CALFED WATER QUALITY

# LOADING ANALYSIS FRAMEWORK

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## CONSTITUENT SELECTION TABLE

| | | 303(d) List Problem Area | 303(d) List Solution Area | | 303(d) List Affecting Problem Area | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Type | Constituent | Delta | Sacramento Basin | San Joaquin Basin | Bay Region | Sacramento R. (above dams) | Drinking Water | Agricultural Water | LOADING LIST |
| Metals | As | | | | | | | | |
| | Cd | ■ | ■ | | ■ | ■ | | | ■ |
| | Cr | | | | | | | | |
| | Cu | ■ | ■ | ■ | ■ | ■ | | | ■ |
| | Hg | ■ | ■ | ■ | ■ | ■ | | | ■ |
| | Pb | | | | | | | | |
| | Ni | | | | | | | | |
| | Zn | ■ | ■ | ■ | ■ | ■ | | | ■ |
| Trace El. | selenium | ■ | | ■ | ■ | | | | ■ |
| | boron | | | ■ | | | | ■ | ■ |
| Organics | TOC | | | | | | ■ | | ■ |
| | DOC | | | | | | | | |
| | THM | | | | | | | | |
| | THMFP | | | | | | | | |
| | TFPC | | | | | | | | |
| | chlorpyrifos | ■ | ■ | ■ | | | | | ■ |
| Pesticides | DDT | ■ | | ■ | | | | | ■ |
| | carbofuran | | ■ | | | | | | ■ |
| | chlordane (A) | ■ | ■ | ■ | | | | | ■ |
| | diazinon | ■ | ■ | ■ | | | | | ■ |
| | toxaphene (A) | ■ | ■ | ■ | | | | | ■ |
| | PCBs | | ■ | | | | | | ■ |
| | endosulfan (A) | | | ■ | | | | | ■ |
| Salts | TDS | | | ■ | | | ■ | ■ | ■ |
| | salinity | ■ | | ■ | | | | ■ | ■ |
| | SAR | | | | | | | ■ | ■ |
| | bromide | | | | | | ■ | | ■ |
| | chloride | | | | | | | ■ | ■ |
| Biotic | pathogens | | | | ■ | ■ | ■ | | ■ |
| | viruses | | | | | | | | |
| Nutrients | nitrate | ■ | | | ■ | ■ | ■ | ■ | ■ |
| | phosphorous | | | | | | | | |
| | ammonia | ■ | | ■ | | | | | ■ |
| Other | DO | ■ | | ■ | | | | | ■ |
| | turbidity | | | | ■ | | ■ | ■ | ■ |
| | temperature | | ■ | | | | | ■ | ■ |
| | unk. toxicity | ■ | ■ | ■ | | | | | ■ |
| | pH | | | | | ■ | | ■ | ■ |
| | alkalinity | | | | | | | ■ | ■ |
| | sediment | | ■ | | | | | | ■ |

