APPENDIX M
SEDIMENT QUALITY REPORT (2010)

U.S. Army Corps of Engineers
San Francisco District

Sampling and Analysis Report
Sacramento River Deep Water Ship Channel Proposed Deepening Project
River Miles 0 – 35

U.S. Army Corps of Engineers
San Francisco District
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LIST OF ACRONYMS AND ABBREVIATIONS

°C	degree Celsius
µg	microgram
µm	micrometer
ac	acre
AGP/NP	acid generating potential/neutralizing potential
ASTM	American Society for Testing and Materials
BOD	Biological Oxygen Demand
CDFG	California Department of Fish and Game
CDQAR	Chemical Data Quality Assessment Report
COC	chain-of custody
CVAA	cold vapor atomic absorption
cy	cubic yard
DI-WET	deionized water – waste extraction test
DWR	Department of Water Resources
ECD	electron capture detector
ERED	Environmental Residue-Effects Database
FPD	flame photometric detection
g	gram
GC	gas chromatography
GO	General Order
HCCPD	hexachlorocyclopentadiene
ICP/AES	inductively coupled plasma atomic emissions spectrometry
ITM	Inland Testing Manual
kg	kilogram
L	liter
LTMS	Long-Term Management Strategy
MDL	method detection limit
MET	modified elutriate test
mg	milligram
MLLW	mean lower low water
MRL	method reporting limit
MS	mass spectrometry

ND	non detect
ng	nanogram
NOER	no observed effect residue
NOI	Notice of Intent
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
Port	Port of West Sacramento
ppt	parts per trillion
Quicksilver	Quicksilver Scientific
RM	River Mile
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SIM	simultaneously extracted metal
SM	Standard Method
SCCWRP	Southern California Coastal Water Research Project
SRDWSC	Sacramento River Deep Water Ship Channel
TDS	total dissolved solid
TMDL	Total Maximum Daily Load
TOC	total organic carbon
TSS	total suspended solid
USACE	U.S. Army Corps of Engineers
USCS	Unified Soil Classification System
USEPA	U.S. Environmental Protection Agency
UTM	Upland Testing Manual
ZSV	zone settling velocity
WET	waste extraction test

1 CASE NARRATIVE

The U.S. Army Corps of Engineers (USACE) is investigating the continuation of the authorized project to deepen and widen portions of the Sacramento River Deep Water Ship Channel (SRDWSC). The SRDWSC serves deep draft commercial vessels en route to the Port of West Sacramento (Port). In 1986, Congress authorized deepening the project from -30 to -35 feet mean lower low water (MLLW) and widening portions of the channel to improve navigation safety. Construction was initiated in 1989, and dredging was completed between River Miles (RMs) 43.3 (Port) and 35.5. The USACE currently plans to complete the project between RMs 35.5 and 1.

The objective of this investigation is to characterize material proposed for dredging between RMs 35.5 and 1 for its environmental suitability for upland disposal at 10 placement sites along the SRDWSC. Sampling and analysis of material under consideration for upland disposal was conducted in accordance with the *Sacramento Deep water Ship Channel Navigation Project Sampling and Analysis Plan* (SAP; USACE 2008). Analytical testing—bulk sediment chemistry, modified elutriate test (MET) chemistry, and deionized water – waste extraction test (DI-WET) chemistry—was conducted in accordance with the *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual* (ITM; USEPA/USACE 1998) and the *Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities – Testing Manual* (UTM; USACE 2003a).

Bulk sediment, MET, and DI-WET chemistry results were evaluated in relationship to maximum concentrations of corresponding analytes measured in material previously placed in proposed placement sites along the SRDWSC. These data, collected as part of previous pre-dredge characterization studies, were provided the USACE in Notices of Intent (NOIs) to Dredge for 2001, 2002, 2003 (2003b), 2005, 2006, and 2007 and used as the "background" for material already deposited in the placement sites. Chemistry results were also evaluated in relationship to criteria described in Waste Discharge Requirement General Order (GO) No. 5-01-116 (CVRWQCB 2001). Results for arsenic, total chromium, and nickel in bulk sediment were compared to criteria consistently used in NOIs for maintenance dredging projects in the SRDWSC, which are based upon a delta-wide background study conducted at the University of California at Berkeley. Mercury in bulk sediment was also compared to the

mercury target of 0.2 milligrams per kilogram (mg/kg) in the Sacramento–San Joaquin Delta Estuary Total Maximum Daily Load (TMDL) for methyl mercury. Barium concentrations in MET samples were compared to the Central Valley Basin Plan effluent discharge limit for barium (100 µg/L) in the dissolved fraction.

Results of bulk sediment composites analyses demonstrated arsenic, chromium, and nickel at concentrations in sediment that exceeded GO criteria and/or criteria from NOIs for maintenance dredging projects. Only one sample exceeded the arsenic sediment criteria and 14 samples exceeded the nickel sediment criteria from NOIs for maintenance dredging projects. Thirty-nine samples exceeded either the chromium sediment criteria from NOIs for maintenance dredging projects or the maximum value from previous pre-dredge characterization studies. Chromium and arsenic in sediment were correlated with iron and aluminum, indicative of background concentrations of these metals. In addition, concentrations of chromium, arsenic, and nickel were similar to sediment from previous pre-dredge characterization studies, in which metals were consistently above GO criteria.

Discrete sediment sample analyses demonstrated that several metals exceeded the GO criteria and criteria from NOIs for maintenance dredging projects, as with the sediment composites. Similar to previous pre-dredge characterization studies, the most widespread exceedances were for chromium and nickel. Only one of 34 discrete samples (08SAC31; 0.248 mg/kg) for total mercury exceeded the Sacramento–San Joaquin TMDL sediment target; however, this estimated concentration was well below the maximum value seen in previously dredged material (0.68 mg/kg) and was within the range seen in previously sampled dredged material.

Results of DI-WET analyses indicated that none of the DI-WET metals exceeded the maximum concentration detected in previous maintenance dredged material investigations; however, arsenic, copper, and lead were detected at concentrations that exceeded the corresponding GO criteria, which is similar to previous dredged material investigations. Based on these results, impacts to groundwater via infiltration and surface water due to stormwater discharge are not expected.

Selenium was the only metal shown in MET results to exceed the maximum concentration detected in previous maintenance dredged material investigations; however, arsenic, barium, copper, lead, mercury, selenium, and chloride were detected at concentrations that exceeded

the corresponding GO criteria or criteria from the Central Valley Basin Plan. To determine if the discharge criteria will be met, MET metals results may be combined with the column settling test data using the SETTLE program to estimate the total metals concentrations in the discharge water.

2 PROJECT OVERVIEW

The USACE is investigating the continuation of the authorized project to deepen and widen portions of the SRDWC (Figure 1). The SRDWSC serves deep draft commercial vessels en route to the Port, and consequently, dredging is necessary to improve safety associated with navigating the SRDWSC in inclement weather and to relieve load restrictions of many of the vessels currently calling on the Port. Deepening the project from -30 to -35 feet MLLW and widening portions of the channel to improve navigation safety was authorized by Congress in 1986. Construction was initiated in 1989, and dredging was completed between RMs 43.3 (Port) and 35.5. The current investigation focuses on resuming the construction and completing the project between RMs 35.5 and 1.

Current plans include dredging to a project depth of -35 feet MLLW plus 2 feet of overdepth (1 foot paid and 1 foot unpaid). The current study characterized sediments to a depth of -37 feet MLLW and discrete horizons representative of the new sediment surface after dredging. Based on the most recent bathymetry data from 2007 and 2009, the USACE anticipates the total dredged material volume will be 5.5 million cubic yards (cy), which includes the volume previously authorized for dredging in 1986 and the sediment that has since accumulated according to 2007 bathymetric survey data. The USACE anticipates the total dredged material volume to be 7 million cy with a 1-foot overdepth, 7.8 million cy with a 1.5-foot overdepth (represents the most likely depth for the proposed project), and 8.7 million cy with a 2-foot overdepth.

The proposed project includes intermittent widening throughout the channel. While most of the proposed widening is generally between 25 and 50 feet, greater widths are proposed in certain areas along the SRDWSC. At approximately RM 15 and from approximately RMs 15.5 through 18, the proposed alignment is wider than the existing alignment by 100 to 200 feet, except in one location near RM 18 where it is as much as 400 feet wider. Figures 2a through 2j shows the proposed widening locations within the existing channel.

The USACE plans to remove material using a hydraulic pipeline dredge, as was previously used during maintenance dredging activities, although other types of dredging equipment may be used. Material will be pumped via pipeline into 10 upland placement sites identified by the USACE in coordination with other agencies. Initial upland placement sites are the

same as those currently used for maintenance dredging along the channel. These placement sites are shown in Figure 3 and described in Table 1. Some of these placement sites may have to be augmented in size while other placement sites, not used in the recent past, may be required as a consequence of volume requirements. The slurry pumped into the sites will consist mostly of water. Water will be discharged back into the SRDWSC after most of the suspended solids have settled out.

Table 1
Upland Placement Sites Proposed for Placement of Dredged Material

Placement Site	RM Extents	Estimated Capacity Need (cy)	Area (ac)	Owner	Previously Used for Dredged Material Placement?
S35	2.0 to 3.1	211,393	335	Sacramento Municipal Utilities District	No
S20	5.0 to 5.5	429,562	98	DWR	Yes
S19	6.9 to 8.5	1,411,817	454	Port; Milpitas Main Street	Yes
S16	9.5 to 11.0	645,439	198	USACE	Yes
S14	14.4 to 14.6	889,172	196	USACE	No
S12	18.6 to 20.0	158,774	294	Port	No
S11	22.4 to 25.0	192,919	354	Port; Private	Yes
S31	26.6 to 40.4	2,390,323	758	Port	Yes
S32	31.6 to 35.2	27,643	265	Private	No
Total		**6,357,042**			
Lower Sherman Island (optional site not included in total)	2.5 to 3.3	500,000	513	CDFG	No

Notes:
ac = acre
CDFG = California Department of Fish and Game
DWR = Department of Water Resources

2.1 Project Site Location

The 45.8-mile-long SRDWSC is located in California's Sacramento-San Joaquin River Delta. It is comprised of an approximately 17-mile section of the Sacramento River (from New York Slough to 2 miles north of Rio Vista) and the entire length of the 29-mile navigation channel (from 2 miles north of Rio Vista to the Port; Figure 1). The upper 25 miles of the navigation channel is manmade, and the 8.4 miles of the navigation channel nearest to the Port comprises the portion previously dredged to -35 feet MLLW.

2.2 Previous Investigations

As part of maintenance dredging programs, numerous dredged material evaluations have been conducted on sediment from the SRDWSC. The initial program was designed to assess only metals; however, the analyte list was expanded in more recent years to include organic chemicals, such as chlorinated pesticides, polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). Results of these studies are briefly described in Sections 2.2.1 through 2.2.7.

2.2.1 2000 Maintenance Dredging Project

As part of this program, metals were assessed in bulk sediment, DI-WET, and MET samples from RMs 6.31 to 12.88 and 33.33 to 37.69. All metals analyzed within 12 sediment samples were below corresponding criteria from GO No. 96-220. All DI-WET metals except arsenic in one of 12 samples and all MET metals were below corresponding criteria in the GO.

2.2.2 2001 Maintenance Dredging Project

As part of this program, metals and organics were assessed in bulk sediment and MET samples, and metals were assessed in DI-WET from RMs 4.83 to 6.16, 9.01 to 9.38, and 42.6 to 43.6. In sediment, chromium concentrations in five samples, mercury in two samples, and nickel in one of six samples exceeded corresponding criteria from GO No. 5-01-0116 (CVRWQCB 2001). All organics in sediment except benzo(a)pyrene, all DI-WET metals except lead in one sample and mercury in one sample, all MET metals except mercury in two samples, all organics except beta-BHC in MET samples, and all organics in sediment except benzo(a)pyrene were below corresponding GO criteria.

2.2.3 2002 Maintenance Dredging Project

RMs 4.51 to 5.06, 6.02 to 6.40, and 7.67 to 7.86A were assessed in bulk sediment for metals and organics and assessed in MET samples and DI-WET for metals. In sediment, chromium concentrations in one sample, mercury in one sample, nickel in two samples, and zinc in one of two samples exceeded corresponding criteria from GO No. 5-01-0116 (CVRWQCB 2001). All organics in sediment were below corresponding criteria from the GO, all MET metals except mercury in both samples, and all organics in MET samples were below corresponding GO criteria. DI-WET metals, including arsenic, chromium, copper, lead, mercury, nickel, and zinc in both samples, exceeded the corresponding criteria from the GO.

2.2.4 2003 Maintenance Dredging Project

RMs 5.11 to 6.44, 8.24 to 8.43, and 30.45 to 33.52 were assessed in bulk sediment and MET samples for metals and organics and assessed in DI-WET for metals. Chromium in three samples, copper in one sample, mercury in two samples, and nickel in five of five samples exceeded corresponding criteria from GO No. 5-01-0116 (CVRWQCB 2001). All organics in sediment were below corresponding criteria from the GO. DI-WET metals, including arsenic, chromium, copper, lead, mercury, nickel, and zinc in all samples, exceeded the corresponding criteria in the GO. MET metals, including cadmium and copper in one sample and mercury in all samples, exceeded the corresponding criteria in the GO. All organics in MET samples were below corresponding GO criteria.

2.2.5 2005 Maintenance Dredging Project

RMs 4.45 to 6.06, 6.89 to 7.69, 27.84 to 28.60, and 29.36 to 34.09 were assed in bulk sediment and MET samples for metals and organics and assessed in DI-WET for metals. In sediment, arsenic concentrations in one sample, chromium in eight samples, mercury in two samples, and nickel in eight of nine samples exceeded corresponding criteria from GO No. 5-01-0116 (CVRWQCB 2001). All organics in sediment were below corresponding criteria from the GO. DI-WET, including copper and lead in two samples, exceeded the corresponding criteria from the GO. MET metals including mercury in four samples and arsenic in one of nine samples and all organics except PAHs in one MET sample and PCBs in two of nine MET samples were below corresponding criteria from the GO.

2.2.6 2006 Maintenance Dredging Project

RMs 5.68 to 7.16, 9.28 to 10.11, and 12.46 to 12.97 were assessed in bulk sediment and MET samples for metals and organics and assessed in DI-WET for metals. In sediment, chromium in two samples, mercury in one sample, and nickel in two of six samples exceeded corresponding criteria from GO No. 5-01-0116 (CVRWQCB 2001). All organics in sediment, all DI-WET metals, all MET metals, and all organics in MET samples were below corresponding criteria from the GO.

2.2.7 2007 Maintenance Dredging Project

RMs 31.97 to 34.81 were assessed in bulk sediment and MET samples for metals and organics and assessed in DI-WET for metals. In sediment, chromium in two samples, copper in one sample, nickel in two samples, and zinc in one of two samples exceeded corresponding criteria from GO No. 5-01-0116 (CVRWQCB 2001). All organics in sediment, all DI-WET metals except zinc in one sample, all MET metals except mercury in one sample, and all organics in MET samples were below corresponding criteria from the GO.

3 METHODS

Sampling was performed pursuant to the SAP (USACE 2008) that described the sampling and analytical methodology that was reviewed by the Delta Long-Term Management Strategy (LTMS). Comments were received and outstanding issues resolved prior to sampling.

3.1 Field Sampling Methods

To adequately characterize the material to be dredged along the entire project, samples were taken at 124 locations along the 35.5 miles of the project area. Sampling locations were selected in accordance with ITM guidance (USEPA/USACE 1998). The ITM outlines considerations for determination of sampling locations, including designation of areas with similar geotechnical properties, sampling relative to bathymetry and shoals, stratification, distribution of sediments to be dredged, historical contamination and potential sources, accessibility, flows (currents, tides), mixing (hydrology), land use activities, and available resources. These considerations were taken into account when designing this program. Due to similarities within sources, flows, land use activities, mixing, and geotechnical properties, the dredge footprint was divided into RMs. The number of samples was chosen based on the amount of dredged material to be removed per RM, as determined from a 2003 bathymetry survey (USACE 2003c and 2003d). Consequently, one composite sample was targeted for every 49,100 cy of material to be dredged within each RM as shown in Table 2. As shown in Table 3, this sample coverage was also similar to that used in previous dredged material investigations of SRDWSC material for maintenance dredging programs.

Table 2

Approximate Dredged Material Volumes and Associated Compositing Scheme

RM	Stationing		Estimated Dredged Material Volume Per RM		Sample Cores	Compositing Scheme
	Start	End	To -35 Feet MLLW	Plus 1 Foot of Overdepth		
1	1+00	52+00	49,027	84,699	2	Composite of 2 samples
2	53+00	105+00	37,556	84,566	2	Composite of 2 samples
3	106+00	158+00	24,323	42,828	1	1 discreet sample
4	159+00	211+00	49,745	88,931	2	Composite of 2 samples
5	212+00	238+00	287,629	355,469	3	Composite of 3 samples
	238+00	264+00			4	Composite of 4 samples
6	265+00	291+00	342,823	410,483	4	Composite of 4 samples
	291+00	317+00			4	Composite of 4 samples
7	318+00	344+00	305,246	371,574	3	Composite of 3 samples
	344+00	370+00			4	Composite of 4 samples
8	371+00	397+00	281,754	346,721	3	Composite of 3 samples
	397+00	422+00			4	Composite of 4 samples
9	423+00	449+00	263,377	330,246	3	Composite of 3 samples
	449+00	475+00			4	Composite of 4 samples
10	476+00	502+00	297,679	364,579	3	Composite of 3 samples
	502+00	528+00			4	Composite of 4 samples
11	529+00	555+00	225,042	292,793	3	Composite of 3 samples
	555+00	581+00			3	Composite of 3 samples
12	582+00	634+00	92,490	141,707	3	Composite of 3 samples
13	635+00	661+00	227,509	293,329	3	Composite of 3 samples
	661+00	687+00			3	Composite of 3 samples
14	688+00	739+00	89,947	120,588	3	Composite of 3 samples
15[1]	740+00	766+00	234,446	253,499	2	Composite of 2 samples
	766+00	792+00			3	Composite of 3 samples
16	793+00	845+00	1,294	1,543	1	Composite of 3 samples
17	846+00	898+00	29,829	35,268	1	
18	899+00	951+00	13,127	13,945	1	
19	952+00	1003+00	59,190	79,600	2	Composite of 2 samples
20	1004+00	1056+00	41,956	80,078	2	Composite of 2 samples
21	1057+00	1109+00	32,914	70,778	2	Composite of 2 samples
22	1110+00	1162+00	25,993	63,028	1	1 discreet sample
23	1163+00	1214+00	27,576	58,977	1	1 discreet sample
24	1215+00	1267+00	3,647	27,873	1	1 discreet sample
25	1268+00	1320+00	47,942	87,067	2	Composite of 2 samples

Table 2

Approximate Dredged Material Volumes and Associated Compositing Scheme

RM	Stationing		Estimated Dredged Material Volume Per RM		Sample Cores	Compositing Scheme
	Start	End	To -35 Feet MLLW	Plus 1 Foot of Overdepth		
26	1321+00	1347+00	316,933	364,171	3	Composite of 3 samples
	1347+00	1373+00			4	Composite of 2 samples
27	1374+00	1426+00	179,900	220,861	4	Composite of 4 samples
28	1427+00	1478+00	130,392	168,235	3	Composite of 3 samples
29	1479+00	1531+00	172,850	211,125	4	Composite of 4 samples
30	1532+00	1584+00	186,204	224,728	4	Composite of 4 samples
31	1585+00	1601+00	228,039	266,934	2	Composite of 2 samples
	1601+00	1637+00			3	Composite of 3 samples
32	1638+00	1654+00	200,288	238,708	2	Composite of 2 samples
	1654+00	1690+00			3	Composite of 3 samples
33	1691+00	1742+00	163,333	200,992	4	Composite of 4 samples
34	1743+00	1769+00	241,369	279,708	2	Composite of 2 samples
	1769+00	1795+00			3	Composite of 3 samples
35	1796+00	1822+00	220,243	258,954	2	Composite of 2 samples
	1822+00	1848+00			3	Composite of 3 samples

Notes:

1 RM 15 was at project depth. No samples were collected.

Table 3

Number of Composite Samples Collected and Analyzed as Part of Maintenance Dredging Programs in the SRDWSC from 2000 to 2007

Maintenance Dredging Year	Approximate Dredged Material Volume (cy)	Number of Composite Samples Analyzed
2000	525,000	12
2001	286,000	6
2002	35,000	2
2003	199,000	5
2005	261,000	9
2006	257,000	6
2007	147,000	2

Target sampling locations were shifted when necessary during sampling because of changes in bathymetry since the 2003 survey (i.e., shoaling, maintenance dredging, etc.), which was used to design the SAP. When necessary to achieve adequate and representative samples, sampling locations were shifted, and samples were taken from shallowest of the shoaled areas in the vicinity of the planned sampling locations. More recent bathymetry has been collected, and sampling locations have been compared to the most recent bathymetry.

3.1.1 Sample Nomenclature

All samples contain the prefix "08SAC" followed by the RM in which they were taken (i.e., 08SAC1 for a sample from RM 1). Composite samples also have a dash and numbers or letters (on maps only) that indicate the individual core samples within that RM that comprise the composite. For example, sample 08SAC10-123 indicates a composite sample from RM 10 is comprised of three individual cores (one through three). Discrete samples (one per RM) were collected at the bottom of selected cores and represent the new surface horizon that will be exposed following dredging. Discrete samples were labeled with a "b" and a dash followed by a number or letter (on maps) representing the individual core sample. For example, sample 08SAC31b-3 indicates a discrete sample in the third station of RM 31. A list of all composite and discrete sample identifications is shown in Table 4.

Table 4
Sample Nomenclature Used for Sediment Composite and Discrete Sediment Samples

RM	Individual Sediment Core Sample ID	Sediment Composite Sample ID	Discrete Sediment Sample (New Horizon) Sample ID
1	08SAC1-1	08SAC1-12	08SAC1b-2
	08SAC1-2		
2	08SAC2-1	08SAC2-12	08SAC2b-2
	08SAC2-2		
3	08SAC3-1	08SAC3-1	08SAC3b-1
4	08SAC4-1	08SAC4-12	08SAC4b-2
	08SAC4-2		

Table 4
Sample Nomenclature Used for Sediment Composite and Discrete Sediment Samples

RM	Individual Sediment Core Sample ID	Sediment Composite Sample ID	Discrete Sediment Sample (New Horizon) Sample ID
5	08SAC5-1	08SAC5-123	08SAC5b-4
	08SAC5-2		
	08SAC5-3		
5	08SAC5-4	08SAC5-4567	
	08SAC5-5		
	08SAC5-6		
	08SAC5-7		
6	08SAC6-1	08SAC6-1234	08SAC6b-5
	08SAC6-2		
	08SAC6-3		
	08SAC6-4		
	08SAC6-5	08SAC6-5678	
	08SAC6-6		
	08SAC6-7		
	08SAC6-8		
7	08SAC7-1	08SAC7-123	08SAC7b-4
	08SAC7-2		
	08SAC7-3		
7	08SAC7-4	08SAC7-456	
	08SAC7-5		
	08SAC7-6		
8	08SAC8-1	08SAC8-123	08SAC8b-4
	08SAC8-2		
	08SAC8-3		
8	08SAC8-4	08SAC8-4567	
	08SAC8-5		
	08SAC8-6		
	08SAC8-7		

Table 4
Sample Nomenclature Used for Sediment Composite and Discrete Sediment Samples

RM	Individual Sediment Core Sample ID	Sediment Composite Sample ID	Discrete Sediment Sample (New Horizon) Sample ID
9	08SAC9-1	08SAC9-123	09SAC9b-4
	08SAC9-2		
	08SAC9-3		
9	08SAC9-4	08SAC9-4567	
	08SAC9-5		
	08SAC9-6		
	08SAC9-7		
10	08SAC10-1	08SAC10-123	08SAC10b-4
	08SAC10-2		
	08SAC10-3		
10	08SAC10-4	08SAC10-4567	
	08SAC10-5		
	08SAC10-6		
	08SAC10-7		
11	08SAC11-1	08SAC11-123	08SAC11b-3
	08SAC11-2		
	08SAC11-3		
11	08SAC11-4	08SAC11-456	
	08SAC11-5		
	08SAC11-6		
12	08SAC12-1	08SAC12-123	08SAC12b-2
	08SAC12-2		
	08SAC12-3		
13	08SAC13-1	08SAC13-123	08SAC13b-3
	08SAC13-2		
	08SAC13-3		
13	08SAC13-4	08SAC13-456	
	08SAC13-5		
	08SAC13-6		
14	08SAC14-1	08SAC14-123	08SAC14b-2
	08SAC14-2		
	08SAC14-3		

Table 4
Sample Nomenclature Used for Sediment Composite and Discrete Sediment Samples

RM	Individual Sediment Core Sample ID	Sediment Composite Sample ID	Discrete Sediment Sample (New Horizon) Sample ID
16, 17, 18	08SAC16/18-1	08SAC16/18-123	08SAC16b-1
	08SAC16/18-2		08SAC17b-1
	08SAC16/18-3		08SAC18b-1
19	08SAC19-1	08SAC19-12	08SAC19b-2
	08SAC19-2		
20	08SAC20-1	08SAC20-12	08SAC20b-2
	08SAC20-2		
21	08SAC21-1	08SAC21-12	08SAC21b-2
	08SAC21-2		
22	08SAC22-1	08SAC22-1	08SAC22b-1
23	08SAC23-1	08SAC23-1	08SAC23b-1
24	08SAC24-1	08SAC24-1	08SAC24b-1
25	08SAC25-1	08SAC25-12	08SAC25b-1
	08SAC25-2		
26	08SAC26-1	08SAC26-123	08SAC26b-4
	08SAC26-2		
	08SAC26-3		
26	08SAC26-4	08SAC26-4567	
	08SAC26-5		
	08SAC26-6		
	08SAC26-7		
27	08SAC27-1	08SAC27-1234	08SAC27b-3
	08SAC27-2		
	08SAC27-3		
	08SAC27-4		
28	08SAC28-1	08SAC28-123	08SAC28b-2
	08SAC28-2		
	08SAC28-3		
29	08SAC29-1	08SAC29-1234	08SAC29b-3
	08SAC29-2		
	08SAC29-3		
	08SAC29-4		

Table 4
Sample Nomenclature Used for Sediment Composite and Discrete Sediment Samples

RM	Individual Sediment Core Sample ID	Sediment Composite Sample ID	Discrete Sediment Sample (New Horizon) Sample ID
30	08SAC30-1	08SAC30-1234	08SAC30b-3
	08SAC30-2		
	08SAC30-3		
	08SAC30-4		
31	08SAC31-1	08SAC31-12	08SAC31b-3
	08SAC31-2		
31	08SAC31-3	08SAC31-345	
	08SAC31-4		
	08SAC31-5		
32	08SAC32-1	08SAC32-12	08SAC32b-3
	08SAC321-2		
32	08SAC32-3	08SAC32-345	
	08SAC32-4		
	08SAC32-5		
33	08SAC33-1	08SAC33-1234	08SAC33b-4
	08SAC33-2		
	08SAC33-3		
	08SAC33-4		
34	08SAC34-1	08SAC34-12	08SAC34b-3
	08SAC34-2		
34	08SAC34-3	08SAC34-345	
	08SAC34-4		
	08SAC34-5		
35	08SAC35-1	08SAC35-12	08SAC35b-4
	08SAC35-2		
35	08SAC35-3	08SAC35-345	
	08SAC35-4		
	08SAC35-5		

3.1.2 Sampling Locations and Depths

Sediment core sampling was conducted at 124 stations within the proposed maintenance dredging footprints of the SRDWSC. Figures 4a through 4j show the target and actual sampling locations while Figures 5a through 5j shows the actual sampling locations in relationship to the most recent bathymetry and the dredge footprint. A total of 44 sediment composite samples were created from these cores and used to characterize material to be dredged within the project area. No samples were collected within RM 15, because the depth already exceeded the project depth of -35 feet MLLW (plus 2 feet of allowable overdepth). One discrete sample from each RM, excluding RM 15, was also collected at the bottom of selected cores (see Table 4). This discrete sample represents the new surface horizon that will be exposed following dredging. The number of cores, sample identification numbers, sampling locations, target lengths, and sampling depths (at each station) were described in the SAP and are summarized in Section 4.1.

All sediment cores were collected to the project depth, plus 2 feet of overdepth, unless refusal was encountered. If refusal was encountered, the vessel was moved and a second core attempted. To collect sufficient sediment for analysis, multiple sediment cores were collected at each core location and were composited into single area samples for all required testing and archival purposes.

3.1.3 Core Collection and Processing

Samples were taken by Kinetics Laboratories, Inc., of Santa Cruz, California, using the 30-foot *R/V Prophesy* that was tended by a whaler skiff. Sample coordinates, water depths, and mudline elevations corrected to MLLW were recorded at each sampling location. Navigation and final positioning were conducted using a differential GPS navigation system, operating in differential mode. Water depths were measured with a graduated leadline.

Coring was conducted using an electric vibracore sampler equipped with a pre-cleaned 4-inch outer diameter coring tube lined with a clean polyvinyl sleeve and a stainless-steel catcher. The vibracore was pulsated into the sediment until it reached the project depth plus 2 feet of overdepth or until the vibracore was rejected from further penetration. Following sampling, the vibracore was retrieved to the deck of the boat, and the liner with the sediment core was removed from the aluminum tube and cut vertically along the length of

the sediment core. The core stratigraphy, grain size distribution, color, texture, and other pertinent sediment characteristics were logged according to the Unified Soil Classification System (USCS). All vibracore equipment was cleaned prior to sampling as described in Section 3.1.4. Cores from each station were composited by subsampling to obtain a representative volume for each strata across the individual core samples. Subsamples were then mixed together to create the uniform composite for each RM. The individual cores were also subsampled, and subsamples were retained and submitted as archives in case future analyses are warranted. Seven-gallon sediment composites were also created for column settling tests by creating representative composites for every 5 RMs.

3.1.4 Decontamination Procedures

Measures were taken to ensure that no external contamination affected the core samples. These measures included wearing nitrile gloves while handling samples, changing gloves for every sample, double sealing the ends of the core tubes, and limiting the use of internal combustion engines for deck winches or deck-mounted generators and the main propulsion engine. All sample containers were chemically cleaned and rinsed. Polyvinyl liners were used for sampling. Between samplings, and prior to moving to the next sampling station, the coring device was decontaminated. The decontamination process consisted of scrubbing and rinsing with site water until no more sediment remained. It was then cleaned with biodegradable non-phosphate detergent, rinsed again with copious amounts of site water taken from at least 5 feet below the surface, and then rinsed with distilled water. The same cleaning process was used on reusable equipment.

3.1.5 Water Sampling

A 1-liter ambient water hardness sample was collected at each sampling location. In addition, 28 liters of ambient water were collected at each location for preparation and use in the MET. Eighty-liter water samples were also collected every 5 RMs for each of the seven column settling tests performed.

3.1.6 Sample Handling

Sediment samples for bulk sediment, MET, and DI-WET chemical analysis were placed into pre-cleaned and certified glass jars with Teflon-lined lids. Individual core samples planned for archive were handled similarly. Composite samples for column settling tests were placed

in 3.5-gallon buckets. Water samples collected for MET chemistry and column settling tests were placed in pre-cleaned 10-liter containers.

Samples were labeled with project name, date, sample identification, analysis, and preservative where applicable; logged into a field chain-of-custody (COC) form; placed on ice; and maintained at 2 to 4 degrees Celsius (°C) until shipped to the analytical laboratory.

3.1.7 Shipping

Prior to shipping, sample containers were securely packed inside coolers with ice. COC forms were completed, and the original signed COC forms were inserted in a sealable plastic bag and placed inside the cooler. Cooler lids were securely taped shut and sent via overnight delivery service to the USACE Engineering Research and Development Center (ERDC) in Vicksburg, Mississippi, for physical and chemical analyses.

3.1.8 Documentation and Chain-of-Custody

COC procedures were used to document all samples throughout the collection, transport, and analytical process and for all data, whether in hard-copy or electronic format. Minimum documentation of sample handling and custody included sample identification, sample collection date and time, any special notations on sample characteristics, initials of the person collecting the sample, date the sample was sent to the laboratory, and shipping company and waybill information. The completed COC form was placed inside the cooler containing the listed samples and signed by the person transferring custody of the samples. The condition of the samples was recorded by the receiver. COC forms were included in the final analytical report prepared by the laboratory.

3.2 Physical and Chemical Analysis

Physical and chemical parameters measured in this testing program were selected to provide data on potential chemicals of concern in sediment between RMs 35 and 1. All analytical methods used to obtain contaminant concentrations followed U.S. Environmental Protection Agency (USEPA), Standard Methods (SM; APHA 1998), or American Society for Testing and Materials (ASTM) standards. In addition, chemical and geotechnical measures selected for this investigation were consistent with those in the ITM (USACE 1998). The method detection limits (MDLs) for target analytes were described in the SAP (USACE 2008).

3.2.1 Physical Analyses

Physical analyses of the sediment included grain size and specific gravity, and physical analysis of aqueous samples included specific conductivity and total suspended and dissolved solids (TSS/TDS). Grain size was analyzed using the sieve analysis test method ASTM D422-63 (ASTM 2007). Specific gravity was measured using ASTM D854-06 (ASTM 2006). Total dissolved and suspended solids were analyzed by USEPA Methods 160.1 and 160.2, respectively, and specific conductivity was measured using USEPA Method 120.1.

3.2.2 Chemical Analyses

Chemical analyses described below were analyzed in sediment composite samples and site water from the SRDWSC. Analyses conducted on MET and DI-WET samples are described in Sections 3.2.3 and 3.2.5. Acid neutral potential ratio was performed using M600/2-78-054. Priority pollutant metals (except mercury) were determined by using inductively coupled plasma atomic emissions spectrometry (ICP/AES) in accordance with SW846 Method 6010 and 6020. Mercury was analyzed by cold vapor atomic absorption (CVAA) in accordance with SW846 Methods 7471A (sediment) and 7470A (water) while methyl mercury was analyzed by cold vapor atomic fluorescence using Method QS-LC/CVAF-001. PAHs were determined by using gas chromatography/mass spectrometry (GC/MS) with simultaneously extracted metals (SIM) in accordance with SW846 Method 8270C SIM. Organochlorine pesticides were determined by using gas chromatography/electron capture detector (GC/ECD) in accordance with SW846 Method 8081A while organophosphate pesticides were analyzed using gas chromatography/flame photometric detector (GC/FPD) in accordance with Method 8141A. PCBs were analyzed and quantified as Aroclors using GC with an electron capture detector (ECD) in accordance with SW846 Method 8082. TBT was analyzed using USEPA Method 8270C SIM. Total organic carbon (TOC) in water was determined using USEPA Method 415.1 while TOC in sediments was determined using USEPA Method 9060. Ammonia was determined by using an automated colorimetric measurement in accordance with USEPA Method 350.2. Chloride was analyzed by USEPA Method 300.0, and Biological Oxygen Demand (BOD) was analyzed by USEPA Method 405.1. Acid generating potential/neutralizing potential (AGP/NP) tests were also conducted by Method M600/2-78-054 prior to conducting DI-WET to determine whether sediment samples exhibited an acid generating capacity or neutralization potential and consequently what extractant should be used to remove the sediment samples.

3.2.3 Discrete Sediment Samples (New Horizon)

Metals, mercury, methyl mercury, and TOC were analyzed in discrete sediment samples in accordance with methods previously described in Section 3.2.2. No other analyses were conducted on discrete sediment samples.

3.2.4 Modified Elutriate Test

The MET was used to predict the quality of effluent discharged from confined placement sites during disposal operations. To prepare the modified elutriate, dredged material and site water were combined in a 4-liter cylinder with the sediment concentration equal to the average field inflow concentration (based on dry weight). The sample was vigorously mixed for 1 hour via aeration. The mixture was then allowed to settle for a time period equal to the anticipated field mean retention time or up to a maximum of 24 hours. The supernatant was siphoned off to create the total fraction, and a portion of the supernatant was then centrifuged to create the dissolved fraction. The dissolved fractions were analyzed for all chemicals except for methyl mercury, as described in Section 3.2.2.

3.2.5 Deionized Water – Waste Extraction Test

Leaching characteristics were evaluated by using the DI-WET, a modification of the state of California Title 22 waste extraction test (WET). This test provides an indication of the concentrations in the potential leachate from the mass of the confined dredged material in combination with attenuation in the vadose zone under the dredged material. This modified WET uses deionized water as an extractant rather than sodium citrate used in the standard WET test. The DI-WET test involved extracting 50 grams of sediment for 48 hours at a ratio of one part sediment to 10 parts deionized water. After extraction, the solution was filtered through a 0.45-micron filter prior to analysis. The dissolved fraction was analyzed for metals and mercury in accordance with the methods previously described in Section 3.2.2.

3.3 Comparison to Background Levels of Chemical Constituents

Bulk sediment, MET, and DI-WET chemistry results were evaluated in relationship to maximum concentrations of corresponding analytes measured in material previously placed in proposed placement sites along the SRDWSC. These data, collected as part of previous pre-dredge characterization studies, were provided by the USACE in NOIs for 2001, 2002, 2003 (2003b), 2005, 2006, and 2007 and used as the background for material already

deposited at the placement sites. Complete results for bulk sediment metals, MET, and DI-WET from previous studies are provided in Appendix A, and the maximum detected concentrations for each analysis are shown below in Table 5. Chemistry results were also evaluated in relationship to criteria described in GO No. 5-01-116 (CVRWQCB 2001). While this sampling effort was completed outside of the GO for maintenance dredging projects, comparison criteria were used as a point of reference to evaluate potential impacts due to dredging. Results for arsenic, total chromium, and nickel in bulk sediment were compared to criteria consistently used in NOIs for maintenance dredging projects in the SRDWSC, which are based upon a delta-wide background study conducted at the University of California at Berkeley. Mercury in bulk sediment was also compared to the mercury target of 0.2 mg/kg in the Sacramento–San Joaquin Delta Estuary TMDL for methyl mercury. Barium concentrations in MET samples were compared to the Central Valley Basin Plan effluent discharge limit for barium (100 micrograms per liter [µg/L]) in the dissolved fraction.

Table 5
Maximum Concentrations of Metals Detected in Pre-Dredge Characterization Studies (2000 to 2007)

Metal	Bulk Sediment (mg/kg)	DI-WET (µg/L)	MET (µg/L)
Arsenic	13.2	42.3	10.3
Cadmium	2	0.9	18.7
Chromium (Total)	122	193	18.6
Copper	73.6	195	34
Lead	41	148	11
Mercury	0.68	15	0.865
Nickel	238	206	40.7
Selenium	N/A	3.6	4.1
Zinc	125	251	59.3

Notes:
N/A = not applicable

3.4 Power Analysis to Assess Sample Size

A power analysis was completed to evaluate whether the sampling design used provided for enough samples to detect a difference between contaminants of concern and background or screening values. In addition, this analysis has implications for post-dredge sampling that

may be conducted to assess mercury in the surface of the sediment. Mercury data (i.e., mean and standard deviation) from discrete sediment samples were not used for this analysis because of the large number of non-detect results and subsequent non-normal, highly skewed distribution. Instead, mercury data from sediment composite samples (i.e., mean = 0.087; standard deviation = 0.039) were used, because non-detects did not appear in this dataset, mercury was normally distributed, and mercury is a contaminant of concern in the Sacramento-San Joaquin Delta. Mercury was used as a representative for other metals found in the SRDWSC. SYSTAT v.12 was used to perform a power analysis based on a one-sample t-test, which is used to compare a mean for a single population to a known standard. An alpha of 0.05 was used to determine the smallest sample size required to meet or exceed a power of 0.80. Table 6 shows the values used in the power analysis.

Table 6
Variables Used in Power Analysis for Determination of Sample Size

Variable	Value
Mercury TMDL Criteria or Mean under the Alternative Hypothesis	0.200
Mean Mercury Concentration or Mean under the Null Hypothesis	0.087
Standard Deviation	0.039
Expected Difference	-0.113
Alpha	0.05
Power	0.80

3.5 Quality Assurance/Quality Control Procedures

Chemical analyses were performed using quality control (QC) criteria specified in the Master SAP (USACE 2004), Test Methods for Evaluating Solid Waste (USEPA 2004), or procedures outlined in ASTM (ASTM 2006 and 2007). Performance objectives were evaluated by using standard reference materials or laboratory control samples, method blanks, surrogates, spiked samples, duplicate samples, and internal QC samples as described in more detail in Sections 3.5.1 through 3.5.5. Precision and accuracy objectives were established for method reporting limits (MRLs), spike recoveries, and duplicate analyses.

3.5.1 Holding Times

Method recommended holding times were used to guard sample integrity and provide adequate time for analyses. Holding times are the length of time an environmental media (e.g., water, soil, sediment, etc.) can be stored under specific conditions after collection and prior to analysis without significantly affecting the analyte's concentration. Holding times vary with the analyte, sample matrix, and analytical methodology used to quantify the analytes concentration.

3.5.2 Blanks

Procedural or method blanks were used to evaluate laboratory contamination introduced during method at a minimum frequency of one per batch or matrix type. It is assumed that the procedural blank represents a constant background contamination that affects standards and samples identically.

3.5.3 Accuracy

Accuracy of analytical measurements is the degree of similarity and it is based on percent recovery calculations between measured values and the actual or true value. Accuracy of the project data was indicated by analysis of matrix spikes, blank spikes, certified reference material, and/or recovery surrogates on a minimum frequency of one per batch.

Matrix spike samples were employed to assess the effect that a particular sample matrix has on the accuracy of a measurement. Samples are prepared by adding a known amount of the target analyte(s) to an aliquot of the field sample. Matrix spikes indicate the bias of analytical measurements due to chemical interferences inherent in the matrix.

Blank spikes were used to demonstrate performance of the preparation method on a clean matrix, void of potential interferences.

3.5.4 Precision

Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value. Precision of sample results and analytical measurements is based on relative percent difference (RPD) calculations between repeated values. Precision

of the project data was determined by analysis of duplicate matrix spikes, blank spikes, recovery surrogate spikes, and/or duplicate test sample analysis on a minimum frequency of one per batch.

3.5.5 Data Validation

Data validation was conducted to assess the laboratory's performance in meeting the quality assurance/quality control (QA/QC) guidelines outlined in the analytical procedures. Laboratory results were reviewed following USEPA Contract Laboratory Program National Functional Guidelines for Inorganics Data Review (USEPA 2004) and USEPA National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2008) as guidelines, and applying laboratory and method QC criteria as stated in SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998. Unless noted in this report, laboratory results for the samples were within QC criteria.

4 RESULTS

The pre-dredge sediment samples were collected from January 12 to 29, 2009. Results of field sampling and physical and chemical analyses are described in the following sections.

4.1 Sediment Sample Collection

Target and actual field coordinates, depth of recovery relative to the mudline, and core length retained for each station location are summarized in Table 7. Field core logs are provided in Appendix B and associated COC forms are found as part of the raw analytical reports in Appendix C.

4.2 Results of Physical and Chemical Analyses of Sediment

4.2.1 Column Settling Test

Column settling test results are summarized here and described in more detail in Appendix D. The sample composites used in the column testing were predominantly coarse grained (greater than 75 micrometer [µm]), with the exception of 08SAC21/25 and 08SAC31/35 that were predominantly fine grained. The mean percent coarse-grained material was 57 percent with a maximum of 82.5 percent and minimum of 24 percent (see Table 8). The salinity was less than 1 percent in all samples except 08SAC1/5, in which the salinity was 2.24 percent. Organic matter ranged from 1.5 to 3.6 percent, with a mean value of 2.6 percent. Specific gravity ranged from 2.62 to 2.66 percent.

