2.
EXPORT WATER QUALITY

Export Water Quality
Supporting Information

All alternatives include a program to reduce the total pollutant load entering the Delta and to manage the timing of pollutant discharges. The ecosystem and other water users will all benefit from this program. Export water quality may further improve or degrade depending on the method of Delta conveyance and the water flows through the Delta. The main uses of exported water is for agricultural, municipal, and industrial uses.

Definition

"Export Water Quality" provides a measure of salinity, bromide, and total organic carbon for four export diversion locations from the Delta. The measure focuses on municipal/industrial uses for the North Bay Aqueduct and Contra Costa Intake and for agricultural and municipal/industrial uses for the SWP and CVP export pumps.

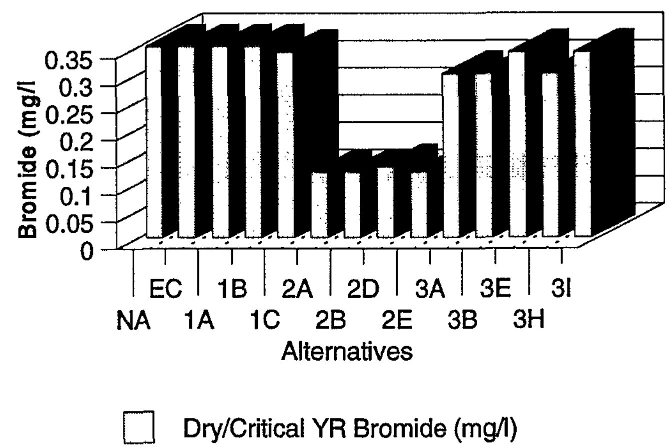
Summary

The salinity, bromide, and total organic carbon vary significantly for the various export locations within the Delta. In general, the alternative 2 variations provide the best export water quality for the Contra Costa Canal diversion. Alternative 3 variations provide the best water quality for the SWP and CVP south Delta export diversions. Alternative 1 variations provide marginally better water quality for the North Bay Intake.

The chart at the right provides one summary from Tables 2.1. Since lower bromide is the most desirable, Table 2.1 provides a score of "5" to the lowest bromide levels and a score of "0" to the highest bromide levels.

Export Water Quality

Contra Costa Bromide Levels



E-001502

2. Export Water Quality

North Bay Aqueduct
- Salinity (TDS)
- Bromide (estimate from DSM)
- TOC (DWR disinfection byproducts model)

Contra Costa Canal Intake
- Salinity (TDS)
- Bromide (estimate from DSM)
- TOC (DWR disinfection byproducts model)

SWP Export Pumps
- Salinity (TDS)
- Bromide (estimate from DSM)
- TOC (DWR disinfection byproducts model)

CVP Export Pumps
- Salinity (TDS)
- Bromide (estimate from DSM)
- TOC (DWR disinfection byproducts model)

To Decision Matrix **To Decision Matrix**

Table 2.1 Summary, All Years

	North Bay (mg/l)			Contra Costa (mg/l)			SWP Export (mg/l)			CVP Export Pumps (mg/l)			S. Delta	Contra C.
Alternative	TDS	Bromide	TOC	TDS	Bromide	TOC	TDS	Bromide	TOC	TDS	Bromide	TOC	Score	Score
Exist. Cond	190	0.05	5.6	300	0.35	3.6	260	0.25	4	310	0.33	4	**2**	**2**
No-action	190	0.05	5.6	300	0.35	3.6	260	0.25	4	310	0.33	4	**2**	**2**
1A	**190**	**0.05**	**5.6**	**300**	**0.35**	**3.6**	**260**	**0.25**	**4**	**310**	**0.33**	**4**	**2**	**2**
1B	190	0.05	5.6	300	0.35	3.6	260	0.25	4	310	0.33	4	**2**	**2**
1C	**190**	**0.05**	**5.6**	**290**	**0.34**	**3.5**	**280**	**0.28**	**4.3**	**280**	**0.28**	**4.3**	**2**	**2**
2A	190	0.05	5.9	160	0.12	4.2	200	0.15	4.4	200	0.15	4.4	**3**	**4**
2B	**190**	**0.05**	**5.9**	**160**	**0.12**	**4.2**	**200**	**0.15**	**4.4**	**200**	**0.15**	**4.4**	**3**	**4**
2D	**190**	**0.05**	**5.9**	**170**	**0.13**	**4.2**	**200**	**0.16**	**4.3**	**200**	**0.16**	**4.3**	**3**	**4**
2E	**190**	**0.05**	**5.7**	**160**	**0.12**	**3.4**	**200**	**0.15**	**4.2**	**200**	**0.15**	**4.1**	**3**	**4**
3A	190	0.05	5.9	270	0.3	5	160	0.07	2.5	160	0.07	2.5	**4**	**2**
3B	190	0.05	5.9	270	0.3	5	160	0.07	2.5	160	0.07	2.5	**4**	**2**
3E	**190**	**0.05**	**5.9**	**290**	**0.34**	**5.5**	**140**	**0.06**	**2.3**	**140**	**0.06**	**2.3**	**4**	**2**
3H	190	0.05	5.9	270	0.3	5	160	0.07	2.5	160	0.07	2.5	**4**	**2**
3I	190	0.05	5.9	290	0.34	5	140	0.06	2.5	140	0.06	2.5	**4**	**2**

