Table D9. Emission Factors for Mining Equipment (2014) with Required Airborne Toxic Control Measures.

Equipment Name	Type	Manufacture Year [a]	Horsepower [a]	Load Factor [b]	Emission Factor (g/bhp-hr) [c,d]					Emission Rate (lb/hr)				
					NOx	PM	ROG	CO	CO2	NOx	PM	ROG	CO	CO2
Hanson American River	Tug (2 engines)	2003	1,710	0.5	6.93	0.29	0.68	1.97	568.3	13.1	0.5	1.3	3.7	1,071.2
Hanson San Joaquin River	Tug (2 engines)	2001	2,600	0.5	6.93	0.29	0.68	1.97	568.3	19.9	0.8	1.9	5.6	1,628.8
Hanson TS & G	Barge - Main Engine	1983	1,000	0.52	3.92	0.36	0.95	3.07	568.3	4.5	0.4	1.1	3.5	651.5
	Barge - Generator (Aux)	1984	265	0.43	3.79	0.32	1.07	4.33	568.3	1.0	0.1	0.3	1.1	142.8
	Barge - Thruster (Aux)	1984	304	0.43	3.79	0.32	1.07	4.33	568.3	1.1	0.1	0.3	1.2	163.8
Hanson DS-10	Barge - Main Engine	2001	1,100	0.52	6.93	0.29	0.68	1.97	568.3	8.7	0.4	0.9	2.5	716.7
	Barge - Monitor Pump (Aux)	2002	440	0.43	6.93	0.26	0.81	2.78	568.3	2.9	0.1	0.3	1.2	237.0
	Barge - Flood Pump (Aux)	2002	440	0.43	6.93	0.26	0.81	2.78	568.3	2.9	0.1	0.3	1.2	237.0
	Barge - Generator (Aux)	1984	375	0.43	4.73	0.32	1.07	4.33	568.3	1.7	0.1	0.4	1.5	202.0
Jerico Tug	Tug (2 engines)	2001	1,060	0.5	6.93	0.29	0.68	1.97	568.3	8.1	0.3	0.8	2.3	664.0
	Tug (generator)	2000	64	0.31	6.93	0.46	1.18	3.59	568.3	0.3	0.0	0.1	0.2	24.9
Jerico Barge	Barge Generator (Aux)	2004	99	0.43	4.62	0.46	1.18	3.59	568.3	0.4	0.0	0.1	0.3	53.3
	Barge Pump (Aux)	2001	230	0.43	6.93	0.26	0.81	2.78	568.3	1.5	0.1	0.2	0.6	123.9
Jerico Loader	Loader	2007	195	0.43	4.83	0.12	0.81	3.73	568.3	0.9	0.0	0.1	0.7	105.1

[a] Provided by Project Applicants.

[b] Based on information provided in Appendix B - Emissions Estimation Methodology for Commercial Harbor Craft Operating in California, from CARB's *Technical Support Document: Initial Statement of Reason for Proposed Rule Making, Proposed Regulation for Commercial Harbor Craft*, September 2007.

[c] Assumes all Hanson engines manufactured in or prior to 1985 would meet USEPA Tier 2 NOx standard of 7.8 grams per kilowatt-hour (5.8 grams per brake-horsepower hour) by 2013 and that all Jerico engines met the USEPA Tier 2 NOx standard of 7.8 grams per kilowatt-hour (5.8 grams per brake-horsepower hour) by 2010.

[d] CO2 emission factors derived from OFFROAD2007. Represents CO2 emission factors for diesel fueled engines.

Emissions_REV_BASELINE_2002-07 vs Actual 2009-11 12_10_11.xls

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Table D10. Emission Rates by Activity (2014) w/ATCM