## SOURCE SELECTION TABLE

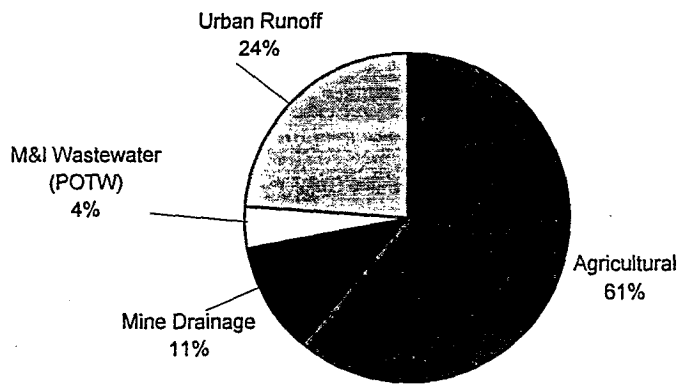
| Type | Constituent | Agricultural | Mine Drainage | M&I Wastewater (POTW) | Urban Runoff | Flow Regulation | Dams | Dairies | Construction | On-site Disposal | Marinas |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Metals | As | | | | | | | | | | |
| | Cd | ■ | ■ | ■ | ■ | ■ | | | | | |
| | Cr | | | | | | | | | | |
| | Cu | ■ | ■ | ■ | ■ | ■ | | | | | |
| | Hg | ■ | ■ | ■ | ■ | ■ | | | | | |
| | Pb | | | | | | | | | | |
| | Ni | | | | | | | | | | |
| | Zn | ■ | ■ | ■ | ■ | ■ | | | | | |
| Trace El. | selenium | ■ | ■ | ■ | ■ | ■ | | | | | |
| | boron | ■ | | | | | | | | | |
| Organics | TOC | | | | | | | | | | |
| | DOC | | | | | | | | | | |
| | THM | | | | | | | | | | |
| | THMFP | | | | | | | | | | |
| | TFPC | | | | | | | | | | |
| | chlorpyrifos | ■ | | | ■ | | | | | | |
| Pesticides | DDT | ■ | | | | | | | | | |
| | carbofuran | ■ | | | | | | | | | |
| | chlordane (A) | ■ | | | ■ | | | | | | |
| | diazinon | ■ | | | ■ | | | | | | |
| | toxaphene (A) | ■ | | | | | | | | | |
| | PCBs | | | ■ | ■ | | | | | | |
| | endosulfan (A) | ■ | | | | | | | | | |
| Salts | TDS | ■ | | | | | | | | | |
| | salinity | ■ | | | ■ | ■ | | ■ | | | |
| | SAR | | | | | | | | | | |
| | bromide | | | | | | | | | | |
| | chloride | | | | | | | | | | |
| Biotic | pathogens | ■ | | | ■ | | | | ■ | ■ | ■ |
| | viruses | | | | | | | | | | |
| Nutrients | nitrate | ■ | | | ■ | ■ | | | ■ | | |
| | phosphorous | | | | | | | | | | |
| | ammonia | ■ | | ■ | | | | ■ | | | |
| Other | DO | ■ | | ■ | ■ | ■ | ■ | ■ | ■ | | |
| | turbidity | ■ | | | ■ | | | | | | |
| | temperature | | | | | | ■ | | | | |
| | unk. toxicity | | | | | | | | | | |
| | pH | | ■ | | | | | | | | |
| | alkalinity | | | | | | | | | | |
| | sediment. | | ■ | | | | | | | | |

## LOADING TABLE

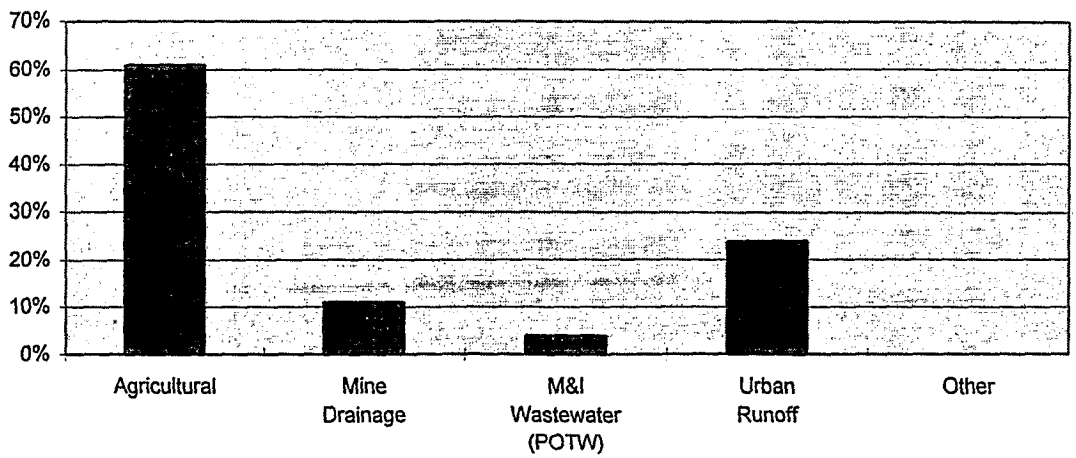
| | Metal Loadings to the Sacramento R. (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | As | Cd | Cr | Cu | Hg | Pb | Ni | Zn |
| Agricultural | 61% | 15% | | 28% | | 15% | | 17% |
| Mine Drainage | 11% | 72% | | 59% | | 3% | | 60% |
| M&I Wastewater (POTW) | 4% | 1% | | 2% | | 3% | | 3% |
| Urban Runoff | 24% | 12% | | 11% | | 80% | | 20% |
| Other | | | | | | | | |
| Total | 100% | 100% | 0% | 100% | 0% | 100% | 0% | 100% |

Source: Brown & Caldwell, 1995. Study of Drinking Water Quality in Delta Tributaries. April (Appendix A, Table 2)