Lower salinity, bromide, and TOC indicate better water quality and will be provided higher rankings.

0 = poorer water quality, 5 = highest water quality

Since preliminary modeling showed that North Bay Aqueduct water quality is unchanged by the alternatives, actual data for 1990-1996 was used for the North Bay TDS and bromide columns

E—001502

Export WQ

Table 2.1 Summary, Critical Years (for comparison only)

	North Bay (mg/l)			Contra Costa (mg/l)			SWP Export (mg/l)			CVP Export Pumps (mg/l)			S. Delta	Contra C.
Alternative	TDS	Bromide	TOC	TDS	Bromide	TOC	TDS	Bromide	TOC	TDS	Bromide	TOC	Score	Score
Exist. Cond				510			370			410				
No-action				510			370			410				
1A				**510**			**370**			**410**				
1B				510			370			410				
1C				**480**			**400**			**400**				
2A				210			220			220				
2B				**210**			**220**			**220**				
2D				**220**			**240**			**240**				
2E				**210**			**230**			**230**				
3A				300			180			180				
3B				300			180			180				
3E				**390**			**150**			**150**				
3H				300			180			180				
3I				390			150			150				

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Supporting Information for Table 2.1

In-Delta water quality will vary with the storage and conveyance facilities. Preliminary Delta Simulation Model (DSM) runs provide an indication of in-Delta water quality for the various alternatives. These runs provide an initial evaluation of flow, circulation, and salinity as total dissolved solids (TDS) contained in *Status Reports on Technical Studies for the Storage and Conveyance Refinement Process, Delta Simulation Model Studies of Alternatives 1A, 1C, 2B, 2D, 2E, 3E, August 4, 1997.* Simulations were conducted for the hydrologic simulation period 1976-1991. TDS predictions were presented for mean monthly tidally-averaged values over the hydrologic period. Since the DSM model is not yet linked with DWRSIM, the evaluations consider only at the change due to Delta conveyance. Future runs will also include TDS changes due to the different hydrology between the alternatives. ***This provisional data supporting Table 1.1 and supporting tables tend to over estimate the TDS concentrations. These will be revised in future model runs.***

Municipal & Industrial Water

Total dissolved solids (mg/l) estimates are summarized at each export location as the primary indicators of export water quality. Bromide levels less than 50 ug/L are preferable for drinking water and will be given the highest score. Bromide levels higher than 500 ug/L will be given the lowest score. Table 2.1 shows estimates of salinity and bromides.