Table 7

Target and Actual Field Coordinates and Sample Depths for Sediment Core Samples Collected

RM	Individual Sediment Core Sample ID	Latitude (°N)	Longitude (°W)	Mudline Elevation (feet MLLW)	Project Depth Including Overdepth (feet MLLW)	Retrieved Core Length (feet)	Core Segment Analyzed (feet)	Comments
1	08SAC1-1	38°03 54.5	121°50 03.8	-30.3	-37	8.25	6.7	Site moved N. Settling column material taken for 08SAC1/5
	08SAC1-2	38°03 51.2	121°49 39.6	-29.5	-37	7.8	7.5	Moved N for better shoaling
2	08SAC2-1	38°03 39.2	121°48 56.1	-27.7	-37	7.8	7.8	Settling column material taken for 08SAC1/5
	08SAC2-2	38°03 43.9	121°48 35.7	-30.2	-37	8.7	6.8	Moved to N side of channel for shoal
3	08SAC3-1	38°03 50.5	121°47 36.3	-30.1	-37	8	6.9	Moved site for shoaling. Settling column material taken for 08SAC1/5
4	08SAC4-1	38°04 11.7	121°46 50.9	-30.7	-37	6.1	6.1	Settling column material taken for 08SAC1/5
	08SAC4-2	38°04 20.5	121°46 30.4	-29.6	-37	6.4	6.4	Moved site E
5	08SAC5-1	38°04 35.5	121°46 02.4	-30.4	-37	7	6.6	
	08SAC5-2	38°04 40.5	121°45 55.8	-29.2	-37	7.6	7.6	
	08SAC5-3	38°04 41.6	121°45 53.8	-29	-37	8.5	8	
	08SAC5-4	38°04 44.4	121°45 45.9	-30.2	-37	7.8	6.8	
	08SAC5-5	38°04 47.8	121°45 38.8	-31.2	-37	7.8	5.8	
	08SAC5-6	38°04 51.1	121°45 31.1	-31.3	-37	7	5.7	
	08SAC5-7	38°04 54.9	121°45 22.4	-31	-37	7.3	6	
6	08SAC6-1	38°05 05.7	121°45 03.7	-31.1	-37	8	5.9	Site moved due to pipeline
	08SAC6-2	38°05 07.0	121°45 00.1	-31.3	-37	5.7	5.7	Site moved due to pipeline
	08SAC6-3	38°05 09.3	121°44 59.1	-31.2	-37	7.8	5.8	

Table 7

Target and Actual Field Coordinates and Sample Depths for Sediment Core Samples Collected

RM	Individual Sediment Core Sample ID	Latitude (°N)	Longitude (°W)	Mudline Elevation (feet MLLW)	Project Depth Including Overdepth (feet MLLW)	Retrieved Core Length (feet)	Core Segment Analyzed (feet)	Comments
	08SAC6-4	38°05 11.2	121°44 52.0	-30.6	-37	6.4	6.4	
	08SAC6-5	38°05 14.9	121°44 47.7	-30.1	-37	6.6	6.6	
	08SAC6-6	38°05 18.8	121°44 41.8	-29.9	-37	8.4	7.1	Settling column material taken for 08SAC6/10
	08SAC6-7	38°05 20.9	121°44 34.9	-29.4	-37	8.4	7.6	
	08SAC6-8	38°05 24.6	121°44 27.8	-28	-37	6.7	6.7	
7	08SAC7-1	38°05 32.7	121°44 16.3	-29.5	-37	7.8	7.5	Settling column material taken for 08SAC6/10
	08SAC7-2	38°05 36.3	121°44 08.5	-29.6	-37	7.4	7.4	
	08SAC7-3	38°05 41.6	121°44 03.1	-30.1	-37	7.5	6.9	
	08SAC7-4	38°05 45.7	121°43 58.4	30.7	-37	7.3	6.3	
	08SAC7-5	38°05 48.7	121°43 50.4	-30.5	-37	8.5	6.5	
	08SAC7-6	38°05 55.2	121°43 43.8	-31.6	-37	8	5.4	
	08SAC7-7	38°06 00.6	121°43 37.9	-30.4	-37	7.5	6.6	
8	08SAC8-1	38°43 25.8	121°06 08.1	-29.4	-37	7.3	7.3	
	08SAC8-2	38°06 13.6	121°43 20.4	-31.4	-37	7.8	5.6	
	08SAC8-3	38°06 15.5	121°43 13.6	-29.9	-37	7.5	7.1	
	08SAC8-4	38°06 20.6	121°43 09.4	-30.8	-37	8.4	6.2	
	08SAC8-5	38°06 25.0	121°43 04.8	-30.3	-37	9	6.7	
	08SAC8-6	38°06 28.6	121°42 56.5	-29.9	-37	6.8	6.8	First attempt no good
	08SAC8-7	38°06 33.6	121°42 51.0	-29.7	-37	6	6	
9	08SAC9-1	38°06 44.3	121°42 35.9	30.4	-37	6.6	6.6	
	08SAC9-2	38°06 48.6	121°42 31.2	-29.8	-37	7.8	7.2	

Table 7

Target and Actual Field Coordinates and Sample Depths for Sediment Core Samples Collected

RM	Individual Sediment Core Sample ID	Latitude (°N)	Longitude (°W)	Mudline Elevation (feet MLLW)	Project Depth Including Overdepth (feet MLLW)	Retrieved Core Length (feet)	Core Segment Analyzed (feet)	Comments
	08SAC9-3	38°06 54.3	121°42 24.8	-31	-37	8	6	
	08SAC9-4	38°06 59.3	121°42 20.1	-30	-37	9	7	
	08SAC9-5	38°07 03.9	121°42 13.7	-29.4	-37	7.9	7.6	
	08SAC9-6	38°07 08.7	121°42 09.8	-29.7	-37	8.5	7.3	
	08SAC9-7	38°07 15.3	121°42 04.0	-31.1	-37	5.9	5.9	
10	08SAC10-1	38°07 25.8	121°41 57.1	-29	-37	9	8	
	08SAC10-2	38°07 30.4	121°41 52.2	-31.5	-37	7.4	5.5	
	08SAC10-3	38°07 35.8	121°41 49.0	-31.9	-37	8.5	5.1	
	08SAC10-4	38°07 42.6	121°41 46.9	-29.8	-37	7.7	7.2	
	08SAC10-5	38°07 48.9	121°41 44.1	-30.7	-37	6.5	6.3	
	08SAC10-6	38°07 55.1	121°41 42.6	-31	-37	7.7	6	
	08SAC10-7	38°08 03.1	121°41 39.4	-32.4	-37	5	4.6	
11	08SAC11-1	38°08 12.7	121°41 32.6	-28.2	-37	6.7	6.7	Site moved for better shoaling
	08SAC11-2	38°08 24.5	121°41 29.6	-29.3	-37	7.2	7.2	Moved site E for shoaling
	08SAC11-3	38°08 30.3	121°41 28.3	-28.2	-37	8.4	8.4	Moved site E for shoaling
	08SAC11-4	38°08 38.6	121°41 26.2	-30	-37	7.7	7	
	08SAC11-5	38°08 47.9	121°41 24.8	-31.8	-37	6.2	5.2	First attempt no good
	08SAC11-6	38°08 55.9	121°41 21.5	-30.4	-37	6.6	6.6	Site moved NE for shoaling
12	08SAC12-1	38°09 12.0	121°41 17.7	-30.5	-37	7.9	6.5	
	08SAC12-2	38°09 23.5	121°41 10.1	-30.1	-37	8.5	6.9	
	08SAC12-3	38°09 33.5	121°41 01.8	-30.4	-37	7.5	6.6	
13	08SAC13-1	38°09 50.1	121°40 47.2	-29.8	-37	6.7	6.7	

Table 7

Target and Actual Field Coordinates and Sample Depths for Sediment Core Samples Collected

RM	Individual Sediment Core Sample ID	Latitude (°N)	Longitude (°W)	Mudline Elevation (feet MLLW)	Project Depth Including Overdepth (feet MLLW)	Retrieved Core Length (feet)	Core Segment Analyzed (feet)	Comments
	08SAC13-2	38°09 56.8	121°40 43.0	-31.7	-37	4.5	4.5	
	08SAC13-3	38°10 02.7	121°40 39.4	-32.1	-37	6.7	4.9	
	08SAC13-4	38°10 08.6	121°40 26.9	-30.4	-37	6.7	6.6	Site moved SE for shoaling
	08SAC13-5	38°10 17.8	121°40 19.0	-28.5	-37	6.6	6.6	Site moved NE for shoaling
	08SAC13-6	38°10 21.3	121°40 16.0	-32	-37	6	5	Site moved for shoaling
14	08SAC14-1	38°10 40.2	121°40 09.8	-31.2	-37	6.8	5.8	Three attempts made. First and second attempts made at E side of channel. Third at W side of channel.
	08SAC14-2	38°10 51.9	121°39 58.0	-30.9	-37	7.9	6.1	Site moved for shoaling
	08SAC14-3	38°11 02.0	121°39 43.4	-28.8	-37	8.2	8.2	Site moved NE for shoaling
16	08SAC16/18-1	38°12 25.8	121°39 41.4	-29.5	-37	8.4	7.5	Site moved to SW edge of channel for shoaling. Two attempts made.
17	08SAC16/18-2	38°13 05.6	121°40 20.8	31.2	-37	7	5.8	
18	08SAC16/18-3	38°14 01.5	121°40 27.0	-32.4	-37	3.7	3.7	First and second attempt failed. Third attempt rejection at 4 feet.
19	08SAC19-1	38°14 37.5	121°40 16.2	-33	-37	5.6	4	
	08SAC19-2	38°14 57.0	121°40 09.8	-32.3	-37	6.8	4.7	Second core taken for settling at 1,440.
20	08SAC20-1	38°15 26.7	121°39 59.9	-32.6	-37	5.3	4.4	
	08SAC20-2	38°15 47.5	121°39 53.1	-32.4	-37	4	4	

Table 7

Target and Actual Field Coordinates and Sample Depths for Sediment Core Samples Collected

RM	Individual Sediment Core Sample ID	Latitude (°N)	Longitude (°W)	Mudline Elevation (feet MLLW)	Project Depth Including Overdepth (feet MLLW)	Retrieved Core Length (feet)	Core Segment Analyzed (feet)	Comments
21	08SAC21-1	38°16 22.5	121°39 44.6	-32.2	-37	6.8	4.8	Two cores taken for volume.
	08SAC21-2	38°16 39.3	121°39 40.1	-32.6	-37	6	4.4	
22	08SAC22-1	38°17 21.7	121°39 29.8	-32.9	-37	3.6	3.6	Rejection at 4.5 feet. Three cores needed for volume.
23	08SAC23-1	38°18 11.0	121°39 16.7	-33	-37	4.2	4	Two cores taken for volume.
24	08SAC24-1	38°19 02.0	121°39 04.6	-31.9	-37	5.1	5.1	Two cores taken for volume.
25	08SAC25-1	38°19 45.7	121°38 55.9	-31.1	-37	6.8	5.9	
	08SAC25-2	38°20 03.7	121°38 50.8	-31.1	-37	5.9	5.9	
26	08SAC26-1	38°20 26.1	121°38 43.6	-31.1	-37	7.3	5.9	
	08SAC26-2	38°20 31.8	121°38 40.1	-31.8	-37	5.2	5.2	
	08SAC26-3	38°20 39.4	121°28 37.0	-32.8	-37	5.5	4.2	
	08SAC26-4	38°20 45.7	121°38 34.3	-30.9	-37	6.1	6.1	
	08SAC26-5	38°20 51.9	121°38 31.5	-30.7	-37	6.5	6.3	
	08SAC26-6	38°20 58.2	121°38 27.7	-32.7	-37	4	4	Rejection at 5.5 feet.
	08SAC26-7	38°21 05.1	121°38 24.7	-33	-37	5.2	4	
27	08SAC27-1	38°21 18.8	121°38 18.5	-32.9	-37	8.3	4.1	
	08SAC27-2	38°21 29.4	121°38 14.0	-32	-37	7.4	5	
	08SAC27-3	28°21 36.6	121°38 09.3	-30.3	-37	7.8	6.7	
	08SAC27-4	38°21 48.0	121°38 05.2	-31.4	-37	6.9	5.6	
28	08SAC28-1	38°22 12.4	121°37 52.5	-30.1	-37	7.3	6.9	
	08SAC28-2	38°22 23.4	121°37 47.1	-29	-37	7.9	7.9	
	08SAC28-3	38°22 37.3	121°37 40.8	-30.1	-37	7.3	6.9	
29	08SAC29-1	38°22 54.7	121°37 34.0	-31	-37	6	6	

Table 7

Target and Actual Field Coordinates and Sample Depths for Sediment Core Samples Collected

RM	Individual Sediment Core Sample ID	Latitude (°N)	Longitude (°W)	Mudline Elevation (feet MLLW)	Project Depth Including Overdepth (feet MLLW)	Retrieved Core Length (feet)	Core Segment Analyzed (feet)	Comments
	08SAC29-2	38°23 05.4	121°37 28.6	-31.4	-37	5.6	5.6	
	08SAC29-3	38°23 15.5	121°37 23.8	-30	-37	7.1	7	
	08SAC29-4	38°23 24.6	121°37 20.3	-31.1	-37	7.3	5.9	
30	08SAC30-1	38°23 44.8	121°37 10.9	-32	-37	7	5	
	08SAC30-2	38°23 53.8	121°37 06.7	-31.5	-37	7	5.5	
	08SAC30-3	38°24 03.0	121°37 02.2	-32.3	-37	6.1	4.7	
	08SAC30-4	38°24 13.8	121°36 56.3	-28.6	-37	8.4	8.4	
31	08SAC31-1	38°24 31.4	121°36 50.2	-28.5	-37	7.9	7.9	
	08SAC31-2	38°24 41.1	121°36 45.5	-29.3	-37	7.8	7.7	
	08SAC31-3	38°24 49.3	121°36 41.1	-31	-37	7.3	6	
	08SAC31-4	38°24 58.1	121°36 37.0	-30	-37	7.3	7	
	08SAC31-5	38°25 07.8	121°36 32.0	-30	-37	7.4	7	
32	08SAC32-1	38°22 22.7	121°36 25.5	-30.4	-37	7.3	6.6	
	08SAC32-2	38°25 30.6	121°36 21.9	-31	-37	6	6	
	08SAC32-3	38°25 38.0	121°36 18.1	-31	-37	7.2	6	
	08SAC32-4	38°25 46.0	121°36 14.4	-31.1	-37	7.2	5.9	
	08SAC32-5	38°25 55.6	121°36 10.0	-31.3	-37	5.8	5.7	
33	08SAC33-1	38°26 14.4	121°36 00.7	-31.5	-37	7.5	5.5	
	08SAC33-2	38°26 23.1	121°35 56.4	-30	-37	7.4	7.6	
	08SAC33-3	38°26 31.2	121°35 53.0	-32	-37	5.4	5	
	08SAC33-4	38°26 41.3	121°35 50.2	-31.6	-37	6.4	5.4	
34	08SAC34-1	38°27 00.4	121°35 40.7	-31	-37	6.4	6	
	08SAC34-2	38°27 07.2	121°35 37.6	-30.3	-37	7.3	6.7	

Table 7

Target and Actual Field Coordinates and Sample Depths for Sediment Core Samples Collected

RM	Individual Sediment Core Sample ID	Latitude (°N)	Longitude (°W)	Mudline Elevation (feet MLLW)	Project Depth Including Overdepth (feet MLLW)	Retrieved Core Length (feet)	Core Segment Analyzed (feet)	Comments
	08SAC34-3	38°27 17.2	121°35 33.1	-28.5	-37	9	8.5	
	08SAC34-4	38°27 23.4	121°35 29.6	-31.5	-37	7.4	5.5	
	08SAC34-5	38°27 33.0	121°35 25.1	-32	-37	6.8	5	
35	08SAC35-1	38°27 50.6	121°35 17.1	-31.5	-37	7.8	5.5	
	08SAC35-2	38°27 56.8	121°35 12.7	-30.5	-37	7.3	6.1	
	08SAC35-3	38°28 06.6	121°35 08.4	-31.2	-37	4.8	4.8	Rejection at 6 feet.
	08SAC35-4	38°28 16.8	121°35 04.4	-32.9	-37	8.3	4.1	
	08SAC35-5	38°28 25.2	121°35 05.0	-29.7	-37	7.7	7.3	

Table 8
Physical Characteristics of Composite Samples Used in Column Settling Tests

Characteristic Sample ID	Composite Sample						
	08SAC1/5	08SAC6/10	08SAC11/15	08SAC16/20	08SAC21/25	08SAC26/30	08SAC31/35
Salinity (ppt)	2.24	0.74	0.17	0.2	0.27	0.36	0.57
Specific Gravity	2.62	2.65	2.66	2.63	2.64	2.64	2.63
Solids Concentration (g/L)	84.2	48	29.2	60.9	73.7	59.7	75.2
Grain Size Distribution (Coulter Counter)							
Percent Coarse (gravel, sand)	57.1	75.7	82.5	59.9	44.2	55.5	24
Percent Fines (silt, clay)	42.9	24.3	17.5	40.1	55.8	44.5	76
Organic Matter (%)	3.6	2	1.5	2.9	2.6	2.5	3.4

Notes:
g/L = grams per liter
ppt = parts per trillion

Zone settling velocity (ZSV) observed for the column tests ranged from 0.21 to 1.00 feet per hour. Plots of ZSV are included in Appendix D for each column. These values were consistent with observed column settling behavior.

Results of the SETTLE program, which are based on column settling test data, are shown in Table 9. The results indicate that the extent of settling varied by RMs. Complete settling occurred quickly in the uppermost RMs (i.e., 08SAC26/30 and 08SAC31/35), with 90 percent of the initial flocculent settled after 24 hour and more the 95 percent settled after 48 hours. In the middle section of the SRDWSC (i.e., 08SAC11/15, 08SAC16/20, and 08SAC21/25) only 40 to 80 percent of the initial flocculent was settled after 24 hours and 95 percent settled only after 168 to 264 hours.

Table 9
Results of SETTLE Program Using Data from Column Settling Tests

Sample ID	Percent of Initial Flocculent Remaining After 24 Hours (across 5 feet)	Total Hours For 95 Percent of Flocculent to Settle
08SAC1/5	20-45	96
08SAC6/10	6	48
08SAC11/15	20	264
08SAC16/20	25	168
08SAC21/25	50-60	264
08SAC26/30	10	48
08SAC31/35	10	48

4.2.2 Grain Size

As shown in Table 10, grain size within SRDWSC sediment composite samples ranged from 2.5 percent fine-grained materials for samples 08SAC13-123 and 08SAC13-456 to 86.2 percent fine-grained materials for sample 08SAC1-12. Raw analytical reports are presented in Appendix C.

4.2.3 Chemical Analyses of Bulk Sediment Composites

Concentrations of metals, PAHs, organochlorine pesticides, PCB Aroclors, and TOC measured in bulk sediments from the SRDWSC are presented in Table 10. Raw analytical reports are presented in Appendix C.

Table 10
Physical Characteristics and Chemistry on SRDWSC Sediment Composite Samples

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC1-12 1/12/2009 N	SRDWSC 08SAC2-12 1/13/2009 N	SRDWSC 08SAC3-1 1/13/2009 N	SRDWSC 08SAC4-12 1/13/2009 N	SRDWSC 08SAC5-123 1/14/2009 N	SRDWSC 08SAC5-4567 1/14/2009 N	SRDWSC 08SAC6-1234 1/14/2009 N	SRDWSC 08SAC6-5678 1/15/2009 N	SRDWSC 08SAC7-123 1/15/2009 N
Conventional Parameters (pct)													
Total organic carbon					**10.9**	**0.233**	**6.7**	**0.726**	**0.821**	**1.4**	**0.536**	**0.75**	**0.592**
Conventional Parameters (g)													
Total solids					**44.4**	**78.1**	**31.2**	**63.5**	**67.7**	**63.4**	**71.7**	**69.7**	**68.3**
Grain Size (pct)													
Gravel					0	**0.1**	0	0	0.4	**0.4**	0.2	**0.1**	**0**
Coarse Sand					**0.1**	0	**0.1**	**0.1**	**0.2**	0.2	**0.3**	**0.2**	**0.1**
Medium Sand					**2.9**	**25.8**	**7.1**	**7.5**	**1.4**	**1.4**	**8.7**	**2.7**	**0.6**
Fine Sand					**10.8**	**61.5**	**17.7**	**43.3**	**43.8**	**43.8**	**59.3**	**60.1**	**55.3**
Fines					**86.2**	**12.6**	**75.1**	**49.1**	**54.2**	**54.2**	**31.5**	**36.9**	**44**
Metals (mg/kg)													
Aluminum					**28400**	**12900**	**25700**	**21700**	**21600**	**21000**	**17000**	**18000**	**22800**
Antimony					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Arsenic	13.2		11.6		**6.8**	**4.94**	**13**	**7.06**	**4.79**	**6.28**	**5.25**	**6.14**	**5.43**
Barium					**127**	**66.5**	**111**	**126**	**111**	**115**	**94.6**	**111**	**132**
Beryllium					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Cadmium	2	21			2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Calcium					**5110**	**4160**	**4590**	**5060**	**4830**	**4490**	**4060**	**3950**	**5110**
Chromium	122		51		**89.6**	**61.6**	**80.1**	**74.3**	**69.8**	**76**	**61.2**	**60.8**	**77.3**
Cobalt					**17.7**	**14.6**	**18.6**	**18.3**	**15.9**	**16.6**	**15.3**	**15.3**	**18.2**
Copper	73.6	61			**50**	**16.4**	**50**	**42.1**	**38.6**	**42.6**	**28.2**	**31.3**	**41.2**
Iron					**33900**	**21100**	**33900**	**30500**	**29600**	**28100**	**24800**	**24700**	**30700**
Lead	41	400			**7.72**	**6.71**	**8.42**	**11**	**8.38**	**10.3**	**7.23**	**7.88**	**8.72**
Magnesium					**12400**	**9110**	**10000**	**10600**	**11700**	**10000**	**9600**	**8680**	**11200**
Manganese					**561**	**379**	**323**	**772**	**631**	**591**	**493**	**548**	**757**
Mercury	0.68	0.2		0.2	**0.046 J**	**0.015 J**	**0.087 J**	**0.13**	**0.115**	**0.156**	**0.083 J**	**0.132**	**0.071 J**
Molybdenum					2 UJ	2 UJ	**1.27 J**	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		**96.2**	**75**	**96.5**	**90.2**	**80.9**	**86.6**	**72**	**67.2**	**94.1**
Potassium					**2150**	**1210**	**2000**	**1830**	**1720**	**1600**	**1450**	**1310**	**1560**
Selenium		390			2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Silver					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Sodium					**2560**	**861**	**2140**	**850**	**717**	**752**	**635**	**525**	**620**
Thallium					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vanadium					**96.1**	**46.5**	**89.3**	**69.2**	**66.8**	**66.1**	**52.2**	**56.9**	**74.4**
Zinc	125	120			**91**	**51.4**	**84**	**105**	**89.2**	**104**	**76.1**	**81.3**	**100**
Organometallic Compounds (µg/kg)													
Methyl mercury					4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)													
Acenaphthene		3700000			29.3 U	16.8 U	42.2 U	20.6 U	19.5 U	20.6 U	18.1 U	18.9 U	19.3 U
Anthracene		22000000			29.3 U	16.8 U	42.2 U	20.6 U	19.5 U	20.6 U	18.1 U	18.9 U	19.3 U
Benzo(a)anthracene		620			**10.4 J**	16.8 U	**25.5 J**	**17.6 J**	**15.7 J**	**15.6 J**	**19.3 J**	**14.3 J**	**15.5 J**

Table 10
Physical Characteristics and Chemistry on SRDWSC Sediment Composite Samples

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC1-12 1/12/2009 N	SRDWSC 08SAC2-12 1/13/2009 N	SRDWSC 08SAC3-1 1/13/2009 N	SRDWSC 08SAC4-12 1/13/2009 N	SRDWSC 08SAC5-123 1/14/2009 N	SRDWSC 08SAC5-4567 1/14/2009 N	SRDWSC 08SAC6-1234 1/14/2009 N	SRDWSC 08SAC6-5678 1/15/2009 N	SRDWSC 08SAC7-123 1/15/2009 N
Benzo(a)pyrene		62			29.3 U	16.8 U	42.2 U	**18.7 J**	**23.5**	**12.5 J**	**18.4**	**17.1 J**	**16.5 J**
Benzo(b)fluoranthene		620			29.3 U	16.8 U	42.2 U	**12.5 J**	**13.7 J**	**9.37 J**	**11 J**	**9.53 J**	**9.71 J**
Benzo(k)fluoranthene		610			29.3 U	16.8 U	42.2 U	**8.3 J**	**8.82 J**	20.6 U	**9.18 J**	**7.62 J**	**7.77 J**
Chrysene		6100			29.3 U	16.8 U	**21.2 J**	**18.7 J**	**15.7 J**	**15.6 J**	**19.3**	**15.2 J**	**16.5 J**
Dibenzo(a,h)anthracene		62			29.3 U	16.8 U	42.2 U	20.6 U	19.5 U	20.6 U	18.1 U	18.9 U	19.3 U
Fluoranthene		2300000			**41.6**	16.8 U	**80.7**	**62.3**	**40.2**	**51**	**64.2**	**44.8**	**68**
Fluorene		2600000			**13.4 J**	16.8 U	**17 J**	20.6 U	19.5 U	20.6 U	18.1 U	18.9 U	19.3 U
Indeno(1,2,3-c,d)pyrene		620			29.3 U	16.8 U	42.2 U	**14.5 J**	**20.6**	**10.4 J**	**13.8 J**	**15.2 J**	**11.7 J**
Naphthalene		56000			29.3 U	16.8 U	**14.9 J**	20.6 U	19.5 U	20.6 U	**6.42 J**	18.9 U	19.3 U
Pyrene		2300000			**19.3 J**	16.8 U	**44.6**	**58.1**	**44.1**	**46.8**	**66.1**	**50.5**	**60.2**
Semivolatile Organics (µg/kg)													
Hexachlorocyclopentadiene		420000			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
PCB Aroclors (µg/kg)													
Aroclor 1016		3900			36.8 UJ	20.9 UJ	53.1 UJ	26 UJ	24.4 U	24.8 U	22.4 UJ	23.3 U	24.1 U
Aroclor 1221		220			36.8 UJ	20.9 UJ	53.1 UJ	26 UJ	24.4 U	24.8 U	22.4 UJ	23.3 U	24.1 U
Aroclor 1232		220			36.8 UJ	20.9 UJ	53.1 UJ	26 UJ	24.4 U	24.8 U	22.4 UJ	23.3 U	24.1 U
Aroclor 1242		220			36.8 UJ	20.9 UJ	53.1 UJ	26 UJ	24.4 U	24.8 U	22.4 UJ	23.3 U	24.1 U
Aroclor 1248		220			36.8 UJ	20.9 UJ	53.1 UJ	26 UJ	24.4 U	24.8 U	22.4 UJ	23.3 U	24.1 U
Aroclor 1254		220			36.8 UJ	20.9 UJ	53.1 UJ	26 UJ	24.4 U	24.8 U	22.4 UJ	23.3 U	24.1 U
Aroclor 1260		220			36.8 UJ	20.9 UJ	53.1 UJ	26 UJ	24.4 U	24.8 U	22.4 UJ	23.3 U	24.1 U
Total PCB Aroclors (U = 0)					36.8 UJ	20.9 UJ	53.1 UJ	26 UJ	24.4 U	24.8 U	22.4 UJ	23.3 U	24.1 U
Pesticides (µg/kg)													
4,4'-DDD (p,p'-DDD)		2400			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
4,4'-DDE (p,p'-DDE)		1700			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
4,4'-DDT (p,p'-DDT)		1700			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
Aldrin		29			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
alpha-Hexachlorocyclohexane		90			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
alpha-Chlordane (cis-Chlordane)					7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
beta-Hexachlorocyclohexane		32			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
beta-Chlordane (trans-Chlordane)					7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
Dieldrin		11			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
Endosulfan sulfate					7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
Endosulfan-alpha (I)					7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
Endosulfan-beta (II)					7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
Endrin		18000			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
gamma-Hexachlorocyclohexane (Lindane)		440			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
Heptachlor		110			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
Heptachlor epoxide		52			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
Methoxychlor		8000			7.99 UJ	4.53 UJ	11.5 UJ	5.65 UJ	5.28 UJ	5.38 UJ	4.86 UJ	5.04 UJ	5.23 UJ
Toxaphene		440			79.9 UJ	45.3 UJ	115 UJ	56.5 UJ	52.8 UJ	53.8 UJ	48.6 UJ	50.4 UJ	52.3 UJ

Table 10
Physical Characteristics and Chemistry on SRDWSC Sediment Composite Samples

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC7-4567 1/15/2009 N	SRDWSC 08SAC8-123 1/16/2009 N	SRDWSC 08SAC8-4567 1/16/2009 N	SRDWSC 08SAC9-123 1/16/2009 N	SRDWSC 08SAC9-4567 1/16/2009 N	SRDWSC 08SAC10-123 1/19/2009 N	SRDWSC 08SAC10-4567 1/20/2009 N	SRDWSC 08SAC11-123 1/20/2009 N	SRDWSC 08SAC11-456 1/20/2009 N
Conventional Parameters (pct)													
Total organic carbon					**0.748**	**0.575**	**0.308**	**0.387**	**0.0484**	**0.0608**	**0.0705**	**0.234**	**0.0862**
Conventional Parameters (g)													
Total solids					**69.1**	**70.2**	**73.1**	**78**	**74.9**	**75.7**	**74.6**	**77.1**	**76.1**
Grain Size (pct)													
Gravel					**0.1**	**0**	**0.3**	**0.3**	**0.4**	0.2	**1.3**	**1.1**	**0.7**
Coarse Sand					**0.2**	**0**	**0.2**	**0.3**	**0.1**	0.2	**0.7**	**0.5**	**1.2**
Medium Sand					**1**	**2.6**	**2**	**7.9**	**14.2**	**14.8**	**23.1**	**29**	**29.4**
Fine Sand					**50.3**	**50.2**	**64.1**	**68.3**	**77.6**	**80.2**	**71.1**	**58.7**	**64.8**
Fines					**48.4**	**47.2**	**33.4**	**23.2**	**7.7**	**4.6**	**3.8**	**10.7**	**3.9**
Metals (mg/kg)													
Aluminum					**21800**	**21700**	**17700**	**14400**	**14400**	**9320 J**	**8730 J**	**12600 J**	**9340 J**
Antimony					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Arsenic	13.2		11.6		**7.64**	**6.86**	**6.07**	**5.01**	**5.74**	**4.04 J**	**3.6 J**	**4 J**	**3.95 J**
Barium					**136**	**127**	**111**	**86.3**	**85.9**	**-- R**	**-- R**	**-- R**	**-- R**
Beryllium					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Cadmium	2	21			2 U	2 U	2 U	2 U	2 U	2 UJ	2 UJ	2 UJ	2 UJ
Calcium					**5270**	**5040**	**4330**	**4040**	**3910**	**2860 J**	**2690 J**	**3350 J**	**2900 J**
Chromium	122		51		**75.5**	**73**	**67.1**	**60.6**	**62.1**	**46.3**	**40.8**	**59.5**	**45.8**
Cobalt					**19.1**	**16.7**	**15.6**	**14.6**	**14.3**	**11.8**	**12.4**	**13.4**	**12.5**
Copper	73.6	61			**44.5**	**42.7**	**32.3**	**26.7**	**24.2**	**-- R**	**-- R**	**-- R**	**-- R**
Iron					**29100**	**29700**	**25400**	**21500**	**21100**	**16600 J**	**16600 J**	**19500 J**	**16800 J**
Lead	41	400			**11.4**	**10.8**	**8.23**	**6.63**	**18.3**	**4.61**	**4.16**	**4.34**	**3.91**
Magnesium					**10900**	**10900**	**9630**	**8150**	**8800**	**6880 J**	**7360 J**	**8770 J**	**7600 J**
Manganese					**652**	**641**	**540**	**477**	**417**	**262**	**283**	**292**	**278**
Mercury	0.68	0.2		0.2	**0.136**	**0.031 J**	**0.081 J**	**0.043 J**	**0.048 J**	0.099 U	0.1 U	0.1 U	0.1 U
Molybdenum					2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		**92.7**	**88.9**	**82.2**	**73.3**	**77.5**	**-- R**	**-- R**	**-- R**	**-- R**
Potassium					**1710**	**1600**	**1360**	**1110**	**1170**	**907 J**	**1180 J**	**1120 J**	**1060 J**
Selenium		390			2 U	2 U	2 U	2 U	2 U	**-- R**	**-- R**	**-- R**	**-- R**
Silver					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Sodium					**913**	**799**	**505**	**422**	**364**	**257 J**	**253 J**	**308 J**	**301 J**
Thallium					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vanadium					**68.3**	**68**	**59**	**49.7**	**50.2**	**34.7**	**35.2**	**46.5**	**35.5**
Zinc	125	120			**105**	**99.1**	**83.4**	**72.6**	**73.3**	**-- R**	**-- R**	**-- R**	**-- R**
Organometallic Compounds (µg/kg)													
Methyl mercury					4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)													
Acenaphthene		3700000			19.1 U	18.6 U	17.8 U	16.9 U	17.4 U	32.7 UJ	**0.88 J**	**0.85 J**	32.5 U
Anthracene		22000000			**10.5 J**	**7.51 J**	17.8 U	16.9 U	17.4 U	32.7 UJ	32.6 U	**4.26 J**	32.5 U
Benzo(a)anthracene		620			**37.4 J**	**32.8 J**	**19.8 J**	**15.3 J**	**7.93 J**	32.7 UJ	32.6 U	**58.8**	32.5 U

Table 10
Physical Characteristics and Chemistry on SRDWSC Sediment Composite Samples

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC7-4567 1/15/2009 N	SRDWSC 08SAC8-123 1/16/2009 N	SRDWSC 08SAC8-4567 1/16/2009 N	SRDWSC 08SAC9-123 1/16/2009 N	SRDWSC 08SAC9-4567 1/16/2009 N	SRDWSC 08SAC10-123 1/19/2009 N	SRDWSC 08SAC10-4567 1/20/2009 N	SRDWSC 08SAC11-123 1/20/2009 N	SRDWSC 08SAC11-456 1/20/2009 N
Benzo(a)pyrene		62			**51.7**	**39.4**	**20.7**	**7.65 J**	**8.81 J**	**2.61 J**	**0.88 J**	**31.6 J**	**0.86 J**
Benzo(b)fluoranthene		620			**28.7**	**20.6**	**12.6 J**	16.9 U	17.4 U	**1.74 J**	**0.88 J**	**17.1 J**	32.5 U
Benzo(k)fluoranthene		610			**18.2 J**	**15 J**	**7.21 J**	16.9 U	17.4 U	**1.74 J**	32.6 U	**14.5 J**	32.5 U
Chrysene		6100			**45**	**35.7**	**20.7**	**12.7 J**	**7.93 J**	**1.74 J**	**0.88 J**	**27.3 J**	**0.86 J**
Dibenzo(a,h)anthracene		62			19.1 U	18.6 U	17.8 U	16.9 U	17.4 U	**2.61 J**	**0.88 J**	**1.71 J**	**0.86 J**
Fluoranthene		2300000			**166**	**160**	**66.7**	**36.5**	**21.2**	**2.61 J**	**2.65 J**	**52.9**	**0.86 J**
Fluorene		2600000			19.1 U	18.6 U	17.8 U	16.9 U	17.4 U	32.7 UJ	32.6 U	32.6 U	32.5 U
Indeno(1,2,3-c,d)pyrene		620			**46.9**	**30**	**15.3 J**	16.9 U	17.4 U	**4.36 J**	**1.76 J**	**29 J**	**0.86 J**
Naphthalene		56000			**8.62 J**	18.6 U	17.8 U	16.9 U	17.4 U	**0.87 J**	**0.88 J**	**3.41 J**	32.5 U
Pyrene		2300000			**170**	**160**	**74.8**	**40.8**	**37.9**	**4.36 J**	**3.53 J**	**142**	32.5 U
Semivolatile Organics (µg/kg)													
Hexachlorocyclopentadiene		420000			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
PCB Aroclors (µg/kg)													
Aroclor 1016		3900			23.3 UJ	23.3 UJ	22.5 UJ	21 UJ	21.9 UJ	21.7 UJ	21 UJ	21.4 U	20.8 UJ
Aroclor 1221		220			23.3 UJ	23.3 UJ	22.5 UJ	21 UJ	21.9 UJ	21.7 UJ	21 UJ	21.4 U	20.8 UJ
Aroclor 1232		220			23.3 UJ	23.3 UJ	22.5 UJ	21 UJ	21.9 UJ	21.7 UJ	21 UJ	21.4 U	20.8 UJ
Aroclor 1242		220			23.3 UJ	23.3 UJ	22.5 UJ	21 UJ	21.9 UJ	21.7 UJ	21 UJ	21.4 U	20.8 UJ
Aroclor 1248		220			23.3 UJ	23.3 UJ	22.5 UJ	21 UJ	21.9 UJ	21.7 UJ	21 UJ	21.4 U	20.8 UJ
Aroclor 1254		220			23.3 UJ	23.3 UJ	22.5 UJ	21 UJ	21.9 UJ	21.7 UJ	21 UJ	21.4 U	20.8 UJ
Aroclor 1260		220			23.3 UJ	23.3 UJ	22.5 UJ	21 UJ	21.9 UJ	21.7 UJ	21 UJ	21.4 U	20.8 UJ
Total PCB Aroclors (U = 0)					23.3 UJ	23.3 UJ	22.5 UJ	21 UJ	21.9 UJ	21.7 UJ	21 UJ	21.4 U	20.8 UJ
Pesticides (µg/kg)													
4,4'-DDD (p,p'-DDD)		2400			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
4,4'-DDE (p,p'-DDE)		1700			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
4,4'-DDT (p,p'-DDT)		1700			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
Aldrin		29			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
alpha-Hexachlorocyclohexane		90			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
alpha-Chlordane (cis-Chlordane)					5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
beta-Hexachlorocyclohexane		32			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
beta-Chlordane (trans-Chlordane)					5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
Dieldrin		11			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
Endosulfan sulfate					5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
Endosulfan-alpha (I)					5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
Endosulfan-beta (II)					5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
Endrin		18000			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
gamma-Hexachlorocyclohexane (Lindane)		440			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
Heptachlor		110			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
Heptachlor epoxide		52			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
Methoxychlor		8000			5.05 UJ	5.06 UJ	4.87 UJ	4.56 UJ	4.74 UJ	2.17 U	2.1 U	2.14 U	2.08 U
Toxaphene		440			50.5 UJ	50.6 UJ	48.7 UJ	45.6 UJ	47.4 UJ	43.6 U	42.3 U	43.2 U	41.9 U

Table 10
Physical Characteristics and Chemistry on SRDWSC Sediment Composite Samples

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC12-123 1/20/2009 N	SRDWSC 08SAC13-123 1/20/2009 N	SRDWSC 08SAC13-456 1/20/2009 N	SRDWSC 08SAC14-123 1/21/2009 N	SRDWSC 08SAC16/18-123 1/21/2009 N	SRDWSC 08SAC19-12 1/23/2009 N	SRDWSC 08SAC20-12 1/23/2009 N	SRDWSC 08SAC21-12 1/23/2009 N	SRDWSC 08SAC22-1 1/23/2009 N
Conventional Parameters (pct)													
Total organic carbon					**0.101**	**0.0597**	**0.113**	**0.417**	**0.786**	**0.698**	**0.54**	**0.604**	**0.497**
Conventional Parameters (g)													
Total solids					**75.7**	**77.5**	**72.2**	**71.5**	**69**	**61.9**	**70.4**	**64.8**	**68.3**
Grain Size (pct)													
Gravel					**1.2**	**3.8**	**3.8**	**0.5**	**0**	**2.1**	**0.3**	**0.2**	**0.1**
Coarse Sand					**0.9**	**1.9**	**1.9**	**0.6**	**0.1**	**1.4**	**1.1**	**1.3**	**0.4**
Medium Sand					**38.3**	**56.1**	**56.1**	**7.4**	**9.3**	**7.4**	**10.5**	**4**	**3.5**
Fine Sand					**55.9**	**35.7**	**35.7**	**47.5**	**27.4**	**59.4**	**46**	**41.3**	**19.2**
Fines					**3.7**	**2.5**	**2.5**	**44**	**63.2**	**29.7**	**42.1**	**53.2**	**76.8**
Metals (mg/kg)													
Aluminum					**7730 J**	**7440 J**	**14300 J**	**20700 J**	**19300 J**	**19700 J**	**19200 J**	**25200 J**	**27800 J**
Antimony					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Arsenic	13.2		11.6		**4.14 J**	**4.52 J**	**3.85 J**	**4.91 J**	**5.52 J**	**6.27 J**	**7.16 J**	**6.58 J**	**8.69 J**
Barium					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Beryllium					2 U	2 U	2 U	**0.461 J**	**0.435 J**	**0.438 J**	**0.445 J**	**0.556 J**	**0.678 J**
Cadmium	2	21			2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Calcium					**2570 J**	**2690 J**	**4010 J**	**4880 J**	**4420 J**	**6410 J**	**6940 J**	**10200 J**	**7710 J**
Chromium	122		51		**36.4**	**44.9**	**52.9**	**76.4**	**66.9**	**91**	**96.6**	**96.6**	**116**
Cobalt					**11.7**	**11**	**14.7**	**18.3**	**18.5**	**20.3**	**18.6**	**20.7**	**23.8**
Copper	73.6	61			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Iron					**14500 J**	**14900 J**	**22900 J**	**31500 J**	**30300 J**	**32100 J**	**30700 J**	**36000 J**	**40600 J**
Lead	41	400			**3.95**	**24.3**	**5.03**	**7.08**	**6.65**	**6.57**	**6.17**	**7.09**	**21.9**
Magnesium					**6290 J**	**6620 J**	**9180 J**	**12300 J**	**11000 J**	**15900 J**	**17700 J**	**19600 J**	**18700 J**
Manganese					**279**	**279**	**355**	**526**	**682**	**541**	**554**	**604**	**812**
Mercury	0.68	0.2		0.2	0.099 U	0.1 U	**0.023 J**	**0.077 J**	**0.05 J**	**0.062 J**	**0.077 J**	**0.056 J**	**0.081 J**
Molybdenum					2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Potassium					**918 J**	**782 J**	**1220 J**	**1370 J**	**1490 J**	**1450 J**	**1480 J**	**2050 J**	**2520 J**
Selenium		390			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Silver					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Sodium					**232 J**	**186 J**	**391 J**	**395 J**	**356 J**	**364 J**	**397 J**	**456 J**	**315 J**
Thallium					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vanadium					**29.9**	**29.5**	**48.7**	**71.1**	**66.6**	**66.1**	**63.8**	**76.8**	**87.6**
Zinc	125	120			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Organometallic Compounds (µg/kg)													
Methyl mercury					4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)													
Acenaphthene		3700000			32.7 U	32.5 U	32.7 U	32.4 U	32.7 U	31.7 U	32.6 U	32.2 U	32.3 U
Anthracene		22000000			32.7 U	32.5 U	32.7 U	32.4 U	**0.96 J**	**1.03 J**	32.6 U	32.2 U	32.3 U
Benzo(a)anthracene		620			32.7 U	32.5 U	32.7 U	32.4 U	32.7 U	31.7 U	32.6 U	32.2 U	32.3 U

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Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC12-123 1/20/2009 N	SRDWSC 08SAC13-123 1/20/2009 N	SRDWSC 08SAC13-456 1/20/2009 N	SRDWSC 08SAC14-123 1/21/2009 N	SRDWSC 08SAC16/18-123 1/21/2009 N	SRDWSC 08SAC19-12 1/23/2009 N	SRDWSC 08SAC20-12 1/23/2009 N	SRDWSC 08SAC21-12 1/23/2009 N	SRDWSC 08SAC22-1 1/23/2009 N
Benzo(a)pyrene		62			32.7 U	32.5 U	32.7 U	32.4 U	**133**	**18.6 J**	32.6 U	**1.01 J**	32.3 U
Benzo(b)fluoranthene		620			32.7 U	32.5 U	32.7 U	**0.92 J**	**0.96 J**	**1.03 J**	32.6 U	32.2 U	32.3 U
Benzo(k)fluoranthene		610			32.7 U	32.5 U	32.7 U	**0.92 J**	**0.96 J**	31.7 U	32.6 U	32.2 U	32.3 U
Chrysene		6100			**0.87 J**	32.5 U	32.7 U	**1.83 J**	**1.92 J**	**1.03 J**	**0.94 J**	**1.01 J**	32.3 U
Dibenzo(a,h)anthracene		62			32.7 U	32.5 U	32.7 U	32.4 U	32.7 U	31.7 U	32.6 U	32.2 U	32.3 U
Fluoranthene		2300000			**0.87 J**	**0.85 J**	**0.91 J**	**2.75 J**	**2.87 J**	**5.17 J**	**2.81 J**	**2.01 J**	32.3 U
Fluorene		2600000			32.7 U	32.5 U	32.7 U	32.4 U	**0.96 J**	**1.03 J**	32.6 U	32.2 U	32.3 U
Indeno(1,2,3-c,d)pyrene		620			32.7 U	32.5 U	32.7 U	**0.92 J**	32.7 U	31.7 U	32.6 U	32.2 U	32.3 U
Naphthalene		56000			32.7 U	32.5 U	**0.91 J**	32.4 U	**0.96 J**	**1.03 J**	**0.94 J**	**1.01 J**	32.3 U
Pyrene		2300000			32.7 U	32.5 U	32.7 U	**1.83 J**	**1.92 J**	**3.1 J**	**1.87 J**	32.2 U	32.3 U
Semivolatile Organics (µg/kg)													
Hexachlorocyclopentadiene		420000			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
PCB Aroclors (µg/kg)													
Aroclor 1016		3900			21.6 UJ	21 U	22.5 UJ	22.6 UJ	22.9 U	25.2 UJ	23.1 UJ	24.5 UJ	24.1 U
Aroclor 1221		220			21.6 UJ	21 U	22.5 UJ	22.6 UJ	22.9 U	25.2 UJ	23.1 UJ	24.5 UJ	24.1 U
Aroclor 1232		220			21.6 UJ	21 U	22.5 UJ	22.6 UJ	22.9 U	25.2 UJ	23.1 UJ	24.5 UJ	24.1 U
Aroclor 1242		220			21.6 UJ	21 U	22.5 UJ	22.6 UJ	22.9 U	25.2 UJ	23.1 UJ	24.5 UJ	24.1 U
Aroclor 1248		220			21.6 UJ	21 U	22.5 UJ	22.6 UJ	22.9 U	25.2 UJ	23.1 UJ	24.5 UJ	24.1 U
Aroclor 1254		220			21.6 UJ	21 U	22.5 UJ	22.6 UJ	22.9 U	25.2 UJ	23.1 UJ	24.5 UJ	24.1 U
Aroclor 1260		220			21.6 UJ	21 U	22.5 UJ	22.6 UJ	22.9 U	25.2 UJ	23.1 UJ	24.5 UJ	24.1 U
Total PCB Aroclors (U = 0)					21.6 UJ	21 U	22.5 UJ	22.6 UJ	22.9 U	25.2 UJ	23.1 UJ	24.5 UJ	24.1 U
Pesticides (µg/kg)													
4,4'-DDD (p,p'-DDD)		2400			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
4,4'-DDE (p,p'-DDE)		1700			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
4,4'-DDT (p,p'-DDT)		1700			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
Aldrin		29			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
alpha-Hexachlorocyclohexane		90			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
alpha-Chlordane (cis-Chlordane)					2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
beta-Hexachlorocyclohexane		32			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
beta-Chlordane (trans-Chlordane)					2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
Dieldrin		11			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
Endosulfan sulfate					2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
Endosulfan-alpha (I)					2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
Endosulfan-beta (II)					2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
Endrin		18000			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
gamma-Hexachlorocyclohexane (Lindane)		440			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
Heptachlor		110			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
Heptachlor epoxide		52			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
Methoxychlor		8000			2.16 U	2.1 U	2.25 U	2.26 UJ	2.29 UJ	2.52 U	2.31 U	2.45 U	2.41 U
Toxaphene		440			43.4 U	42.2 U	45.4 U	45.4 UJ	46 UJ	50.7 U	46.5 U	49.3 U	48.5 U