**Example:**
**Arsenic Loads in the Sacramento Drainage**




**Example:**
**Arsenic Loads in the Sacramento Drainage**

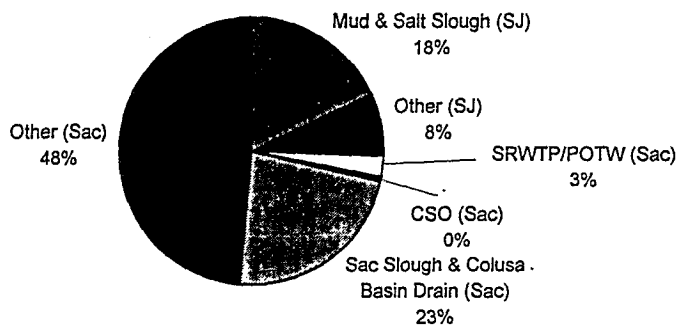


## LOADING TABLE

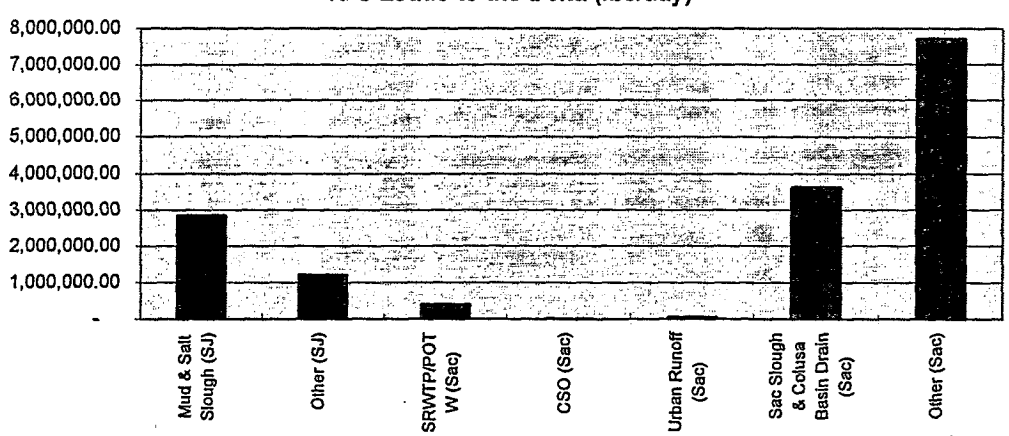
| | TDS (lbs/day) | | | | |
|---|---|---|---|---|---|
| | Average | Dry Year/ Wet Season | Dry Year/ Dry Season | Wet Year/ Wet Season | Wet Year/ Dry Season |
| Mud & Salt Slough (SJ) | 2,852,250.00 | 3,318,000 | 2,142,000 | 4,087,000 | 1,862,000 |
| Other (SJ) | 1,208,250.00 | 882,000 | - | 2,013,000 | 1,938,000 |
| SRWTP/POTW (Sac) | 405,500.00 | 390,000 | 432,000 | 440,000 | 360,000 |
| CSO (Sac) | 11,000.00 | - | - | 44,000 | - |
| Urban Runoff (Sac) | 50,000.00 | 156,000 | - | 44,000 | - |
| Sac Slough & Colusa Basin Drain (Sac) | 3,631,500.00 | 2,418,000 | 1,728,000 | 7,260,000 | 3,120,000 |
| Other (Sac) | 7,724,000.00 | 4,836,000 | 3,240,000 | 14,300,000 | 8,520,000 |
| Total | 15,882,500 | 12,000,000 | 7,542,000 | 28,188,000 | 15,800,000 |