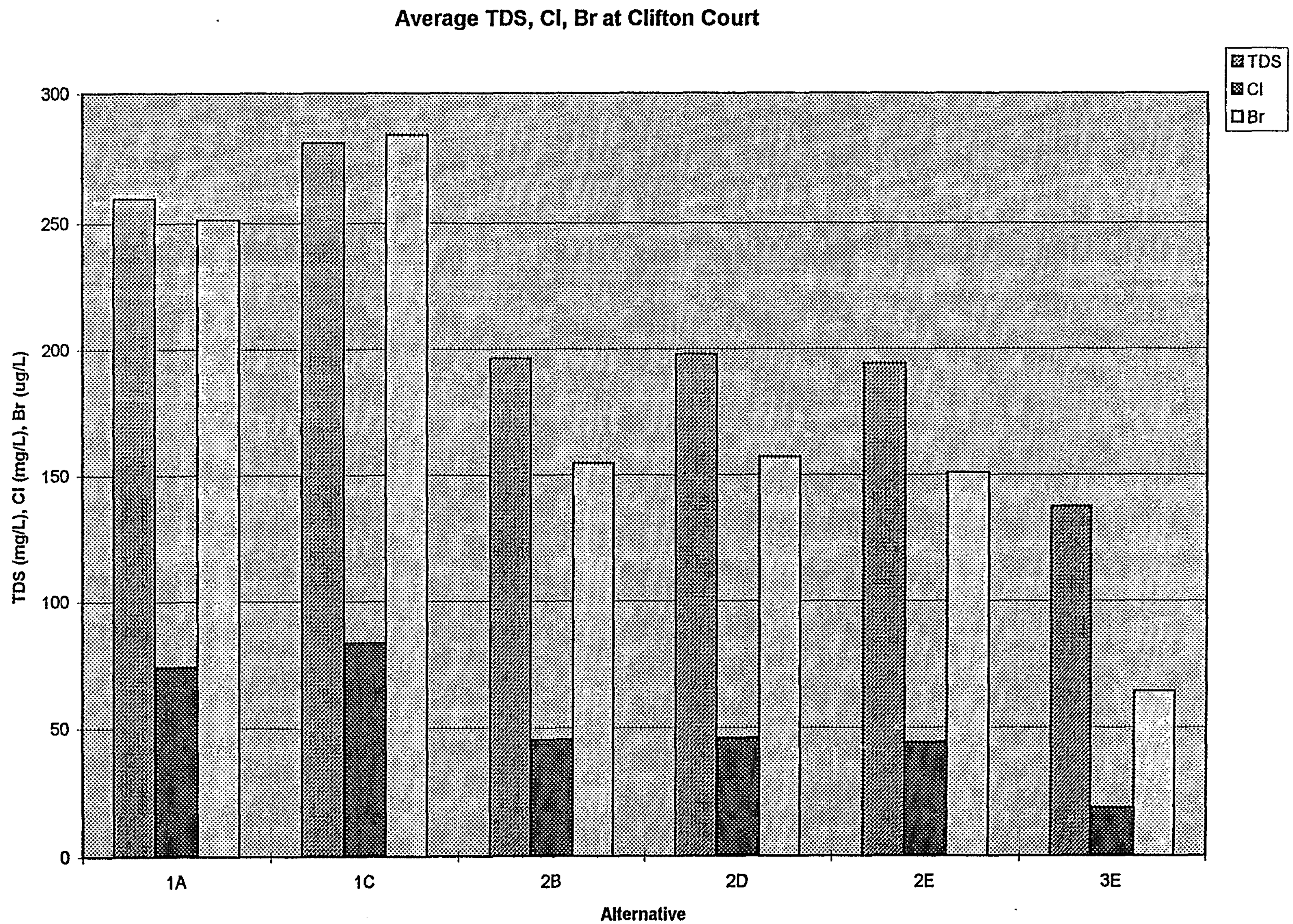
The DWR disinfection byproducts model will be used to estimate organic carbon concentrations. Lower levels of organic carbon are preferable and will be provided the highest score. Table 2.1 shows estimates of organic carbon levels.

Agricultral Water

Agricultural areas that rely on surface water exported from the south-Delta will be adversely impacted from any increase in the salinity of their source water, regardless of the magnitude. This is primarily due to the increased total mass of salts that would be delivered to irrigated fields by the saltier irrigation water. To ensure that reductions in crop yields would not result from the increased salinity, more water would have to be used to provide adequate leaching. This results in greater quantities of salinity laden drainage water that would have to be discharged back to surface waters or sent to evaporation ponds or other disposal sites.

In addition, during drought periods when surface water supplies are reduced, export areas, especially along the westside of the San Joaquin Valley, rely on groundwater as a supplemental source. This groundwater tends to be much higher in salts and is historically diluted with available surface water prior to applying to fields. When the surface water salinity increases, more water would be needed to dilute the groundwater to achieve the desired irrigation water salinity level. However, if there is a limited supply of surface water and more is needed to blend, then the result is a reduction in amount of water available for irrigation (at a given quality).

Though yield impacts from higher water salinity is an issue in the export areas, the adverse impact to drainage quality and quantity and to water supply are of greater importance.