Table 10
Physical Characteristics and Chemistry on SRDWSC Sediment Composite Samples

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC23-1 1/22/2009 N	SRDWSC 08SAC24-1 1/22/2009 N	SRDWSC 08SAC25-12 1/22/2009 N	SRDWSC 08SAC26-123 1/22/2009 N	SRDWSC 08SAC26-4567 1/26/2009 N	SRDWSC 08SAC27-1234 1/26/2009 N	SRDWSC 08SAC28-123 1/26/2009 N	SRDWSC 08SAC29-1234 1/27/2009 N	SRDWSC 08SAC30-1234 1/27/2009 N
Conventional Parameters (pct)													
Total organic carbon					0.192	0.48	0.404	0.634	0.872	0.66	0.517	0.558	0.711
Conventional Parameters (g)													
Total solids					72	67.1	70.1	69.5	69.7	71.6	68.5	72.9	69.3
Grain Size (pct)													
Gravel					0.1	0.2	4.1	13.8	5.3	4.7	0.8	15.2	11.2
Coarse Sand					0.2	0.7	4.3	6.7	4.4	8.8	1.6	8.5	11.1
Medium Sand					4.1	5.5	8.3	18.9	17.2	18.6	6.5	12.5	12.6
Fine Sand					9.6	44.3	25.6	28.5	32.8	28.3	32.5	23.1	15.6
Fines					86	49.3	57.7	32.1	40.3	39.6	58.6	40.7	49.5
Metals (mg/kg)													
Aluminum					29300 J	23200 J	21300 J	18900 J	20100 J	18500 J	22300 J	23000 J	24000 J
Antimony					-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R
Arsenic	13.2		11.6		10.5 J	7.37 J	7.57 J	5.34 J	6.18 J	6.5	6.74	6.31	7.22
Barium					-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R
Beryllium					0.673 J	0.585 J	0.499 J	0.427 J	0.458 J	0.499 J	0.559 J	0.614 J	0.666 J
Cadmium	2	21			2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 U	2 U	2 U	2 U
Calcium					13000 J	8120 J	6230 J	6850 J	6660 J	6260 J	6180 J	5440 J	5850 J
Chromium	122		51		98.9	106	112	94.7	111	122	100	122	158
Cobalt					24.2	20.5	20.4	18.6	20.6	21.2	21.8	22.7	23.3
Copper	73.6	61			-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R
Iron					42600 J	35400 J	34900 J	30200 J	32500 J	30300 J	32600 J	34400 J	37200 J
Lead	41	400			9.11	8	6.81	6.35	7.49	6.51	7.97	8.02	9.44
Magnesium					23800 J	20100 J	20600 J	17000 J	19200 J	19100 J	15900 J	18800 J	21300 J
Manganese					1140	680	700	579	621	595	681	693	771
Mercury	0.68	0.2		0.2	0.075 J	0.096 J	0.101 J	0.098 J	0.116 J	0.108 J	0.089 J	0.157 J	0.134 J
Molybdenum					2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R
Potassium					2180 J	1500 J	1410 J	1460 J	1510 J	1360 J	1590 J	1690 J	1850 J
Selenium		390			-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R
Silver					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Sodium					636 J	422 J	418 J	427 J	664 J	337 J	446 J	413 J	425 J
Thallium					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vanadium					94.8	73.6	74	64.9	69.9	67.6	73.8	76	81.8
Zinc	125	120			-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R	-- R
Organometallic Compounds (µg/kg)													
Methyl mercury					4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)													
Acenaphthene		3700000			32.5 U	31.9 U	32.5 U	32 U	32.3 U	32.5 U	32.4 U	32 U	32.2 U
Anthracene		22000000			32.5 U	31.9 U	32.5 U	32 U	32.3 U	32.5 U	32.4 U	32 U	32.2 U
Benzo(a)anthracene		620			32.5 U	31.9 U	32.5 U	32 U	32.3 U	32.5 U	32.4 U	5.31 J	32.2 U

Table 10
Physical Characteristics and Chemistry on SRDWSC Sediment Composite Samples

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC23-1 1/22/2009 N	SRDWSC 08SAC24-1 1/22/2009 N	SRDWSC 08SAC25-12 1/22/2009 N	SRDWSC 08SAC26-123 1/22/2009 N	SRDWSC 08SAC26-4567 1/26/2009 N	SRDWSC 08SAC27-1234 1/26/2009 N	SRDWSC 08SAC28-123 1/26/2009 N	SRDWSC 08SAC29-1234 1/27/2009 N	SRDWSC 08SAC30-1234 1/27/2009 N
Benzo(a)pyrene		62			32.5 U	31.9 U	32.5 U	**0.93 J**	**0.94 J**	32.5 U	32.4 U	32 U	32.2 U
Benzo(b)fluoranthene		620			32.5 U	31.9 U	32.5 U	**0.93 J**	**0.94 J**	32.5 U	32.4 U	32 U	32.2 U
Benzo(k)fluoranthene		610			32.5 U	31.9 U	32.5 U	**0.93 J**	**0.94 J**	32.5 U	32.4 U	32 U	32.2 U
Chrysene		6100			32.5 U	31.9 U	**0.94 J**	**0.93 J**	**0.94 J**	32.5 U	**3.82 J**	**3.54 J**	32.2 U
Dibenzo(a,h)anthracene		62			32.5 U	31.9 U	32.5 U	32 U	32.3 U	**3.66 J**	32.4 U	32 U	32.2 U
Fluoranthene		2300000			32.5 U	**3.84 J**	**2.81 J**	**3.73 J**	**3.74 J**	**5.49 J**	**7.64 J**	**7.08 J**	**3.75 J**
Fluorene		2600000			32.5 U	31.9 U	**0.94 J**	32 U	**0.94 J**	32.5 U	32.4 U	32 U	32.2 U
Indeno(1,2,3-c,d)pyrene		620			32.5 U	31.9 U	32.5 U	**0.93 J**	**0.94 J**	**3.66 J**	**3.82 J**	32 U	32.2 U
Naphthalene		56000			32.5 U	31.9 U	**0.94 J**	**0.93 J**	**0.94 J**	32.5 U	32.4 U	32 U	32.2 U
Pyrene		2300000			32.5 U	31.9 U	**1.87 J**	**1.86 J**	**2.81 J**	32.5 U	32.4 U	32 U	32.2 U
Semivolatile Organics (µg/kg)													
Hexachlorocyclopentadiene		420000			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
PCB Aroclors (µg/kg)													
Aroclor 1016		3900			22.3 U	24.2 UJ	23.4 UJ	23.7 UJ	23.4 UJ	19.5 UJ	20.2 UJ	19.3 UJ	21.1 UJ
Aroclor 1221		220			22.3 U	24.2 UJ	23.4 UJ	23.7 UJ	23.4 UJ	19.5 UJ	20.2 UJ	19.3 UJ	21.1 UJ
Aroclor 1232		220			22.3 U	24.2 UJ	23.4 UJ	23.7 UJ	23.4 UJ	19.5 UJ	20.2 UJ	19.3 UJ	21.1 UJ
Aroclor 1242		220			22.3 U	24.2 UJ	23.4 UJ	23.7 UJ	23.4 UJ	19.5 UJ	20.2 UJ	19.3 UJ	21.1 UJ
Aroclor 1248		220			22.3 U	24.2 UJ	23.4 UJ	23.7 UJ	23.4 UJ	19.5 UJ	20.2 UJ	19.3 UJ	21.1 UJ
Aroclor 1254		220			22.3 U	24.2 UJ	23.4 UJ	23.7 UJ	23.4 UJ	19.5 UJ	20.2 UJ	19.3 UJ	21.1 UJ
Aroclor 1260		220			22.3 U	24.2 UJ	23.4 UJ	23.7 UJ	23.4 UJ	19.5 UJ	20.2 UJ	19.3 UJ	21.1 UJ
Total PCB Aroclors (U = 0)					22.3 U	24.2 UJ	23.4 UJ	23.7 UJ	23.4 UJ	19.5 UJ	20.2 UJ	19.3 UJ	21.1 UJ
Pesticides (µg/kg)													
4,4'-DDD (p,p'-DDD)		2400			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
4,4'-DDE (p,p'-DDE)		1700			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
4,4'-DDT (p,p'-DDT)		1700			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
Aldrin		29			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
alpha-Hexachlorocyclohexane		90			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
alpha-Chlordane (cis-Chlordane)					2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
beta-Hexachlorocyclohexane		32			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
beta-Chlordane (trans-Chlordane)					2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
Dieldrin		11			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
Endosulfan sulfate					2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
Endosulfan-alpha (I)					2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
Endosulfan-beta (II)					2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
Endrin		18000			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
gamma-Hexachlorocyclohexane (Lindane)		440			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
Heptachlor		110			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
Heptachlor epoxide		52			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
Methoxychlor		8000			2.23 U	2.42 U	2.34 U	2.37 U	2.34 UJ	1.95 UJ	2.02 UJ	1.93 UJ	2.11 UJ
Toxaphene		440			45 U	48.7 U	47.1 U	47.7 U	47.2 UJ	39.2 UJ	40.6 UJ	38.8 UJ	42.4 UJ

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Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC31-12 1/28/2009 N	SRDWSC 08SAC31-345 1/28/2009 N	SRDWSC 08SAC32-12 1/28/2009 N	SRDWSC 08SAC32-345 1/28/2009 N	SRDWSC 08SAC33-1234 1/28/2009 N	SRDWSC 08SAC34-12 1/28/2009 N	SRDWSC 08SAC34-345 1/29/2009 N	SRDWSC 08SAC35-12 1/29/2009 N	SRDWSC 08SAC35-345 1/29/2009 N
Conventional Parameters (pct)													
Total organic carbon					**0.916**	**0.525**	**0.459**	**0.552**	**0.469**	**0.602**	**0.534**	**0.4**	**0.763**
Conventional Parameters (g)													
Total solids					**63.1**	**68.6**	**68.9**	**65.1**	**63.9**	**66.9**	**61.6**	**54.7**	**49.3**
Grain Size (pct)													
Gravel					**4.6**	**10.8**	**0.3**	**0.1**	**13.7**	**2.7**	**0.4**	**0.4**	**0**
Coarse Sand					**6.8**	**10.3**	**1.3**	**0.8**	**9.4**	**0.3**	**0**	**0.8**	**0**
Medium Sand					**7.1**	**6.4**	**14.6**	**15.3**	**10.7**	**11.7**	**5.6**	**6.2**	**0.9**
Fine Sand					**9.6**	**15.5**	**33**	**26.2**	**15.3**	**36.3**	**34.9**	**7.3**	**24**
Fines					**71.9**	**57**	**50.8**	**57.6**	**50.9**	**49**	**59.1**	**85.3**	**75.1**
Metals (mg/kg)													
Aluminum					**26400 J**	**26200 J**	**23600 J**	**23700 J**	**24200 J**	**22900 J**	**26700 J**	**32000 J**	**33600 J**
Antimony					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Arsenic	13.2		11.6		**7.14**	**7.55**	**5.97**	**5.57**	**7.05**	**5.96**	**7.35**	**7.3**	**6.29**
Barium					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Beryllium					**0.705 J**	**0.657 J**	**0.582 J**	**0.59 J**	**0.621 J**	**0.572 J**	**0.619 J**	**0.868 J**	**0.808 J**
Cadmium	2	21			2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Calcium					**6340 J**	**5450 J**	**5680 J**	**7040 J**	**6400 J**	**6070 J**	**6900 J**	**5700 J**	**6160 J**
Chromium	122		51		**132**	**117**	**87.2**	**94.3**	**176**	**86.1**	**97.6**	**119**	**117**
Cobalt					**25.3**	**23.5**	**19.4**	**19**	**22.3**	**17.4**	**20**	**23.8**	**23.1**
Copper	73.6	61			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Iron					**38800 J**	**38100 J**	**32800 J**	**33000 J**	**38400 J**	**32200 J**	**35700 J**	**40600 J**	**41900 J**
Lead	41	400			**9.4**	**8.84**	**8.47**	**8.21**	**8.33**	**8.22**	**8.95**	**10.8**	**10.6**
Magnesium					**20200 J**	**18300 J**	**14800 J**	**15500 J**	**22700 J**	**14200 J**	**16000 J**	**17000 J**	**17400 J**
Manganese					**830**	**839**	**728**	**624**	**695**	**525**	**647**	**836**	**823**
Mercury	0.68	0.2		0.2	**0.134 J**	**0.112 J**	**0.088 J**	**0.106 J**	**0.186 J**	**0.072 J**	**0.091 J**	**0.125 J**	**0.116 J**
Molybdenum					2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Potassium					**2020 J**	**1750 J**	**1590 J**	**1770 J**	**1740 J**	**1570 J**	**1830 J**	**2260 J**	**2330 J**
Selenium		390			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Silver					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Sodium					**493 J**	**704 J**	**544 J**	**480 J**	**576 J**	**573 J**	**610 J**	**560 J**	**637 J**
Thallium					2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vanadium					**85.6**	**87.4**	**75.6**	**74.2**	**82.3**	**74.1**	**82.2**	**93.7**	**92.8**
Zinc	125	120			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Organometallic Compounds (µg/kg)													
Methyl mercury					4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)													
Acenaphthene		3700000			32.6 U	32.1 U	32.2 U	32 U	32.1 U	32.2 U	32.2 U	32.4 U	32.5 U
Anthracene		22000000			32.6 U	32.1 U	32.2 U	32 U	32.1 U	32.2 U	32.2 U	32.4 U	32.5 U
Benzo(a)anthracene		620			**8.34 J**	**5.67 J**	**7.56 J**	**5.95 J**	**6.1 J**	32.2 U	**6.33 J**	**9.57 J**	**8 J**

Table 10
Physical Characteristics and Chemistry on SRDWSC Sediment Composite Samples

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC31-12 1/28/2009 N	SRDWSC 08SAC31-345 1/28/2009 N	SRDWSC 08SAC32-12 1/28/2009 N	SRDWSC 08SAC32-345 1/28/2009 N	SRDWSC 08SAC33-1234 1/28/2009 N	SRDWSC 08SAC34-12 1/28/2009 N	SRDWSC 08SAC34-345 1/29/2009 N	SRDWSC 08SAC35-12 1/29/2009 N	SRDWSC 08SAC35-345 1/29/2009 N
Benzo(a)pyrene		62			32.6 U	32.1 U	32.2 U	**3.97 J**	32.1 U	32.2 U	32.2 U	**4.79 J**	32.5 U
Benzo(b)fluoranthene		620			32.6 U	32.1 U	32.2 U	32 U	32.1 U	32.2 U	32.2 U	32.4 U	32.5 U
Benzo(k)fluoranthene		610			32.6 U	32.1 U	32.2 U	32 U	32.1 U	32.2 U	32.2 U	32.4 U	32.5 U
Chrysene		6100			**4.17 J**	**3.78 J**	**3.78 J**	32 U	**4.06 J**	32.2 U	**4.22 J**	**4.79 J**	**5.33 J**
Dibenzo(a,h)anthracene		62			32.6 U	32.1 U	32.2 U	32 U	32.1 U	32.2 U	32.2 U	32.4 U	32.5 U
Fluoranthene		2300000			**10.4 J**	**9.45 J**	**7.56 J**	**7.93 J**	**8.13 J**	**3.89 J**	**6.33 J**	**12 J**	**10.7 J**
Fluorene		2600000			32.6 U	32.1 U	32.2 U	32 U	32.1 U	32.2 U	32.2 U	32.4 U	32.5 U
Indeno(1,2,3-c,d)pyrene		620			32.6 U	32.1 U	32.2 U	**3.97 J**	32.1 U	32.2 U	32.2 U	32.4 U	32.5 U
Naphthalene		56000			32.6 U	32.1 U	32.2 U	32 U	32.1 U	32.2 U	32.2 U	32.4 U	32.5 U
Pyrene		2300000			32.6 U	32.1 U	32.2 U	32 U	32.1 U	32.2 U	32.2 U	32.4 U	32.5 U
Semivolatile Organics (µg/kg)													
Hexachlorocyclopentadiene		420000			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 UJ	2.59 UJ	2.91 UJ
PCB Aroclors (µg/kg)													
Aroclor 1016		3900			22.2 UJ	20.9 UJ	20.5 UJ	22.7 UJ	21.3 UJ	20.8 UJ	22.7 UJ	25.9 UJ	29.1 UJ
Aroclor 1221		220			22.2 UJ	20.9 UJ	20.5 UJ	22.7 UJ	21.3 UJ	20.8 UJ	22.7 UJ	25.9 UJ	29.1 UJ
Aroclor 1232		220			22.2 UJ	20.9 UJ	20.5 UJ	22.7 UJ	21.3 UJ	20.8 UJ	22.7 UJ	25.9 UJ	29.1 UJ
Aroclor 1242		220			22.2 UJ	20.9 UJ	20.5 UJ	22.7 UJ	21.3 UJ	20.8 UJ	22.7 UJ	25.9 UJ	29.1 UJ
Aroclor 1248		220			22.2 UJ	20.9 UJ	20.5 UJ	22.7 UJ	21.3 UJ	20.8 UJ	22.7 UJ	25.9 UJ	29.1 UJ
Aroclor 1254		220			22.2 UJ	20.9 UJ	20.5 UJ	22.7 UJ	21.3 UJ	20.8 UJ	22.7 UJ	25.9 UJ	29.1 UJ
Aroclor 1260		220			22.2 UJ	20.9 UJ	20.5 UJ	22.7 UJ	21.3 UJ	20.8 UJ	22.7 UJ	25.9 UJ	29.1 UJ
Total PCB Aroclors (U = 0)					22.2 UJ	20.9 UJ	20.5 UJ	22.7 UJ	21.3 UJ	20.8 UJ	22.7 UJ	25.9 UJ	29.1 UJ
Pesticides (µg/kg)													
4,4'-DDD (p,p'-DDD)		2400			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
4,4'-DDE (p,p'-DDE)		1700			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 UJ	2.59 UJ	2.91 UJ
4,4'-DDT (p,p'-DDT)		1700			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
Aldrin		29			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
alpha-Hexachlorocyclohexane		90			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
alpha-Chlordane (cis-Chlordane)					2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
beta-Hexachlorocyclohexane		32			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
beta-Chlordane (trans-Chlordane)					2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
Dieldrin		11			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 UJ	2.59 UJ	2.91 UJ
Endosulfan sulfate					2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
Endosulfan-alpha (I)					2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 UJ	2.59 UJ	2.91 UJ
Endosulfan-beta (II)					2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 UJ	2.59 UJ	2.91 UJ
Endrin		18000			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
gamma-Hexachlorocyclohexane (Lindane)		440			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
Heptachlor		110			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
Heptachlor epoxide		52			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
Methoxychlor		8000			2.22 UJ	2.09 UJ	2.05 UJ	2.27 UJ	2.13 UJ	2.08 UJ	2.27 U	2.59 U	2.91 UJ
Toxaphene		440			44.6 UJ	42 UJ	41.2 UJ	45.7 UJ	42.9 UJ	41.8 UJ	45.6 U	52 U	58.6 UJ

Table 10
Physical Characteristics and Chemistry on SRDWSC Sediment Composite Samples

Notes:

Detected concentration is greater than Sediment Max Value Previous Studies (2001 - 2007) screening level

Detected concentration is greater than Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001) screening level

Detected concentration is greater than Criteria from NOIs for SRDWSC Dredging Projects

Detected concentration is greater than Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury screening level

Non-detected concentration is above one or more identified screening levels

Bold = Detected result

J = Estimated value

U = Compound analyzed, but not detected above detection limit

UJ = Compound analyzed, but not detected above estimated detection limit

R = Rejected

Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest reporting limit value is reported as the sum.

Data Validation Applied

As shown in Table 10, arsenic, chromium, and nickel were detected at concentrations that exceeded sediment quality criteria. Concentrations of arsenic ranged from 3.6 mg/kg (08SAC10-4567) to 13 mg/kg (08SAC3-1). Only sample 08SAC3-1 exceeded the criteria in NOIs for maintenance dredging projects and the maximum value from previous pre-dredge characterization studies. Concentrations of chromium ranged from 36.4 mg/kg (08SAC12-123) to 176 mg/kg (08SAC33-123). Thirty-nine samples exceeded the criteria in NOIs for maintenance dredging projects, and one sample exceeded the maximum value from previous pre-dredge characterization studies. However, the measured concentrations for chromium are all well below the risk-based USEPA Regional Screening Level (2010) of 280 mg/kg for a residential receptor. Concentrations of nickel ranged from 67.2 mg/kg (08SAC6-5678) to 96.5 mg/kg (08SAC3-1). Fourteen samples exceeded the criteria in NOIs for maintenance dredging projects, but all samples were less than the maximum value from previous pre-dredge characterization studies. Copper, lead, mercury, and zinc were detected in at least one sample; however, concentrations were less than respective sediment quality criteria. Cadmium, selenium, and the organometallic compound methyl mercury were not detected in bulk sediments from the SRDWSC.

Semi-volatile organic compounds analyzed as part of this project included PAHs and hexachlorocyclopentadiene (HCCPD). PAHs were detected in all samples, with the exception of samples 08SAC22-1 and 08SAC23-1. All concentrations were below the detection limit or at extremely low levels, ranging from non-detect to 170 µg/kg (pyrene; 08SAC7-4567). At a concentration of 133 µg/kg (08SAC16/18-123), benzo(a)pyrene was the only PAH to exceed the respective GO criteria.

No organochlorine pesticides were detected in bulk sediments from the SRDWSC. It should be noted that the non-detect concentration of dieldrin in sample 08SAC3-1 exceeded the criteria in the GO.

No PCB Aroclors were detected in bulk sediments from the SRDWSC.

TOC concentrations in bulk sediment from the SRDWRC ranged from 0.0484 percent (08SAC9-4567) to 10.9 percent (08SAC1-12).

4.2.4 Discrete Sediment Sample Chemistry

TOC concentrations in discrete sediment samples from the SRDWSC ranged from 0.0119 percent (08SAC34B-3) to 4.47 percent (08SAC3B-1).

Metals, methyl mercury, and TOC concentrations measured in discrete sediment samples from the SRDWSC are presented in Table 11. Arsenic, chromium, lead, mercury, and nickel were detected at concentrations that exceeded sediment quality criteria. Concentrations of arsenic ranged from an estimated 1.89 mg/kg (08SAC5B-4) to 24.1 mg/kg (08SAC3B-1). Sample 08SAC3B-1 exceeded both the criteria from NOIs for maintenance dredging projects and the maximum value from previous pre-dredge characterization studies. Concentrations of chromium ranged from 42.9 mg/kg (08SAC12B-2) to 232 mg/kg (08SAC30B-3). Thirty samples exceeded the criteria from NOIs for maintenance dredging projects and three samples exceeded the maximum value from previous pre-dredge characterization studies. However, the measured concentrations for chromium are all well below the risk-based USEPA Regional Screening Level (2010) of 280 mg/kg for a residential receptor. Concentrations of lead ranged from 3.15 mg/kg (08SAC34B-3) to 53.3 mg/kg (08SAC23B-1). Sample 08SAC23B-1 exceeded the maximum value from previous pre-dredge characterization studies. Concentrations of mercury ranged from non-detect to an estimated concentration of 0.248 mg/kg (08SAC31B-3). Sample 08SAC31B-3 exceeded both the respective criteria in the GO and the mercury target in the Sacramento–San Joaquin Delta Estuary TMDL for methyl mercury. Concentrations of nickel ranged from 60.5 mg/kg (08SAC9B-4) to 121 mg/kg (08SAC7B-4). Seven samples exceeded the criteria from NOIs for maintenance dredging projects. Copper, selenium, and zinc were detected in at least one sample; however, concentrations were less than respective sediment quality criteria. Selenium was only detected in one sample (08SAC3B-1) at an estimated concentration of 1.08 mg/kg. Cadmium and the organometallic compound methyl mercury were not detected in discrete sediment samples from the SRDWSC.

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC1B-2 1/12/2009 N	SRDWSC 08SAC2B-2 1/13/2009 N	SRDWSC 08SAC3B-1 1/13/2009 N	SRDWSC 08SAC4B-2 1/13/2009 N	SRDWSC 08SAC5B-4 1/14/2009 N	SRDWSC 08SAC6B-5 1/15/2009 N
Conventional Parameters (pct)										
Total organic carbon					**1.96**	**1.16**	**4.47**	**1.69**	**0.0748**	**0.059**
Conventional Parameters (g)										
Total solids					--	--	--	--	--	--
Metals (mg/kg)										
Aluminum					**19600**	**24900**	**24700**	**13800**	**8890**	**10900**
Antimony					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Arsenic	13.2		11.6		**6.52**	**8.09**	**24.1**	**5.12**	**1.89 J**	**5.77**
Barium					**119**	**123**	**103**	**78.3**	**35.7**	**65.7**
Beryllium					2 U	2 U	2 U	2 U	2 U	2 U
Cadmium	2	21			2 U	2 U	2 U	2 U	2 U	2 U
Calcium					**5670**	**5190**	**4330**	**3740**	**3350**	**3520**
Chromium	122		51		**60.3**	**82**	**73.8**	**69.3**	**51.3**	**57.7**
Cobalt					**6.73**	**21.1**	**22.7**	**15**	**13**	**14.7**
Copper	73.6	61			**37.2**	**40.9**	**58.2**	**20.4**	**12**	**13.6**
Iron					**17300**	**31900**	**50500**	**24300**	**14600**	**18700**
Lead	41	400			**6.11**	**7.09**	**7.9**	**5.74**	**4.58**	**3.6**
Magnesium					**8030**	**12200**	**8120**	**9700**	**7500**	**8970**
Manganese					**196**	**596**	**280**	**600**	**301**	**371**
Mercury	0.68	0.2		0.2	**0.022 J**	**0.034 J**	**0.055 J**	**0.037 J**	0.101 U	**0.009 J**
Molybdenum					2 UJ	2 UJ	**4.71 J**	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		**62.3**	**98.6**	**102**	**80.6**	**68.7**	**78.5**
Potassium					**1020**	**1950**	**1920**	**1320**	**686**	**1050**
Selenium		390			2 U	2 U	**1.08 J**	2 U	2 U	2 U
Silver					2 U	2 U	2 U	2 U	2 U	2 U
Sodium					**3040**	**1430**	**2350**	**656**	**524**	**550**
Thallium					2 U	2 U	2 U	2 U	2 U	2 U
Vanadium					**87.6**	**85.4**	**96**	**49.4**	**36.6**	**43**
Zinc	125	120			**51.8**	**91.1**	**84.4**	**60**	**34.9**	**47.2**

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC1B-2 1/12/2009 N	SRDWSC 08SAC2B-2 1/13/2009 N	SRDWSC 08SAC3B-1 1/13/2009 N	SRDWSC 08SAC4B-2 1/13/2009 N	SRDWSC 08SAC5B-4 1/14/2009 N	SRDWSC 08SAC6B-5 1/15/2009 N
Organometallic Compounds (µg/kg)										
Methyl mercury					4 U	4 U	4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)										
Acenaphthene		3700000			--	--	--	--	--	--
Anthracene		22000000			--	--	--	--	--	--
Benzo(a)anthracene		620			--	--	--	--	--	--
Benzo(a)pyrene		62			--	--	--	--	--	--
Benzo(b)fluoranthene		620			--	--	--	--	--	--
Benzo(k)fluoranthene		610			--	--	--	--	--	--
Chrysene		6100			--	--	--	--	--	--
Dibenzo(a,h)anthracene		62			--	--	--	--	--	--
Fluoranthene		2300000			--	--	--	--	--	--
Fluorene		2600000			--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene		620			--	--	--	--	--	--
Naphthalene		56000			--	--	--	--	--	--
Pyrene		2300000			--	--	--	--	--	--
Semivolatile Organics (µg/kg)										
Hexachlorocyclopentadiene		420000			--	--	--	--	--	--
PCB Aroclors (µg/kg)										
Aroclor 1016		3900			--	--	--	--	--	--
Aroclor 1221		220			--	--	--	--	--	--
Aroclor 1232		220			--	--	--	--	--	--
Aroclor 1242		220			--	--	--	--	--	--
Aroclor 1248		220			--	--	--	--	--	--
Aroclor 1254		220			--	--	--	--	--	--
Aroclor 1260		220			--	--	--	--	--	--
Total PCB Aroclors (U = 0)					--	--	--	--	--	--

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC7B-4 1/15/2009 N	SRDWSC 08SAC8B-4 1/16/2009 N	SRDWSC 08SAC9B-4 1/16/2009 N	SRDWSC 08SAC10B-4 1/19/2009 N	SRDWSC 08SAC11B-3 1/20/2009 N	SRDWSC 08SAC12B-2 1/20/2009 N
Conventional Parameters (pct)										
Total organic carbon					**0.6**	**0.117**	**0.0338**	**0.739**	**0.12**	**0.153**
Conventional Parameters (g)										
Total solids					--	--	--	--	--	--
Metals (mg/kg)										
Aluminum					**31200**	**20700**	**9620**	**10500 J**	**20800 J**	**8370 J**
Antimony					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Arsenic	13.2		11.6		**5.15**	**6.17**	**2.88**	**3.19 J**	**3.31 J**	**3.32 J**
Barium					**196**	**121**	**63.6**	**-- R**	**-- R**	**-- R**
Beryllium					2 U	2 U	2 U	2 U	**0.44 J**	2 U
Cadmium	2	21			2 U	2 U	2 U	2 UJ	2 UJ	2 UJ
Calcium					**11300**	**5320**	**2860**	**3280 J**	**4310 J**	**2780 J**
Chromium	122		51		**102**	**74.3**	**44.7**	**47.2**	**74.6**	**42.9**
Cobalt					**22**	**16.1**	**10.8**	**12.6**	**14.8**	**11.7**
Copper	73.6	61			**50.9**	**33.9**	**11.7**	**-- R**	**-- R**	**-- R**
Iron					**38400**	**29400**	**14700**	**17600 J**	**26300 J**	**15700 J**
Lead	41	400			**8.27**	**5.29**	**3.49**	**4.2**	**5.63**	**3.95**
Magnesium					**17800**	**12400**	**6920**	**7620 J**	**9860 J**	**7110 J**
Manganese					**921**	**493**	**212**	**260**	**303**	**250**
Mercury	0.68	0.2		0.2	**0.045 J**	**0.032 J**	**0.006 J**	**0.023 J**	**0.028 J**	0.1 U
Molybdenum					2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		**121**	**97.7**	**60.5**	**-- R**	**-- R**	**-- R**
Potassium					**2700**	**1600**	**817**	**876 J**	**1270 J**	**839 J**
Selenium		390			2 U	2 U	2 U	**-- R**	**-- R**	**-- R**
Silver					2 U	2 U	2 U	2 U	2 U	2 U
Sodium					**935**	**1020**	**379**	**285 J**	**340 J**	**224 J**
Thallium					2 U	2 U	2 U	2 U	2 U	2 U
Vanadium					**96.1**	**70.2**	**33.1**	**37.7**	**67.4**	**31.8**
Zinc	125	120			**109**	**70.1**	**47.1**	**-- R**	**-- R**	**-- R**

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC7B-4 1/15/2009 N	SRDWSC 08SAC8B-4 1/16/2009 N	SRDWSC 08SAC9B-4 1/16/2009 N	SRDWSC 08SAC10B-4 1/19/2009 N	SRDWSC 08SAC11B-3 1/20/2009 N	SRDWSC 08SAC12B-2 1/20/2009 N
Organometallic Compounds (µg/kg)										
Methyl mercury					4 U	4 U	4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)										
Acenaphthene		3700000			--	--	--	--	--	--
Anthracene		22000000			--	--	--	--	--	--
Benzo(a)anthracene		620			--	--	--	--	--	--
Benzo(a)pyrene		62			--	--	--	--	--	--
Benzo(b)fluoranthene		620			--	--	--	--	--	--
Benzo(k)fluoranthene		610			--	--	--	--	--	--
Chrysene		6100			--	--	--	--	--	--
Dibenzo(a,h)anthracene		62			--	--	--	--	--	--
Fluoranthene		2300000			--	--	--	--	--	--
Fluorene		2600000			--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene		620			--	--	--	--	--	--
Naphthalene		56000			--	--	--	--	--	--
Pyrene		2300000			--	--	--	--	--	--
Semivolatile Organics (µg/kg)										
Hexachlorocyclopentadiene		420000			--	--	--	--	--	--
PCB Aroclors (µg/kg)										
Aroclor 1016		3900			--	--	--	--	--	--
Aroclor 1221		220			--	--	--	--	--	--
Aroclor 1232		220			--	--	--	--	--	--
Aroclor 1242		220			--	--	--	--	--	--
Aroclor 1248		220			--	--	--	--	--	--
Aroclor 1254		220			--	--	--	--	--	--
Aroclor 1260		220			--	--	--	--	--	--
Total PCB Aroclors (U = 0)					--	--	--	--	--	--

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC13B-3 1/20/2009 N	SRDWSC 08SAC14B-2 1/21/2009 N	SRDWSC 08SAC16B-1 1/21/2009 N	SRDWSC 08SAC17B-1 1/21/2009 N	SRDWSC 08SAC18B-1 1/21/2009 N	SRDWSC 08SAC19B-2 1/23/2009 N
Conventional Parameters (pct)										
Total organic carbon					**0.0274**	**0.0515**	**1.3**	**0.828**	**0.13**	**0.071**
Conventional Parameters (g)										
Total solids					--	--	--	--	--	--
Metals (mg/kg)										
Aluminum					**7390 J**	**13400 J**	**25300 J**	**26800 J**	**17900 J**	**18800 J**
Antimony					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Arsenic	13.2		11.6		**3.91 J**	**2.39 J**	**7.14 J**	**6.03 J**	**2.4 J**	**7.59 J**
Barium					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Beryllium					2 U	2 U	**0.585 J**	**0.596 J**	**0.402 J**	2 U
Cadmium	2	21			2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Calcium					**3330 J**	**4030 J**	**6360 J**	**5570 J**	**4810 J**	**7210 J**
Chromium	122		51		**43.4**	**61.1**	**78.9**	**81.9**	**70.1**	**77.3**
Cobalt					**9.57**	**14.7**	**20.7**	**22.2**	**16.8**	**20**
Copper	73.6	61			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Iron					**14000 J**	**20400 J**	**48000 J**	**40400 J**	**27600 J**	**30600 J**
Lead	41	400			**3.98**	**7.49**	**7.79**	**9.09**	**7.01**	**5.77**
Magnesium					**6590 J**	**5970 J**	**13400 J**	**14000 J**	**12600 J**	**16500 J**
Manganese					**237**	**453**	**2480**	**1180**	**546**	**1120**
Mercury	0.68	0.2		0.2	0.1 U	**0.051 J**	**0.048 J**	**0.048 J**	**0.02 J**	**0.033 J**
Molybdenum					2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Potassium					**652 J**	**1080 J**	**1800 J**	**1830 J**	**1120 J**	**1200 J**
Selenium		390			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Silver					2 U	2 U	2 U	2 U	2 U	2 U
Sodium					**251 J**	**189 J**	**455 J**	**468 J**	**315 J**	**477 J**
Thallium					2 U	2 U	2 U	2 U	2 U	2 U
Vanadium					**29.2**	**48.5**	**83.8**	**91.3**	**57.9**	**68.1**
Zinc	125	120			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC13B-3 1/20/2009 N	SRDWSC 08SAC14B-2 1/21/2009 N	SRDWSC 08SAC16B-1 1/21/2009 N	SRDWSC 08SAC17B-1 1/21/2009 N	SRDWSC 08SAC18B-1 1/21/2009 N	SRDWSC 08SAC19B-2 1/23/2009 N
Organometallic Compounds (µg/kg)										
Methyl mercury					4 U	4 U	4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)										
Acenaphthene		3700000			--	--	--	--	--	--
Anthracene		22000000			--	--	--	--	--	--
Benzo(a)anthracene		620			--	--	--	--	--	--
Benzo(a)pyrene		62			--	--	--	--	--	--
Benzo(b)fluoranthene		620			--	--	--	--	--	--
Benzo(k)fluoranthene		610			--	--	--	--	--	--
Chrysene		6100			--	--	--	--	--	--
Dibenzo(a,h)anthracene		62			--	--	--	--	--	--
Fluoranthene		2300000			--	--	--	--	--	--
Fluorene		2600000			--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene		620			--	--	--	--	--	--
Naphthalene		56000			--	--	--	--	--	--
Pyrene		2300000			--	--	--	--	--	--
Semivolatile Organics (µg/kg)										
Hexachlorocyclopentadiene		420000			--	--	--	--	--	--
PCB Aroclors (µg/kg)										
Aroclor 1016		3900			--	--	--	--	--	--
Aroclor 1221		220			--	--	--	--	--	--
Aroclor 1232		220			--	--	--	--	--	--
Aroclor 1242		220			--	--	--	--	--	--
Aroclor 1248		220			--	--	--	--	--	--
Aroclor 1254		220			--	--	--	--	--	--
Aroclor 1260		220			--	--	--	--	--	--
Total PCB Aroclors (U = 0)					--	--	--	--	--	--

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC20B-2 1/23/2009 N	SRDWSC 08SAC21B-2 1/23/2009 N	SRDWSC 08SAC22B-1 1/23/2009 N	SRDWSC 08SAC23B-1 1/22/2009 N	SRDWSC 08SAC24B-1 1/22/2009 N	SRDWSC 08SAC25B-1 1/22/2009 N
Conventional Parameters (pct)										
Total organic carbon					**0.701**	**1.04**	**0.832**	**0.484**	**0.874**	**0.0988**
Conventional Parameters (g)										
Total solids					--	--	--	--	--	--
Metals (mg/kg)										
Aluminum					**25100 J**	**30200 J**	**32000 J**	**30200 J**	**28100 J**	**25500 J**
Antimony					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Arsenic	13.2		11.6		**9.31 J**	**7.28 J**	**10.5 J**	**8.06 J**	**9.45 J**	**6.63 J**
Barium					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Beryllium					**0.609 J**	**0.688 J**	**0.733 J**	**0.665 J**	**0.634 J**	**0.518 J**
Cadmium	2	21			2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Calcium					**10200 J**	**14900 J**	**3290 J**	**10200 J**	**9560 J**	**4170 J**
Chromium	122		51		**90.5**	**103**	**110**	**105**	**95.1**	**80.5**
Cobalt					**23.9**	**22.8**	**23.5**	**25.4**	**21.8**	**20.7**
Copper	73.6	61			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Iron					**33800 J**	**41100 J**	**44100 J**	**42400 J**	**40800 J**	**35100 J**
Lead	41	400			**7.43**	**10.3**	**9.05**	**53.3**	**8.23**	**7.29**
Magnesium					**20500 J**	**24800 J**	**16800 J**	**23600 J**	**20000 J**	**16400 J**
Manganese					**829**	**667**	**711**	**1050**	**870**	**508**
Mercury	0.68	0.2		0.2	**0.047 J**	**0.064 J**	**0.07 J**	**0.059 J**	**0.098 J**	**0.066 J**
Molybdenum					2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Potassium					**2260 J**	**2130 J**	**3580 J**	**2570 J**	**1670 J**	**1160 J**
Selenium		390			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Silver					2 U	2 U	2 U	2 U	2 U	2 U
Sodium					**443 J**	**439 J**	**283 J**	**646 J**	**403 J**	**444 J**
Thallium					2 U	2 U	2 U	2 U	2 U	2 U
Vanadium					**77.8**	**90.6**	**93.8**	**91**	**89.2**	**85.7**
Zinc	125	120			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC20B-2 1/23/2009 N	SRDWSC 08SAC21B-2 1/23/2009 N	SRDWSC 08SAC22B-1 1/23/2009 N	SRDWSC 08SAC23B-1 1/22/2009 N	SRDWSC 08SAC24B-1 1/22/2009 N	SRDWSC 08SAC25B-1 1/22/2009 N
Organometallic Compounds (µg/kg)										
Methyl mercury					4 U	4 U	4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)										
Acenaphthene		3700000			--	--	--	--	--	--
Anthracene		22000000			--	--	--	--	--	--
Benzo(a)anthracene		620			--	--	--	--	--	--
Benzo(a)pyrene		62			--	--	--	--	--	--
Benzo(b)fluoranthene		620			--	--	--	--	--	--
Benzo(k)fluoranthene		610			--	--	--	--	--	--
Chrysene		6100			--	--	--	--	--	--
Dibenzo(a,h)anthracene		62			--	--	--	--	--	--
Fluoranthene		2300000			--	--	--	--	--	--
Fluorene		2600000			--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene		620			--	--	--	--	--	--
Naphthalene		56000			--	--	--	--	--	--
Pyrene		2300000			--	--	--	--	--	--
Semivolatile Organics (µg/kg)										
Hexachlorocyclopentadiene		420000			--	--	--	--	--	--
PCB Aroclors (µg/kg)										
Aroclor 1016		3900			--	--	--	--	--	--
Aroclor 1221		220			--	--	--	--	--	--
Aroclor 1232		220			--	--	--	--	--	--
Aroclor 1242		220			--	--	--	--	--	--
Aroclor 1248		220			--	--	--	--	--	--
Aroclor 1254		220			--	--	--	--	--	--
Aroclor 1260		220			--	--	--	--	--	--
Total PCB Aroclors (U = 0)					--	--	--	--	--	--

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC26B-4 1/22/2009 N	SRDWSC 08SAC27B-3 1/26/2009 N	SRDWSC 08SAC28B-2 1/26/2009 N	SRDWSC 08SAC29B-3 1/27/2009 N	SRDWSC 08SAC30B-3 1/27/2009 N	SRDWSC 08SAC31B-3 1/27/2009 N
Conventional Parameters (pct)										
Total organic carbon					**0.0585**	**0.063**	**0.0664**	**0.0758**	**0.145**	**0.117**
Conventional Parameters (g)										
Total solids					--	--	--	--	--	--
Metals (mg/kg)										
Aluminum					**11400 J**	**14200 J**	**32500 J**	**12700 J**	**16500 J**	**19300 J**
Antimony					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Arsenic	13.2		11.6		**2.69 J**	**5.72**	**7.91**	**5.5**	**6.46**	**4.24**
Barium					**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Beryllium					2 U	2 U	**0.723 J**	2 U	**0.433 J**	**0.523 J**
Cadmium	2	21			2 UJ	2 U	2 U	2 U	2 U	2 U
Calcium					**4950 J**	**13000 J**	**5250 J**	**6270 J**	**8660 J**	**7900 J**
Chromium	122		51		**75.1**	**142**	**113**	**118**	**232**	**179**
Cobalt					**13.1**	**19.5**	**24.9**	**14.1**	**26.7**	**27.8**
Copper	73.6	61			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Iron					**20100 J**	**26900 J**	**41600 J**	**23500 J**	**34300 J**	**35500 J**
Lead	41	400			**3.4**	**4.5**	**9.63**	**4.43**	**8.14**	**5.21**
Magnesium					**13300 J**	**22200 J**	**16600 J**	**15500 J**	**30500 J**	**32600 J**
Manganese					**291**	**670**	**433**	**642**	**963**	**544**
Mercury	0.68	0.2		0.2	**0.023 J**	**0.15 J**	**0.066 J**	**0.049 J**	**0.088 J**	**0.248 J**
Molybdenum					2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Potassium					**750 J**	**1070 J**	**1770 J**	**949 J**	**1090 J**	**1330 J**
Selenium		390			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Silver					2 U	2 U	2 U	2 U	2 U	2 U
Sodium					**468 J**	**335 J**	**548 J**	328 UJ	**350 J**	**604 J**
Thallium					2 U	2 U	2 U	2 U	2 U	2 U
Vanadium					**46.2**	**58.5**	**89.8**	**54.3**	**70.5**	**80.8**
Zinc	125	120			**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC26B-4 1/22/2009 N	SRDWSC 08SAC27B-3 1/26/2009 N	SRDWSC 08SAC28B-2 1/26/2009 N	SRDWSC 08SAC29B-3 1/27/2009 N	SRDWSC 08SAC30B-3 1/27/2009 N	SRDWSC 08SAC31B-3 1/27/2009 N
Organometallic Compounds (µg/kg)										
Methyl mercury					4 U	4 U	4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)										
Acenaphthene		3700000			--	--	--	--	--	--
Anthracene		22000000			--	--	--	--	--	--
Benzo(a)anthracene		620			--	--	--	--	--	--
Benzo(a)pyrene		62			--	--	--	--	--	--
Benzo(b)fluoranthene		620			--	--	--	--	--	--
Benzo(k)fluoranthene		610			--	--	--	--	--	--
Chrysene		6100			--	--	--	--	--	--
Dibenzo(a,h)anthracene		62			--	--	--	--	--	--
Fluoranthene		2300000			--	--	--	--	--	--
Fluorene		2600000			--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene		620			--	--	--	--	--	--
Naphthalene		56000			--	--	--	--	--	--
Pyrene		2300000			--	--	--	--	--	--
Semivolatile Organics (µg/kg)										
Hexachlorocyclopentadiene		420000			--	--	--	--	--	--
PCB Aroclors (µg/kg)										
Aroclor 1016		3900			--	--	--	--	--	--
Aroclor 1221		220			--	--	--	--	--	--
Aroclor 1232		220			--	--	--	--	--	--
Aroclor 1242		220			--	--	--	--	--	--
Aroclor 1248		220			--	--	--	--	--	--
Aroclor 1254		220			--	--	--	--	--	--
Aroclor 1260		220			--	--	--	--	--	--
Total PCB Aroclors (U = 0)					--	--	--	--	--	--

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC32B-3 1/28/2009 N	SRDWSC 08SAC33B-4 1/28/2009 N	SRDWSC 08SAC34B-3 1/29/2009 N	SRDWSC 08SAC35B-4 1/29/2009 N
Conventional Parameters (pct)								
Total organic carbon					**0.0298**	**0.0374**	**0.0119**	**0.0416**
Conventional Parameters (g)								
Total solids					--	--	--	--
Metals (mg/kg)								
Aluminum					**9940 J**	**13900 J**	**12800 J**	**16100 J**
Antimony					**-- R**	**-- R**	**-- R**	**-- R**
Arsenic	13.2		11.6		**2.7**	**3.64**	**3.27**	**4.68**
Barium					**-- R**	**-- R**	**-- R**	**-- R**
Beryllium					2 U	2 U	2 U	2 U
Cadmium	2	21			2 U	2 U	2 U	2 U
Calcium					**4280 J**	**4330 J**	**4740 J**	**5700 J**
Chromium	122		51		**63.9**	**61.6**	**55**	**61.1**
Cobalt					**9.21**	**13.1**	**11.1**	**14.2**
Copper	73.6	61			**-- R**	**-- R**	**-- R**	**-- R**
Iron					**14600 J**	**20800 J**	**17500 J**	**28600 J**
Lead	41	400			**11.7**	**3.86**	**3.15**	**4.08**
Magnesium					**8320 J**	**9760 J**	**8830 J**	**9820 J**
Manganese					**404**	**521**	**287**	**318**
Mercury	0.68	0.2		0.2	0.1 U	0.1 U	0.1 U	0.1 U
Molybdenum					2 UJ	2 UJ	2 UJ	2 UJ
Nickel	238		64.5		**-- R**	**-- R**	**-- R**	**-- R**
Potassium					**563 J**	**900 J**	**741 J**	**756 J**
Selenium		390			**-- R**	**-- R**	**-- R**	**-- R**
Silver					2 U	2 U	2 U	2 U
Sodium					**499 J**	**577 J**	**625 J**	**748 J**
Thallium					2 U	2 U	2 U	2 U
Vanadium					**37.3**	**52.5**	**50.8**	**72.3**
Zinc	125	120			**-- R**	**-- R**	**-- R**	**-- R**

Table 11
Discrete Sediment Sample Chemistry Results

Task Sample ID Sample Date Sample Type	Sediment Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Criteria from NOIs for SRDWSC Dredging Projects	Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury	SRDWSC 08SAC32B-3 1/28/2009 N	SRDWSC 08SAC33B-4 1/28/2009 N	SRDWSC 08SAC34B-3 1/29/2009 N	SRDWSC 08SAC35B-4 1/29/2009 N
Organometallic Compounds (µg/kg)								
Methyl mercury					4 U	4 U	4 U	4 U
Aromatic Hydrocarbons (µg/kg)								
Acenaphthene		3700000			--	--	--	--
Anthracene		22000000			--	--	--	--
Benzo(a)anthracene		620			--	--	--	--
Benzo(a)pyrene		62			--	--	--	--
Benzo(b)fluoranthene		620			--	--	--	--
Benzo(k)fluoranthene		610			--	--	--	--
Chrysene		6100			--	--	--	--
Dibenzo(a,h)anthracene		62			--	--	--	--
Fluoranthene		2300000			--	--	--	--
Fluorene		2600000			--	--	--	--
Indeno(1,2,3-c,d)pyrene		620			--	--	--	--
Naphthalene		56000			--	--	--	--
Pyrene		2300000			--	--	--	--
Semivolatile Organics (µg/kg)								
Hexachlorocyclopentadiene		420000			--	--	--	--
PCB Aroclors (µg/kg)								
Aroclor 1016		3900			--	--	--	--
Aroclor 1221		220			--	--	--	--
Aroclor 1232		220			--	--	--	--
Aroclor 1242		220			--	--	--	--
Aroclor 1248		220			--	--	--	--
Aroclor 1254		220			--	--	--	--
Aroclor 1260		220			--	--	--	--
Total PCB Aroclors (U = 0)					--	--	--	--

Table 11
Discrete Sediment Sample Chemistry Results

Notes:

Detected concentration is greater than Sediment Max Value Previous Studies (2001 - 2007) screening level

Detected concentration is greater than Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001) screening level

Detected concentration is greater than Criteria from NOIs for SRDWSC Dreding Projects screening level

Detected concentration is greater than Sacramento – San Joaquin Delta Estuary TMDL for Methylmercury screening level

Non-detected concentration is above one or more identified screening levels

Bold = Detected result

J = Estimated value

U = Compound analyzed, but not detected above detection limit

UJ = Compound analyzed, but not detected above estimated detection limit

R = Rejected

Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest reporting limit value is reported as the sum.