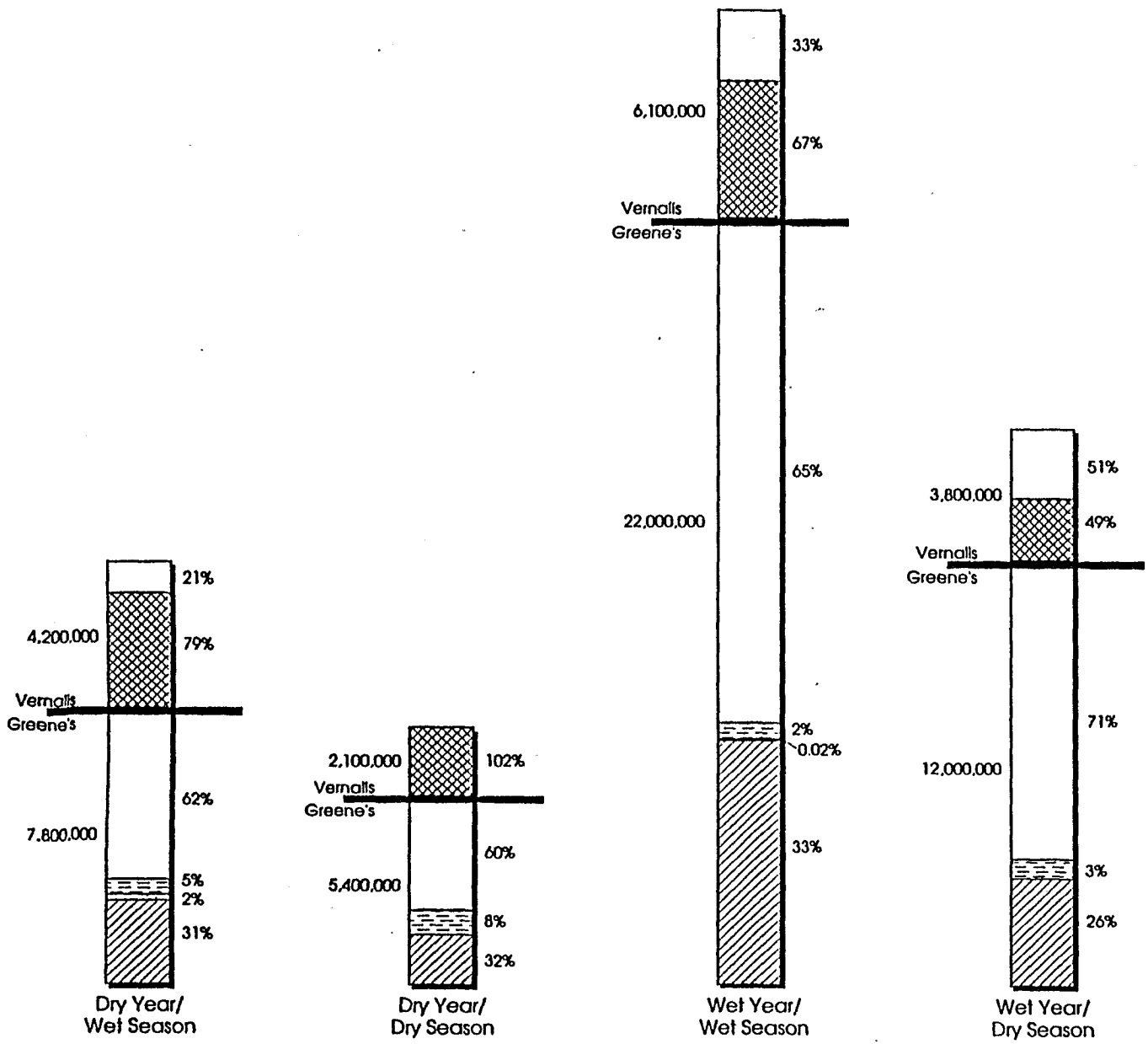
Adopted from: Brown & Caldwell, 1995. Study of Drinking Water Quality in Delta Tributaries. April (Figure 4-3)

**Example:**
**TDS Loads to the Delta**




**Example:**
**TDS Loads to the Delta (lbs/day)**





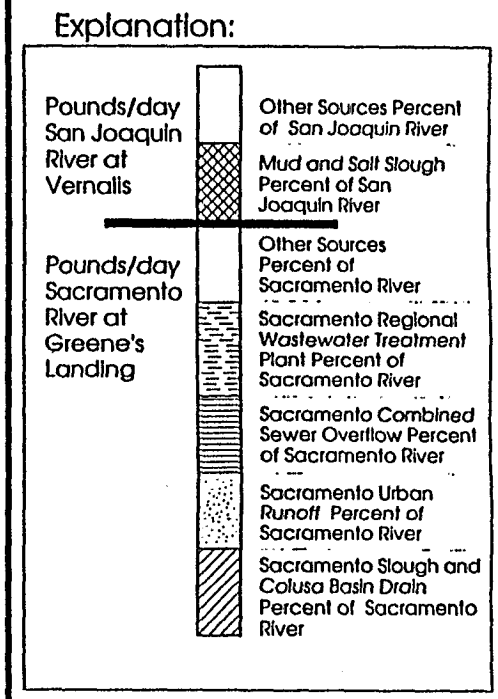




**Figure 4-3.**
**Relative Contribution of Total Dissolved Solids from the Delta Tributaries**

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