Average TDS, Cl, Br at Clifton Court
TDS (mg/L), Cl (mg/L), Br (ug/L)
0
50
100
150
200
250
300
1A
1C
2B
2D
2E
3E
Alternative
TDS
Cl
Br

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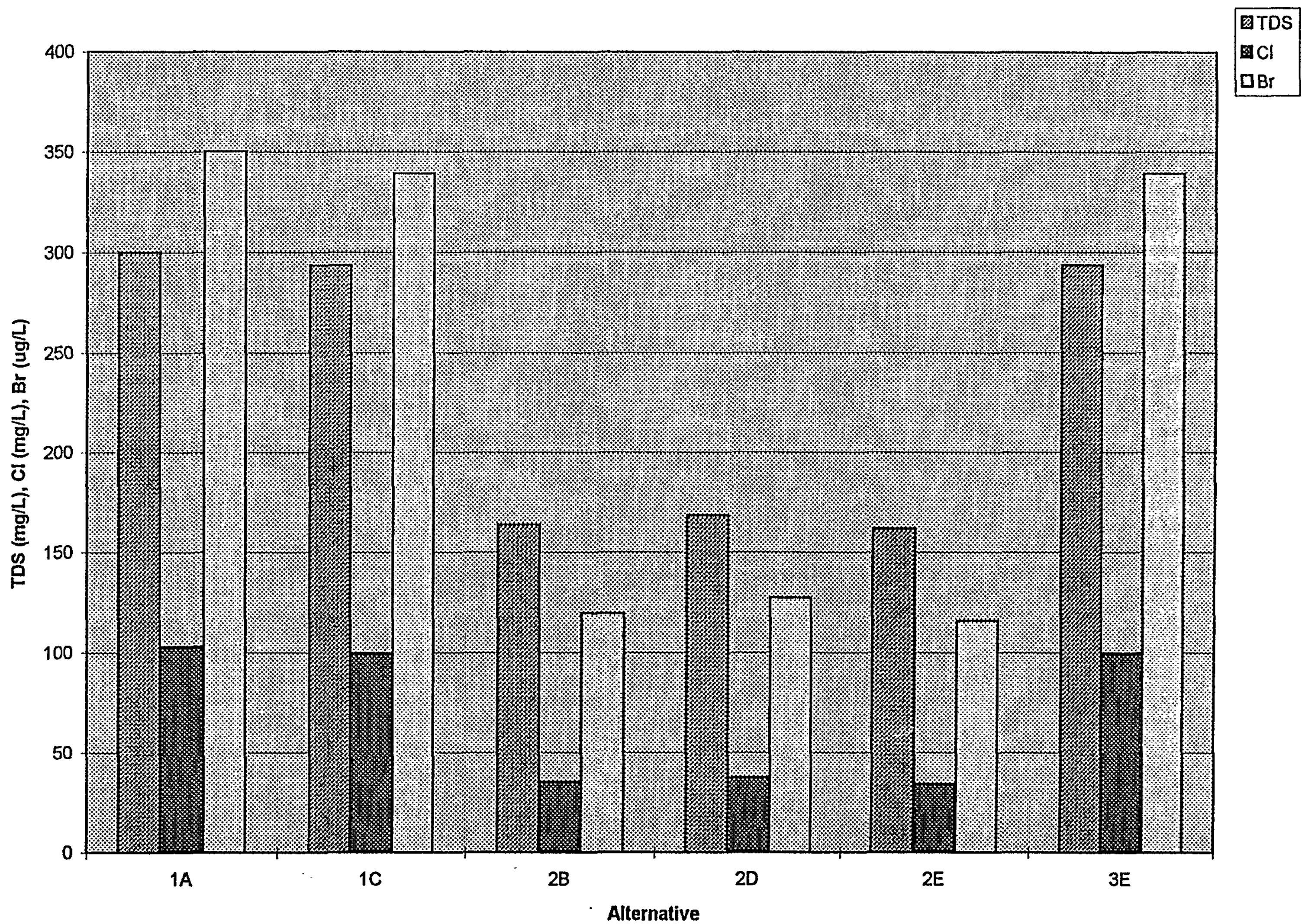
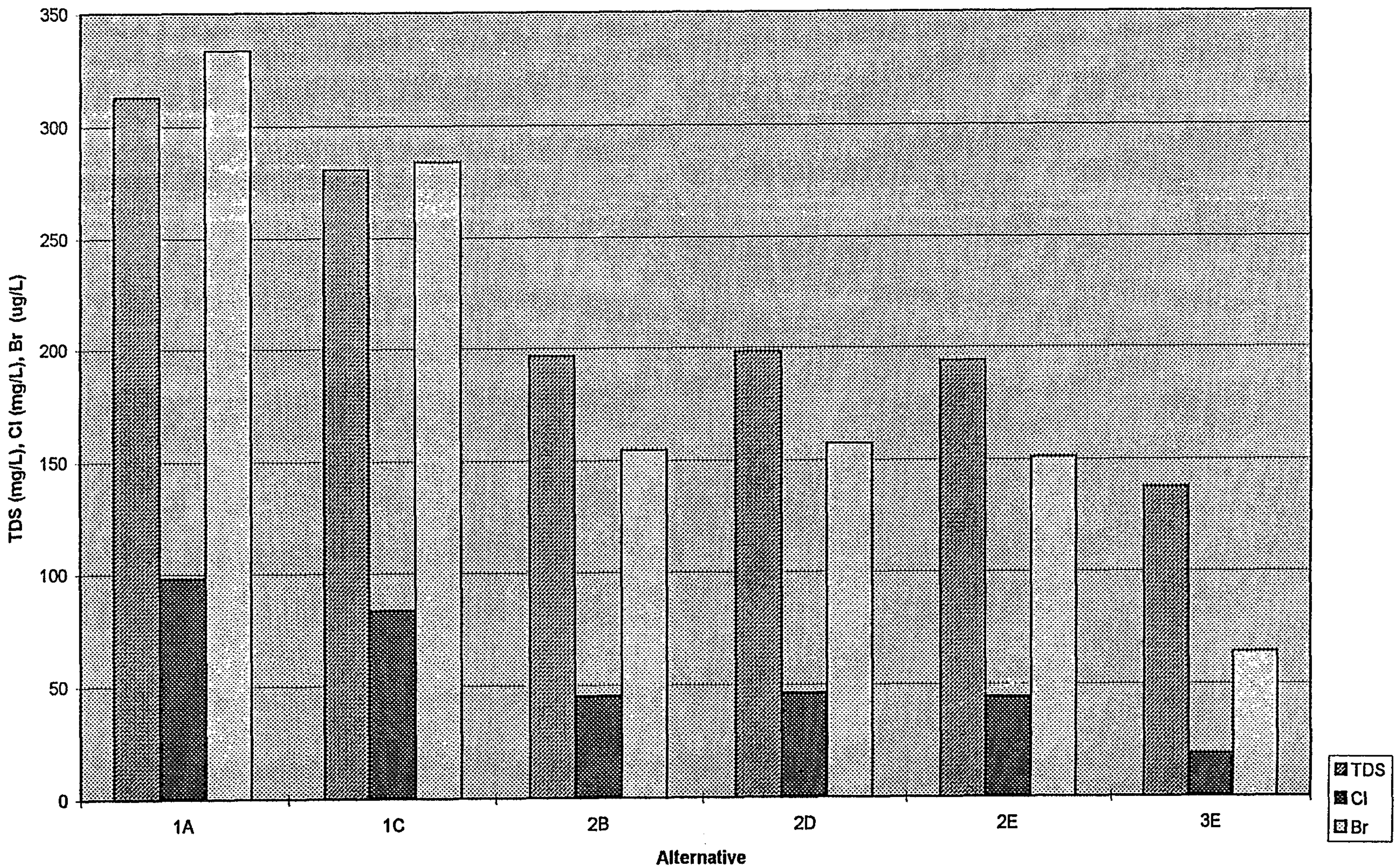
Average TDS, Cl, Br at Old R. @ Rock Sl.