Data Validation Applied

4.2.5 Modified Elutriate Test Chemistry

Concentrations of conventional parameters (i.e., ammonia, BOD, chloride, TOC, TDS, TSS, conductivity, and pH), metals, PAHs, organochlorine pesticides, organophosphorous pesticides, PCB Aroclors, and oil and grease were measured in MET samples and are presented in Table 12. For purposes of comparison, site water chemistry is provided in Table 13.

Ammonia concentrations in 39 samples were higher than corresponding site water concentrations by an order of magnitude. BOD and TOC were higher than corresponding site water concentrations in 32 and 39 samples, respectively; however, both measurements were found to be in the same approximate order of magnitude. Chloride concentrations in 15 samples exceeded the corresponding GO criteria and were approximately an order of magnitude greater than GO criteria. TDS concentrations in 19 samples exceeded the corresponding GO criteria but were in the same order of magnitude. Conductivity in 20 samples exceeded the corresponding GO criteria.

The only MET metal to exceed the maximum concentration detected in previous pre-dredge characterization studies was selenium; however, arsenic, barium, copper, lead, mercury, and selenium were detected at concentrations that exceeded the corresponding GO criteria or criteria from the Central Valley Basin Plan (barium only). Concentrations of arsenic ranged from an estimated concentration of 12.1 µg/L (08SAC10-4567) to 23.3 µg/L (08SAC3-1). Two samples exceeded the GO criteria for arsenic. Concentrations of barium ranged from 24.6 µg/L (08SAC23-123) to 910 µg/L (08SAC4-12). Twenty samples exceeded the GO criteria for barium. Concentrations of copper ranged from an estimated concentration of 1.3 µg/L in several samples to 26.3 µg/L (08SAC16/18-123). Three samples exceeded the GO criteria for copper. Concentrations of lead ranged from non-detect in several samples to 5.9 µg/L (08SAC16/18-123). Two samples exceeded the GO criteria for lead. Concentrations of mercury ranged from non-detect in several samples to an estimated concentration of 0.2 µg/L (08SAC9-123). Twelve samples exceeded the GO criteria for mercury. Concentrations of selenium ranged from non-detect in several samples to 15µg/L (08SAC14-123). Five samples exceeded the GO criteria for selenium, and eight samples exceeded the maximum concentration detected in previous pre-dredge characterization studies. Chromium, nickel, and zinc were detected in at least one sample; however, concentrations were less than respective MET criteria. Cadmium was not detected in MET samples.

Semi-volatile organic compounds analyzed as part of this project included PAHs and HCCPD. PAHs were detected in seven MET samples. All concentrations were below GO criteria, ranging from non-detect in many samples to 0.11 nanograms per liter (ng/L; napthalene; 08SAC34-12).

Organochlorine pesticides were not detected in MET samples, with the exception of 4,4'-DDE at an estimated concentration in two samples; however, concentrations in these samples were below GO criteria.

PCB Aroclors and organophosphate pesticides were not detected in any MET samples.

Oil and grease exceeded GO criteria in all samples, ranging from 7 mg/L (08SAC10-123) to 45.5 mg/L (08SAC31-12).

4.2.6 Deionized Water – Waste Extraction Test Chemistry

Metals (including mercury) were measured in DI-WET samples and are presented in Table 14.

None of the DI-WET metals exceeded the maximum concentration detected in previous pre-dredge characterization studies; however, arsenic, copper, and lead were detected at concentrations that exceeded the corresponding GO criteria. Concentrations of arsenic ranged from an estimated concentration of 1.4 µg/L (08SAC11-456) to 15.5 µg/L (08SAC23-1), with eight samples exceeded the GO criteria for arsenic. Concentrations of copper ranged from an estimated concentration of 1.4 µg/L (08SAC28-12) to 46.6 µg/L (08SAC7-123), with 17 samples exceeded the GO criteria for copper. Concentrations of lead ranged from non-detect in several samples to 8 µg/L (08SAC32-345), with six samples exceeded the GO criteria for lead. Barium, chromium, mercury, nickel, and zinc were detected in at least one sample; however, concentrations were less than respective DI-WET criteria. Cadmium was not detected in DI-WET samples.

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC1-12 - MET 1/26/2009 N	SRDWSC 08SAC2-12 - MET 1/26/2009 N	SRDWSC 08SAC3-1 - MET 1/26/2009 N	SRDWSC 08SAC4-12 - MET 1/26/2009 N	SRDWSC 08SAC5-123 - MET 1/26/2009 N	SRDWSC 08SAC5-4567 - MET 1/26/2009 N	SRDWSC 08SAC6-1234 - MET 1/26/2009 N
Conventional Parameters (mg/L)										
Ammonia				**42.3**	**2.1**	**23**	**7.4**	**6.7**	**9**	**4.5**
Biological oxygen demand				**5.9**	**3.2**	**7.7**	**4.3**	**4.4**	**4.6**	**4.4**
Chloride (total)		106[1]		**2740**	**2000**	**1550**	**2020**	**1000**	**954**	**858**
Total dissolved solids		450[1]		**5050 J**	**4790 J**	--	**4090 J**	**2140 J**	**2130 J**	**1950 J**
Total suspended solids				**61 J**	**28 J**	--	**16 J**	**40 J**	**52 J**	**48 J**
Conventional Parameters (pct)										
Total organic carbon				**0.00121**	**0.00023**	**0.00117**	**0.00037**	**0.00106**	**0.0004**	**0.00025**
Conventional Parameters (ms/cm)										
Conductivity		0.700[1]		**9.03**	**8.23**	**5.6**	**7.08**	**3.93**	**3.86**	**3.49**
Conventional Parameters (su)										
pH				**7.61 J**	**7.77 J**	**7.06 J**	**7.38 J**	**7.66 J**	**7.65 J**	**7.75 J**
Metals (µg/L)										
Arsenic	10.3	10		**5.8**	**3.3 J**	**23.3**	**6.6**	**7.1**	**7.4**	**8.5**
Barium			100	**811**	**492**	**566**	**910**	**477**	**459**	**296**
Cadmium	18.7	5		4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	18.6	50		**2.7 J**	**2.5 J**	**1.8 J**	**2.2 J**	**1.2 J**	**1.2 J**	**1.1 J**
Copper	13.4	10		**7.5**	**7.3**	**4.1**	**5.4**	**2.7 J**	**2.8 J**	**1.8 J**
Lead	11	2.5		2 U	2 U	2 U	2 U	2 U	**0.7 J**	2 U
Mercury	0.865	0.05		0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	**0.02 J**
Nickel	40.7	52		**5.3**	**9.1**	**4.6**	**4.6**	**3 J**	**3.5 J**	**2.6 J**
Selenium	4.1	5		4 U	4 U	4 U	4 U	4 U	4 U	4 U
Zinc	59.3	100		**3.2 J**	**2.6 J**	**3.7 J**	**2.5 J**	**1.9 J**	**19.5**	**2.5 J**
Volatile Organics (µg/L)										
Dimethoate		1		0.012 U	0.012 U	0.01 UJ	0.012 U	0.012 U	0.012 U	0.012 U
Aromatic Hydrocarbons (µg/L)										
Acenaphthene		1200		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U
Anthracene		9600		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(a)pyrene		0.0044		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	**0.004**
Benzo(b)fluoranthene		0.0044		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	**0.004**
Benzo(k)fluoranthene		0.0044		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	**0.004**
Chrysene		0.0044		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	**0.008**
Dibenzo(a,h)anthracene		0.0044		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U
Fluoranthene		300		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	**0.004**
Fluorene		1300		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U
Indeno(1,2,3-c,d)pyrene		0.0044		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U
Naphthalene		620		0.006 U	0.004 U	0.004 UJ	0.006 U	0.008 U	0.004 U	0.004 U
Pyrene		960		0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	**0.006**

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC1-12 - MET 1/26/2009 N	SRDWSC 08SAC2-12 - MET 1/26/2009 N	SRDWSC 08SAC3-1 - MET 1/26/2009 N	SRDWSC 08SAC4-12 - MET 1/26/2009 N	SRDWSC 08SAC5-123 - MET 1/26/2009 N	SRDWSC 08SAC5-4567 - MET 1/26/2009 N	SRDWSC 08SAC6-1234 - MET 1/26/2009 N
Semivolatile Organics (µg/L)										
Hexachlorocyclopentadiene		0.01		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
PCB Aroclors (µg/L)										
Aroclor 1016				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1221				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1232				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1242				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1248				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1254				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1260				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Total PCB Aroclors (U = 0)		0.00017		0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Pesticides (µg/L)										
4,4'-DDD (p,p'-DDD)		0.05		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
4,4'-DDE (p,p'-DDE)		0.05		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
4,4'-DDT (p,p'-DDT)		0.01		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Aldrin		0.005		**-- R**	**-- R**	0.005 UJ	**-- R**	**-- R**	**-- R**	**-- R**
alpha-Hexachlorocyclohexane		0.01		0.005 UJ	0.005 UJ	**-- R**	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
alpha-Chlordane (cis-Chlordane)				**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
beta-Hexachlorocyclohexane		0.005		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
beta-Chlordane (trans-Chlordane)				0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Chlorpyrifos		0.014		0.012 U	0.012 U	0.01 UJ	0.012 U	0.012 U	0.012 U	0.012 U
Diazinon		0.05		0.012 U	0.012 U	0.01 UJ	0.012 U	0.012 U	0.012 U	0.012 U
Dieldrin		0.01		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Endosulfan sulfate		0.05		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Endosulfan-alpha (I)		0.02		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Endosulfan-beta (II)		0.01		0.005 UJ	0.005 UJ	**-- R**	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Endrin		0.01		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Endrin aldehyde				0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
gamma-Hexachlorocyclohexane (Lindane)		0.02		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Heptachlor		0.01		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Heptachlor epoxide		0.01		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Malathion		0.43		0.012 U	0.012 U	0.01 UJ	0.012 U	0.012 U	0.012 U	0.012 U
Methoxychlor		0.1		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Parathion		0.013		0.012 U	0.012 U	0.01 UJ	0.012 U	0.012 U	0.012 U	0.012 U
Phorate		0.7		0.012 U	0.012 U	0.01 UJ	0.012 U	0.012 U	0.012 U	0.012 U
Toxaphene		0.5		0.1 UJ	0.1 UJ	0.005 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
Total Petroleum Hydrocarbons (mg/L)										
Oil and grease		5		**20.3**	**19.8**	**13.7**	**24.5**	**13.3**	**17.8**	**15.3**

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC6-5678- MET 1/26/2009 N	SRDWSC 08SAC7-123 - MET 1/26/2009 N	SRDWSC 08SAC7-4567 - MET 1/26/2009 N	SRDWSC 08SAC8-123 - MET 1/26/2009 N	SRDWSC 08SAC8-4567 - MET 1/26/2009 N	SRDWSC 08SAC9-123 MET 2/2/2009 N	SRDWSC 08SAC9-4567 MET 2/2/2009 N
Conventional Parameters (mg/L)										
Ammonia				6.6	7.7	5.4	2.9	2.7	0.2 U	1.3
Biological oxygen demand				5.1	4.6	4.3	4.6	5	2.4	2.4
Chloride (total)		106[1]		791	464	483	266	274	75.9	79.5
Total dissolved solids		450[1]		1720 J	1100 J	1220 J	768 J	727 J	358	282
Total suspended solids				41 J	58 J	51 J	60 J	60 J	706 J	274 J
Conventional Parameters (pct)										
Total organic carbon				0.00031	0.00028	0.00038	0.0003	0.00029	0.00022	0.00015
Conventional Parameters (ms/cm)										
Conductivity		0.700[1]		3.22	2.01	2.13	1.33	1.28	0.46	0.453
Conventional Parameters (su)										
pH				7.75 J	7.57 J	7.94 J	7.96 J	7.79 J	7.7	7.6
Metals (µg/L)										
Arsenic	10.3	10		8.2	6.4	8.6	9.1	7.5	6.3	4.1
Barium			100	296	258	179	123	141	79.8	75.9
Cadmium	18.7	5		4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	18.6	50		1 J	1 J	2.5 J	1.9 J	1.6 J	7.9	4.3
Copper	13.4	10		2 J	1.3 J	2.8 J	4.1	2.2 J	10.5	4.3
Lead	11	2.5		2 U	2 U	2 U	2 U	2 U	2.3	1.1 J
Mercury	0.865	0.05		0.02 UJ	0.02 UJ	0.02 J	0.04 J	0.02 J	0.2 J	0.06 J
Nickel	40.7	52		2.9 J	2.4 J	3.4 J	2.8 J	2.9 J	8.3	5.9
Selenium	4.1	5		4 U	4 U	4 U	2 J	2.1 J	9.6	4.5
Zinc	59.3	100		5.3	2.4 J	3.8 J	3.9 J	2.6 J	14 U	5.7 U
Volatile Organics (µg/L)										
Dimethoate		1		0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.01 U	0.01 U
Aromatic Hydrocarbons (µg/L)										
Acenaphthene		1200		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ
Anthracene		9600		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ
Benzo(a)pyrene		0.0044		0.004 U	0.004 U	0.004	0.008	0.007	0.008	0.005
Benzo(b)fluoranthene		0.0044		0.004 U	0.004 U	0.004 U	0.008	0.006	0.007	0.004
Benzo(k)fluoranthene		0.0044		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004	0.004 U
Chrysene		0.0044		0.004 U	0.004 U	0.004	0.007	0.004	0.007	0.004 U
Dibenzo(a,h)anthracene		0.0044		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Fluoranthene		300		0.004 U	0.004 U	0.007	0.02	0.008	0.02	0.007
Fluorene		1300		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Indeno(1,2,3-c,d)pyrene		0.0044		0.004 U	0.004 U	0.004 U	0.01	0.01	0.008	0.006
Naphthalene		620		0.004 U	0.006 U	0.005 U	0.006 U	0.006 U	0.004 UJ	0.004 UJ
Pyrene		960		0.004 U	0.004 U	0.01	0.02	0.01	0.02	0.009

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC6-5678- MET 1/26/2009 N	SRDWSC 08SAC7-123 - MET 1/26/2009 N	SRDWSC 08SAC7-4567 - MET 1/26/2009 N	SRDWSC 08SAC8-123 - MET 1/26/2009 N	SRDWSC 08SAC8-4567 - MET 1/26/2009 N	SRDWSC 08SAC9-123 MET 2/2/2009 N	SRDWSC 08SAC9-4567 MET 2/2/2009 N
Semivolatile Organics (µg/L)										
Hexachlorocyclopentadiene		0.01		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
PCB Aroclors (µg/L)										
Aroclor 1016				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.003 UJ	0.003 UJ
Aroclor 1221				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.003 UJ	0.003 UJ
Aroclor 1232				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.003 UJ	0.003 UJ
Aroclor 1242				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.003 UJ	0.003 UJ
Aroclor 1248				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.003 UJ	0.003 UJ
Aroclor 1254				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.003 UJ	0.003 UJ
Aroclor 1260				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.003 UJ	0.003 UJ
Total PCB Aroclors (U = 0)		0.00017		0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.003 UJ	0.003 UJ
Pesticides (µg/L)										
4,4'-DDD (p,p'-DDD)		0.05		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
4,4'-DDE (p,p'-DDE)		0.05		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	**0.003 J**	0.005 U
4,4'-DDT (p,p'-DDT)		0.01		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Aldrin		0.005		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	0.005 U	0.005 U
alpha-Hexachlorocyclohexane		0.01		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	**-- R**	**-- R**
alpha-Chlordane (cis-Chlordane)				**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
beta-Hexachlorocyclohexane		0.005		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
beta-Chlordane (trans-Chlordane)				0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Chlorpyrifos		0.014		0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.01 U	0.01 U
Diazinon		0.05		0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.01 U	0.01 U
Dieldrin		0.01		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Endosulfan sulfate		0.05		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Endosulfan-alpha (I)		0.02		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Endosulfan-beta (II)		0.01		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	**-- R**	**-- R**
Endrin		0.01		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Endrin aldehyde				0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
gamma-Hexachlorocyclohexane (Lindane)		0.02		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Heptachlor		0.01		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Heptachlor epoxide		0.01		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Malathion		0.43		0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.01 U	0.01 U
Methoxychlor		0.1		0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Parathion		0.013		0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.01 U	0.01 U
Phorate		0.7		0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.01 U	0.01 U
Toxaphene		0.5		0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.005 U	0.005 U
Total Petroleum Hydrocarbons (mg/L)										
Oil and grease		5		**19.5**	**17.5**	**20**	**22.3**	**22**	12 U	14.6 U

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC10-123 MET 2/2/2009 N	SRDWSC 08SAC10-4567 MET 2/2/2009 N	SRDWSC 08SAC11-123 MET 2/2/2009 N	SRDWSC 08SAC11-456 MET 2/2/2009 N	SRDWSC 08SAC12-123 MET 2/2/2009 N	SRDWSC 08SAC13-123 MET 2/2/2009 N	SRDWSC 08SAC13-456 MET 2/2/2009 N
Conventional Parameters (mg/L)										
Ammonia				**0.6**	**0.57**	**0.76**	**0.47**	**0.28**	**0.21**	0.2 U
Biological oxygen demand				**2**	**2.2**	**2.2**	**2.8**	**2.6**	**2.6**	**2.5**
Chloride (total)		106[1]		**50.6**	**53.8**	**36.3**	**37.1**	**15.6**	**13.7**	**14**
Total dissolved solids		450[1]		**246**	**240**	**704**	**222**	**206**	**186**	**188**
Total suspended solids				**174 J**	**96 J**	**758 J**	**140 J**	**126 J**	**64 J**	**138 J**
Conventional Parameters (pct)										
Total organic carbon				**0.00011**	0.0001 U	**0.00021**	**0.00013**	**0.00012**	**0.00011**	**0.00012**
Conventional Parameters (ms/cm)										
Conductivity		0.700[1]		**0.384**	**0.402**	**0.322**	**0.336**	**0.278**	**0.27**	**0.26**
Conventional Parameters (su)										
pH				**7.6**	**7.8**	**7.8**	**7.8**	**7.8**	**7.8**	**7.9**
Metals (µg/L)										
Arsenic	10.3	10		**3.3 J**	**2.1 J**	**5.5**	**2.4 J**	**2.3 J**	**2.6 J**	**2.2 J**
Barium			100	**56.3**	**59.8**	**80.8**	**58**	**52.1**	**43.9**	**46.9**
Cadmium	18.7	5		4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	18.6	50		**2.5 J**	**1 J**	**6.1**	**1.6 J**	**1.6 J**	4 U	**3.1 J**
Copper	13.4	10		**2.8 J**	**1.2 J**	**5.9**	**2 J**	**1.5 J**	**1.3 J**	**3 J**
Lead	11	2.5		**0.6 J**	2 U	**1.4 J**	2 U	2 U	**1.1 J**	2 U
Mercury	0.865	0.05		**0.05 J**	**0.02 J**	**0.1 J**	**0.03 J**	**0.02 J**	**0.02 J**	**0.03 J**
Nickel	40.7	52		**3.4 J**	**2.4 J**	**7**	**3.1 J**	**2.9 J**	**2 J**	**4**
Selenium	4.1	5		**2.8 J**	**2.1 J**	**13**	**2.7 J**	**2.3 J**	**1.6 J**	**2.8 J**
Zinc	59.3	100		4 U	4 U	6.5 U	3.7 U	4 U	4 U	4.6 U
Volatile Organics (µg/L)										
Dimethoate		1		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aromatic Hydrocarbons (µg/L)										
Acenaphthene		1200		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Anthracene		9600		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Benzo(a)pyrene		0.0044		**0.008**	**0.004**	**0.008**	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(b)fluoranthene		0.0044		**0.005**	0.004 U	**0.006**	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(k)fluoranthene		0.0044		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Chrysene		0.0044		0.004 U	0.004 U	**0.006**	0.004 U	0.004 U	0.004 U	0.004 U
Dibenzo(a,h)anthracene		0.0044		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Fluoranthene		300		**0.009**	**0.004**	**0.01**	0.004 U	0.004 U	0.004 U	0.004 U
Fluorene		1300		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Indeno(1,2,3-c,d)pyrene		0.0044		**0.008**	**0.004**	**0.009**	0.004 U	0.004 U	0.004 U	0.004 U
Naphthalene		620		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Pyrene		960		**0.01**	**0.007**	**0.02**	0.004 U	0.004 U	0.004 U	0.004 U

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC10-123 MET 2/2/2009 N	SRDWSC 08SAC10-4567 MET 2/2/2009 N	SRDWSC 08SAC11-123 MET 2/2/2009 N	SRDWSC 08SAC11-456 MET 2/2/2009 N	SRDWSC 08SAC12-123 MET 2/2/2009 N	SRDWSC 08SAC13-123 MET 2/2/2009 N	SRDWSC 08SAC13-456 MET 2/2/2009 N
Semivolatile Organics (µg/L)										
Hexachlorocyclopentadiene		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
PCB Aroclors (µg/L)										
Aroclor 1016				0.003 UJ	0.003 UJ	0.002 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Aroclor 1221				0.003 UJ	0.003 UJ	0.002 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Aroclor 1232				0.003 UJ	0.003 UJ	0.002 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Aroclor 1242				0.003 UJ	0.003 UJ	0.002 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Aroclor 1248				0.003 UJ	0.003 UJ	0.002 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Aroclor 1254				0.003 UJ	0.003 UJ	0.002 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Aroclor 1260				0.003 UJ	0.003 UJ	0.002 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Total PCB Aroclors (U = 0)		0.00017		0.003 UJ	0.003 UJ	0.002 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Pesticides (µg/L)										
4,4'-DDD (p,p'-DDD)		0.05		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
4,4'-DDE (p,p'-DDE)		0.05		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	--	0.005 U
4,4'-DDT (p,p'-DDT)		0.01		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Aldrin		0.005		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
alpha-Hexachlorocyclohexane		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
alpha-Chlordane (cis-Chlordane)				-- R	-- R	-- R	-- R	-- R	-- R	-- R
beta-Hexachlorocyclohexane		0.005		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
beta-Chlordane (trans-Chlordane)				0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Chlorpyrifos		0.014		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Diazinon		0.05		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dieldrin		0.01		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Endosulfan sulfate		0.05		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Endosulfan-alpha (I)		0.02		0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Endosulfan-beta (II)		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Endrin		0.01		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Endrin aldehyde				0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
gamma-Hexachlorocyclohexane (Lindane)		0.02		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Heptachlor		0.01		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Heptachlor epoxide		0.01		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Malathion		0.43		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methoxychlor		0.1		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Parathion		0.013		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Phorate		0.7		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Toxaphene		0.5		0.005 U	0.005 U	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 U
Total Petroleum Hydrocarbons (mg/L)										
Oil and grease		5		7 U	**16.5**	13.5 U	7.4 U	**27**	**28.5**	**21**

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC14-123 MET 2/2/2009 N	SRDWSC 08SAC16/18-123 ME 2/2/2009 N	SRDWSC 08SAC19-12 MET 2/2/2009 N	SRDWSC 08SAC20-123 MET 2/2/2009 N	SRDWSC 08SAC21-123 MET 2/2/2009 N	SRDWSC 08SAC22-123 MET 2/2/2009 N	SRDWSC 08SAC23-123 MET 2/2/2009 N
Conventional Parameters (mg/L)										
Ammonia				**1.6**	**3.6**	**1**	**0.67**	**0.5**	0.2 U	0.2 U
Biological oxygen demand				**3.1**	**3.3**	**2.7**	**2.5**	**3.8**	**2.5**	**2.1**
Chloride (total)		106[1]		**14.6**	**18.9**	**17.9**	**18.5**	**19.3**	**20.7**	**24.1**
Total dissolved solids		450[1]		**292**	**674**	**294**	**272**	**224**	**220**	**251**
Total suspended solids				**1560 J**	**924 J**	**1790 J**	**111 J**	**54 J**	**10 J**	**8 J**
Conventional Parameters (pct)										
Total organic carbon				**0.00023**	**0.00034**	**0.00025**	**0.00012**	**0.00024**	0.0001 U	0.0001 U
Conventional Parameters (ms/cm)										
Conductivity		0.700[1]		**0.247**	**0.329**	**0.319**	**0.356**	**0.39**	**0.39**	**0.431**
Conventional Parameters (su)										
pH				**7.8**	**7.8**	**7.8**	**7.4**	**7.9**	**8**	**8**
Metals (µg/L)										
Arsenic	10.3	10		**6.9**	**12.9**	**6.1**	**3.5 J**	**3.1 J**	**4.2**	**5.6**
Barium			100	**174**	**178**	**120**	**88.1 J**	**79.4 J**	**67 J**	**24.6 J**
Cadmium	18.7	5		4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	18.6	50		**7.9**	**9.6**	**6.4**	**2.2 J**	**2.3 J**	**2.5 J**	**3 J**
Copper	13.4	10		**18.3**	**26.3**	**7.5**	**2.9 J**	**3.2 J**	**2.5 J**	**2.5 J**
Lead	11	2.5		**4.3**	**5.9**	**1.5 J**	2 U	2 U	2 U	2 U
Mercury	0.865	0.05		**0.2 J**	**0.1 J**	**0.2 J**	**0.05**	**0.05**	**0.03**	**0.02**
Nickel	40.7	52		**10.6**	**11.5**	**8.8**	**1.8 J**	**1.7 J**	**2.3 J**	**1.8 J**
Selenium	4.1	5		**15**	**13**	**12**	**2 J**	**1.3 J**	4 U	4 U
Zinc	59.3	100		14.9 U	14.4 U	7.6 U	3.2 UJ	**3 J**	5.1 UJ	3.8 UJ
Volatile Organics (µg/L)										
Dimethoate		1		0.01 U	0.01 U	0.01 U	**-- R**	**-- R**	**-- R**	**-- R**
Aromatic Hydrocarbons (µg/L)										
Acenaphthene		1200		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Anthracene		9600		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Benzo(a)pyrene		0.0044		0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Benzo(b)fluoranthene		0.0044		0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Benzo(k)fluoranthene		0.0044		0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Chrysene		0.0044		0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Dibenzo(a,h)anthracene		0.0044		0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Fluoranthene		300		0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Fluorene		1300		0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Indeno(1,2,3-c,d)pyrene		0.0044		0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Naphthalene		620		0.004 UJ	0.004 UJ	0.004 UJ	**0.002 J**	**0.002 J**	**0.006 J**	**0.003 J**
Pyrene		960		0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC14-123 MET 2/2/2009 N	SRDWSC 08SAC16/18-123 ME 2/2/2009 N	SRDWSC 08SAC19-12 MET 2/2/2009 N	SRDWSC 08SAC20-123 MET 2/2/2009 N	SRDWSC 08SAC21-123 MET 2/2/2009 N	SRDWSC 08SAC22-123 MET 2/2/2009 N	SRDWSC 08SAC23-123 MET 2/2/2009 N
Semivolatile Organics (µg/L)										
Hexachlorocyclopentadiene		0.01		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
PCB Aroclors (µg/L)										
Aroclor 1016				0.003 UJ	0.003 UJ	0.003 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1221				0.003 UJ	0.003 UJ	0.003 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1232				0.003 UJ	0.003 UJ	0.003 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1242				0.003 UJ	0.003 UJ	0.003 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1248				0.003 UJ	0.003 UJ	0.003 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1254				0.003 UJ	0.003 UJ	0.003 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1260				0.003 UJ	0.003 UJ	0.003 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Total PCB Aroclors (U = 0)		0.00017		0.003 UJ	0.003 UJ	0.003 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Pesticides (µg/L)										
4,4'-DDD (p,p'-DDD)		0.05		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
4,4'-DDE (p,p'-DDE)		0.05		0.005 U	0.005 U	**0.003 J**	**-- R**	**-- R**	**-- R**	**-- R**
4,4'-DDT (p,p'-DDT)		0.01		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
Aldrin		0.005		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
alpha-Hexachlorocyclohexane		0.01		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
alpha-Chlordane (cis-Chlordane)				**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
beta-Hexachlorocyclohexane		0.005		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
beta-Chlordane (trans-Chlordane)				0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
Chlorpyrifos		0.014		0.01 U	0.01 U	0.01 U	**-- R**	**-- R**	**-- R**	**-- R**
Diazinon		0.05		0.01 U	0.01 U	0.01 U	**-- R**	**-- R**	**-- R**	**-- R**
Dieldrin		0.01		0.005 UJ	0.005 UJ	0.005 UJ	**-- R**	**-- R**	**-- R**	**-- R**
Endosulfan sulfate		0.05		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
Endosulfan-alpha (I)		0.02		0.005 UJ	0.005 UJ	0.005 UJ	**-- R**	**-- R**	**-- R**	**-- R**
Endosulfan-beta (II)		0.01		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Endrin		0.01		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
Endrin aldehyde				0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
gamma-Hexachlorocyclohexane (Lindane)		0.02		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
Heptachlor		0.01		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
Heptachlor epoxide		0.01		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
Malathion		0.43		0.01 U	0.01 U	0.01 U	**-- R**	**-- R**	**-- R**	**-- R**
Methoxychlor		0.1		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
Parathion		0.013		0.01 U	0.01 U	0.01 U	**-- R**	**-- R**	**-- R**	**-- R**
Phorate		0.7		0.01 U	0.01 U	0.01 U	**-- R**	**-- R**	**-- R**	**-- R**
Toxaphene		0.5		0.005 U	0.005 U	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
Total Petroleum Hydrocarbons (mg/L)										
Oil and grease		5		**24**	**21**	**17.5**	23 U	27.5 U	13 U	20 U

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC24-123 MET 2/2/2009 N	SRDWSC 08SAC25-123 MET 2/2/2009 N	SRDWSC 08SAC26-123 MET 2/2/2009 N	SRDWSC 08SAC26-4567 MET 2/2/2009 N	SRDWSC 08SAC27-1234 MET 2/2/2009 N	SRDWSC 08SAC28-123 MET 2/2/2009 N	SRDWSC 08SAC29-1234 MET 2/2/2009 N
Conventional Parameters (mg/L)										
Ammonia				0.3	0.53	0.77	0.77	0.91	1.1	1.2
Biological oxygen demand				2.6	2.8	2.9	4.9	3.7	4.4	3.8
Chloride (total)		106[1]		30.6	34.1	40.1	37.8	42.5	51.5	53.8
Total dissolved solids		450[1]		236	254	274	274	306	310	320
Total suspended solids				26 J	40 J	96 J	111 J	77 J	85 J	101 J
Conventional Parameters (pct)										
Total organic carbon				0.00012	0.00014	0.00016	0.00015	0.00013	0.00021	0.0002
Conventional Parameters (ms/cm)										
Conductivity		0.700[1]		0.422	0.43	0.471	0.456	0.478	0.533	0.527
Conventional Parameters (su)										
pH				8	8	7.9	8	8	8	8
Metals (µg/L)										
Arsenic	10.3	10		3.7 J	5.7	5.5	4.8	5.5	6.5	7.5
Barium			100	59.6 J	68.3 J	87.7 J	88.7 J	96	80.7	80.8
Cadmium	18.7	5		4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	18.6	50		2.9 J	3.4 J	3.2 J	3.4 J	3.2 J	3.5 J	3.5 J
Copper	13.4	10		2.7 J	4.6 J	4.2 J	4.5 J	3.5 J	3.6 J	5.9
Lead	11	2.5		2 U	2 U	2 U	2 U	2 U	2 U	2 U
Mercury	0.865	0.05		0.06	0.07	0.05	0.06	0.06	0.04	0.09
Nickel	40.7	52		2.2 J	2.2 J	2.2 J	2.2 J	4.2	2.5 J	9.1
Selenium	4.1	5		4 U	1 J	1.5 J	4.4	4.5	1.4 J	1.9 J
Zinc	59.3	100		5.4 J	21.6 UJ	4.2 UJ	4.3 J	5.2	4.5	14.2
Volatile Organics (µg/L)										
Dimethoate		1		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Aromatic Hydrocarbons (µg/L)										
Acenaphthene		1200		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Anthracene		9600		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Benzo(a)pyrene		0.0044		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Benzo(b)fluoranthene		0.0044		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Benzo(k)fluoranthene		0.0044		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Chrysene		0.0044		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Dibenzo(a,h)anthracene		0.0044		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Fluoranthene		300		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Fluorene		1300		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Indeno(1,2,3-c,d)pyrene		0.0044		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Naphthalene		620		0.003 J	0.002 J	0.002 J	0.002 J	0.004 UJ	0.004 UJ	0.004 UJ
Pyrene		960		0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC24-123 MET 2/2/2009 N	SRDWSC 08SAC25-123 MET 2/2/2009 N	SRDWSC 08SAC26-123 MET 2/2/2009 N	SRDWSC 08SAC26-4567 MET 2/2/2009 N	SRDWSC 08SAC27-1234 MET 2/2/2009 N	SRDWSC 08SAC28-123 MET 2/2/2009 N	SRDWSC 08SAC29-1234 MET 2/2/2009 N
Semivolatile Organics (µg/L)										
Hexachlorocyclopentadiene		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
PCB Aroclors (µg/L)										
Aroclor 1016				0.002 UJ	0.002 UJ	0.002 U	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1221				0.002 UJ	0.002 UJ	0.002 U	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1232				0.002 UJ	0.002 UJ	0.002 U	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1242				0.002 UJ	0.002 UJ	0.002 U	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1248				0.002 UJ	0.002 UJ	0.002 U	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1254				0.002 UJ	0.002 UJ	0.002 U	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1260				0.002 UJ	0.002 UJ	0.002 U	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ
Total PCB Aroclors (U = 0)		0.00017		0.002 UJ	0.002 UJ	0.002 U	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ
Pesticides (µg/L)										
4,4'-DDD (p,p'-DDD)		0.05		-- R	-- R	-- R	-- R	-- R	-- R	-- R
4,4'-DDE (p,p'-DDE)		0.05		-- R	-- R	-- R	-- R	-- R	-- R	-- R
4,4'-DDT (p,p'-DDT)		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Aldrin		0.005		-- R	-- R	-- R	-- R	-- R	-- R	-- R
alpha-Hexachlorocyclohexane		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
alpha-Chlordane (cis-Chlordane)				-- R	-- R	-- R	-- R	-- R	-- R	-- R
beta-Hexachlorocyclohexane		0.005		-- R	-- R	-- R	-- R	-- R	-- R	-- R
beta-Chlordane (trans-Chlordane)				-- R	-- R	-- R	-- R	-- R	-- R	-- R
Chlorpyrifos		0.014		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Diazinon		0.05		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Dieldrin		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Endosulfan sulfate		0.05		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Endosulfan-alpha (I)		0.02		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Endosulfan-beta (II)		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Endrin		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Endrin aldehyde				-- R	-- R	-- R	-- R	-- R	-- R	-- R
gamma-Hexachlorocyclohexane (Lindane)		0.02		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Heptachlor		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Heptachlor epoxide		0.01		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Malathion		0.43		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Methoxychlor		0.1		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Parathion		0.013		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Phorate		0.7		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Toxaphene		0.5		-- R	-- R	-- R	-- R	-- R	-- R	-- R
Total Petroleum Hydrocarbons (mg/L)										
Oil and grease		5		**41**	**44.5**	29.5 U	22 U	18.5 U	10.5 U	21 U

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC30-1234-MET 2/12/2009 N	SRDWSC 08SAC31-12-MET 2/12/2009 N	SRDWSC 08SAC31-345-MET 2/12/2009 N	SRDWSC 08SAC32-12-MET 2/12/2009 N	SRDWSC 08SAC32-345-MET 2/12/2009 N	SRDWSC 08SAC33-1234-MET 2/12/2009 N	SRDWSC 08SAC34-12-MET 2/12/2009 N
Conventional Parameters (mg/L)										
Ammonia				**1.6**	**1.6**	**1.4**	**1.2**	**2.2**	**2**	**1**
Biological oxygen demand				**3.5**	**4.1**	**2.9**	**2.8**	**3**	**3.1**	**2.2**
Chloride (total)		106[1]		**65.3**	**68.1**	**113**	**82.1**	**82.2**	**88.5**	**101**
Total dissolved solids		450[1]		**414**	**396**	**520**	**429**	**452**	**455**	**480**
Total suspended solids				**67**	**81**	**35**	**57**	**63**	**53**	**43**
Conventional Parameters (pct)										
Total organic carbon				**0.00026**	**0.00039**	**0.00039**	**0.00041**	**0.00023**	**0.00048**	**0.0002**
Conventional Parameters (ms/cm)										
Conductivity		0.700[1]		**0.64**	**0.683**	**0.894**	**0.706**	**0.705**	**0.781**	**0.839**
Conventional Parameters (su)										
pH				**7.5**	**7.8**	**7.9**	**8.1**	**8**	**8.1**	**8**
Metals (µg/L)										
Arsenic	10.3	10		**5.7**	**6.3**	**7**	**6.3**	**5.2**	**6.4**	**6.4**
Barium			100	**100**	**93.3**	**53.3**	**121**	**111**	**94.8**	**112**
Cadmium	18.7	5		4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	18.6	50		**3.7 J**	**3.9 J**	**4.8**	**3.5 J**	**3.6 J**	**4.1**	**4.2**
Copper	13.4	10		**2.4 J**	**2.2 J**	**1.6 J**	**2.1 J**	**3.1 J**	**2.2 J**	**2.1 J**
Lead	11	2.5		2 U	2 U	2 U	2 U	2 U	2 U	2 U
Mercury	0.865	0.05		**0.04**	**0.08**	**0.03**	**0.03**	**0.04**	**0.05**	**0.03**
Nickel	40.7	52		**2.6 J**	**3 J**	**3.3 J**	**2.3 J**	**2.1 J**	**2.9 J**	**3 J**
Selenium	4.1	5		**1.8 J**	**2.1 J**	**1.4 J**	**1.9 J**	**1.9 J**	**2.1 J**	**1.5 J**
Zinc	59.3	100		**1 J**	4 UJ	**0.9 J**	**1.3 J**	**9.1 J**	**1.1 J**	**0.8 J**
Volatile Organics (µg/L)										
Dimethoate		1		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aromatic Hydrocarbons (µg/L)										
Acenaphthene		1200		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Anthracene		9600		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(a)pyrene		0.0044		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(b)fluoranthene		0.0044		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(k)fluoranthene		0.0044		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Chrysene		0.0044		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Dibenzo(a,h)anthracene		0.0044		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Fluoranthene		300		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Fluorene		1300		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Indeno(1,2,3-c,d)pyrene		0.0044		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Naphthalene		620		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	**0.11**
Pyrene		960		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC30-1234-MET 2/12/2009 N	SRDWSC 08SAC31-12-MET 2/12/2009 N	SRDWSC 08SAC31-345-MET 2/12/2009 N	SRDWSC 08SAC32-12-MET 2/12/2009 N	SRDWSC 08SAC32-345-MET 2/12/2009 N	SRDWSC 08SAC33-1234-MET 2/12/2009 N	SRDWSC 08SAC34-12-MET 2/12/2009 N
Semivolatile Organics (µg/L)										
Hexachlorocyclopentadiene		0.01		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
PCB Aroclors (µg/L)										
Aroclor 1016				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1221				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1232				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1242				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1248				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1254				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1260				0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Total PCB Aroclors (U = 0)		0.00017		0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Pesticides (µg/L)										
4,4'-DDD (p,p'-DDD)		0.05		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
4,4'-DDE (p,p'-DDE)		0.05		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
4,4'-DDT (p,p'-DDT)		0.01		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Aldrin		0.005		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
alpha-Hexachlorocyclohexane		0.01		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
alpha-Chlordane (cis-Chlordane)				**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
beta-Hexachlorocyclohexane		0.005		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
beta-Chlordane (trans-Chlordane)				0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Chlorpyrifos		0.014		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Diazinon		0.05		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dieldrin		0.01		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Endosulfan sulfate		0.05		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Endosulfan-alpha (I)		0.02		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Endosulfan-beta (II)		0.01		**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
Endrin		0.01		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Endrin aldehyde				0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
gamma-Hexachlorocyclohexane (Lindane)		0.02		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Heptachlor		0.01		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Heptachlor epoxide		0.01		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Malathion		0.43		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Methoxychlor		0.1		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Parathion		0.013		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Phorate		0.7		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Toxaphene		0.5		0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Total Petroleum Hydrocarbons (mg/L)										
Oil and grease		5		**9.5 J**	**45.5 J**	**9.5 J**	**11.5 J**	**12.5 J**	**9 J**	**23.5 J**

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC34-345-MET 2/12/2009 N	SRDWSC 08SAC35-12-MET 2/12/2009 N	SRDWSC 08SAC35-345-MET 2/12/2009 N
Conventional Parameters (mg/L)						
Ammonia				**1.8**	**2.9**	**3.1**
Biological oxygen demand				**3**	**4.3**	**4.3**
Chloride (total)		106[1]		**99**	**113**	**129**
Total dissolved solids		450[1]		**479**	**531**	**575**
Total suspended solids				**45**	**20**	**20**
Conventional Parameters (pct)						
Total organic carbon				**0.00041**	**0.00045**	**0.00046**
Conventional Parameters (ms/cm)						
Conductivity		0.700[1]		**0.833**	**0.946**	**1.03**
Conventional Parameters (su)						
pH				**8.1**	**8.1**	**8**
Metals (µg/L)						
Arsenic	10.3	10		**6.9**	**6.1**	**6.9**
Barium			100	**102**	**124**	**130**
Cadmium	18.7	5		4 U	4 U	4 U
Chromium	18.6	50		**3.9 J**	**4.5**	**4.7**
Copper	13.4	10		**2 J**	**1.7 J**	**1.3 J**
Lead	11	2.5		2 U	2 U	2 U
Mercury	0.865	0.05		**0.02**	**0.02**	**0.02**
Nickel	40.7	52		**2.8 J**	**4.1**	**3.6 J**
Selenium	4.1	5		**2.1 J**	**2.1 J**	**2 J**
Zinc	59.3	100		**1.4 J**	**1.9 J**	**0.9 J**
Volatile Organics (µg/L)						
Dimethoate		1		0.01 U	0.01 U	0.01 U
Aromatic Hydrocarbons (µg/L)						
Acenaphthene		1200		0.004 U	0.004 U	0.004 U
Anthracene		9600		0.004 U	0.004 U	0.004 U
Benzo(a)pyrene		0.0044		0.004 U	0.004 U	0.004 U
Benzo(b)fluoranthene		0.0044		0.004 U	0.004 U	0.004 U
Benzo(k)fluoranthene		0.0044		0.004 U	0.004 U	0.004 U
Chrysene		0.0044		0.004 U	0.004 U	0.004 U
Dibenzo(a,h)anthracene		0.0044		0.004 U	0.004 U	0.004 U
Fluoranthene		300		0.004 U	0.004 U	0.004 U
Fluorene		1300		0.004 U	0.004 U	0.004 U
Indeno(1,2,3-c,d)pyrene		0.0044		0.004 U	0.004 U	0.004 U
Naphthalene		620		0.004 U	0.004 U	0.004 U
Pyrene		960		0.004 U	0.004 U	0.004 U

Table 12
Modified Elutriate Test Chemistry Results

Task Sample ID Sample Date Sample Type	MET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	Central Valley Basin Plan Effluent Discharge Limit	SRDWSC 08SAC34-345-MET 2/12/2009 N	SRDWSC 08SAC35-12-MET 2/12/2009 N	SRDWSC 08SAC35-345-MET 2/12/2009 N
Semivolatile Organics (µg/L)						
Hexachlorocyclopentadiene		0.01		**-- R**	**-- R**	**-- R**
PCB Aroclors (µg/L)						
Aroclor 1016				0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1221				0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1232				0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1242				0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1248				0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1254				0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1260				0.002 UJ	0.002 UJ	0.002 UJ
Total PCB Aroclors (U = 0)		0.00017		0.002 UJ	0.002 UJ	0.002 UJ
Pesticides (µg/L)						
4,4'-DDD (p,p'-DDD)		0.05		0.005 U	0.005 U	0.005 U
4,4'-DDE (p,p'-DDE)		0.05		0.005 U	0.005 U	0.005 U
4,4'-DDT (p,p'-DDT)		0.01		0.005 U	0.005 U	0.005 U
Aldrin		0.005		**-- R**	**-- R**	**-- R**
alpha-Hexachlorocyclohexane		0.01		0.005 U	0.005 U	0.005 U
alpha-Chlordane (cis-Chlordane)				**-- R**	**-- R**	**-- R**
beta-Hexachlorocyclohexane		0.005		0.005 U	0.005 U	0.005 U
beta-Chlordane (trans-Chlordane)				0.005 U	0.005 U	0.005 U
Chlorpyrifos		0.014		0.01 U	0.01 U	0.01 U
Diazinon		0.05		0.01 U	0.01 U	0.01 U
Dieldrin		0.01		0.005 U	0.005 U	0.005 U
Endosulfan sulfate		0.05		0.005 U	0.005 U	0.005 U
Endosulfan-alpha (I)		0.02		0.005 U	0.005 U	0.005 U
Endosulfan-beta (II)		0.01		**-- R**	**-- R**	**-- R**
Endrin		0.01		0.005 U	0.005 U	0.005 U
Endrin aldehyde				0.005 U	0.005 U	0.005 U
gamma-Hexachlorocyclohexane (Lindane)		0.02		0.005 U	0.005 U	0.005 U
Heptachlor		0.01		0.005 U	0.005 U	0.005 U
Heptachlor epoxide		0.01		0.005 U	0.005 U	0.005 U
Malathion		0.43		0.01 U	0.01 U	0.01 U
Methoxychlor		0.1		0.005 U	0.005 U	0.005 U
Parathion		0.013		0.01 U	0.01 U	0.01 U
Phorate		0.7		0.01 U	0.01 U	0.01 U
Toxaphene		0.5		0.005 U	0.005 U	0.005 U
Total Petroleum Hydrocarbons (mg/L)						
Oil and grease		5		**13 J**	**31.5 J**	**23 J**

Table 12
Modified Elutriate Test Chemistry Results

Notes:

Detected concentration is greater than MET Max Value Previous Studies (2001 - 2007) screening level

Detected concentration is greater than Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001) screening level

Detected concentration is greater than Other Corps Criteria screening level

Non-detected concentration is above one or more identified screening levels

Bold = Detected result

J = Estimated value

U = Compound analyzed, but not detected above detection limit

UJ = Compound analyzed, but not detected above estimated detection limit

R = Rejected

Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest reporting limit value is reported as the sum.

