill Slough	1.830	2.83	70	--	--	monthly	0.535	2018	0.838	1.30	30	210	0.105	max month
						105	--	--	weekly	0.802							
City of Nampa - WWTP	ID0022063	cont	Indian Creek	11.800	18.27	30	3000	1.500	monthly	1.476	2015	16.51	25.56	30	4135	2.067	
						45	4500	2.250	weekly	2.216	2020	17.58	27.21	30	4403	2.201	
Star Water & Sewer District	ID0023591	cont	Lawrence - Kennedy Canal which drains into Mill Slough (based on USGS quad)	0.330	0.51	70	--	--	monthly	0.096	2015	0.403	0.624	70	236	0.118	max month
						105	--	--	weekly	0.145							
Boise City - West Boise WWTP	ID0023981	cont	Boise River	16.000	24.77		3000	1.5				46	71.21	7.81	3000	1.5	peak month

Note:
Wilder - based on a 1990 permit application, plant design flow is 0.12 mgd Buildout - per phone call w/ Brian Maisor/JUB, 20 year buildout from 1987 design
Notus - based on an old application, design flow is 0.056 mgd
Middleton - based on an application, design flow is 1.83 mgd
Star - based on an old application, design flow is 0.33 mgd
For the sensitivity analysis, 0.019 T/day was used for the City of Notus, and 0.535 T/day was used for the City of Middleton to be conservative

Industrial Facilities

Point Source Name	Permit No	Discharge Duration	Receiving Waters	Existing Permit Flow Volume (mgd)	Existing Permit Flow Volume (cfs)	Permit TSS Limit (mg/L)	Permit Existing Load (lb/day)	Permit Existing Load (T/day)	Permit Averaging Conditions	Calculated Existing Load (T/day)	Buildout Year	Buildout Flow Volume (mgd)	Buildout Flow Volume (cfs)	Buildout Load (T/day)
Armour (ConAgra) Fresh Meats	ID0000787	cont	Indian Creek	0.475	0.74	--	100	0.050	daily avg.					
						--	120	0.060	daily max.					
ID F&G, Nampa	ID0023779	cont	Wilson Drain and then into Indian Creek	20	30.96	5	--	--	monthly	0.417				
						15	--	--	inst. max					
ID F&G, Eagle Island	ID0022748	cont	Boise River	>1	>1.55	5	--	--	monthly	0.021				
						15	--	--	inst. max					

Note
The proposed ConAgra permit retains these numbers
For the sensitivity analyses, 0.060 T/day was used for Armour