Average TDS, Cl, Br @ Tracy PP



E-001508

PRELIMINARY
SUBJECT TO REVISION

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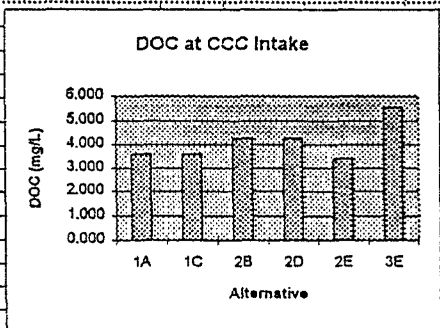
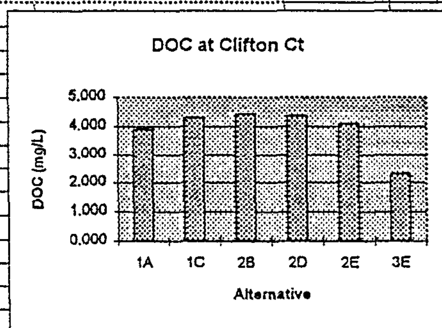
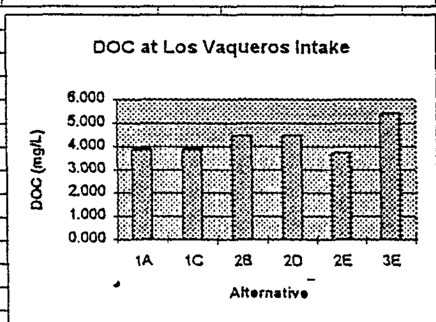
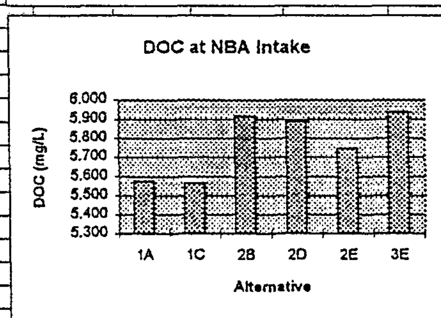
Summary of Predicted Average DOC concentrations at export locations during water years 1985, 86, and 87.

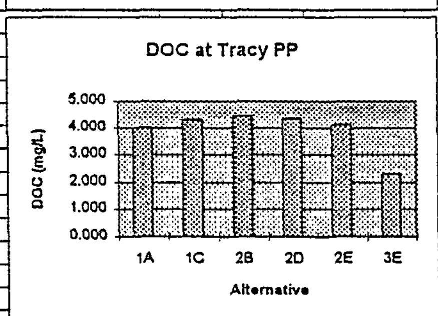
Station	Alt	Avg	Parameter	Min	Max	StDev	Count
CCC Intake	1A	3.592	DOC	2.422	7.735	0.971	36
CCC Intake	1C	3.611	DOC	2.456	7.663	0.958	36
CCC Intake	2B	4.266	DOC	3.256	7.665	0.918	36
CCC Intake	2D	4.276	DOC	3.350	7.352	0.839	36
CCC Intake	2E	3.419	DOC	2.499	7.241	0.864	36
CCC Intake	3E	5.537	DOC	4.104	9.994	1.674	36
Clft Court	1A	3.921	DOC	2.538	6.032	0.855	36
Clft Court	1C	4.316	DOC	3.199	5.843	0.617	36
Clft Court	2B	4.441	DOC	3.615	5.841	0.571	36
Clft Court	2D	4.368	DOC	3.484	5.849	0.642	36
Clft Court	2E	4.122	DOC	2.957	5.848	0.717	36
Clft Court	3E	2.325	DOC	2.006	2.715	0.160	36
Los Vaqueros Intake	1A	3.889	DOC	2.543	6.279	0.906	36
Los Vaqueros Intake	1C	3.886	DOC	2.673	6.171	0.879	36
Los Vaqueros Intake	2B	4.481	DOC	3.405	7.013	0.889	36
Los Vaqueros Intake	2D	4.520	DOC	3.526	6.525	0.845	36
Los Vaqueros Intake	2E	3.758	DOC	2.726	6.486	0.820	36
Los Vaqueros Intake	3E	5.434	DOC	4.223	7.469	0.917	36
NBA Intake	1A	5.574	DOC	3.287	13.876	2.421	36
NBA Intake	1C	5.567	DOC	3.291	13.889	2.414	36
NBA Intake	2B	5.916	DOC	3.533	13.912	2.393	36
NBA Intake	2D	5.889	DOC	3.498	13.844	2.381	36
NBA Intake	2E	5.747	DOC	3.344	13.814	2.381	36
NBA Intake	3E	5.942	DOC	3.546	13.933	2.386	36
Tracy PP	1A	4.025	DOC	3.057	6.010	0.781	36
Tracy PP	1C	4.316	DOC	3.199	5.843	0.617	36
Tracy PP	2B	4.441	DOC	3.615	5.841	0.571	36
Tracy PP	2D	4.368	DOC	3.484	5.849	0.642	36
Tracy PP	2E	4.122	DOC	2.957	5.848	0.717	36
Tracy PP	3E	2.325	DOC	2.006	2.715	0.160	36











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