Data Validation Applied

1 - Sample results are screened against these values or against background levels of the site water, whichever is higher.

Table 13
Site Water Chemistry Results

Task	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC
Sample ID	08SAC1	08SAC10	08SAC11	08SAC12	08SAC13	08SAC14	08SAC16	08SAC19	08SAC2	08SAC20	08SAC21	08SAC22
Sample Date	1/19/2009	1/27/2009	1/27/2009	1/27/2009	1/27/2009	1/27/2009	1/27/2009	1/27/2009	1/19/2009	2/2/2009	2/2/2009	2/2/2009
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
Conventional Parameters (mg/L)												
Ammonia	**0.33**	**0.46**	**0.44**	**0.4**	**0.46**	**0.41**	**0.29**	**0.27**	0.2 U	0.2 U	0.2 U	**0.26**
Biological oxygen demand	2 U	**4.8**	**4.9**	**4.5**	**4.4**	**4.4**	**4.8**	**4.4**	2 U	**2.1**	**2.2**	2 U
Chloride (total)	**2920**	**45.7 J**	**40.1 J**	**16 J**	**31.1 J**	**18.6 J**	**20.2 J**	**23.1 J**	**2480**	**17.2**	**21**	**22.3**
Total dissolved solids	**5560 J**	**226 J**	**198 J**	**172 J**	**177 J**	**181 J**	**211 J**	**204 J**	**4810 J**	**171**	**189**	**210**
Conventional Parameters (pct)												
Total organic carbon	**0.00034**	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	**0.00037**	**0.00014**	0.0001 U	**0.00014**
Conventional Parameters (ms/cm)												
Conductivity	**9.26**	**0.4 J**	**0.341 J**	**0.268 J**	**7.9 J**	**0.289 J**	**8 J**	**0.338 J**	**8.03**	**0.276**	**0.309**	**0.332**
Conventional Parameters (su)												
pH	**7.65 J**	**7.8 J**	**8 J**	**8 J**	**7.9 J**	**7.9 J**	**7.9 J**	**8 J**	**7.69 J**	**7.4**	**7.7**	**7.7**
Metals (µg/L)												
Arsenic	**2.6 J**	**2.6 J**	**2.7 J**	**2.7 J**	**2.6 J**	**2.7 J**	**3.2 J**	**2.9 J**	**2.9 J**	**2.2 J**	**2.7 J**	**2.5 J**
Barium	**38.5**	**28.8**	**28.3**	**29.5**	**28.4**	**30.7**	**36.7**	**35.6**	**38.3**	**31.8 J**	**34 J**	**35.1 J**
Cadmium	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	**2.9 J**	4 U	4 U	4 U	4 U	4 U	4 U	4 U	**2.6 J**	**1.2 J**	**2.4 J**	**2.3 J**
Copper	**11.7**	**3.6 J**	**1 J**	4 U	4 U	**1.4 J**	4 U	**1.2 J**	**10.6**	**4.2 J**	**2.5 J**	**5.3 J**
Lead	2 U	2 U	**0.6 J**	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Mercury	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 U	0.02 U	0.02 U
Nickel	**3.4 J**	**1.6 J**	**1.3 J**	**1.4 J**	**1.3 J**	**1.5 J**	**1.6 J**	**1.8 J**	**4.3**	**2 J**	**2 J**	**3 J**
Selenium	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Zinc	**3.8 J**	4.8 U	4 U	4 U	4 U	4 U	4 U	4 U	**2.6 J**	3 UJ	3.6 UJ	5.4 UJ
Organometallic Compounds (µg/L)												
Methyl mercury	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Volatile Organics (µg/L)												
Dimethoate	0.012 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.012 U	0.01 U	0.01 U	0.01 U
Aromatic Hydrocarbons (µg/L)												
Acenaphthene	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Anthracene	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ
Benzo(a)pyrene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(b)fluoranthene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(k)fluoranthene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Chrysene	**0.004 J**	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U
Dibenzo(a,h)anthracene	**0.005**	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	**0.007**	**0.002 J**	**0.002 J**
Fluoranthene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Fluorene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Indeno(1,2,3-c,d)pyrene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	**0.006**	**0.003 J**	**0.003 J**
Naphthalene	0.004 UJ	0.004 U	**0.004**	**0.006**	0.004 U	**0.007**	**0.004**	**0.004**	0.004 UJ	**0.003 J**	**0.002 J**	**0.003 J**
Pyrene	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U

Table 13
Site Water Chemistry Results

Task	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC
Sample ID	08SAC1	08SAC10	08SAC11	08SAC12	08SAC13	08SAC14	08SAC16	08SAC19	08SAC2	08SAC20	08SAC21	08SAC22
Sample Date	1/19/2009	1/27/2009	1/27/2009	1/27/2009	1/27/2009	1/27/2009	1/27/2009	1/27/2009	1/19/2009	2/2/2009	2/2/2009	2/2/2009
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
Semivolatile Organics (µg/L)												
Hexachlorocyclopentadiene	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	0.005 UJ	0.005 U
PCB Aroclors (µg/L)												
Aroclor 1016	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.004 UJ	0.002 U	0.002 UJ	0.002 UJ
Aroclor 1221	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.004 UJ	0.002 U	0.002 UJ	0.002 UJ
Aroclor 1232	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.004 UJ	0.002 U	0.002 UJ	0.002 UJ
Aroclor 1242	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.004 UJ	0.002 U	0.002 UJ	0.002 UJ
Aroclor 1248	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.004 UJ	0.002 U	0.002 UJ	0.002 UJ
Aroclor 1254	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.004 UJ	0.002 U	0.002 UJ	0.002 UJ
Aroclor 1260	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.004 UJ	0.002 U	0.002 UJ	0.002 UJ
Total PCB Aroclors (U = 0)	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.004 UJ	0.002 U	0.002 UJ	0.002 UJ
Pesticides (µg/L)												
4,4'-DDD (p,p'-DDD)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
4,4'-DDE (p,p'-DDE)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
4,4'-DDT (p,p'-DDT)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
Aldrin	0.005 UJ	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
alpha-Hexachlorocyclohexane	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 UJ
alpha-Chlordane (cis-Chlordane)	0.005 UJ	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	0.005 UJ	0.025 UJ	0.005 UJ	0.005 UJ
beta-Hexachlorocyclohexane	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
beta-Chlordane (trans-Chlordane)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
Chlorpyrifos	0.012 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.012 U	0.01 U	0.01 U	0.01 U
Diazinon	0.012 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	**0.003 J**	0.005 U	0.012 U	0.01 U	0.01 U	0.01 U
Dieldrin	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 UJ
Endosulfan sulfate	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
Endosulfan-alpha (I)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
Endosulfan-beta (II)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
Endrin	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
Endrin aldehyde	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
gamma-Hexachlorocyclohexane (Lindane)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
Heptachlor	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
Heptachlor epoxide	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
Malathion	0.012 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.012 U	0.01 U	0.01 U	0.01 U
Methoxychlor	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.025 UJ	0.005 UJ	0.005 U
Parathion	0.012 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.012 U	0.01 U	0.01 U	0.01 U
Phorate	0.012 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.012 U	0.01 U	0.01 U	0.01 U
Toxaphene	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.025 UJ	0.1 UJ	0.1 U
Total Petroleum Hydrocarbons (mg/L)												
Oil and grease	**21.5**	**15.5**	**11.3**	**17.8**	**17.5**	**12**	**11.4**	**15.8**	**26.8**	12.3 U	**20**	3.5 U

Table 13
Site Water Chemistry Results

Task	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC
Sample ID	08SAC23	08SAC24	08SAC25	08SAC26	08SAC27	08SAC28	08SAC29	08SAC3	08SAC30	08SAC31	08SAC32	08SAC33
Sample Date	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009	1/19/2009	2/10/2009	2/10/2009	2/10/2009	2/10/2009
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
Conventional Parameters (mg/L)												
Ammonia	**0.35**	**0.26**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.26**	0.2 U	0.2 U	0.2 U	0.2 U
Biological oxygen demand	2 U	**2.4**	**2.1**	2 U	**2.5**	2 U	2 U	**4.3**	**2.5**	**2.2**	**2.6**	**2.4**
Chloride (total)	**46**	**32.5**	**37.3**	**44.7**	**48.1**	**53.7**	**60.4**	**1800**	**63.1**	**71.1**	**77.4**	**88.8**
Total dissolved solids	**210**	**222**	**250**	**268**	**274**	**293**	**307**	**3680 J**	**391 J**	**406 J**	**438 J**	**470 J**
Conventional Parameters (pct)												
Total organic carbon	**0.00013**	**0.00013**	0.0001 U	0.0001 U	**0.00018**	**0.00012**	0.0001 U	**0.00031**	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Conventional Parameters (ms/cm)												
Conductivity	**0.366**	**0.379**	**0.399**	**0.426**	**0.449**	**0.483**	**0.505**	**6.56**	**0.644**	**0.676**	**0.722**	**0.78**
Conventional Parameters (su)												
pH	**7.3**	**7.7**	**7.7**	**7.8**	**7.9**	**7.9**	**8**	**7.76 J**	**7.5 J**	**7.8 J**	**8 J**	**8.1 J**
Metals (µg/L)												
Arsenic	**2.6 J**	**2.6 J**	**2.8 J**	**3.3 J**	**3.4 J**	**3 J**	**3.6 J**	**2.9 J**	**5**	**5**	**5.2**	**5.7**
Barium	**36.5 J**	**37.8 J**	**39.3 J**	**40.4 J**	**41.8**	**44.1**	**44.6**	**37.4**	**51.9**	**54.7**	**55.6**	**57.3**
Cadmium	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	**2.8 J**	**2.6 J**	**3.2 J**	**3.3 J**	**3.7 J**	**3.6 J**	**3.9 J**	**2 J**	**3.1 J**	**3.6 J**	**4.1**	**4.3**
Copper	**2.7 J**	**2.8 J**	**3.9 J**	**31.7 J**	**2.9 J**	**25.7**	**3.7 J**	**6.6**	**2.8 J**	**2.2 J**	**2.2 J**	**2.6 J**
Lead	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Mercury	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	**0.02**	**0.02**	0.02 U	0.02 U
Nickel	**2 J**	**2 J**	**2 J**	**2.4 J**	**1.9 J**	**2 J**	**2.2 J**	**2.8 J**	**2.2 J**	**2 J**	**2.3 J**	**2.4 J**
Selenium	4 U	4 U	4 U	4 U	4 U	**1 J**	4 U	4 U	**1.3 J**	**1.3 J**	**1.2 J**	**1 J**
Zinc	4 UJ	5.1 UJ	**7.9 J**	9.1 UJ	4 U	5.8 U	4.3 U	**2.5 J**	**1.3 J**	**1.7 J**	4 UJ	**1.6 J**
Organometallic Compounds (µg/L)												
Methyl mercury	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Volatile Organics (µg/L)												
Dimethoate	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U
Aromatic Hydrocarbons (µg/L)												
Acenaphthene	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U
Anthracene	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(a)pyrene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(b)fluoranthene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Benzo(k)fluoranthene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Chrysene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 U	0.004 U
Dibenzo(a,h)anthracene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Fluoranthene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Fluorene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Indeno(1,2,3-c,d)pyrene	**0.002 J**	**0.002 J**	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Naphthalene	**0.008 J**	**0.006 J**	**0.005 J**	**0.006 J**	**0.007 J**	**0.007 J**	**0.008 J**	0.004 UJ	**0.004**	**0.004**	**0.004**	0.004 U
Pyrene	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U

Table 13
Site Water Chemistry Results

Task	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC
Sample ID	08SAC23	08SAC24	08SAC25	08SAC26	08SAC27	08SAC28	08SAC29	08SAC3	08SAC30	08SAC31	08SAC32	08SAC33
Sample Date	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009	2/2/2009	1/19/2009	2/10/2009	2/10/2009	2/10/2009	2/10/2009
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
Semivolatile Organics (µg/L)												
Hexachlorocyclopentadiene	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
PCB Aroclors (µg/L)												
Aroclor 1016	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1221	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1232	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1242	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1248	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1254	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Aroclor 1260	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Total PCB Aroclors (U = 0)	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.004 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Pesticides (µg/L)												
4,4'-DDD (p,p'-DDD)	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
4,4'-DDE (p,p'-DDE)	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
4,4'-DDT (p,p'-DDT)	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
Aldrin	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
alpha-Hexachlorocyclohexane	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
alpha-Chlordane (cis-Chlordane)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
beta-Hexachlorocyclohexane	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
beta-Chlordane (trans-Chlordane)	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
Chlorpyrifos	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U
Diazinon	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U
Dieldrin	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
Endosulfan sulfate	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
Endosulfan-alpha (I)	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
Endosulfan-beta (II)	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	**-- R**	**-- R**	**-- R**	**-- R**
Endrin	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
Endrin aldehyde	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
gamma-Hexachlorocyclohexane (Lindane)	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
Heptachlor	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
Heptachlor epoxide	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
Malathion	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U
Methoxychlor	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U
Parathion	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U
Phorate	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.01 U	0.01 U	0.01 U
Toxaphene	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U
Total Petroleum Hydrocarbons (mg/L)												
Oil and grease	**21.5**	**16.8**	**26.5**	**18.8**	**19.5**	**19.3**	13.3 U	**24**	**52.5**	**46**	**27**	**66**

Table 13
Site Water Chemistry Results

Task	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC
Sample ID	08SAC34	08SAC35	08SAC4	08SAC5	08SAC6	08SAC7	08SAC8	08SAC9
Sample Date	2/10/2009	2/10/2009	1/19/2009	1/19/2009	1/19/2009	1/19/2009	1/19/2009	1/27/2009
Sample Type	N	N	N	N	N	N	N	N
Conventional Parameters (mg/L)								
Ammonia	0.2 U	0.2 U	**0.23**	**0.31**	**0.28**	**0.3**	**0.3**	**0.38**
Biological oxygen demand	**2.4**	2 U	**2.1**	2 U	**2.1**	**2.3**	**2.4**	**4.4**
Chloride (total)	**97.2**	**116**	**1970**	**1010**	**790**	**465**	**279**	**62.4 J**
Total dissolved solids	**513 J**	**564 J**	**4090 J**	**2220 J**	**1860 J**	**1190 J**	**771 J**	**273 J**
Conventional Parameters (pct)								
Total organic carbon	0.0001 U	**0.00011**	**0.00031**	**0.00028**	**0.00021**	**0.00018**	**0.0002**	0.0001 U
Conventional Parameters (ms/cm)								
Conductivity	**0.813**	**0.899**	**7.02**	**4.09**	**3.36**	**2.14**	**1.41**	**0.491 J**
Conventional Parameters (su)								
pH	**8.1 J**	**8.1 J**	**7.77 J**	**7.82 J**	**7.81 J**	**7.82 J**	**7.78 J**	**7.4 J**
Metals (µg/L)								
Arsenic	**5.5**	**5.6**	**2.7 J**	**2.9 J**	**3 J**	**3 J**	**2.8 J**	**2.8 J**
Barium	**60**	**61.1**	**38.2**	**35.2**	**34.5**	**32.5**	**30.2**	**27.9**
Cadmium	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	**5.5**	**5.9**	**2.3 J**	**1.2 J**	**1.2 J**	4 U	4 U	4 U
Copper	**2.2 J**	**2.5 J**	**7.4**	**3.1 J**	**2.7 J**	**1.9 J**	**1.8 J**	**1 J**
Lead	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Mercury	0.02 U	0.02 U	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ
Nickel	**2.1 J**	**2.4 J**	**3.2 J**	**2.2 J**	**2.1 J**	**2 J**	**1.7 J**	**1.5 J**
Selenium	**1.2 J**	**1.3 J**	4 U	4 U	4 U	4 U	4 U	4 U
Zinc	**2.4 J**	**1.5 J**	**3.7 J**	**3.3 J**	**2.5 J**	**2.9 J**	**12**	4 U
Organometallic Compounds (µg/L)								
Methyl mercury	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Volatile Organics (µg/L)								
Dimethoate	0.01 U	0.01 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Aromatic Hydrocarbons (µg/L)								
Acenaphthene	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 U
Anthracene	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 U
Benzo(a)pyrene	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 UJ	0.004 U
Benzo(b)fluoranthene	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 UJ	0.004 U
Benzo(k)fluoranthene	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 UJ	0.004 U
Chrysene	0.004 U	0.004 U	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 U
Dibenzo(a,h)anthracene	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 UJ	0.004 U
Fluoranthene	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 UJ	0.004 U
Fluorene	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 UJ	0.004 U
Indeno(1,2,3-c,d)pyrene	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 UJ	0.004 U
Naphthalene	0.004 U	**0.004**	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	**0.004**
Pyrene	0.004 U	0.004 U	0.004 U	0.004 UJ	0.004 U	0.004 U	0.004 UJ	0.004 U

Table 13
Site Water Chemistry Results

Task	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC	SRDWSC
Sample ID	08SAC34	08SAC35	08SAC4	08SAC5	08SAC6	08SAC7	08SAC8	08SAC9
Sample Date	2/10/2009	2/10/2009	1/19/2009	1/19/2009	1/19/2009	1/19/2009	1/19/2009	1/27/2009
Sample Type	N	N	N	N	N	N	N	N
Semivolatile Organics (µg/L)								
Hexachlorocyclopentadiene	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**	**-- R**
PCB Aroclors (µg/L)								
Aroclor 1016	0.002 UJ	0.002 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.002 UJ
Aroclor 1221	0.002 UJ	0.002 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.002 UJ
Aroclor 1232	0.002 UJ	0.002 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.002 UJ
Aroclor 1242	0.002 UJ	0.002 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.002 UJ
Aroclor 1248	0.002 UJ	0.002 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.002 UJ
Aroclor 1254	0.002 UJ	0.002 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.002 UJ
Aroclor 1260	0.002 UJ	0.002 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.002 UJ
Total PCB Aroclors (U = 0)	0.002 UJ	0.002 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.004 UJ	0.002 UJ
Pesticides (µg/L)								
4,4'-DDD (p,p'-DDD)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
4,4'-DDE (p,p'-DDE)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
4,4'-DDT (p,p'-DDT)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
Aldrin	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	**-- R**
alpha-Hexachlorocyclohexane	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
alpha-Chlordane (cis-Chlordane)	**-- R**	**-- R**	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	**-- R**
beta-Hexachlorocyclohexane	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
beta-Chlordane (trans-Chlordane)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
Chlorpyrifos	0.01 U	0.01 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Diazinon	0.01 U	0.01 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Dieldrin	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	**-- R**
Endosulfan sulfate	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
Endosulfan-alpha (I)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
Endosulfan-beta (II)	**-- R**	**-- R**	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
Endrin	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
Endrin aldehyde	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
gamma-Hexachlorocyclohexane (Lindane)	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
Heptachlor	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
Heptachlor epoxide	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	0.005 UJ
Malathion	0.01 U	0.01 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Methoxychlor	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 U	0.005 U	**-- R**
Parathion	0.01 U	0.01 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Phorate	0.01 U	0.01 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Toxaphene	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ
Total Petroleum Hydrocarbons (mg/L)								
Oil and grease	21.5 U	13 U	**18.5**	**17.8**	**22.3**	**24.5**	**26.3**	**10.5**

Table 13
Site Water Chemistry Results

Notes:

Bold = Detected result

J = Estimated value

U = Compound analyzed, but not detected above detection limit

UJ = Compound analyzed, but not detected above estimated detection limit

R = Rejected

Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest reporting limit value is reported as the sum.

Data Validation Applied

Table 14

Deionized Water Waste Extraction Test Chemistry Results

Task Sample ID Sample Date Sample Type	DIWET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	SRDWSC 08SAC1-12 DIWET 1/25/2009 N	SRDWSC 08SAC2-12 DIWET 1/25/2009 N	SRDWSC 08SAC3-1 DIWET 1/25/2009 N	SRDWSC 08SAC4-12 DIWET 1/25/2009 N	SRDWSC 08SAC5-123 DIWET 1/25/2009 N	SRDWSC 08SAC5-4567 DIWET 1/25/2009 N	SRDWSC 08SAC6-1234 DIWET 1/25/2009 N	SRDWSC 08SAC6-5678 DIWET 1/25/2009 N	SRDWSC 08SAC7-123 DIWET 1/25/2009 N
Metals (µg/L)											
Arsenic	42.3	10	**5.5**	**4.1**	**6.7**	**9.8**	**7.3**	**5.1**	**9.2**	**4.5**	**10.4**
Barium			**23.4**	**29.1**	**16.7**	**30.8**	**28.3**	**27.6**	**29.6**	**17.4**	**28.1**
Cadmium	0.9	5	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	193	50	**7.8**	**7.7**	**5.2**	**7.9**	**7**	**6.1**	**11**	**3.6 J**	**7.8**
Copper	195	10	**22.4**	**14**	**7.2**	**33.3**	**45.7**	**20.9**	**34.6**	**13.3**	**46.6**
Lead	148	2.5	**1.5 J**	**2**	**0.8 J**	**3.8**	**4.3**	**2.8**	**5.4**	**1.3 J**	**5**
Mercury	15	0.05	**0.02 J**	**0.05 J**	**0.02 J**	**0.04 J**	**0.03 J**	**0.03 J**	**0.05 J**	**0.02 J**	**0.03 J**
Nickel	206	52	**11.8**	**7.3**	**9.2**	**6.1**	**5.9**	**6.7**	**9.4**	**3.3 J**	**6.4**
Selenium	3.6	5	--	--	--	--	--	--	--	--	--
Zinc	251	100	**6.1**	**11.7**	**6**	**10.1**	**9.7**	**9.9**	**16.8**	**5.2**	**9.4**

Table 14
Deionized Water Waste Extraction Test Chemistry Results

Task Sample ID Sample Date Sample Type	DIWET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	SRDWSC 08SAC7-4567 DIWET 1/25/2009 N	SRDWSC 08SAC8-123 DIWET 1/25/2009 N	SRDWSC 08SAC8-4567 DIWET 1/25/2009 N	SRDWSC 08SAC9-123 DIWET 1/25/2009 N	SRDWSC 08SAC9-4567 DIWET 1/25/2009 N	SRDWSC 08SAC10-123 DIWET 2/2/2009 N	SRDWSC 08SAC10-4567 DIWET 2/2/2009 N	SRDWSC 08SAC11-123 DIWET 2/2/2009 N
Metals (µg/L)										
Arsenic	42.3	10	**6.3**	**10.3**	**4.1**	**3.8 J**	**3.7 J**	**3.7 J**	**1.6 J**	**2.5 J**
Barium			**33.2**	**33**	**28.1**	**12.4**	**10.4**	**20.7**	**8.1**	**12.7**
Cadmium	0.9	5	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	193	50	**2.5 J**	**5.6**	**5.1**	**3.3 J**	**2.6 J**	**3.7 J**	**1.9 J**	**4.8**
Copper	195	10	**18.9**	**40.9**	**19.3**	**9.7**	**4.7**	**15**	**1.7 J**	**7.3**
Lead	148	2.5	**1.4 J**	**4.6**	**2.1**	**1.3 J**	**0.7 J**	**2.1**	**0.5 J**	**0.8 J**
Mercury	15	0.05	**0.02 J**	**0.03 J**	**0.03 J**	**0.02 J**	**0.02 J**	0.02 UJ	0.02 UJ	0.02 UJ
Nickel	206	52	**3.9 J**	**5.7**	**5.2**	**3.1 J**	**2.9 J**	**3.1 J**	**1.7 J**	**4.3**
Selenium	3.6	5	--	--	--	--	--	--	--	--
Zinc	251	100	**14**	**13.2**	**6.6**	**6.4**	**4.9**	5.6 U	2 U	4.4 U

Table 14

Deionized Water Waste Extraction Test Chemistry Results

Task Sample ID Sample Date Sample Type	DIWET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	SRDWSC 08SAC11-456 DIWET 2/2/2009 N	SRDWSC 08SAC12-123 DIWET 2/2/2009 N	SRDWSC 08SAC13-123 DIWET 2/2/2009 N	SRDWSC 08SAC13-456 DIWET 2/2/2009 N	SRDWSC 08SAC14-123 DIWET 2/2/2009 N	SRDWSC 08SAC16/18-123 DIWET 2/2/2009 N	SRDWSC 08SAC19-12 DIWET 2/2/2009 N	SRDWSC 08SAC20-12 DIWET 2/2/2009 N
Metals (µg/L)										
Arsenic	42.3	10	**1.4 J**	**1.8 J**	**2.2 J**	**1.8 J**	**3.3 J**	**3.9 J**	**4.1**	**8.3**
Barium			**8.6**	**10.3**	**7.5**	**7.4**	**51.5**	**36.6**	**44.6**	**28.6**
Cadmium	0.9	5	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	193	50	**2.2 J**	**2.6 J**	**1.8 J**	**2.6 J**	**4.4**	**4.7**	**1 J**	**1.7 J**
Copper	195	10	**2.5 J**	**2.2 J**	**1.6 J**	**2.9 J**	**20.8**	**42**	**6.1**	**7.6**
Lead	148	2.5	2 U	2 U	2 U	2 U	**2.4**	**2.5**	2 U	2 U
Mercury	15	0.05	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	**0.02 J**	**0.03 J**	0.02 UJ	**0.02 J**
Nickel	206	52	**1.8 J**	**2.4 J**	**1.5 J**	**2.2 J**	**5.1**	**6.3**	**2.3 J**	**3.1 J**
Selenium	3.6	5	--	--	--	--	--	--	--	--
Zinc	251	100	4 U	4 U	2 U	3.8 U	4.8 U	3.5 U	4 U	4 U

Table 14
Deionized Water Waste Extraction Test Chemistry Results

Task Sample ID Sample Date Sample Type	DIWET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	SRDWSC 08SAC21-12 DIWET 2/2/2009 N	SRDWSC 08SAC22-1 DIWET 2/2/2009 N	SRDWSC 08SAC23-1 DIWET 2/2/2009 N	SRDWSC 08SAC24-1 DIWET 2/2/2009 N	SRDWSC 08SAC25-12 DIWET 2/2/2009 N	SRDWSC 08SAC26-123 DIWET 2/2/2009 N	SRDWSC 08SAC26-4567 DIWET 2/2/2009 N	SRDWSC 08SAC27-1234 DIWET 2/9/2009 N
Metals (µg/L)										
Arsenic	42.3	10	**11**	**11.5**	**15.5**	**11.9**	**8.8**	**8**	**6**	**5.7**
Barium			**28.1**	**22.1**	**14.7**	**20.5**	**29.6**	**36**	**34.6**	**25.4**
Cadmium	0.9	5	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	193	50	**4**	**2.9 J**	**2 J**	**3.1 J**	**1.5 J**	**3.1 J**	**1.7 J**	**1.8 J**
Copper	195	10	**9.2**	**1.5 J**	4 U	**5.5**	**1.6 J**	**6.7**	**1.6 J**	**5.3**
Lead	148	2.5	**0.5 J**	2 U	2 U	2 U	2 U	2 U	2 U	**0.7 J**
Mercury	15	0.05	**0.02 J**	0.02 UJ	0.02 UJ	**0.02 J**	0.02 UJ	0.02 UJ	0.02 UJ	0.02 U
Nickel	206	52	**5.3**	**3 J**	**2.3 J**	**4.3**	**2.5 J**	**4.9**	**2.8 J**	**2.1 J**
Selenium	3.6	5	--	--	--	--	--	--	--	--
Zinc	251	100	3.6 U	4 U	4 U	2 U	4 U	4 U	4 U	**8.3**

Table 14

Deionized Water Waste Extraction Test Chemistry Results

Task Sample ID Sample Date Sample Type	DIWET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	SRDWSC 08SAC28-123 DIWET 2/9/2009 N	SRDWSC 08SAC29-1234 DIWET 2/9/2009 N	SRDWSC 08SAC30-1234 DIWET 2/9/2009 N	SRDWSC 08SAC31-12 DIWET 2/9/2009 N	SRDWSC 08SAC31-345 DIWET 2/9/2009 N	SRDWSC 08SAC32-12 DIWET 2/9/2009 N	SRDWSC 08SAC32-345 DIWET 2/9/2009 N	SRDWSC 08SAC33-1234 DIWET 2/9/2009 N
Metals (µg/L)										
Arsenic	42.3	10	**4.6**	**5.8**	**6.5**	**4.8**	**4.1**	**6.6**	**11.9**	**5.3**
Barium			**35.1**	**28**	**30.6**	**39.3**	**35.2**	**30.3**	**25.5**	**30.6**
Cadmium	0.9	5	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
Chromium	193	50	**1.7 J**	**1.8 J**	**2.2 J**	**1.7 J**	**2.4 J**	**1.5 J**	**2.6 J**	**1.5 J**
Copper	195	10	**1.4 J**	**5.8**	**10.5**	**4.3**	**10.6**	**6.7**	**38.1**	**3.9 J**
Lead	148	2.5	2 U	**0.4 J**	**1.9 J**	2 U	2 U	**1.1 J**	**8**	**0.8 J**
Mercury	15	0.05	**0.03**	**0.02**	**0.02**	0.02 U	0.02 U	**0.02**	**0.03**	**0.02**
Nickel	206	52	**1.8 J**	**2.2 J**	**2.1 J**	**2 J**	**2 J**	**1.5 J**	**2.7 J**	**2.4 J**
Selenium	3.6	5	--	--	--	--	--	--	--	--
Zinc	251	100	**5**	**3.9 J**	**4.3**	**4.6**	**9.6**	**2.5 J**	**9.5**	**30.9**

Table 14
Deionized Water Waste Extraction Test Chemistry Results

Task Sample ID Sample Date Sample Type	DIWET Max Value Previous Studies (2001 - 2007)	Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001)	SRDWSC 08SAC34-12 DIWET 2/9/2009 N	SRDWSC 08SAC34-345 DIWET 2/9/2009 N	SRDWSC 08SAC35-12 DIWET 2/9/2009 N	SRDWSC 08SAC35-345 DIWET 2/9/2009 N
Metals (µg/L)						
Arsenic	42.3	10	**6.8**	**6.6**	**6.8**	**13.1**
Barium			**24**	**24**	**30.5**	**28.3**
Cadmium	0.9	5	4 U	4 U	4 U	4 U
Chromium	193	50	**1.6 J**	**1.5 J**	**1.9 J**	**1.6 J**
Copper	195	10	**2.4 J**	**6.1**	**4.2**	**5.1**
Lead	148	2.5	**0.5 J**	**0.4 J**	**0.6 J**	**1.1 J**
Mercury	15	0.05	0.02 U	0.02 U	0.02 U	0.02 U
Nickel	206	52	**1.8 J**	**1.8 J**	**2 J**	**1.7 J**
Selenium	3.6	5	--	--	--	--
Zinc	251	100	**20.2**	**12.3**	**8.8**	**5.1**

Table 14

Deionized Water Waste Extraction Test Chemistry Results

Notes:

Detected concentration is greater than DIWET Max Value Previous Studies (2001 - 2007) screening level

Detected concentration is greater than Waste Discharge Requirement General Order (GO) No. 5-01-116 Criteria (CVRWQCB, 2001) screening level

Non-detected concentration is above one or more identified screening levels

Bold = Detected result

J = Estimated value

U = Compound analyzed, but not detected above detection limit

UJ = Compound analyzed, but not detected above estimated detection limit

R = Rejected

Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest reporting limit value is reported as the sum.

Data Validation Applied

4.3 Power Analysis

Results of the power analysis using mercury data from sediment composite samples are shown in Table 15 and detailed in Appendix E. Results indicate that a sample size of four is required to have a power of at least 0.80 for detecting a significant difference in sediment mercury between the SRDWSC and the GO criteria/TMDL target.

Table 15
Results of Power Analysis on Sediment Mercury Data

Sample Size	Power
2	0.252
3	0.722
4	0.958

These power analysis results are most relevant to projects in which a random sampling approach is used; however, this dredged material investigation program used a targeted, non-random sampling design that focused on taking the most samples in areas requiring the greatest volumes to be dredged due to shoaling or accumulation. This approach is standard for dredged material programs and is in accordance with the ITM guidance (USEPA/USACE 1998), which suggests that compositing may be used to minimize the chemical analyses costs while maximizing sample coverage of an area to be dredged. These sample size estimates may be appropriate for future post-dredge sampling that may be conducted to assess surface mercury concentrations.

4.4 Data Validation Summary

Data validation involved the review of analytical results for 79 soil/sediment samples, 32 water samples, and 135 elutriate samples collected between January 12 and February 12, 2009. Samples were submitted to the USACE Engineer Research and Development Center (ERDC) in Vicksburg, Mississippi. Samples were analyzed for the following:

- PAHs by USEPA method 8270C
- PCBs by USEPA method 8082
- Organochlorine pesticides by USEPA method 8081A
- Organophosphorous pesticides by USEPA method 8141A
- Total metals by USEPA methods 6010B, 6020, and 7471A

- Methyl mercury by USEPA method 7471A
- TOC by USEPA method 9060
- Oil and grease by USEPA method 1664
- Ammonia by USEPA method 350.2
- Chloride by USEPA method 300.0
- BOD by USEPA method 405.1
- TDS by USEPA method 160.1
- TSS by USEPA method 160.2
- Specific conductance by USEPA method 120.1
- pH by USEPA method 150.1
- Total solids by ASTM method D2216
- Grain size by ASTM D422

Data validation verified the accuracy and precision of chemical and physical determinations performed during this investigation. The validation evaluated hold times, spike and surrogate recoveries, method blank contamination, and general overall data quality. The data may have been qualified as estimated for a particular analysis based on method or technical criterion as stated in the USEPA National Functional Guidelines (USEPA 2004, 2008). Data qualified with a "J" indicates that the associated numerical value is the approximate concentration of the analyte. Data qualified with a "UJ" indicates the approximate reporting limit below which the analyte was not detected. Data qualified as "R" means it is rejected and not usable for any purpose. It should be noted that some results may have more than on qualifier applied due to multiple quality control exceedences. Out of approximately 12,000 results, 1,019 (approximately 8%) were rejected due to very low or no spike recoveries in the laboratory control sample, laboratory control sample duplicate, matrix spike, or matrix spike duplicate samples or due to extractions performed greater than two times past the hold times. Method blank contamination resulted in the qualification of 119 (approximately 1%) results as non-detects when they were detected previously. There were 4,177 results qualified as estimated, biased high, or biased low due to:

- Sample preparation or analyses past hold times
- Laboratory duplicates outside of method criteria
- Laboratory control sample, laboratory control sample duplicate, matrix spike, matrix spike duplicate, or surrogate spike percent recoveries outside of laboratory control limits

- No or insufficient quality control results
- Missing surrogate results or surrogate results reported from confirmation column analyses when sample results were reported from the primary column in methods that require confirmation.

The validation confirmed a completeness of 92%. Detailed results are provided in Appendix F.

5 DISCUSSION

5.1 Bulk Sediment

Arsenic, chromium, nickel, and benzo(a)pyrene were detected at concentrations that exceeded GO criteria and/or criteria from NOIs for maintenance dredging projects. Only one sample exceeded the arsenic criteria from NOIs for maintenance dredging projects. Thirty-nine samples exceeded either the chromium criteria from NOIs for maintenance dredging projects or the maximum value from previous pre-dredge characterization studies. Fourteen samples exceeded the nickel criteria from NOIs for maintenance dredging projects.

Numerous factors suggest that measured chromium concentrations represent background conditions for the native material in the SRDWSC. Thirty-nine of 45 samples, or 87 percent of samples, exceed the background criterion for chromium. Concentrations of chromium are log-normally distributed and demonstrate a strong correlation with aluminum and iron (Appendix E), normalization to which can be used to estimate the background or natural level of heavy metals (Daskalakis and O'Connor 1995). There is a random spatial distribution of concentrations along the channel that is contrary to anthropogenic sources of metals. Chromium concentrations have been consistently above the GO for maintenance dredging background values in pre-dredge characterization samples, as described in Section 2.2. Furthermore, the measured concentrations for chromium are all well below the risk-based USEPA Regional Screening Level (2010) of 280 mg/kg for a residential receptor.

Similar to chromium, concentrations of arsenic in SRDWSC sediments are log-normally distributed, ubiquitous throughout the sampling locations, and tightly correlated with aluminum and iron (Appendix G). In previous pre-dredge characterization studies, arsenic exceeded GO criteria; however, similar to the present studies, there have been few exceedances of this criterion observed. These results suggest that arsenic is similar to background concentrations and may be associated with native material.

Nickel only exceeded the GO criteria between RMs 0 and 9. Similar to chromium, nickel concentrations have been consistently above the GO for maintenance dredging background values in pre-dredge characterization samples. These findings indicate that nickel concentrations in SRDWSC material is at background levels and also may be associated with native material.

The only organic compound to exceed the GO criteria was benzo(a)pyrene in the composite sample comprised of material from RM 16 to 18. The bioaccumulation potential of benzo(a)pyrene in freshwater sediments was evaluated by reviewing the primary or peer-reviewed literature. Several studies have evaluated benzo(a)pyrene bioaccumulation in benthic organisms. Freshwater tubificid oligochaete worms exposed to sediment contaminated with benzo(a)pyrene at 1.57 mg/kg, a concentration more than nine-fold that measured in the composite sample from RM 16 to 18, demonstrated minimal bioaccumulation (100 µg/kg wet weight, assuming 5% lipid content) after 26 days of exposure (Lu et al. 2006). Similarly, McCarthy et al. (2003) demonstrated minimal bioaccumulation (100 to 175 µg/kg) in the fathead minnow *Pimephales promelas* following a 10-day exposure benzo(a)pyrene spiked sediments contaminated ranging from 100 to 140 µg/kg, concentrations that are similar to those in the composite sample from RM16/18. Freshwater oligochaete worms exposed to sediment contaminated with benzo(a)pyrene at 32 to 36 µg/kg demonstrated bioaccumulation (440 µg/kg wet weight, assuming 5% lipid content) after 4 to 6 weeks of exposure (Sormunen et al. 2009). Finally, studies in which benzo(a)pyrene bioaccumulation was examined in marine organisms at sediment concentrations as high as 612 µg/kg, more than 3 times higher than sediment concentrations in composite sample from RM 16/18, demonstrated maximum bioaccumulation levels of 5.31 µg/kg (Baumard et al. 1998).

The bioaccumulation levels observed in the studies described above (ranging from 5.31 to 440 µg/kg, in which organisms were exposed to benzo(a)pyrene-contaminated sediments in the field or laboratory (at concentrations ranging from 32 to 1570 µg/kg), indicate concentrations of bioaccumulation in exposed organisms that are well below those shown to cause detrimental effects. Specifically, bioaccumulation data from the Environmental Residue-Effects Database (ERED), which is based on numerous studies, showed that the no observed effect residue (NOER) for relevant freshwater species (amphipods, freshwater fish, and midges) were as high as 43 mg/kg (USACE/USEPA 2009). This no effect tissue concentration is approximately 200 times greater than bioaccumulation expected in freshwater benthic organisms, based on sediment concentration in RM 16/18 and bioaccumulation occurring in the studies described above.

5.2 Discrete Sediment (New Horizon)

Similar to the sediment composite samples, several metals exceeded the GO criteria and criteria from NOIs for maintenance dredging. The most widespread exceedances were for chromium and nickel, similar to previous pre-dredge characterization studies. One of the 34 discrete samples (09SAC23; 53.3 mg/kg) for lead exceeded the maximum value measured in previous pre-dredge characterization studies (41.0 mg/kg); however, the concentration was well below the GO criteria for lead (400 mg/kg). One of 34 discrete samples (08SAC31; 0.248 mg/kg) for total mercury exceeded the Sacramento–San Joaquin TMDL sediment target (CVRWQCB 2001); however, as described in the data validation report (Appendix F), the concentration was qualified with a J to indicate high bias in the concentration because one of two matrix spike duplicate samples and the matrix spike/matrix spike duplicate RPD were above control limits. In addition, the concentration was well below the maximum value seen in previous pre-dredge characterization studies (0.68 mg/kg) and within the range seen in previous pre-dredge characterization studies (see Section 2.2). Furthermore, none of the sediment composite samples demonstrated an exceedance of the TMDL target. Nonetheless, it is recognized that additional analysis may be required post-dredging to ascertain the concentration of mercury in the z-layer within RM 31. Power analyses, based on normally distributed mercury data in sediment composite samples, indicated that a sample size of four is required to have a power of at least 0.80 for detecting a significant difference in sediment mercury between the SRDWSC and the GO criteria/TMDL target. These results may be useful should additional post-dredge sampling be necessary.

The bioavailability, including bioaccumulation potential of mercury and lead in freshwater sediments, was evaluated by reviewing the primary or peer-reviewed literature. Bioavailability of metals in sediment is controlled by numerous factors including grain size and adsorptive behavior, hydrodynamics, biogeochemical processes, and environmental conditions (i.e., redox, pH, salinity, and temperature) of the specific area (Samiullah 1990). Important binding sites for metals within fine-grained sediments, like those found at stations where lead and mercury were detected at elevated levels, include clay minerals, iron and manganese oxides/hydroxides, carbonates, sulfides, organic matter, and biological materials such as humic acid (Calmano et al.1993). Adsorption of mercury and lead to these binding sites reduces the bioavailability, bioaccumulation, and toxicity of metals such as lead and mercury (Fan et al. 2002).

5.2.1 Lead

Bioaccumulation of metals is one way to assess bioavailability of sediment contaminants to benthic organisms; however, bioaccumulation of contaminants from sediments may occur with no acute or chronic toxicity or effects to an organism. Several studies have evaluated lead bioaccumulation in benthic organisms. Freshwater clams (*Corbicula fluminea*) exposed to sediment contaminated with lead at 99 mg/kg, a concentration that is two-fold higher than those in the discrete sample from RM 23, demonstrated minimal bioaccumulation (2.29 mg/kg wet weight) after 48 days of exposure (Tatem 1986). Similarly, Ankley et al. (1994) demonstrated minimal bioaccumulation (0.5 to 1.0 mg/kg) in the oligochaete *Lumbriculus variegates* following a 30-day exposure to Lower Fox River, Wisconsin, sediments contaminated with lead ranging from 63 to 150 mg/kg, concentrations that are two- to three-fold those in the discrete sample from RM23. Finally, clam (*Corbicula fluminea*) samples collected as part of a multi-year, regional monitoring program in San Francisco Bay estuary have shown low levels of bioaccumulation of lead (mean = 1.09 mg/kg) at most sites throughout the San Francisco Bay estuary across multiple years, based on exposure levels ranging averaging 20.9 mg/kg and ranging from 3.1 to 76.8 mg/kg (SCCWRP 2003).

The bioaccumulation levels observed in the studies described above, in which organisms were exposed to lead-contaminated sediments in the field or laboratory (at concentrations ranging from 20 to 150 mg/kg), indicate concentrations of bioaccumulation in exposed organisms that are well below those shown to cause detrimental effects. Specifically, bioaccumulation data from the Environmental Residue-Effects Database (ERED), which is based on numerous studies, showed that the no observed effect residue (NOER) for relevant species (amphipods, mussel, oligochaetes, and midges) ranged from 4.0 mg/kg in amphipods to 481 mg/kg in the midge (USACE/USEPA 2009). These no effect tissue concentrations are at least four times greater than bioaccumulation expected in freshwater benthic organisms, based on sediment concentration in RM 23 and bioaccumulation occurring in the studies described above.

5.2.2 Inorganic Mercury

Numerous studies have also investigated mercury bioaccumulation in benthic organisms. Amphipods (*Leptocheirus plumulosus*) exposed to 0.127 mg/kg inorganic mercury in sediment for 8 days demonstrated bioaccumulation at 1 mg/kg wet weight (Lawrence and

Mason 2001). Freshwater clams (*Elliptio dilatata)* collected from the Tadenec Lake (Ontario, Canada) demonstrated levels of mercury ranging from 0.06 to 0.26 mg/kg; sediment concentrations in the lake ranged from 0.02 to 0.14 mg/kg (Wren and MacCrimmon 1986). Finally, clam (*Corbicula fluminea*) samples collected as part of a multi-year, regional monitoring program in San Francisco Bay estuary, have shown low levels of bioaccumulation of lead (mean = 0.25 +/- 0.11 mg/kg) at most sites throughout the San Francisco Bay estuary across multiple years, based on exposure levels ranging averaging 0.26 +/- 0.13 mg/kg and ranging from 0.014 to 1.08 mg/kg in sediment (SCCWRP 2003).

The bioaccumulation levels observed in the studies described above, in which organisms were exposed to mercury-contaminated sediments in the field or laboratory (at concentrations ranging from 0.014 to 1.08 mg/kg), indicate concentrations of tissue in exposed organisms that are well below those shown to cause detrimental effects. Specifically, bioaccumulation data from the ERED, which is based on numerous studies, showed that the NOER was 5.4 mg/kg in the slipper limpet and 6.84 mg/kg in zebrafish (USACE/USEPA 2009). These no effect tissue concentrations are at least five times greater than bioaccumulation expected in freshwater benthic organisms (0.26 to 1.0 mg/kg), based on the sediment concentration for the discrete sample at RM 31 and bioaccumulation occurring in the studies described above.

5.3 Deionized Water – Waste Extraction Test

None of the DI-WET metals exceeded the maximum concentration detected in previous pre-dredge characterization studies; however, arsenic, copper, and lead were detected at concentrations that exceeded the corresponding GO criteria. Concentrations of arsenic, copper, and lead in DI-WET samples are similar to those from previous pre-dredge investigations (see Section 2.2).

5.4 Modified Elutriate Test

The only MET metal to exceed the maximum concentration detected in previous pre-dredge characterization studies was selenium; however, arsenic, barium, copper, lead, mercury, and selenium were detected at concentrations that exceeded the corresponding GO criteria or criteria from the Central Valley Basin Plan. In addition, chloride concentrations in 15 samples exceeded the corresponding GO criteria and were approximately order of magnitude greater than GO criteria. These results indicate that further evaluation may be necessary to

determine if discharge water will impact water quality. It is recommended that MET metals results be combined with the column settling test data using the SETTLE program to estimate the total metals concentrations in the discharge water to see if the discharge criteria will be met.

6 REFERENCES

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FIGURES

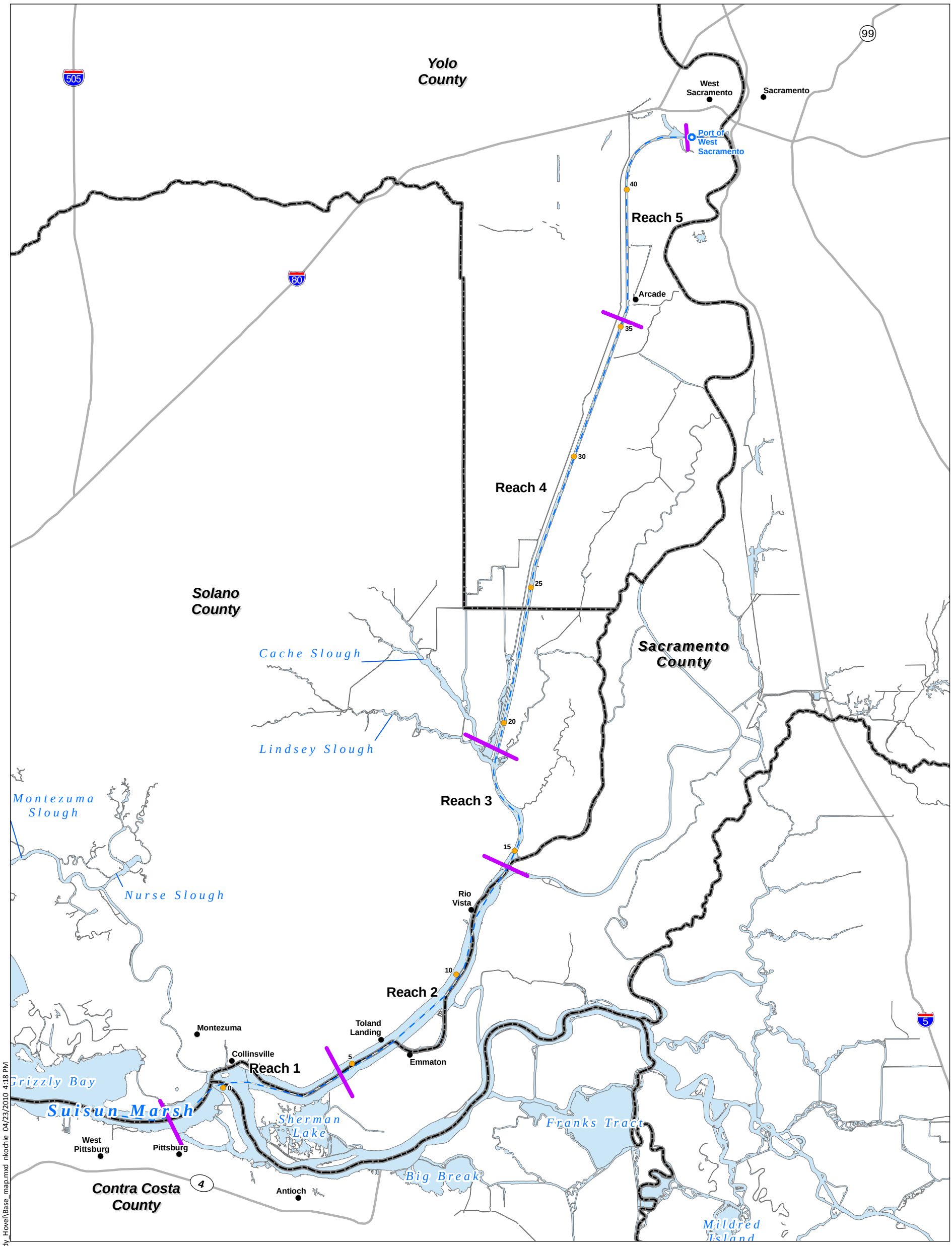

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Figure 1
Overview
Sacramento River Deep Water Ship Channel Proposed Deepening

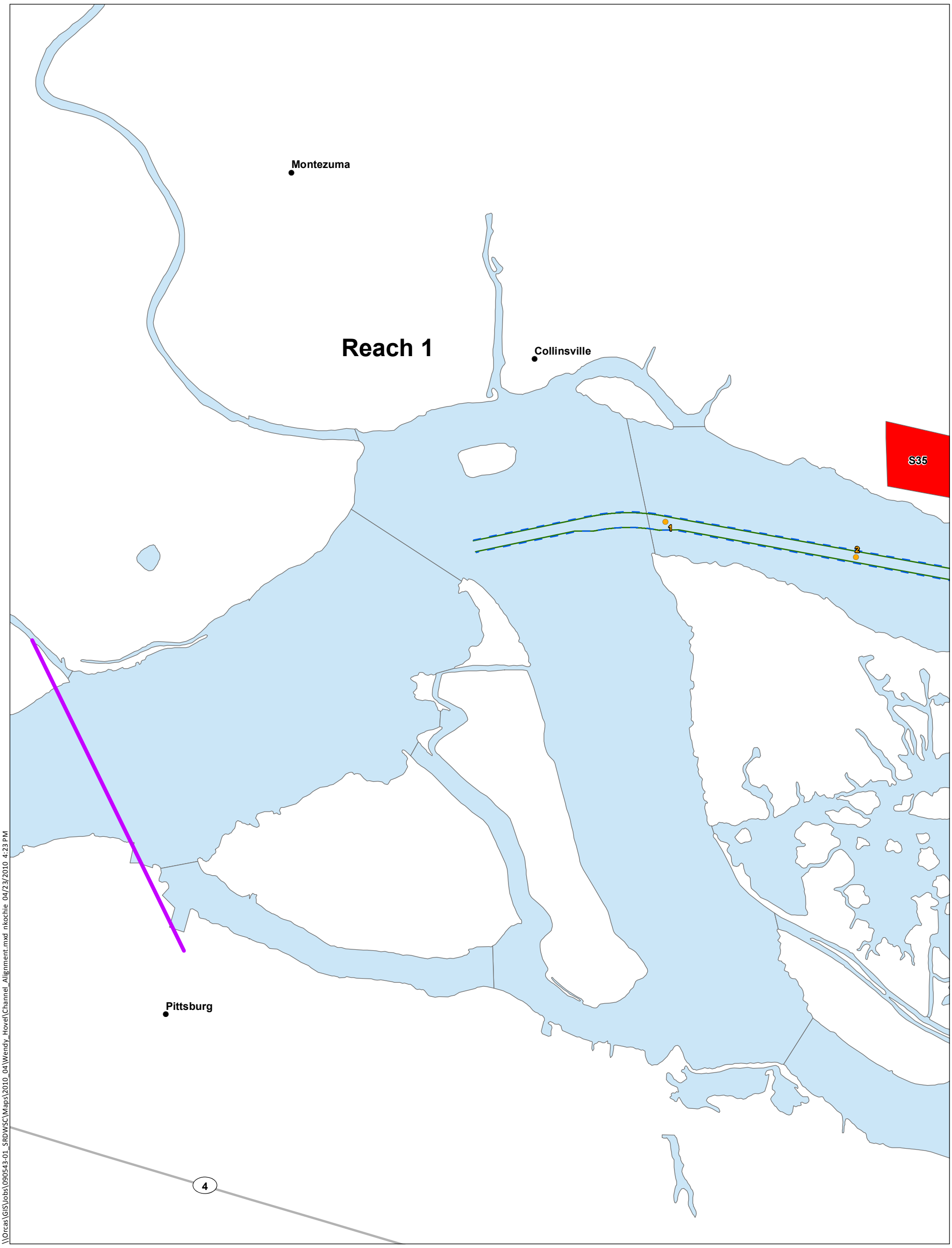

Figure 2a
Proposed Changes in Alignment
Sacramento River Deep Water Ship Channel Proposed Deepening

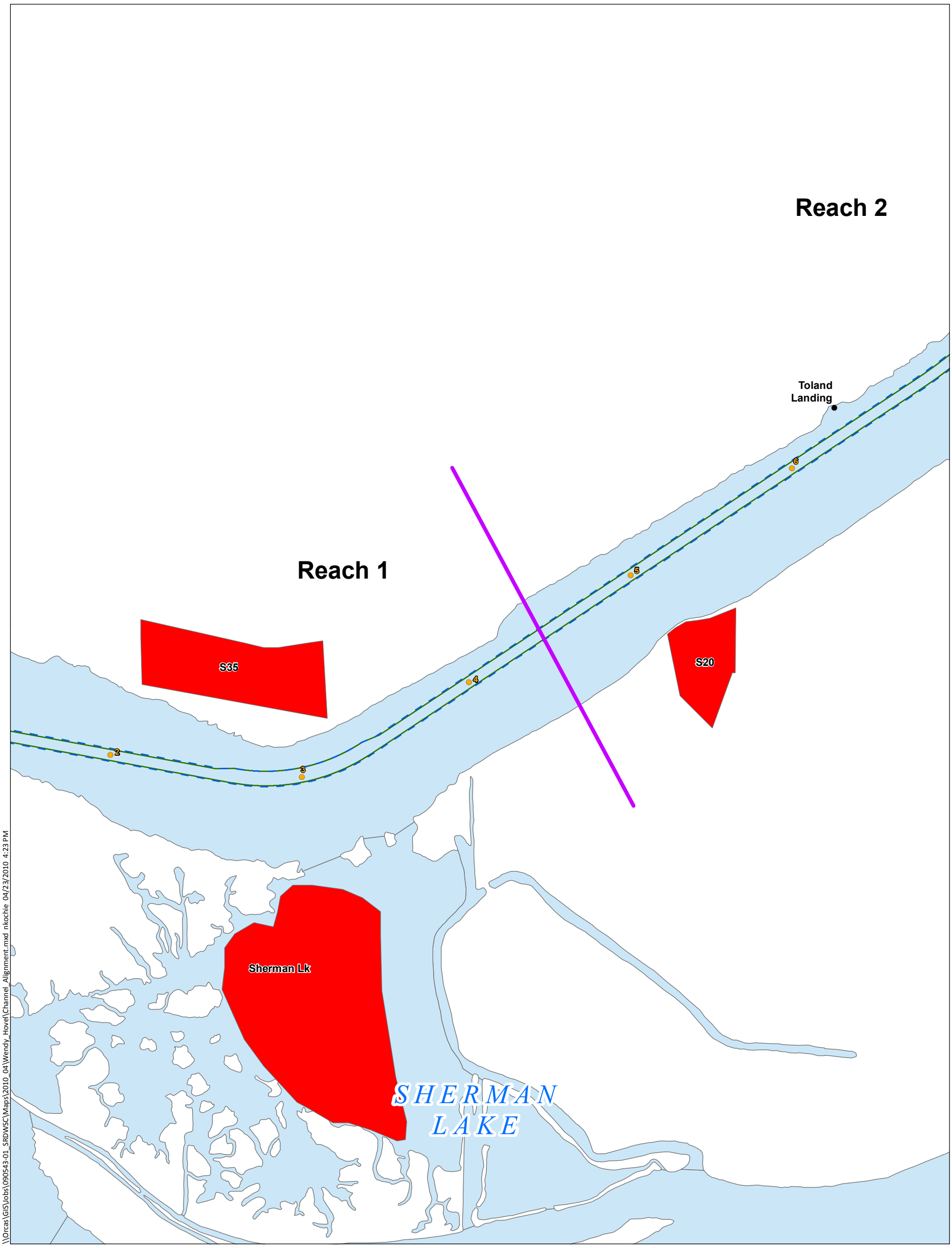

Figure 2b
Proposed Changes in Alignment
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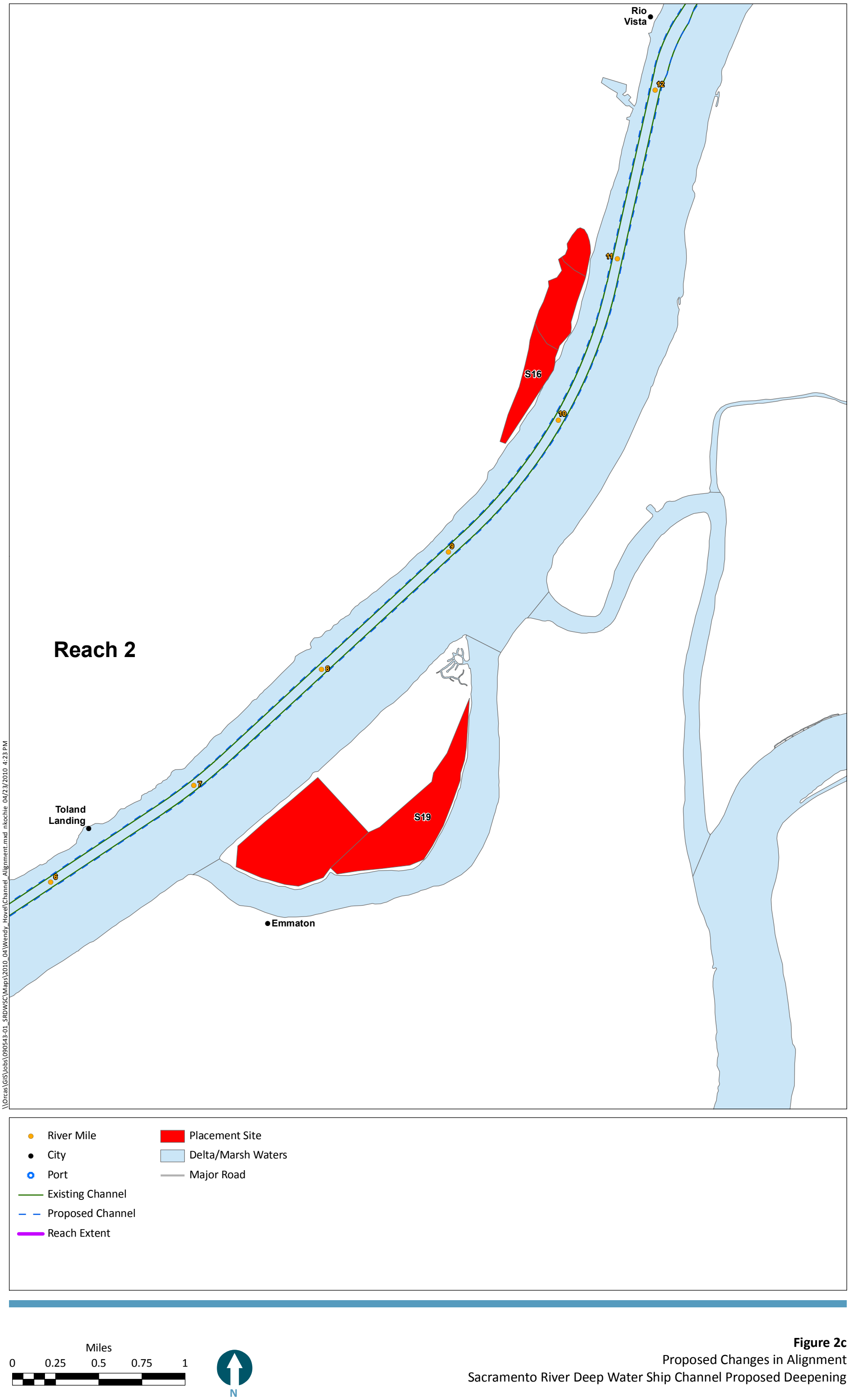

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Proposed Changes in Alignment
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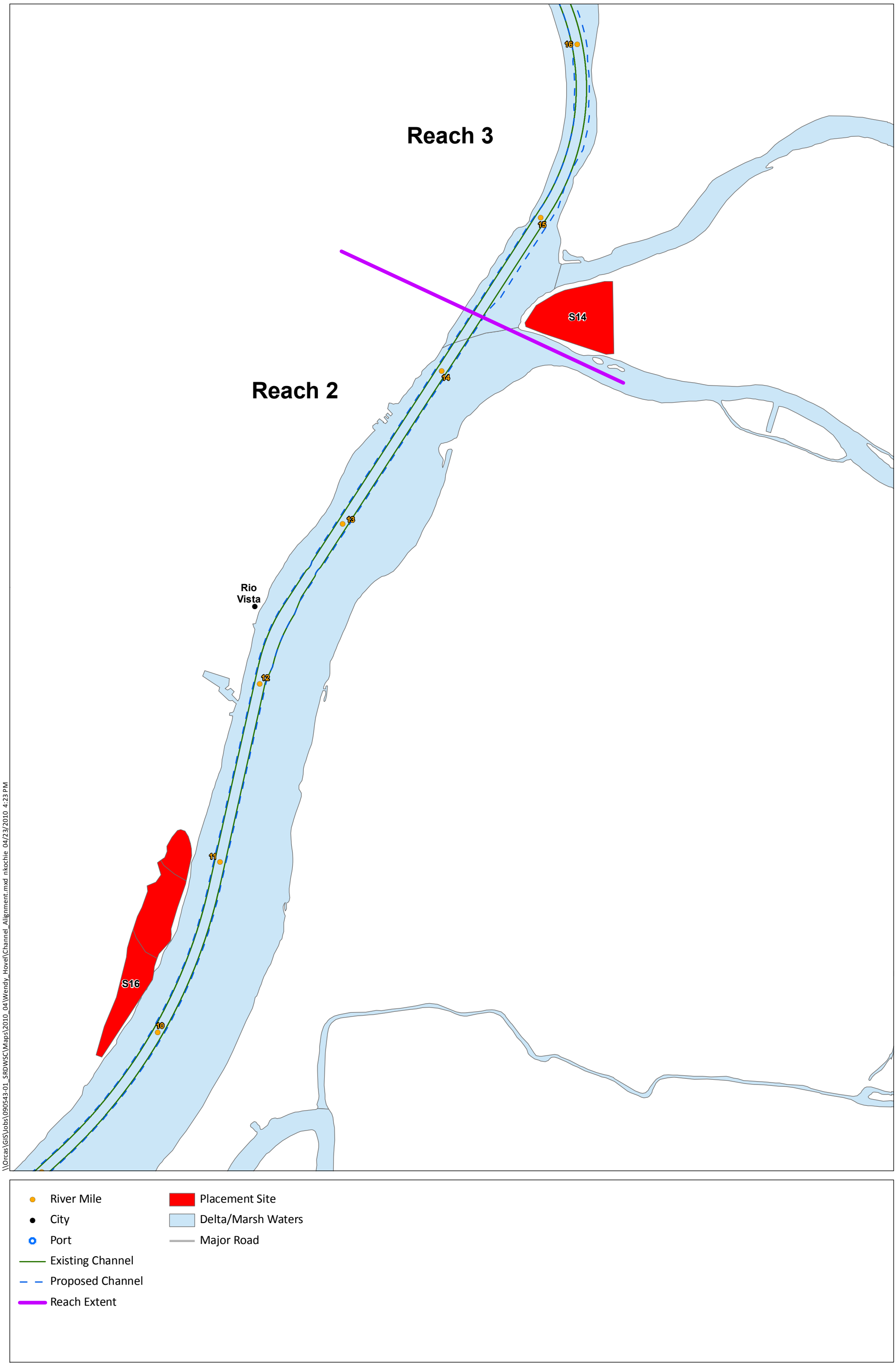

Figure 2d
Proposed Changes in Alignment
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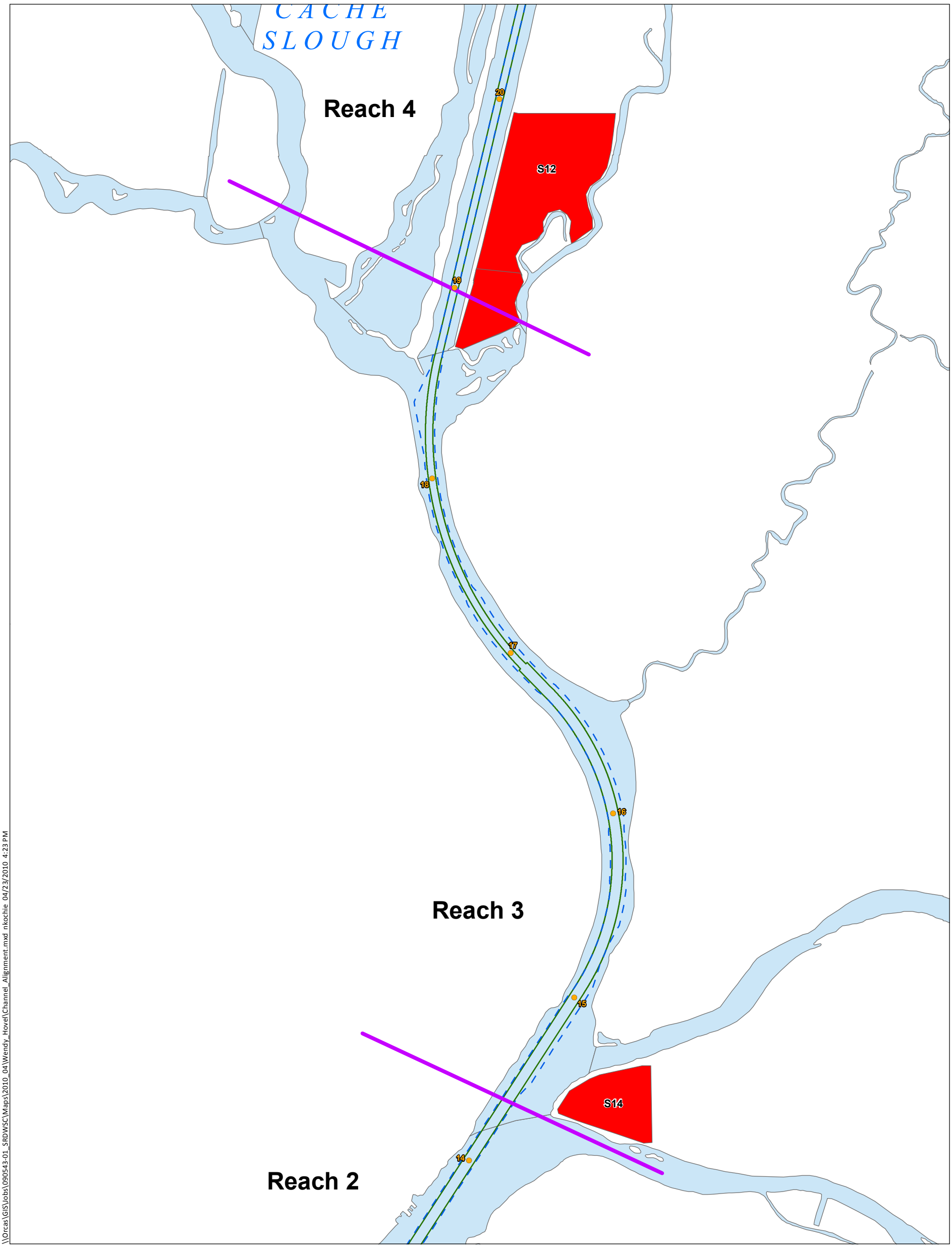

Figure 2e
Proposed Changes in Alignment
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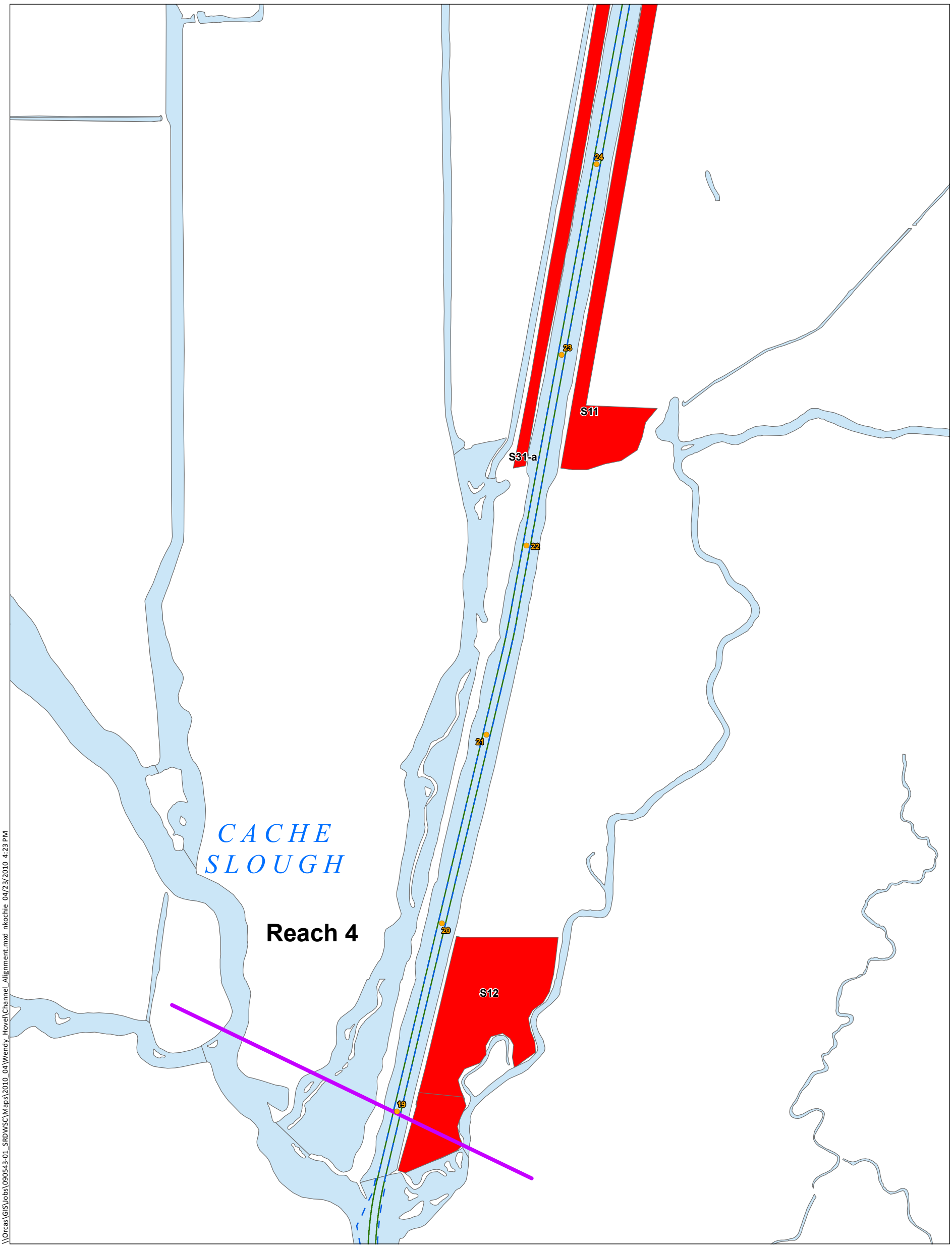


Figure 2f
Proposed Changes in Alignment
Sacramento River Deep Water Ship Channel Proposed Deepening

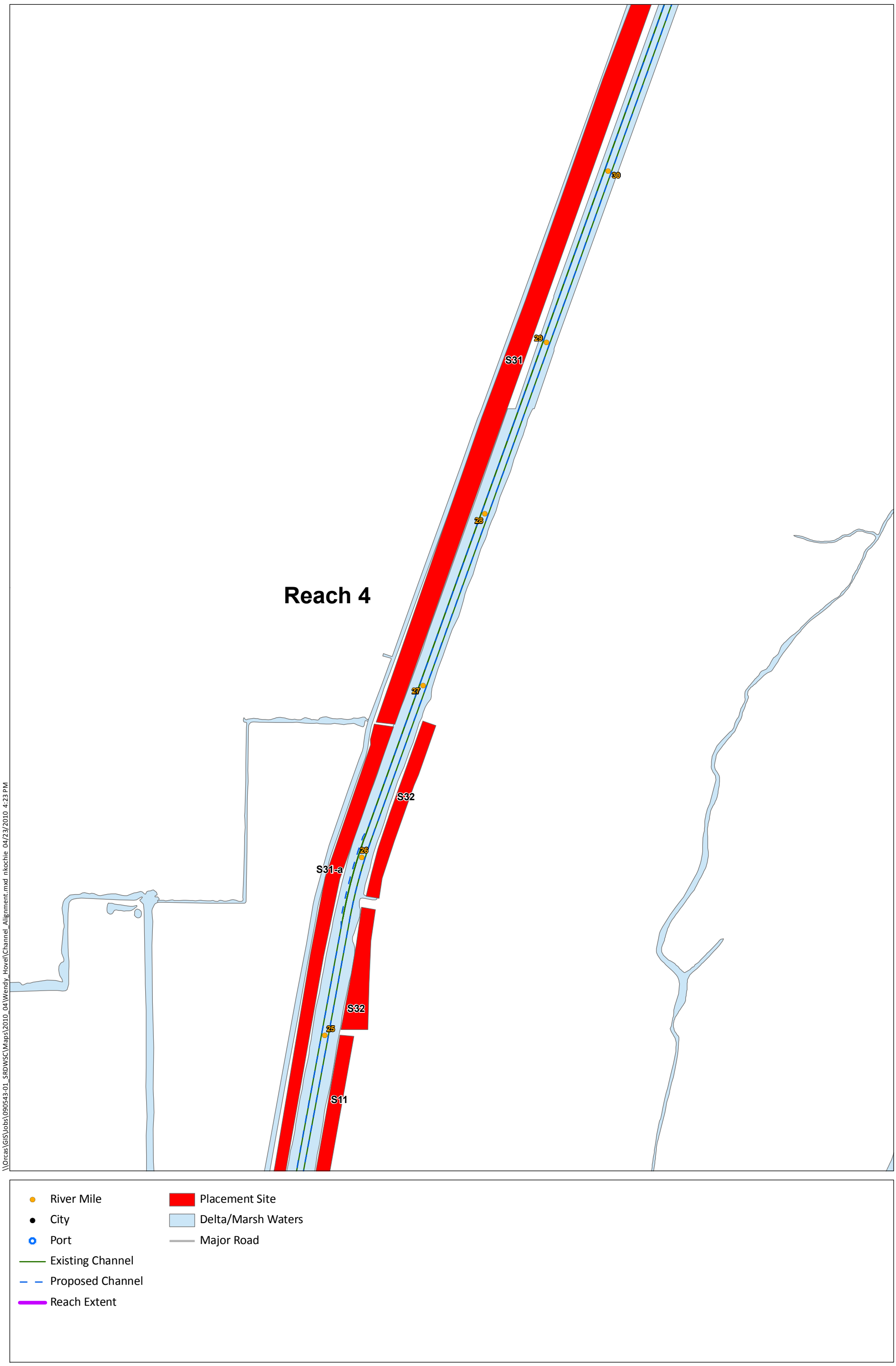


Figure 2g
Proposed Changes in Alignment
Sacramento River Deep Water Ship Channel Proposed Deepening

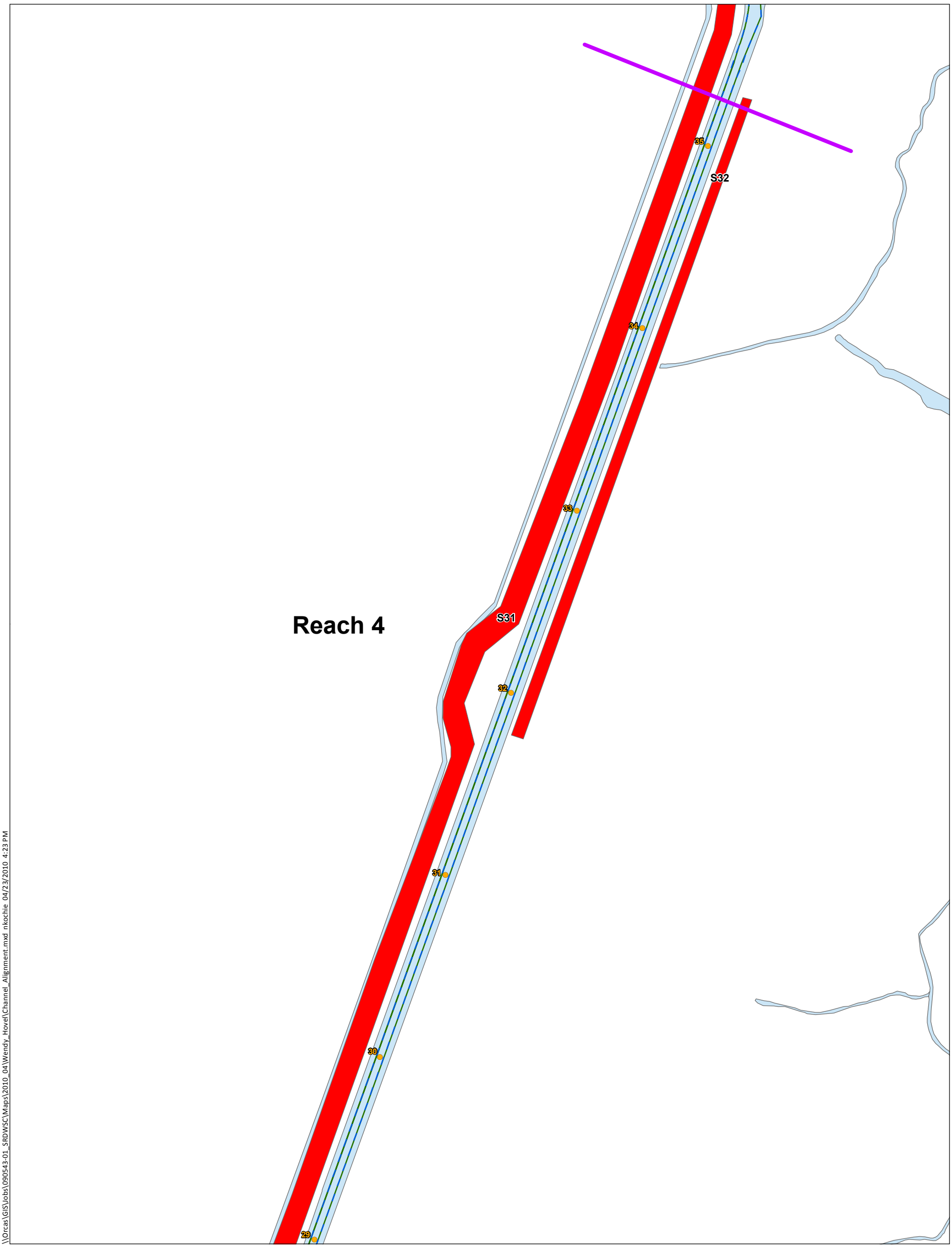


Figure 2h
Proposed Changes in Alignment
Sacramento River Deep Water Ship Channel Proposed Deepening

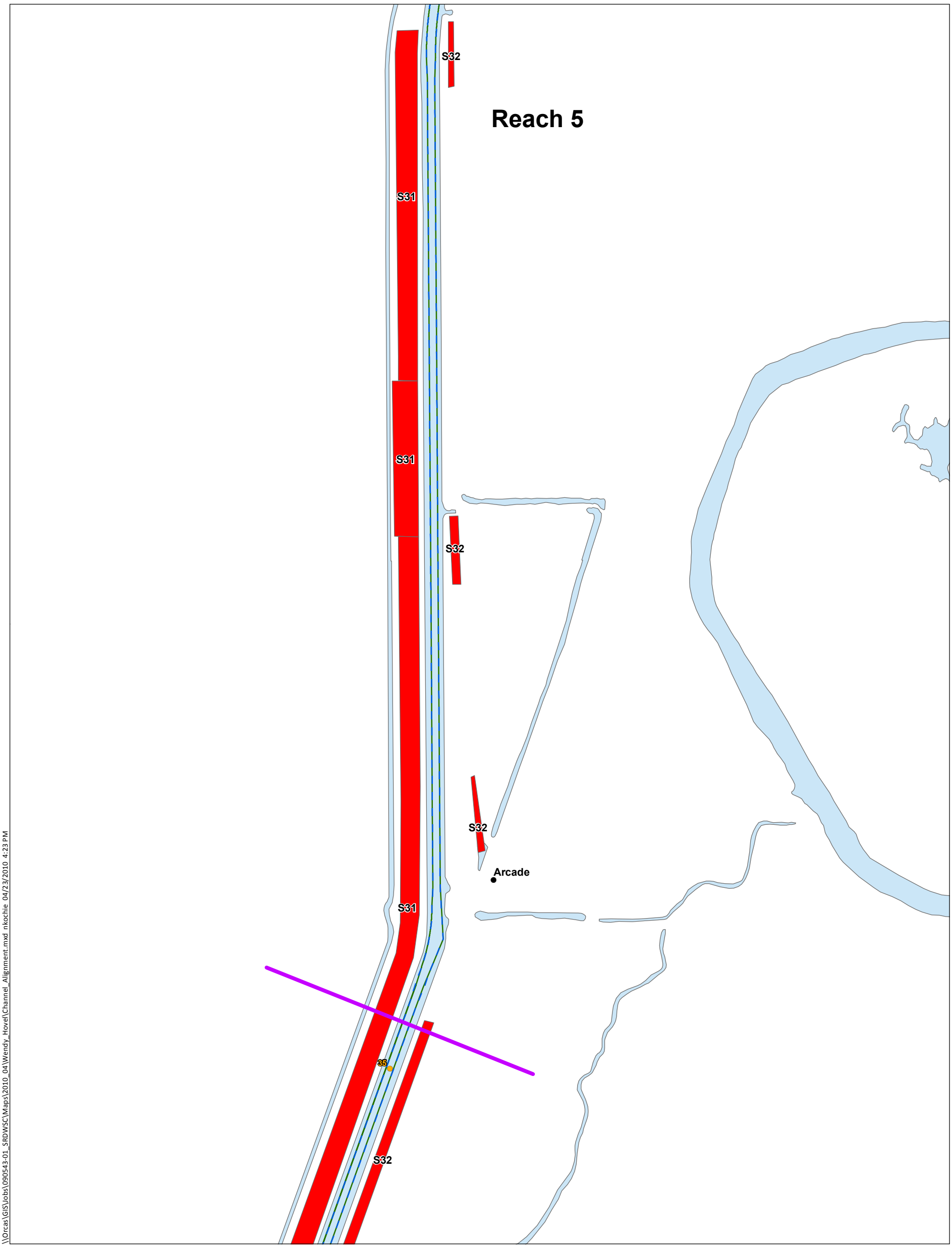


Figure 2i
Proposed Changes in Alignment
Sacramento River Deep Water Ship Channel Proposed Deepening

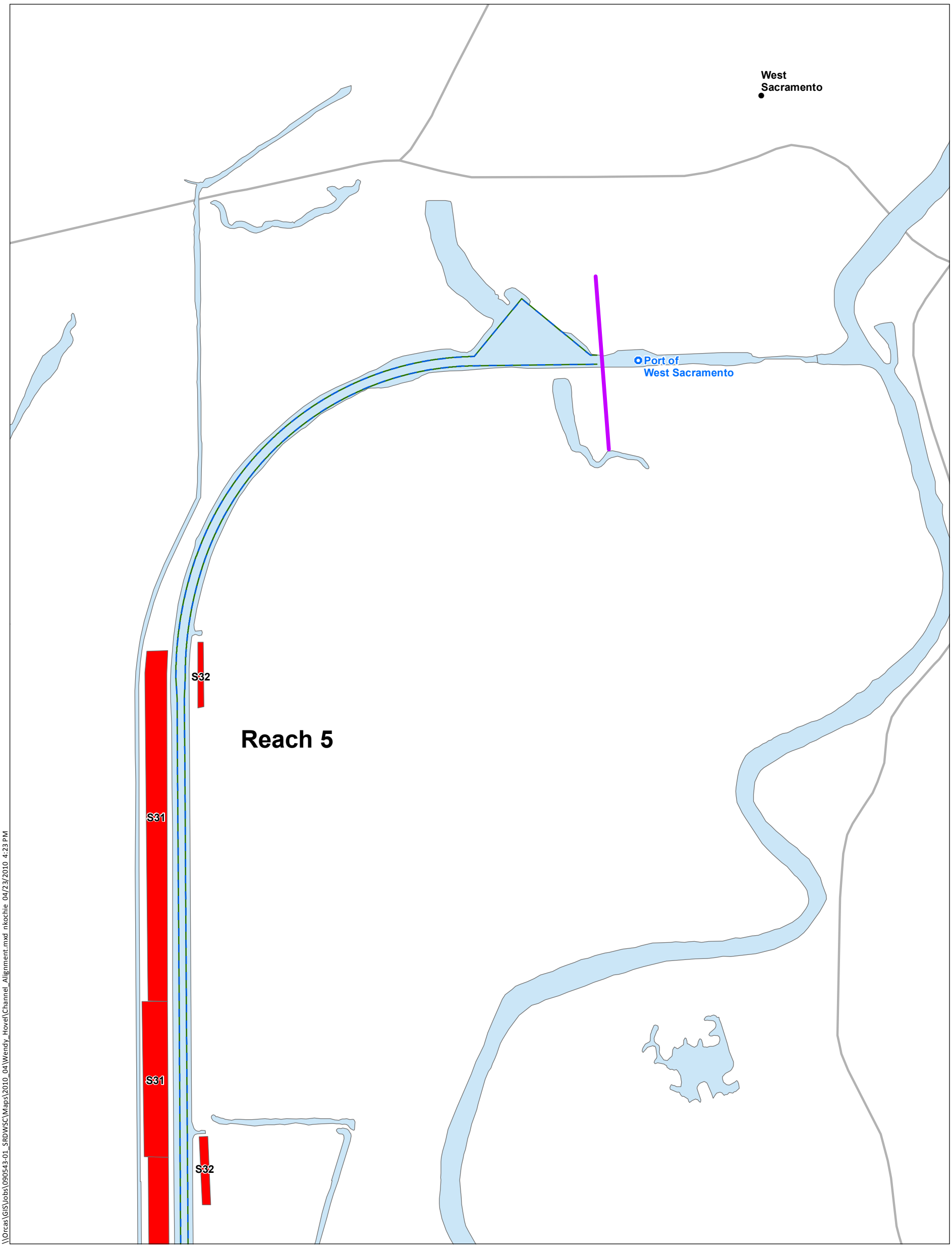


Figure 2j
Proposed Changes in Alignment
Sacramento River Deep Water Ship Channel Proposed Deepening

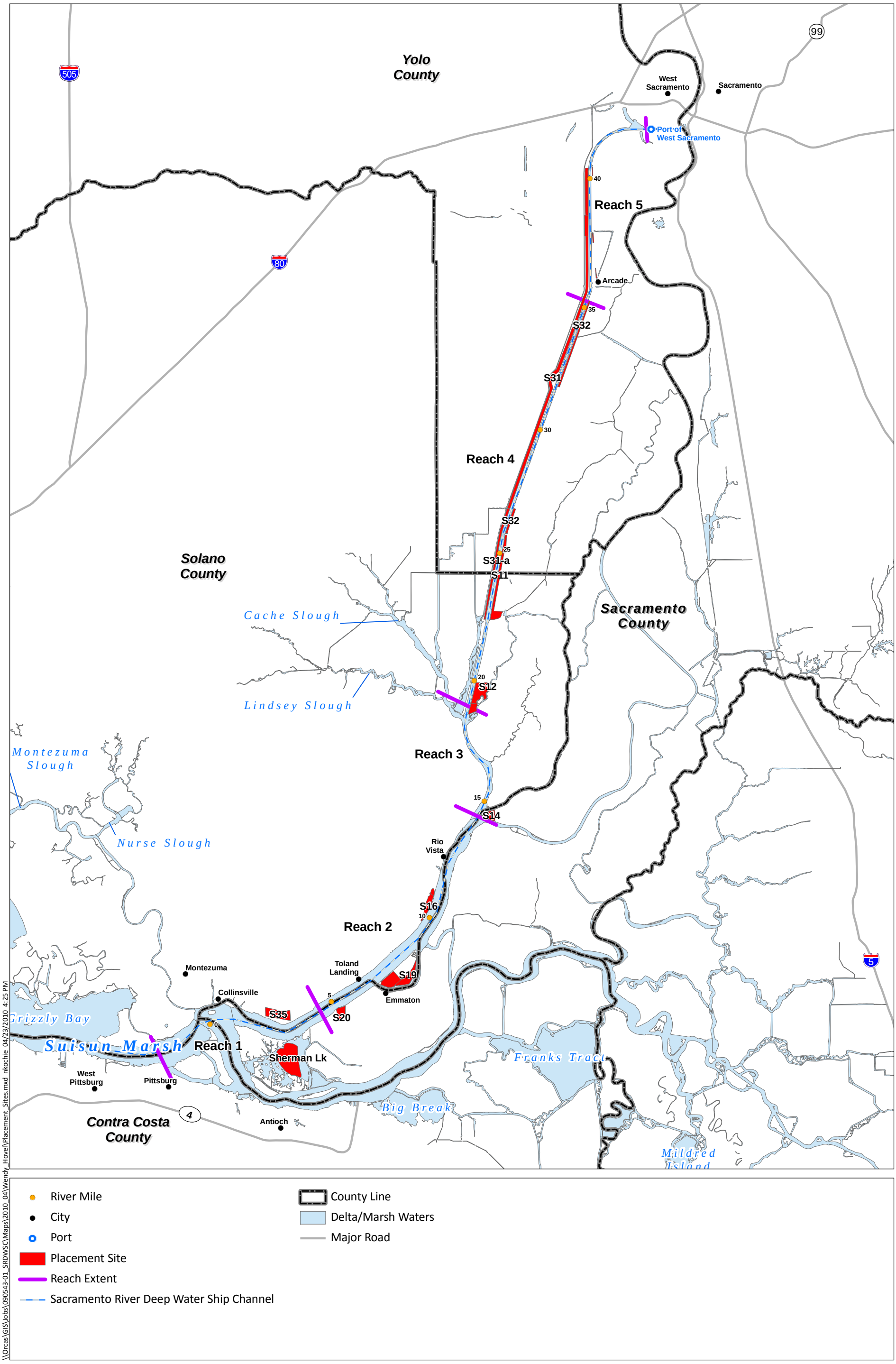


Figure 3
Upland Placement Sites Proposed for Placement of Dredged Material
Sacramento River Deep Water Ship Channel Proposed Deepening

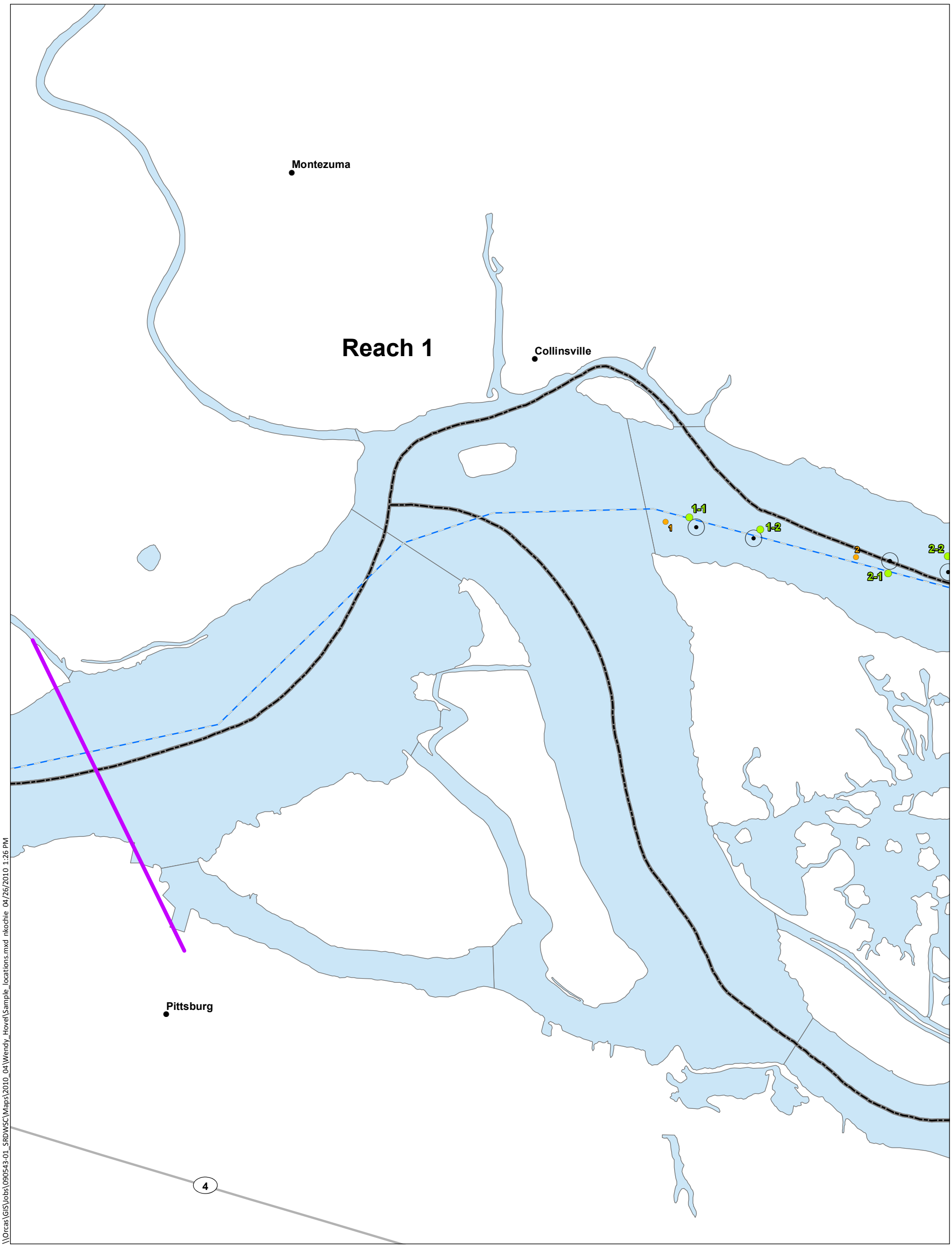


Figure 4a
Target and Actual Sediment Sampling Locations
Sacramento River Deep Water Ship Channel Proposed Deepening

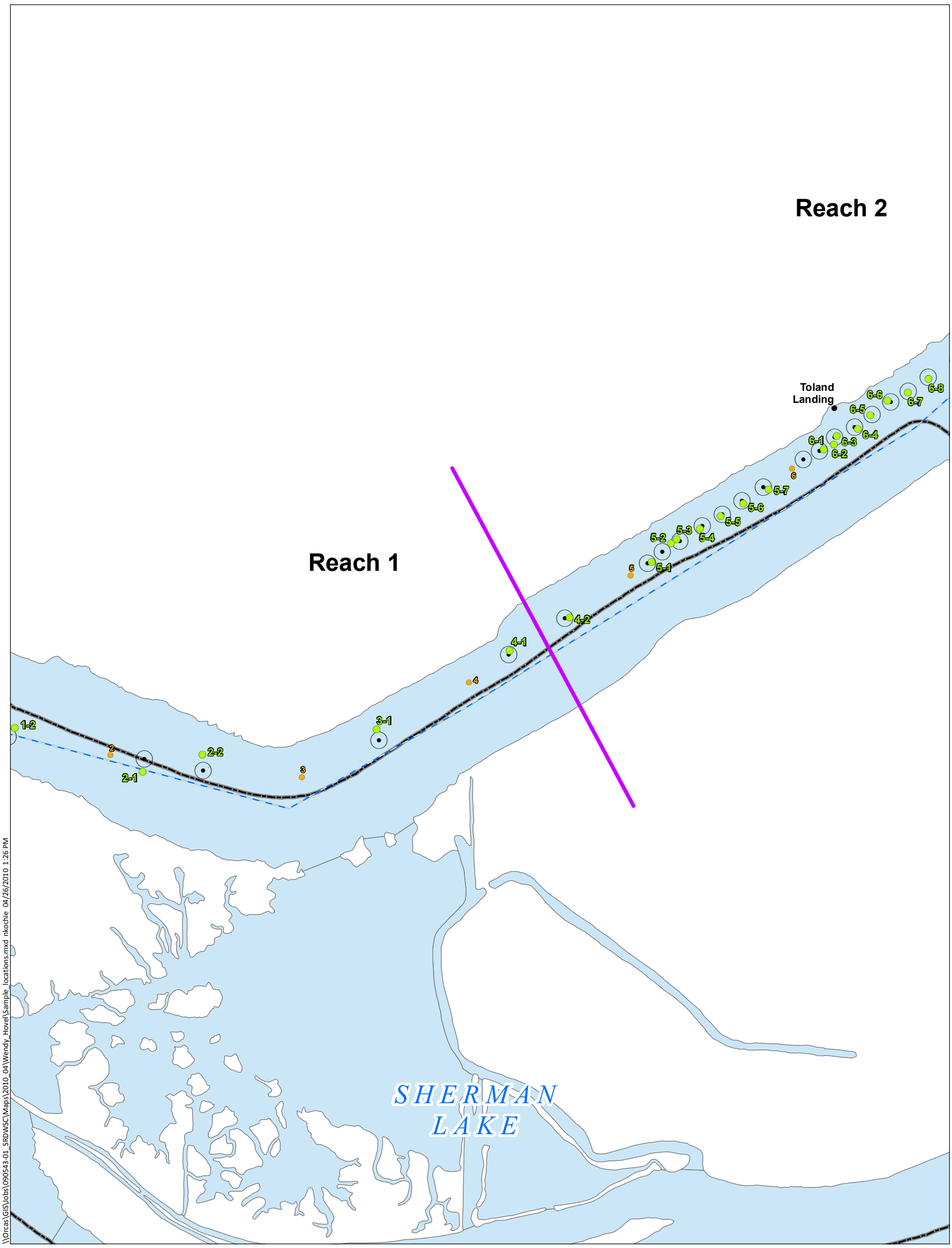
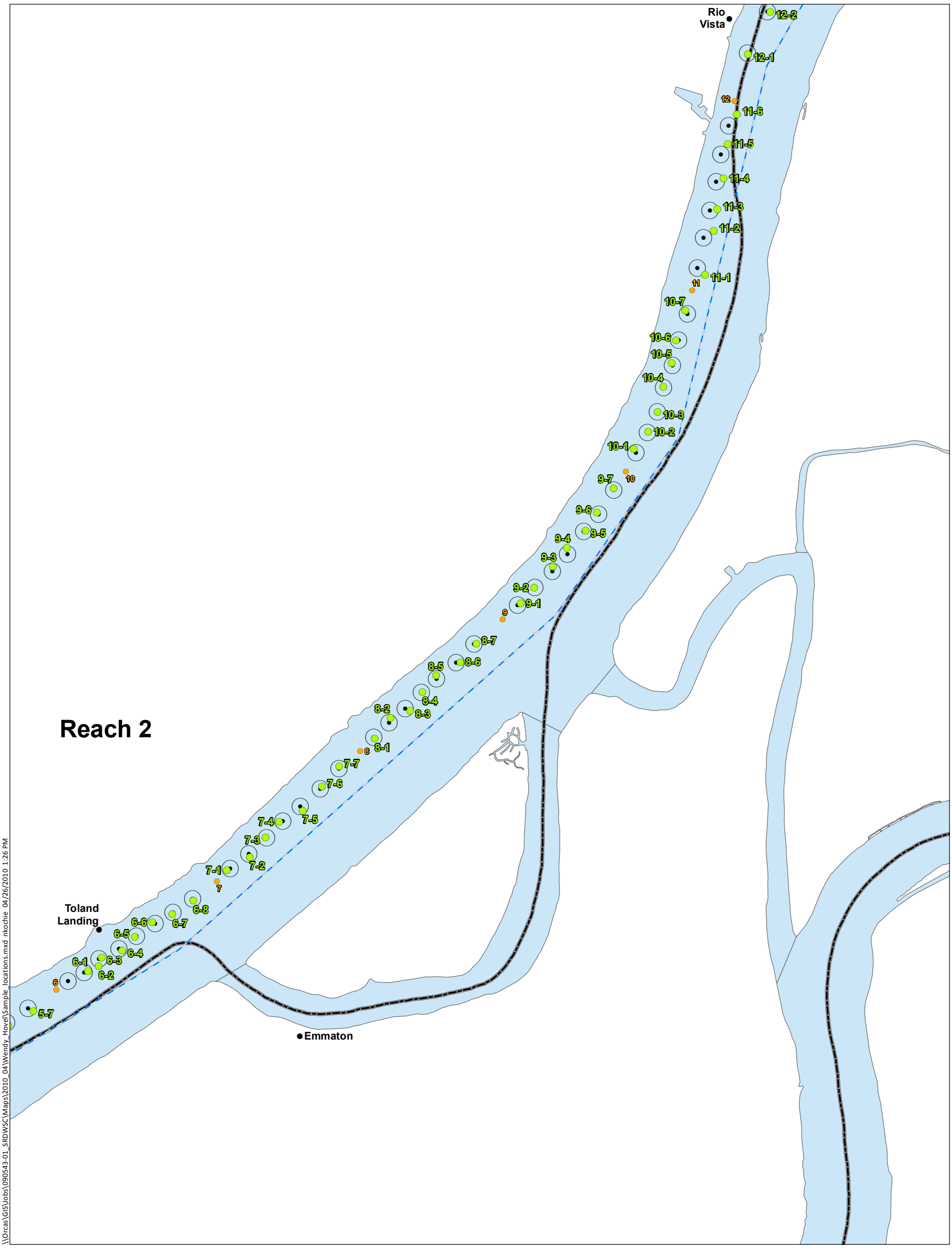


Figure 4b
Target and Actual Sediment Sampling Locations
Sacramento River Deep Water Ship Channel Proposed Deepening



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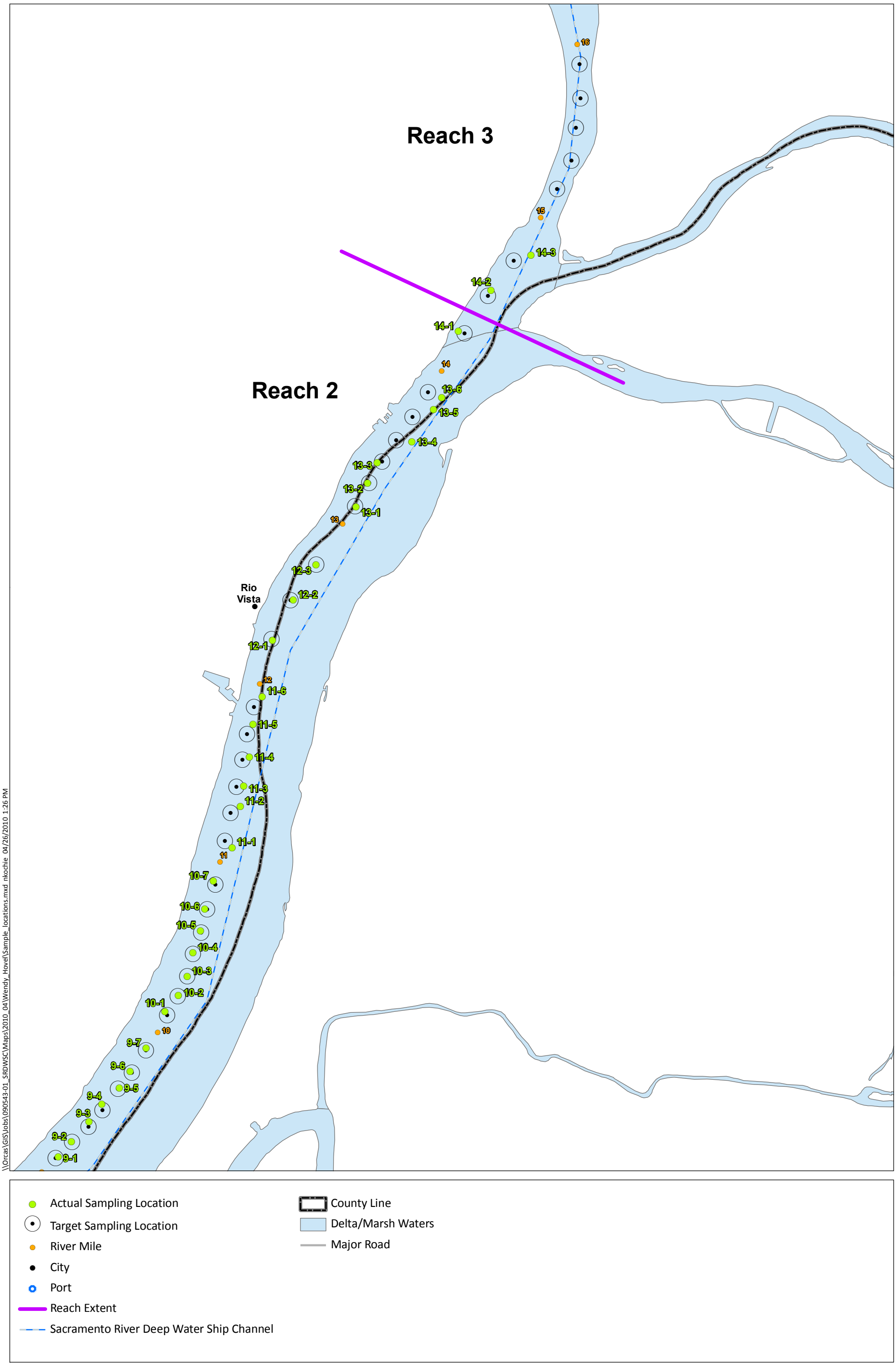
Target and Actual Sediment Sampling Locations
Sacramento River Deep Water Ship Channel Proposed Deepening



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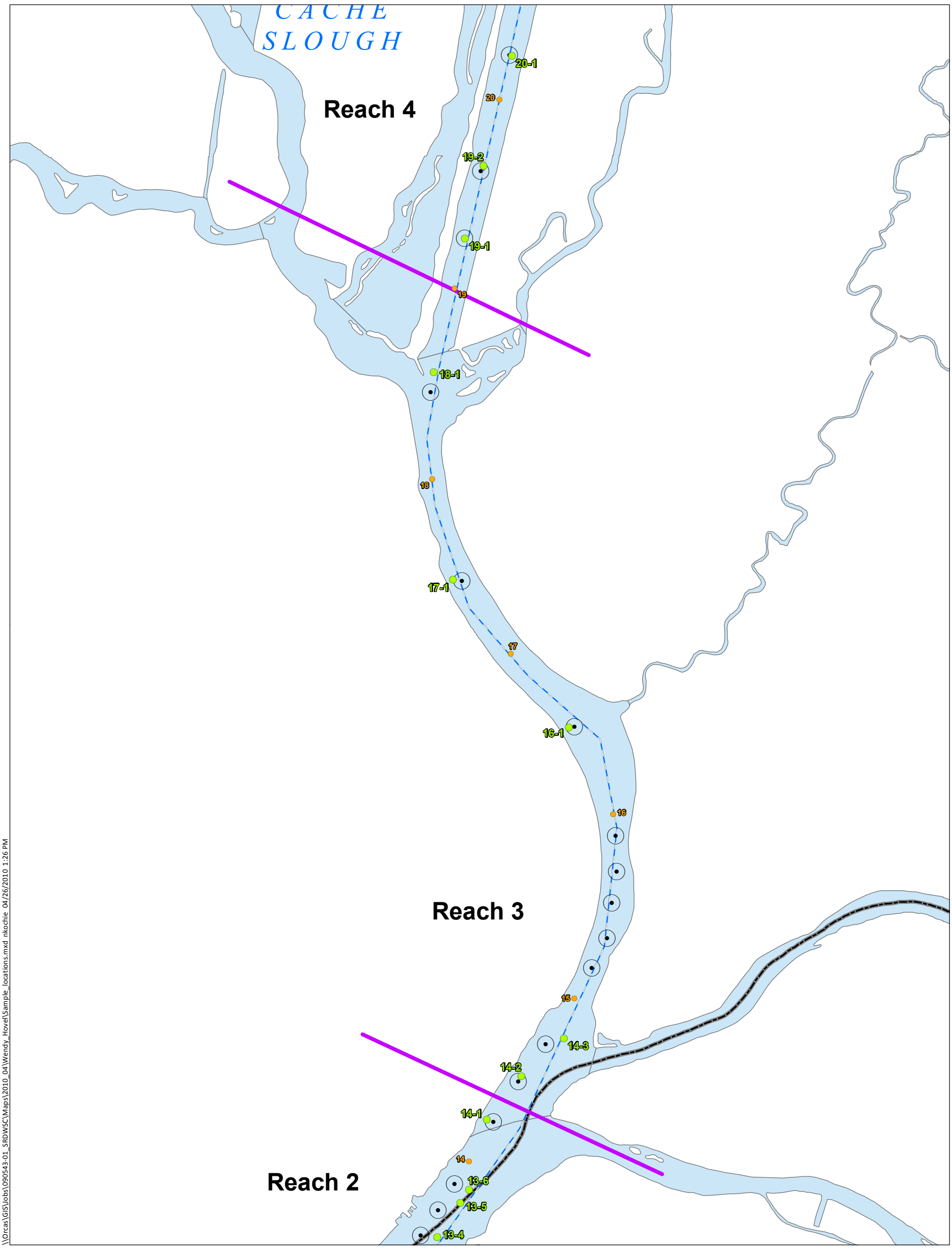
Target and Actual Sediment Sampling Locations
Sacramento River Deep Water Ship Channel Proposed Deepening



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Target and Actual Sediment Sampling Locations
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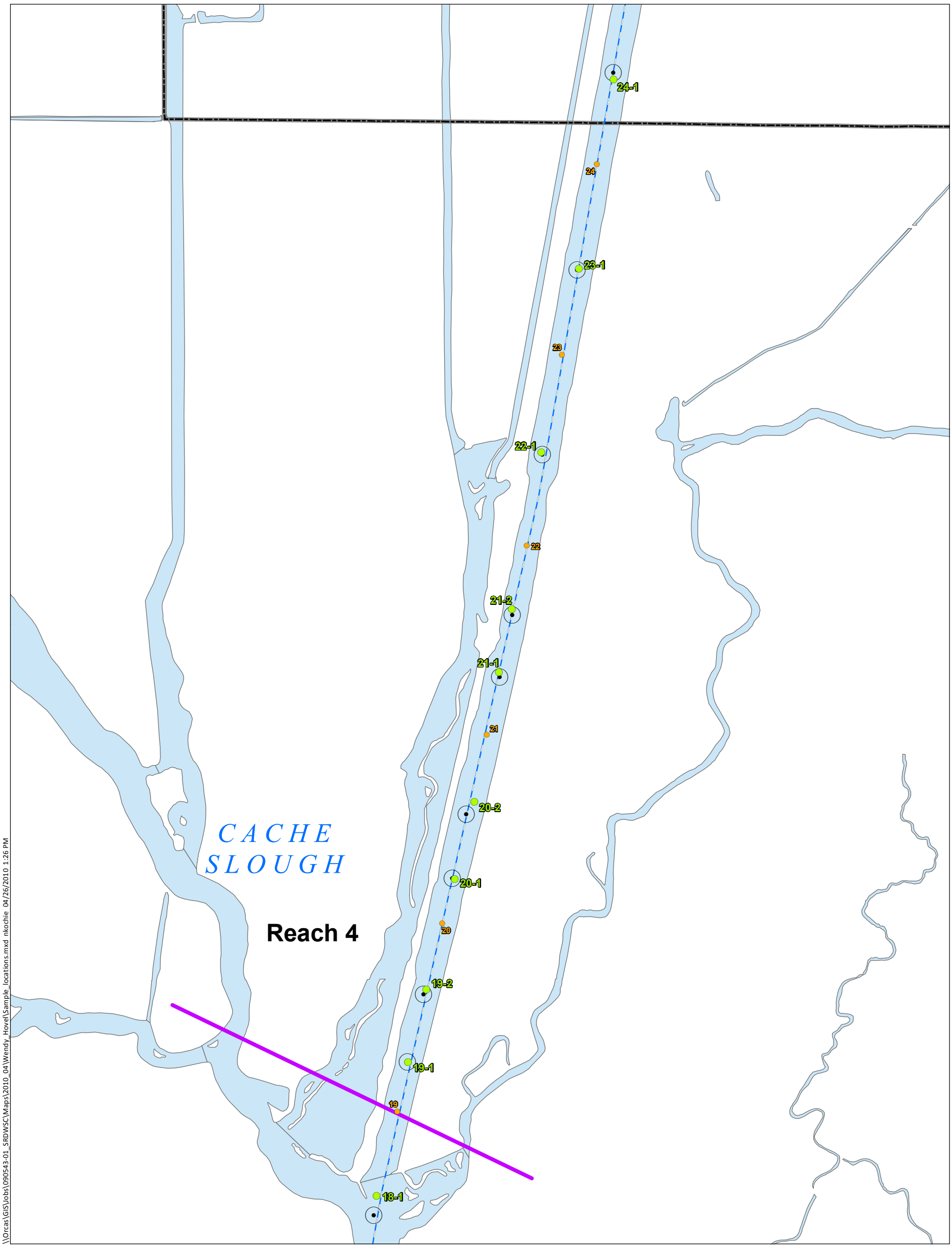

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Target and Actual Sediment Sampling Locations
Sacramento River Deep Water Ship Channel Proposed Deepening

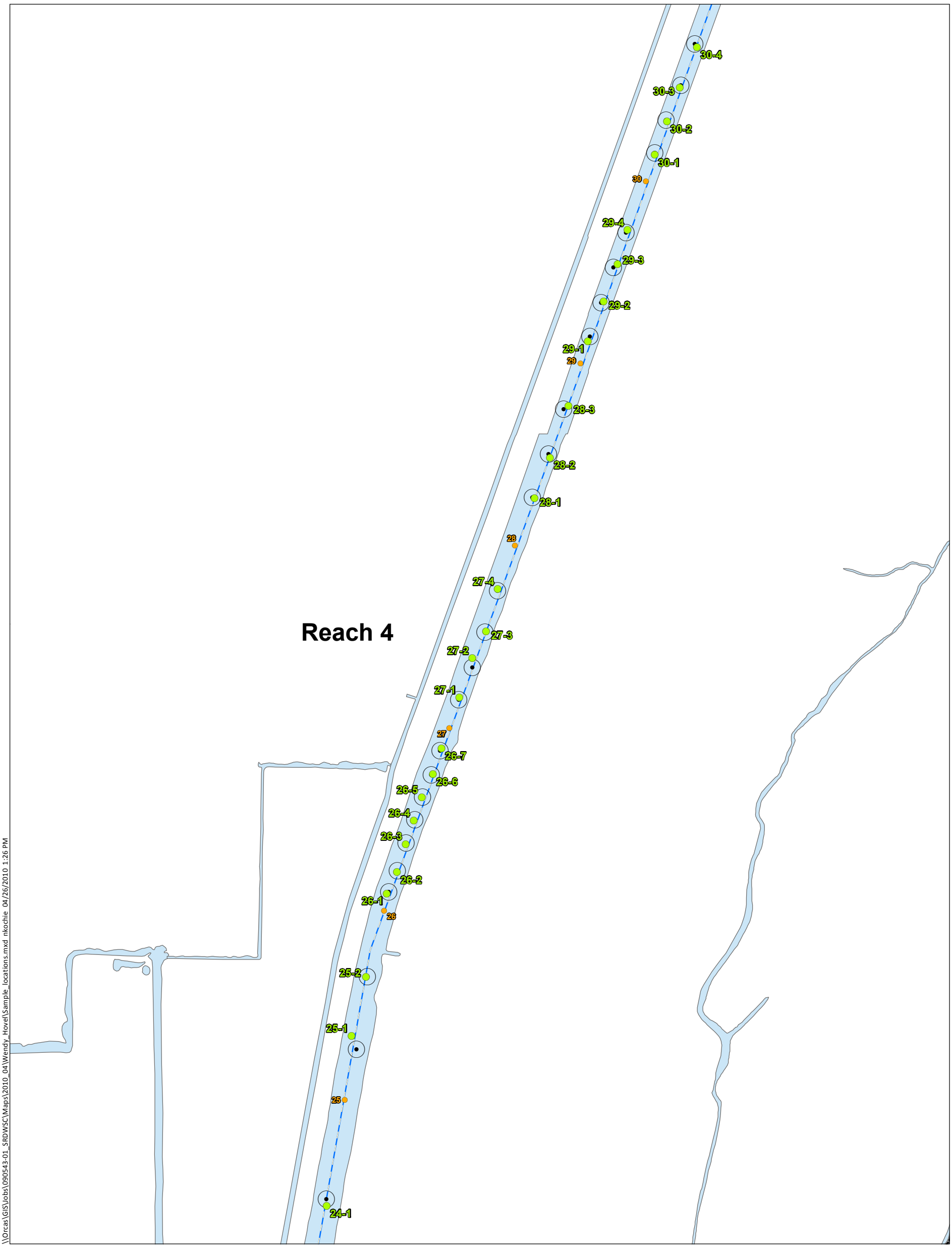


Figure 4g
Target and Actual Sediment Sampling Locations
Sacramento River Deep Water Ship Channel Proposed Deepening

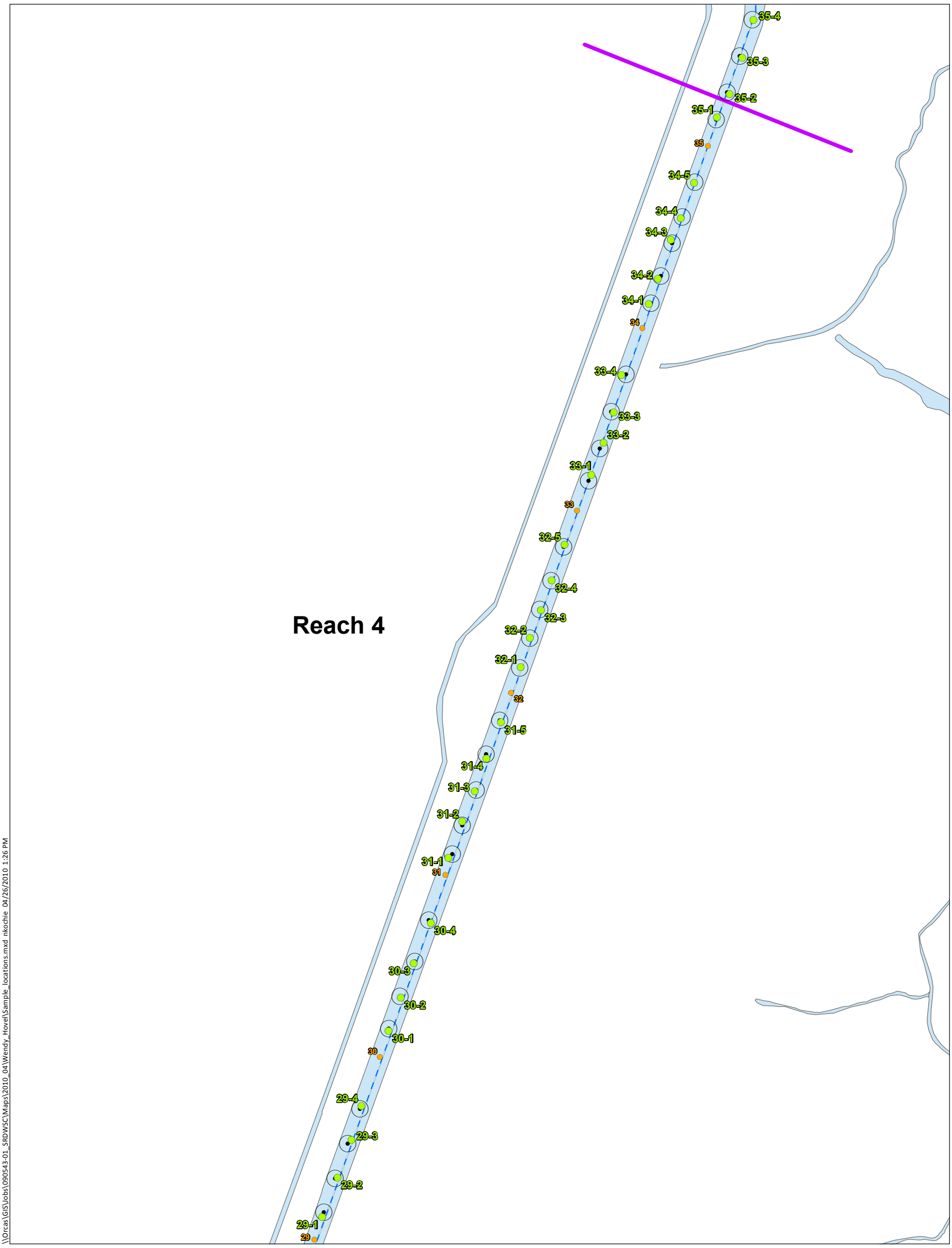


Figure 4h
Target and Actual Sediment Sampling Locations
Sacramento River Deep Water Ship Channel Proposed Deepening

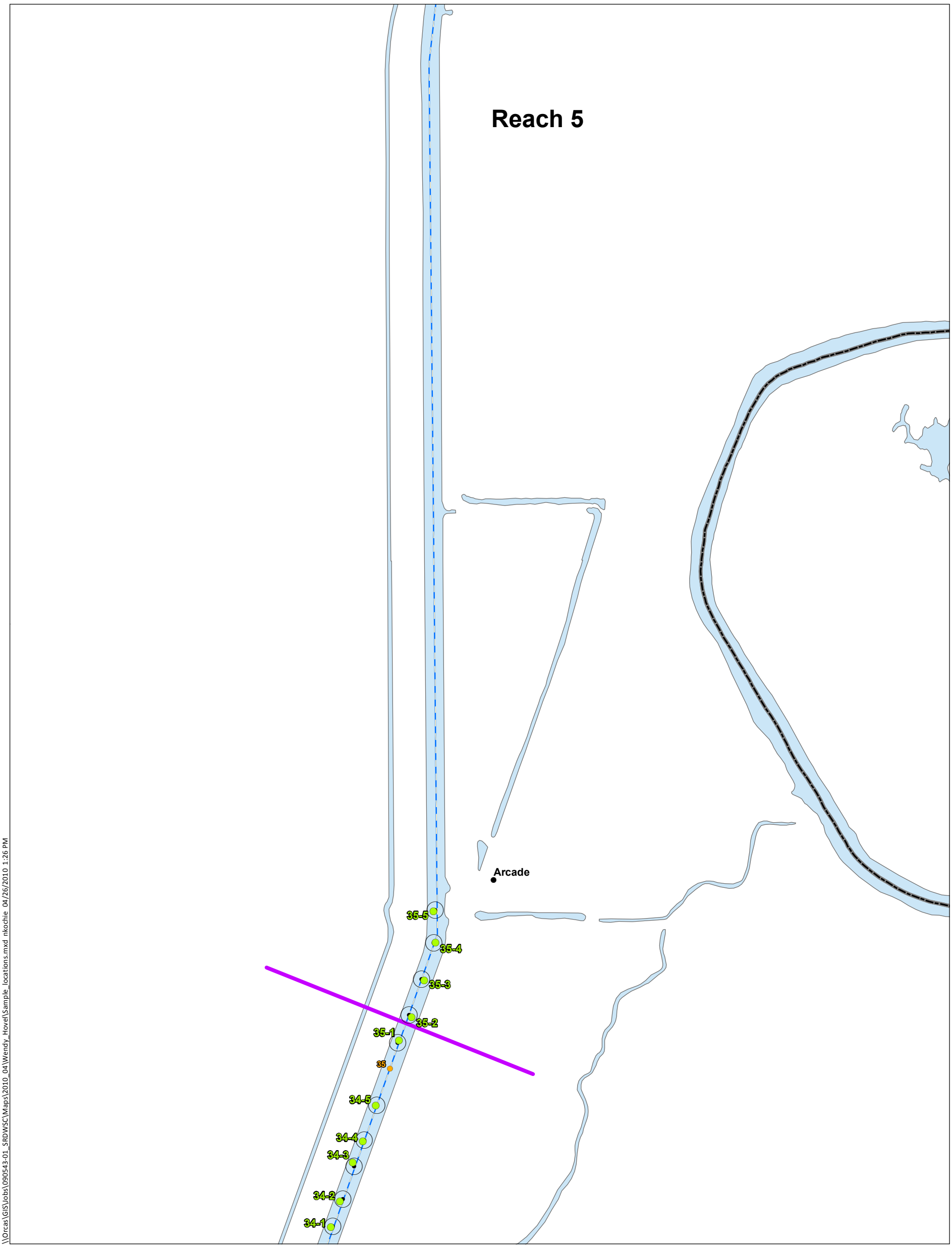
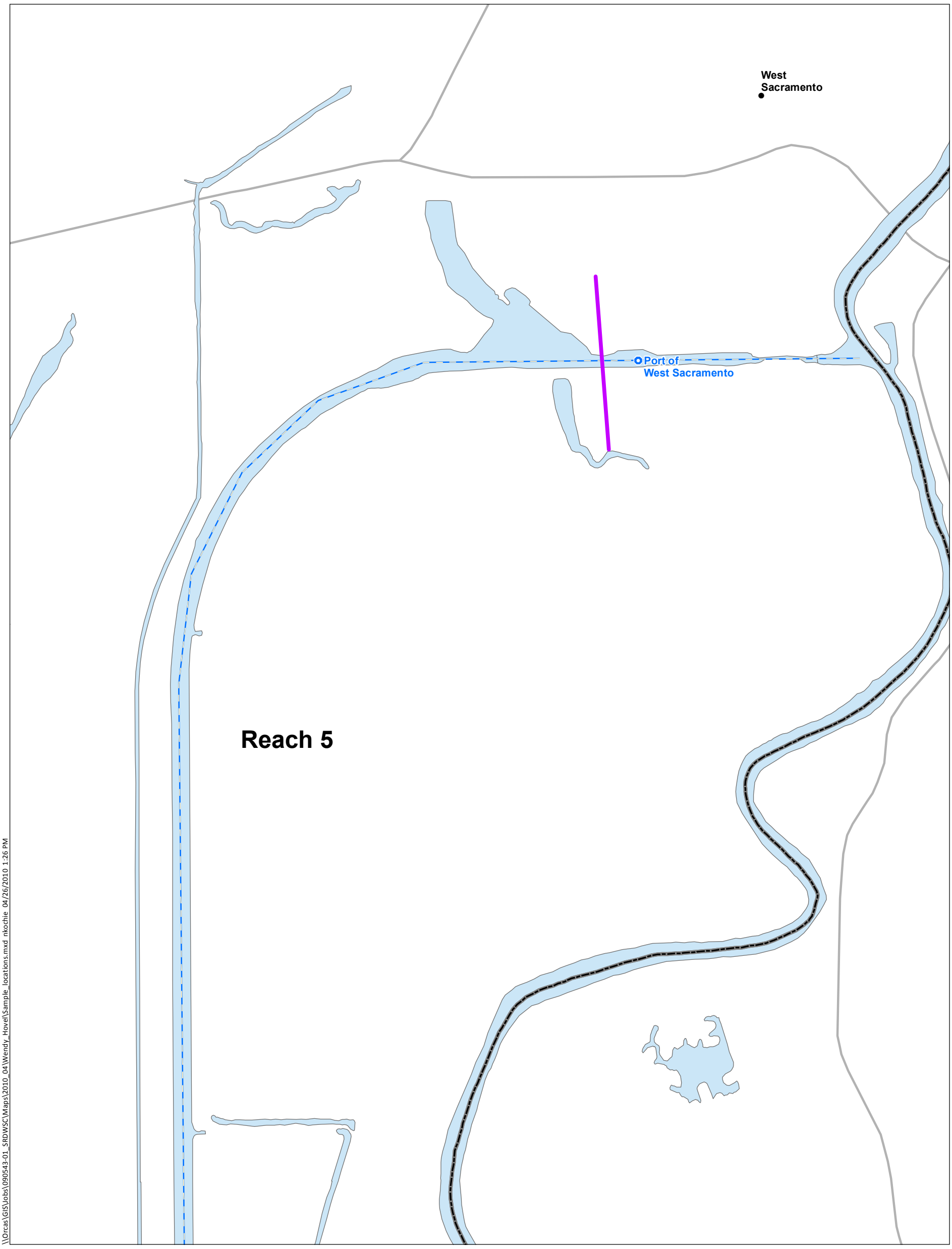


Figure 4i
Target and Actual Sediment Sampling Locations
Sacramento River Deep Water Ship Channel Proposed Deepening



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Target and Actual Sediment Sampling Locations
Sacramento River Deep Water Ship Channel Proposed Deepening

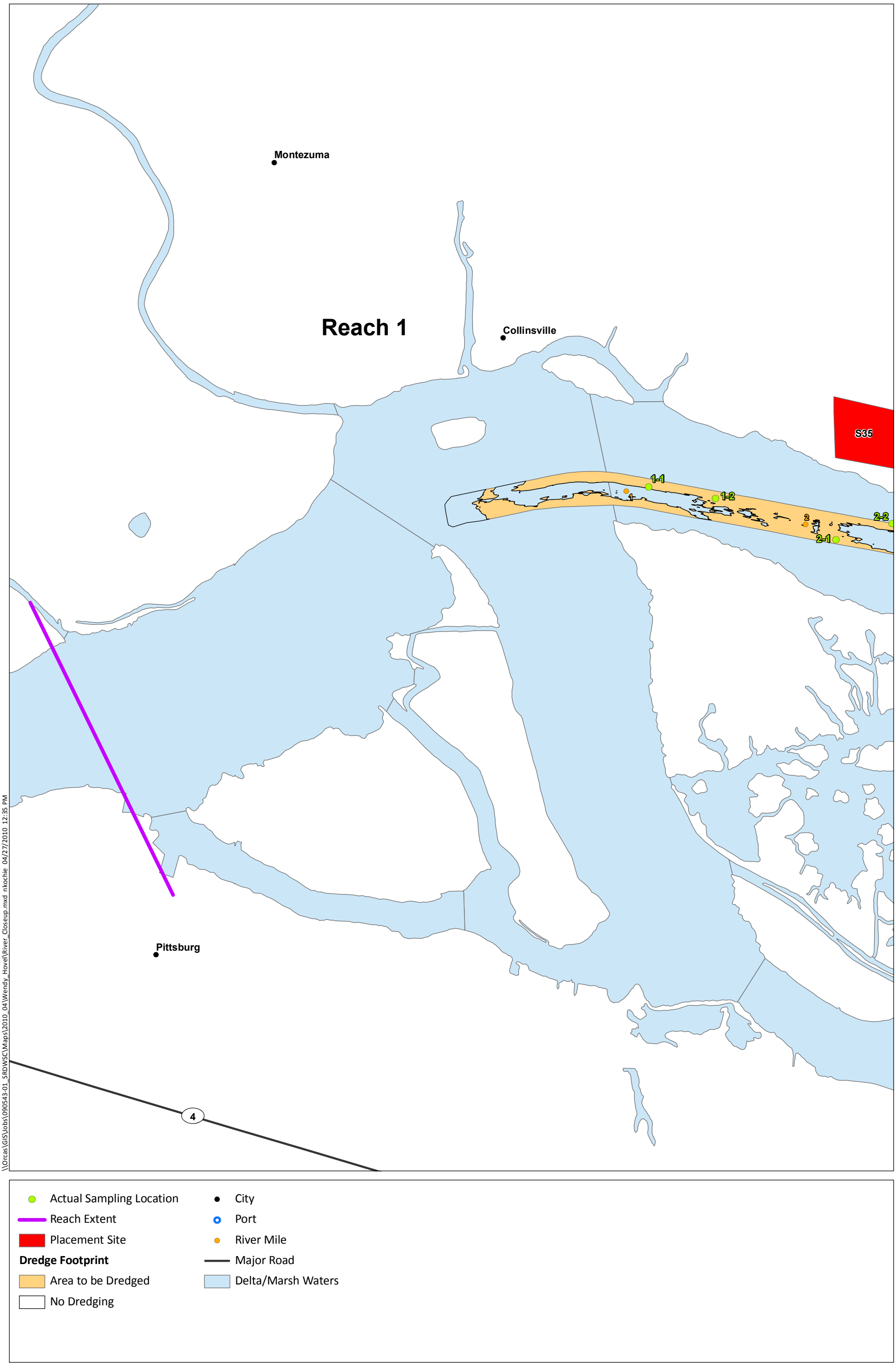
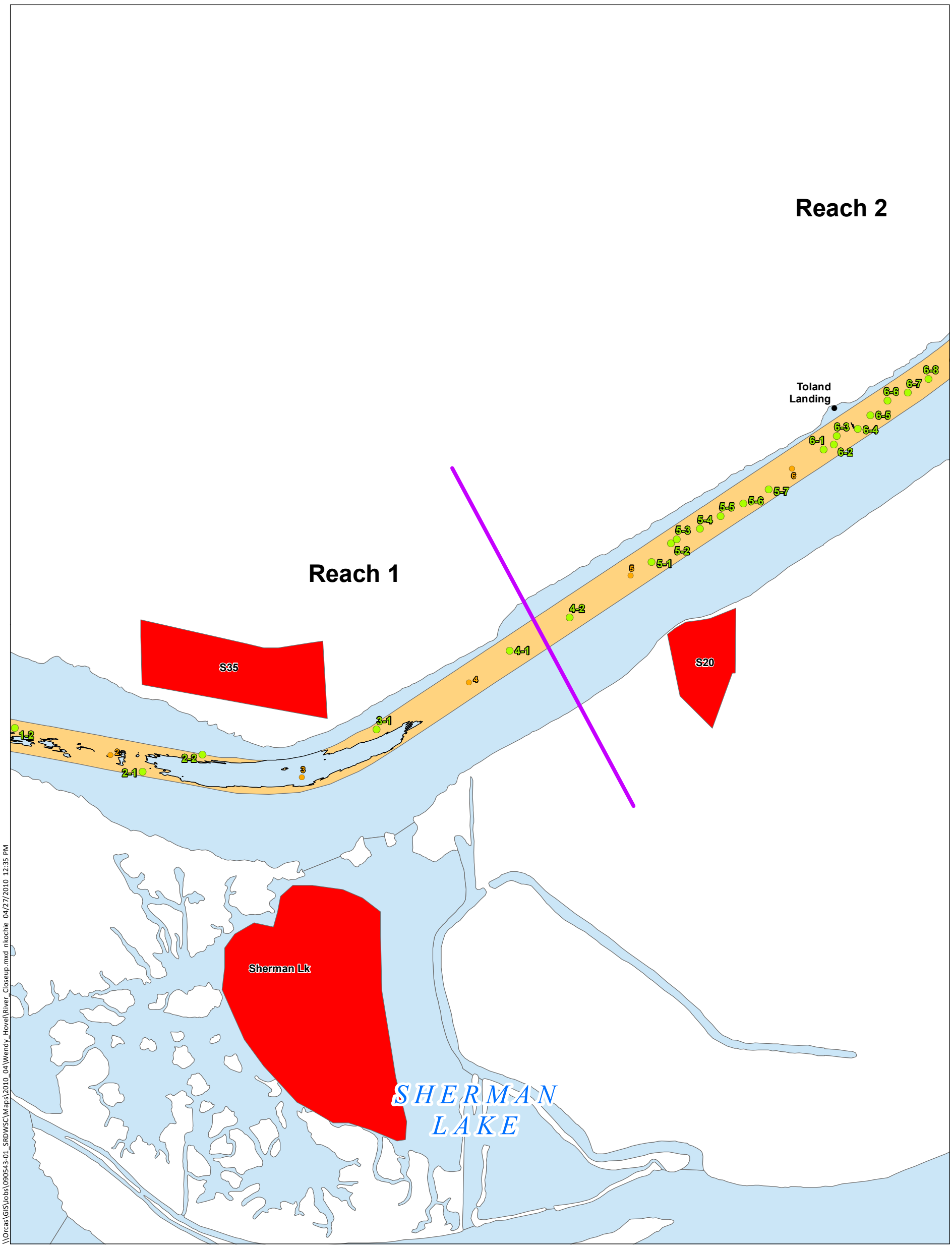


Figure 5a
Actual Sampling Locations in Relationship to the Dredge Footprint
Sacramento River Deep Water Ship Channel Proposed Deepening



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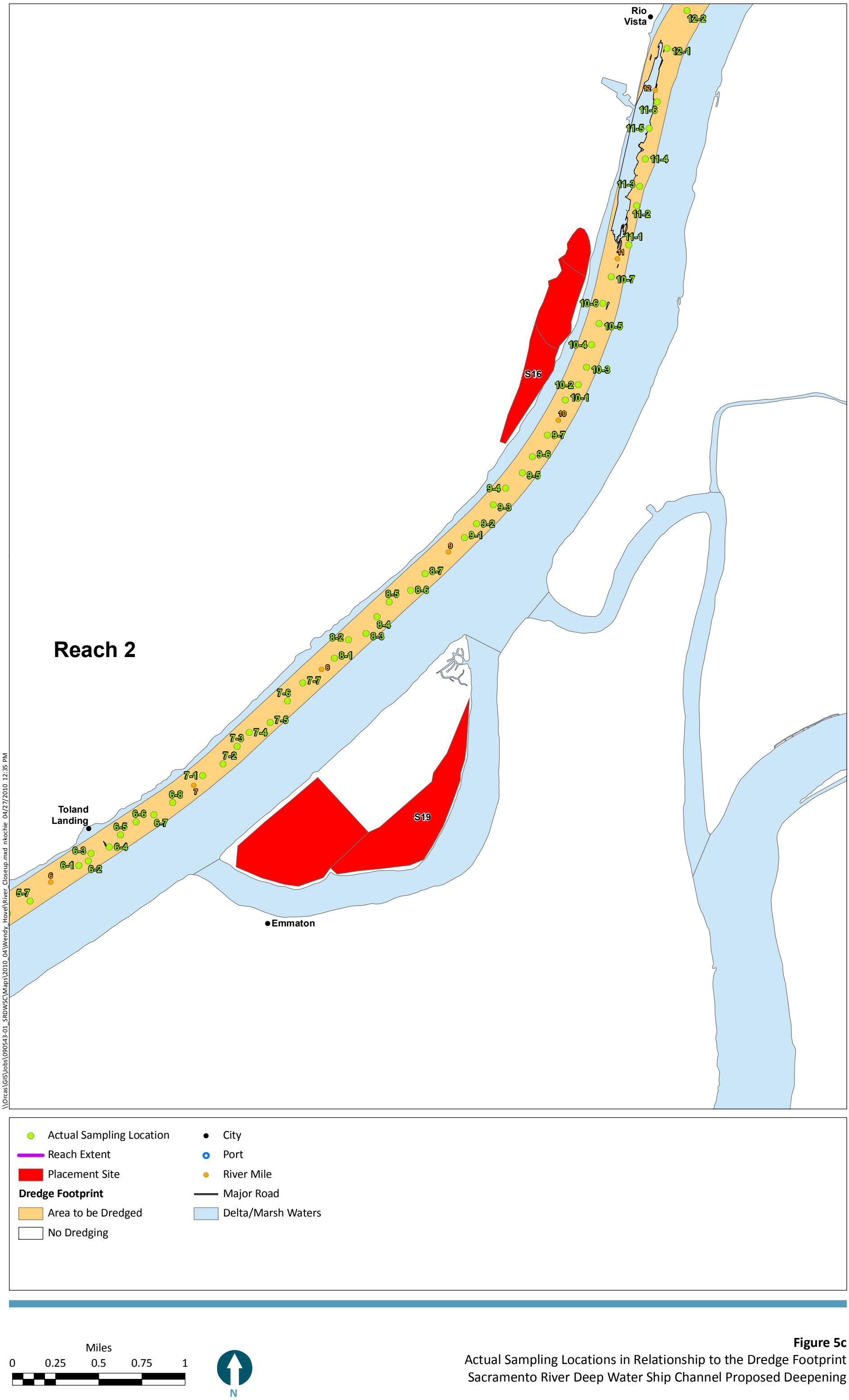
Actual Sampling Locations in Relationship to the Dredge Footprint
Sacramento River Deep Water Ship Channel Proposed Deepening



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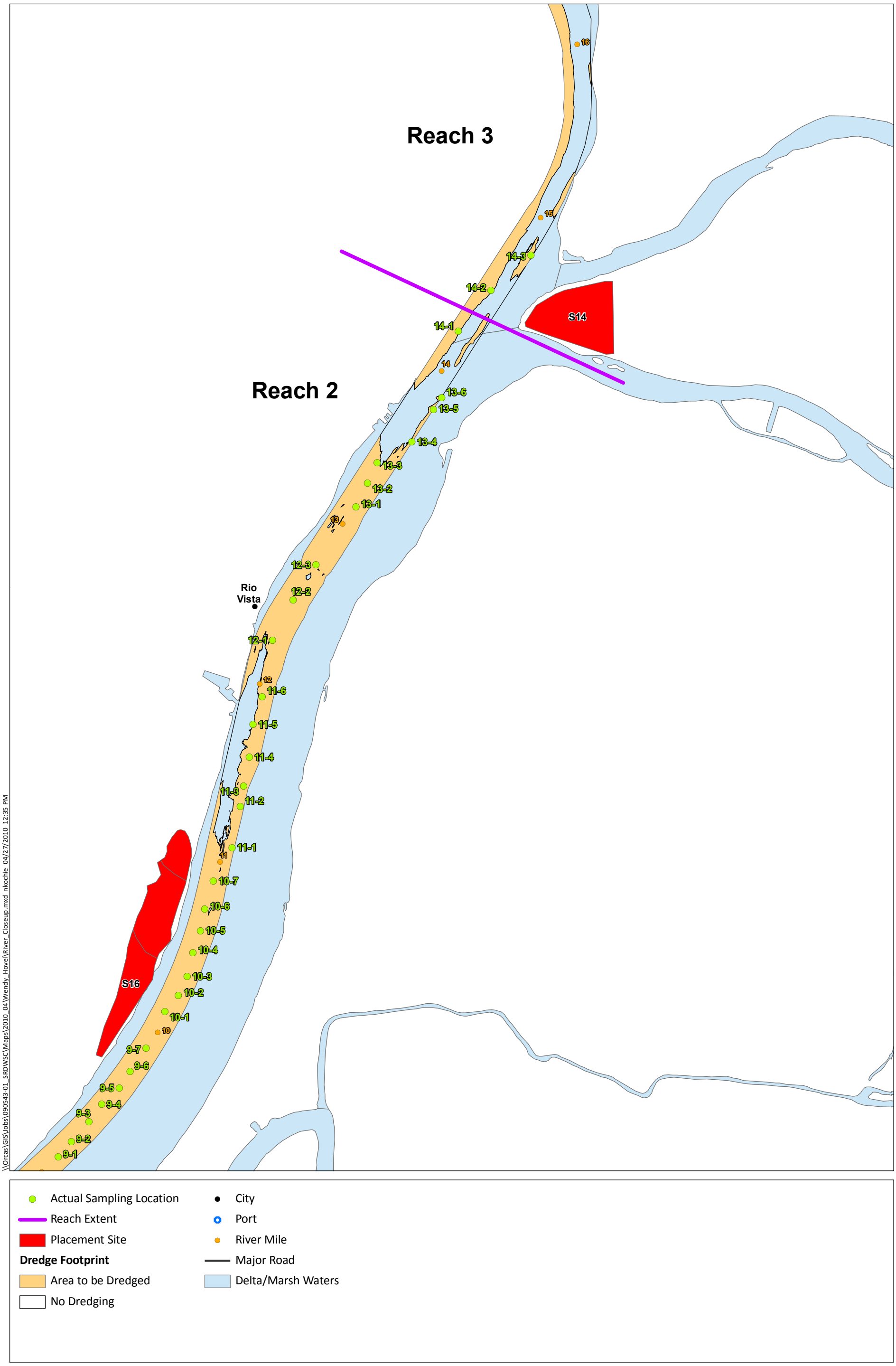
Actual Sampling Locations in Relationship to the Dredge Footprint
Sacramento River Deep Water Ship Channel Proposed Deepening



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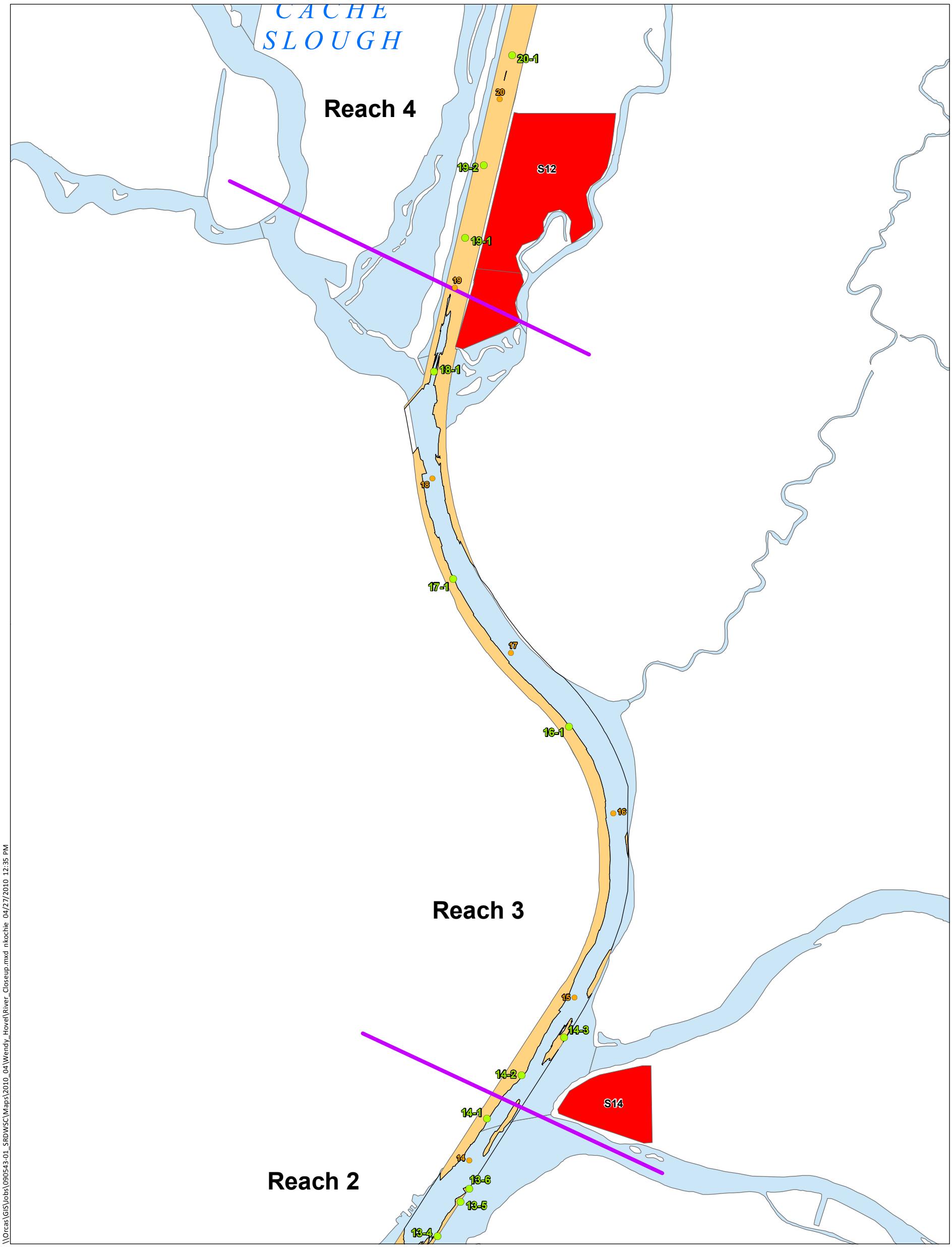
Actual Sampling Locations in Relationship to the Dredge Footprint
Sacramento River Deep Water Ship Channel Proposed Deepening



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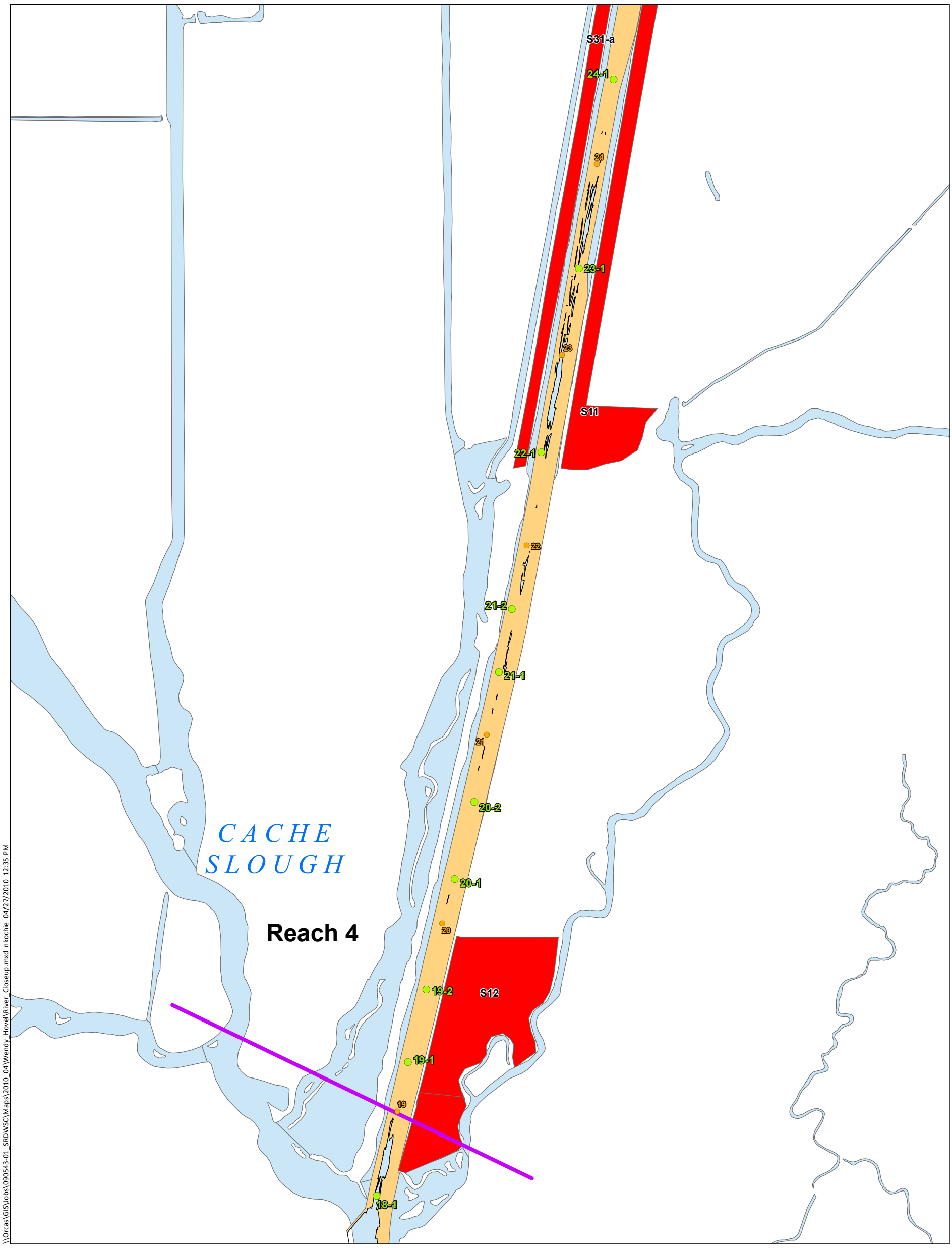

Figure 5f
Actual Sampling Locations in Relationship to the Dredge Footprint
Sacramento River Deep Water Ship Channel Proposed Deepening

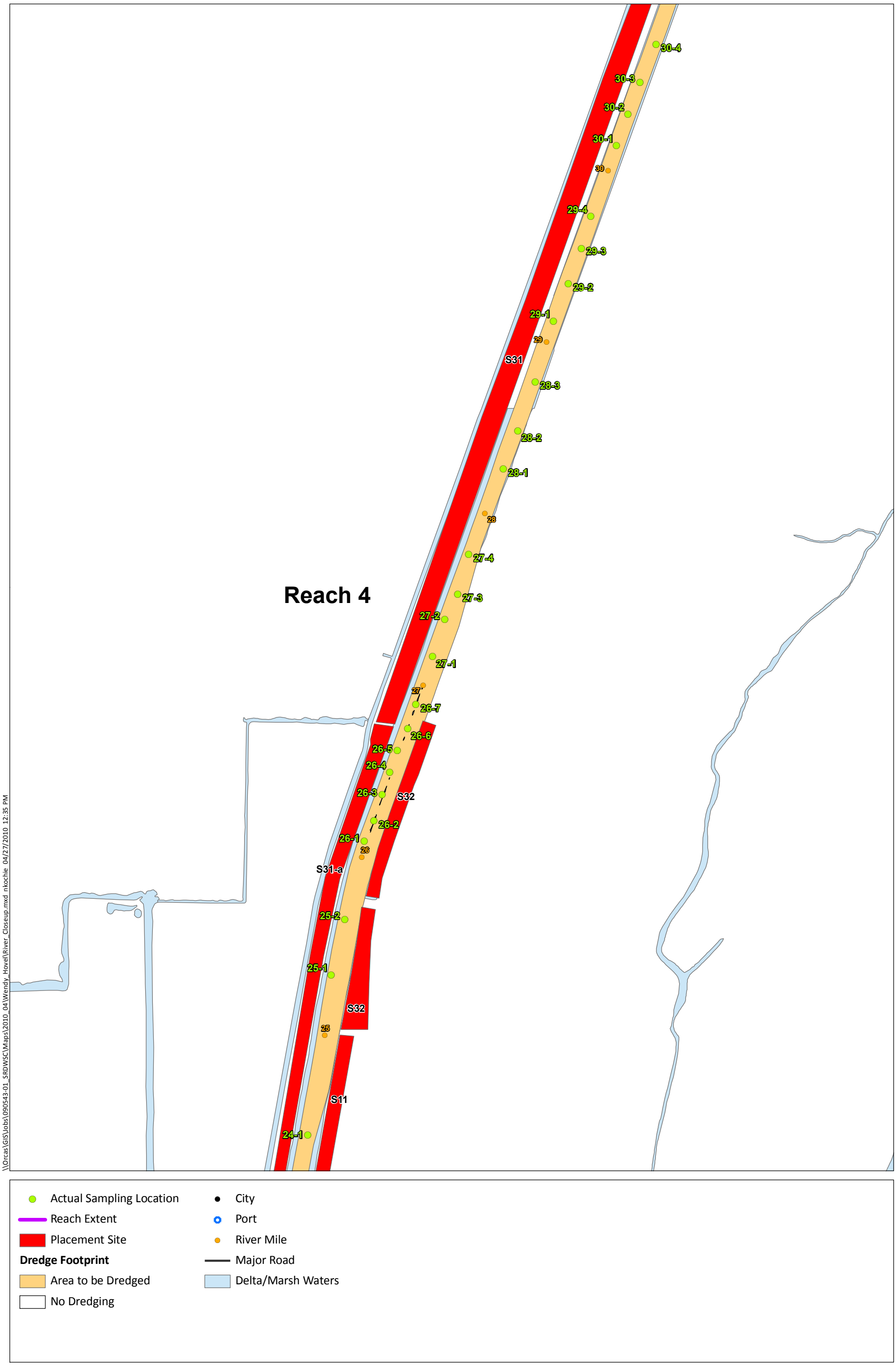

Figure 5g
Actual Sampling Locations in Relationship to the Dredge Footprint
Sacramento River Deep Water Ship Channel Proposed Deepening

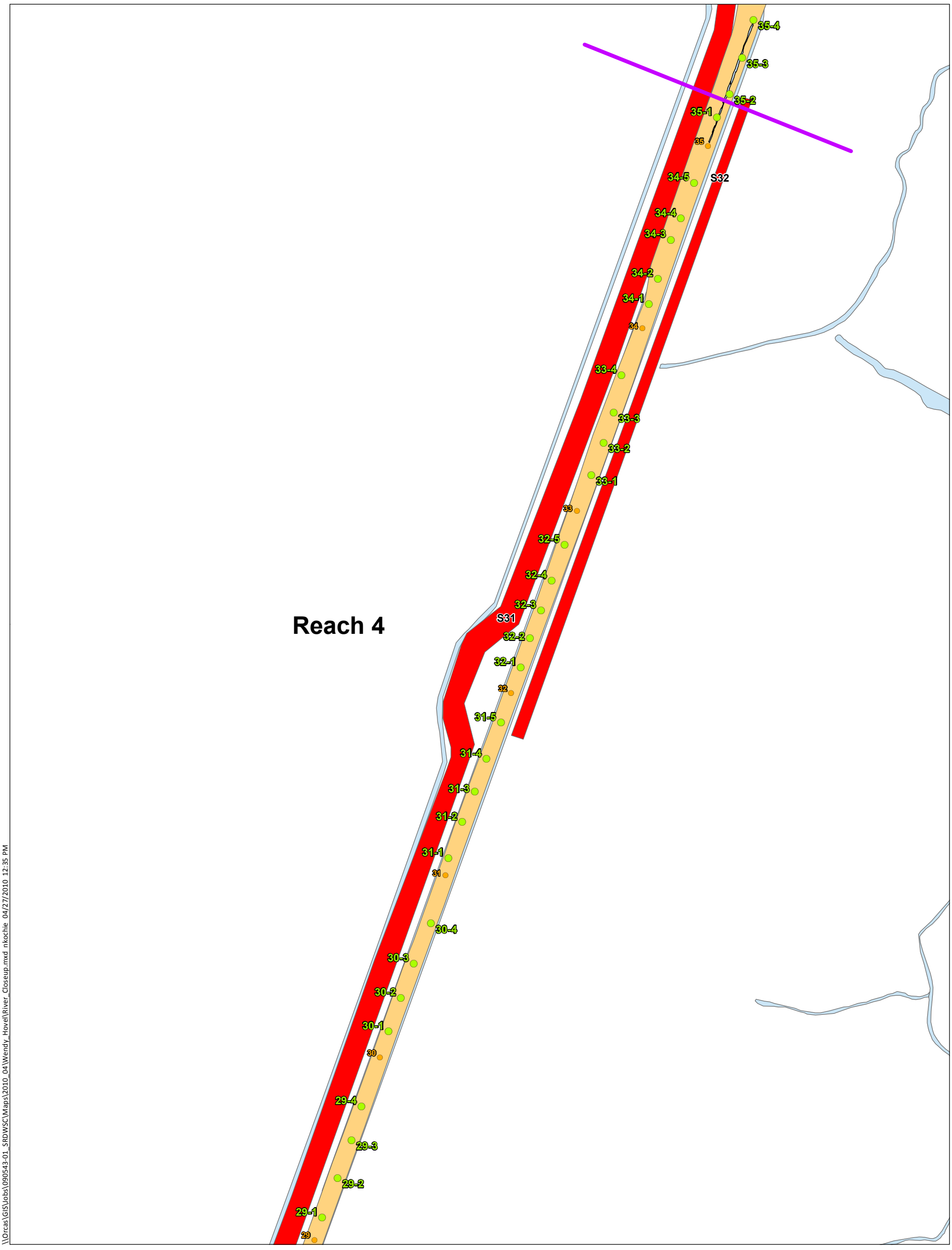

Figure 5h
Actual Sampling Locations in Relationship to the Dredge Footprint
Sacramento River Deep Water Ship Channel Proposed Deepening

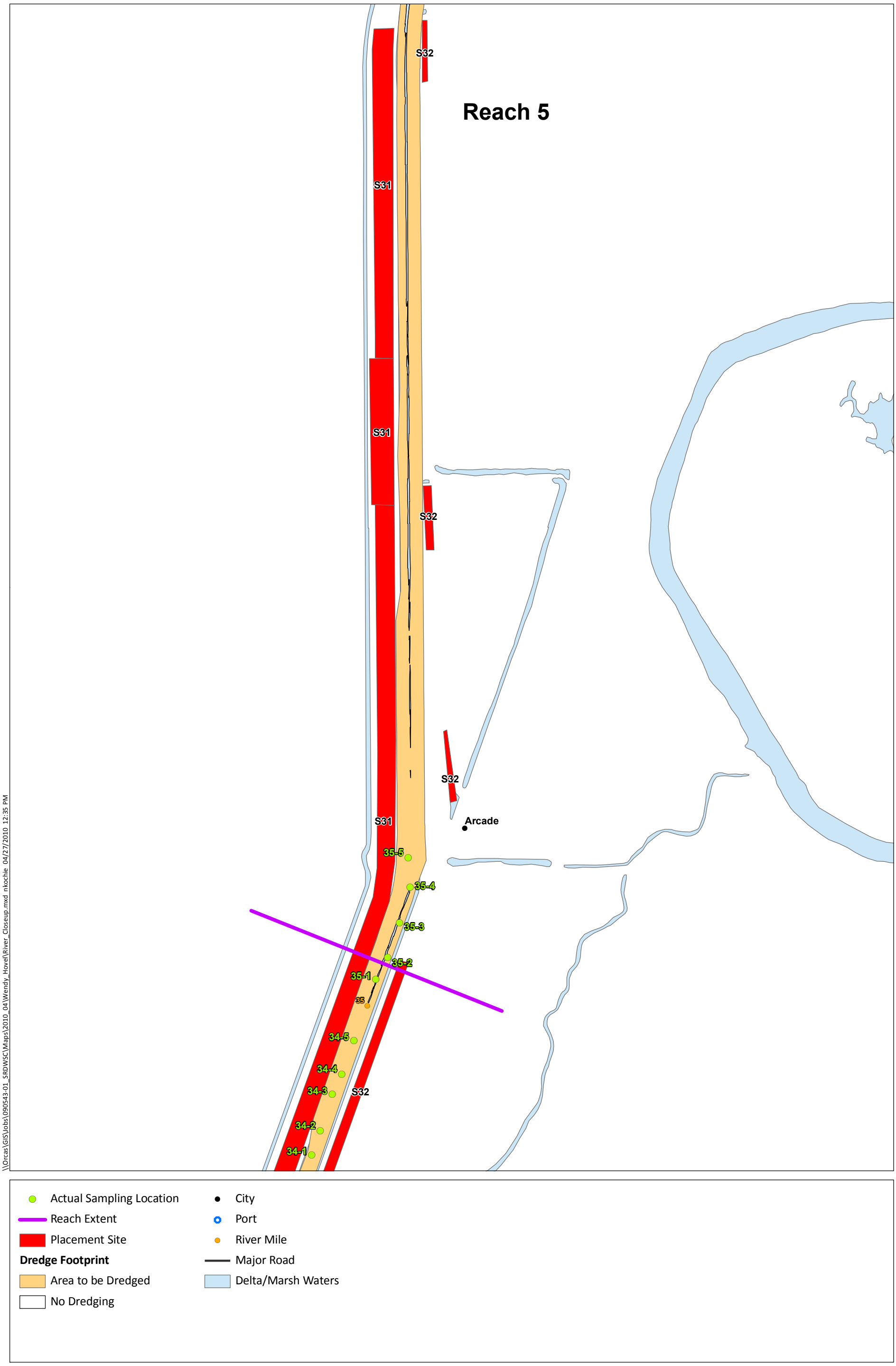

Figure 5i
Actual Sampling Locations in Relationship to the Dredge Footprint
Sacramento River Deep Water Ship Channel Proposed Deepening

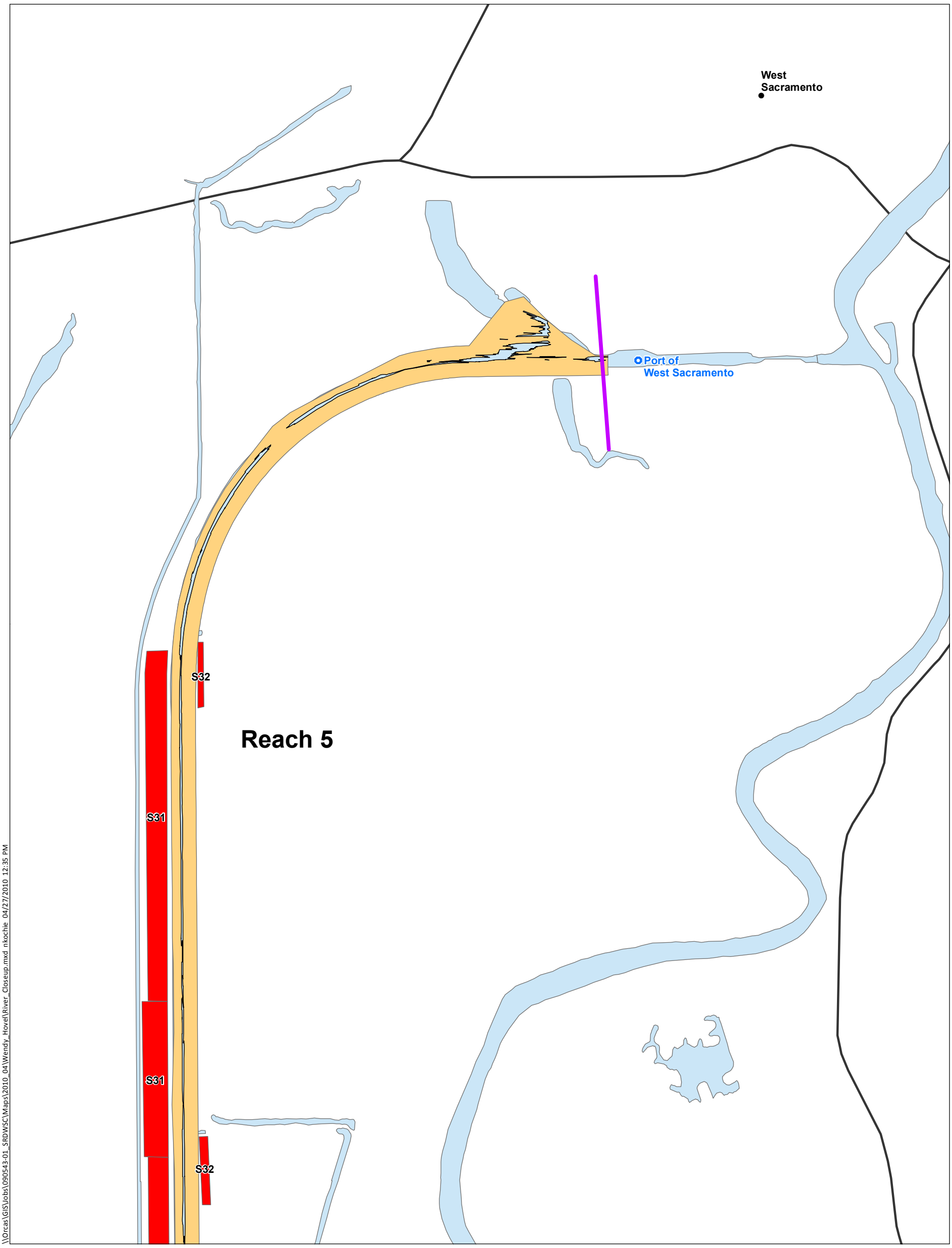

Figure 5j
Actual Sampling Locations in Relationship to the Dredge Footprint
Sacramento River Deep Water Ship Channel Proposed Deepening

APPENDIX A
BULK SEDIMENT METALS, DI-WET, AND MET RESULTS FROM 2001 – 2007

Results from Previous Dredge Material Characterizations in the SRDWSC from 2001-2007

Bulk Metal Summary Results from 2006-07 (mg/kg)

Constituent	2007a	2007b	2006a	2006b	2006c	2006d	2006e	2006f
Arsenic	9.71	11	5.9	4.5	9.3	3	4	3.8
Cadmium	<0.163	<0.186	**2**	1.4	1.9	0.95	0.5	0.93
Total Cr	105	112	59.2	48.3	64.2	37.6	36.4	37.2
Copper	56.7	**73.6**	36.4	22.1	44.6	10	10	11
Lead	10.9	14.2	9.8	6.8	11	3.6	3.6	**41**
Mercury	0.195	0.157	0.109	0.066	0.232	0.025	0.015	0.02
Nickel	211	196	75.2	60.2	71.4	52.1	48.2	50.4
Zinc	99.4	**125**	95.2	69	74.2	38.6	42	53.1

DI-WET Summary Results from 2006-07 (ug/L)

Constituent	2007a	2007b	2006a	2006b	2006c	2006d	2006e	2006f
Arsenic	5.3	8.26	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Cadmium	<2.5	<2.5	<0.5	<0.5	<0.5	<0.5	**0.9**	<0.5
Total Cr	<2.5	5.62	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Copper	6.07	9.08	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Lead	<2.5	<2.5	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Mercury	0.03	0.02	0.08	0.11	0.19	0.02	0.04	0.04
Nickel	3.27	6.92	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Selenium	<2.5	<2.5	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Zinc	63	194	<3.0	<3.0	<3.0	<3.0	5	<3.0

MET Summary Results from 2006-07 (ug/L)

Constituent	2007a	2007b	2006a	2006b	2006c	2006d	2006e	2006f
Arsenic	5.43	3.58	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Cr	1.47	1.49	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Copper	4.43	2.71	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Lead	0.707	<0.5	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Mercury	0.144	0.014	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Nickel	7.05	5.02	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Selenium	<0.5	<0.5	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Zinc	12	10.4	<3.0	4	4	<3.0	<3.0	<3.0

Bulk Metal Summary Results from 2005 (mg/kg)

Constituent	2005a	2005b	2005c	2005d	2005e	2005f	2005g	2005h	2005i
Arsenic	7.3	7.84	4.19	6.09	8.1	10.1	**13.2**	7.58	7.2
Cadmium	0.503	0.548	0.236	0.49	0.246	0.328	0.428	0.378	0.394
Total Cr	63.3	67.5	47.7	61.5	**122**	88	118	107	102
Copper	48.2	53.1	21.9	41.6	49.1	44.3	51.8	57.7	56.4
Lead	15.2	16.5	6.43	11.5	10.7	10.3	15.5	12.8	12.9
Mercury	0.252	0.22	0.053	0.191	0.171	0.087	0.201	0.141	0.154
Nickel	75	81.1	63.7	80.1	205	178	**238**	170	170
Zinc	98.4	110	76.8	102	90.1	82.2	93.5	106	104

DI-WET Summary Results from 2005 (ug/L)

Constituent	2005a	2005b	2005c	2005d	2005e	2005f	2005g	2005h	2005i
Arsenic	1.77	4.6	3.5	3.1	2.4	4.3	4	1.7	1.9
Cadmium	0.096	0.131	0.7	0.135	0.023	0.02	0.026	0.018	0.02
Total Cr	8.24	13.4	9.78	8.55	0.34	0.82	1.14	1.13	0.84
Copper	14.5	25.4	12.5	20.1	1.73	1.96	2.62	1.98	1.87
Lead	3.54	6.42	3.55	4.74	0.011	0.007	0.018	0.019	0.025
Mercury	0.0344	0.0279	0.0214	0.0289	0.0013	0.0013	0.0013	0.0009	0.0009
Nickel	8.61	14.5	9.9	10.2	1.97	2.64	3.48	1.96	2.22
Selenium	1	1	0.5	0.6	0.6	0.6	0.3	0.6	0.6
Zinc	8.96	16	12.2	20.2	20.2	0.39	0.57	0.82	1.17

MET Summary Results from 2005 (ug/L)

Constituent	2005a	2005b	2005c	2005d	2005e	2005f	2005g	2005h	2005i
Arsenic	4.5	4.5	1.5	1.1	7.4	5.1	3.9	7.1	**10.3**
Cadmium	0.06	0.056	0.051	0.088	0.016	0.096	.0.39	0.044	0.021
Total Cr	0.44	0.48	0.41	0.32	0.36	0.42	0.69	0.79	1.01
Copper	2.98	5.32	2.89	4.09	1.53	1.59	2.53	1.85	1.84
Lead	0.111	0.04	0.084	0.15	0.023	0.094	0.027	0.011	0.018
Mercury	0.0748	0.241	0.386	**0.865**	0.0174	0.0083	0.0153	0.0083	0.009
Nickel	2.37	2.13	0.9	1.56	2.18	2.78	4.28	4.91	4.78
Selenium	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Zinc	1.53	2	2.42	2.09	1.06	1.22	0.84	0.84	1.64

Bulk Metal Summary Results from 2002-03 (mg/kg)

Constituent	2003a	2003b	2003c	2003d	2003e	2002a	2002b
Arsenic	10.6	7.7	7.6	8.6	7.4	8.5	4.8
Cadmium	0.59	0.79	0.41	1.8	0.59	0.31	0.65
Total Cr	68.8	76.3	87.5	95.5	102	85.3	50.8
Copper	39	57.4	55.9	56.6	64	60	20.7
Lead	12	13.4	11.6	16.1	13	13.7	6.2
Mercury	0.16	0.23	0.19	0.29	0.19	**0.68**	0.61
Nickel	98.4	98.8	145	160	168	108	67.7
Zinc	101	114	98.7	102	116	122	61.2

DI-WET Summary Results from 2002-03 (ug/L)

Constituent	2003a	2003b	2003c	2003d	2003e	2002a	2002b
Arsenic	**42.3**	38.4	4.5	20.6	28.6	21.1	15.2
Cadmium	<2	<2	<2	<2	<2	0.03	0.33
Total Cr	78	101	37.4	116	121	**193**	141
Copper	140	**195**	73	140	157	132	105
Lead	28.7	**148**	7.5	61.1	28.8	37.1	32.9
Mercury	**15**	0.18	0.091	0.16	0.23	0.29	0.22
Nickel	105	131	63.2	195	**206**	204	148
Selenium	<10	<10	<10	<10	<10	2.6	**3.6**
Zinc	110	145	41.5	115	139	211	**251**

MET Summary Results from 2002-03 (ug/L)

Constituent	2003a	2003b	2003c	2003d	2003e	2002a	2002b
Arsenic	4.5	7.6	5.1	<5	2.3	4.1	4.2
Cadmium	<2	**18.7**	<2	<2	<2	<2	<2
Total Cr	10	**18.6**	3.9	3.3	3	3.7	1.2
Copper	10.8	**13.4**	6.7	5.7	5.1	7.1	5.6
Lead	2.2	3.3	1.5	<2.5	2	1.7	1.2
Mercury	0.1	0.099	0.068	0.057	0.051	0.12	0.099
Nickel	14.3	**40.7**	9.6	7.3	5.8	3	1.8
Selenium	<5	<5	<5	**4.1**	<5	2.1	2.2
Zinc	12.3	**59.3**	8.3	14.3	5.1	7.7	2.2

Bulk Metal Summary Results from 2001 (mg/kg)

Constituent	2001a	2001b	2001d	2001d	2001e	2001f
Arsenic	6.3	6.4	3.1	3.3	8.5	5.6
Cadmium	0.26	<0.10	<0.10	<0.10	0.35	0.2
Total Cr	120	96	72	61	90	78
Copper	33	30	11	10	41	26
Lead	12	6.8	4.8	5	20	11
Mercury	<0.10	<0.10	0.25	0.043	0.28	0.12
Nickel	83	70	42	41	55	50
Zinc	120	66	38	37	92	72

DI-WET Summary Results from 2001 (ug/L)

Constituent	2001a	2001b	2001d	2001d	2001e	2001f
Arsenic	<5	7.3	<5	<5	<5	6.5
Cadmium	<2	<2	<2	<2	<2	<2
Total Cr	<25	<25	<25	<25	<25	<25
Copper	<5	<5	<5	<5	<5	34
Lead	<1	<1	<1	<1	5.33	<1
Mercury	<0.025	<0.025	<0.025	<0.025	0.033	0.06
Nickel	<26	<26	<26	<26	<26	<26
Selenium	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Zinc	<50	<50	<50	<50	<50	<50

MET Summary Results from 2001 (ug/L)

Constituent	2001a	2001b	2001d	2001d	2001e	2001f
Arsenic	<5	7.3	<5	<5	<5	6.5
Cadmium	<2	<2	<2	<2	<2	<2
Total Cr	<25	<25	<25	<25	<25	<25
Copper	<5	<5	<5	<5	<5	<5
Lead	5.4	5.5	<1	<1	7.4	**11**
Mercury	<0.025	<0.025	<0.025	<0.025	0.033	0.06
Nickel	<26	<26	<26	<26	<26	<26
Selenium	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Zinc	<50	<50	<50	<50	<50	<50

Bolded values indicate the maximum detected concentration for that analysis and constituent.

APPENDIX B
FIELD CORE LOGS

APPENDIX C
RAW ANALYTICAL REPORTS

APPENDIX D
COLUMN SETTLING TEST REPORT

APPENDIX E
POWER ANALYSIS RESULTS

APPENDIX F
DATA VALIDATION RESULTS

APPENDIX G
STATISTICAL CORRELATION RESULTS