Equipment - Activity	Emission Rate (lb/hr-equipment)				
	NOx	PM	ROG	CO	CO2
Hanson TS&G 230 - Mining					
San Joaquin Tug	19.9	0.8	1.9	5.6	1,628.8
TS&G - Barge - Main	4.5	0.4	1.1	3.5	651.5
TS&G - Barge - Gen - Aux	1.0	0.1	0.3	1.1	142.8
Total	***25.3***	***1.3***	***3.3***	***10.3***	***2,423.0***
Hanson TS&G 230 - Cruising					
San Joaquin Tug	19.9	0.8	1.9	5.6	1,628.8
TS&G - Barge - Gen - Aux	1.0	0.1	0.3	1.1	142.8
Total	***20.8***	***0.9***	***2.2***	***6.7***	***1,771.5***
Hanson TS&G 230 - Unloading					
TS&G - Barge - Main	4.5	0.4	1.1	3.5	651.5
TS&G - Barge - Gen - Aux	1.0	0.1	0.3	1.1	142.8
Total	***5.4***	***0.5***	***1.4***	***4.6***	***794.3***
Hanson DS-10 - Mining					
American River Tug	13.1	0.5	1.3	3.7	1,071.2
DS-10 - Barge (Main)	8.7	0.4	0.9	2.5	716.7
DS-10 - Barge (Generator)	1.7	0.1	0.4	1.5	202.0
Total	***23.5***	***1.0***	***2.5***	***7.7***	***1,989.9***
Hanson DS-10 - Cruising					
American River Tug	13.1	0.5	1.3	3.7	1,071.2
DS-10 - Barge (Generator)	1.7	0.1	0.4	1.5	202.0
Total	***14.7***	***0.7***	***1.7***	***5.3***	***1,273.3***
Hanson DS-10 - Unloading					
Barge - Main	8.7	0.4	0.9	2.5	716.7
Barge - Monitor Pump - Aux	2.9	0.1	0.3	1.2	237.0
Barge - Flood Pump- Aux	2.9	0.1	0.3	1.2	237.0
Barge - Gen - Aux	1.7	0.1	0.4	1.5	202.0
Total	***16.2***	***0.7***	***1.9***	***6.3***	***1,392.8***
Jerico Barge - Mining					
Jerico Barge - Generator	0.4	0.0	0.1	0.3	53.3
Jerico Barge - Monitor	1.5	0.1	0.2	0.6	123.9
Total	***1.9***	***0.1***	***0.3***	***0.9***	***177.2***
Jerico Barge - Cruising					
Jerico Tug - Main	8.1	0.3	0.8	2.3	664.0
Jerico Barge - Generator	0.4	0.0	0.1	0.3	53.3
Total	***8.5***	***0.4***	***0.9***	***2.6***	***717.4***
Jerico Unloading					
Loader	0.9	0.0	0.1	0.7	105.1
Total	***0.9***	***0.0***	***0.1***	***0.7***	***105.1***

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Emissions_REV_BASELINE_2002-07 vs Actual 2009-11 12_10_11.xls

Table D11. Annual Emissions (2014) with Required Airborne Toxic Control Measures.

Barge	Mining Events	Activity	Hours	Emission Rates (lb/hr)					Annual Emissions (tons per year)				
				NOx	PM	ROG	CO	CO2	NOx	PM	ROG	CO	CO2
Hanson (TS&G 230)	158	Cruising	2	20.8	0.9	2.2	6.7	1,771.5	3.3	0.1	0.4	1.1	279.9
		Mining	5.5	25.3	1.3	3.3	10.3	2,423.0	11.0	0.6	1.4	4.5	1,052.8
		Unloading	4	5.4	0.5	1.4	4.6	794.3	1.7	0.2	0.4	1.5	251.0
									16.0	***0.9***	***2.2***	***7.0***	***1583.7***
Hanson (DS-10)	0	Cruising	2	14.7	0.7	1.7	5.3	1,273.3	0.0	0.0	0.0	0.0	-
		Mining	5.5	23.5	1.0	2.5	7.7	1,989.9	0.0	0.0	0.0	0.0	-
		Unloading	4	16.2	0.7	1.9	6.3	1,392.8	0.0	0.0	0.0	0.0	-
									0.0	***0.0***	***0.0***	***0.0***	***0.0***
Suisun Associates (TS&G 230)	11	Cruising	2	20.8	0.9	2.2	6.7	1,771.5	0.2	0.0	0.0	0.1	19.5
		Mining	5.5	25.3	1.3	3.3	10.3	2,423.0	0.8	0.0	0.1	0.3	73.3
		Unloading	4	5.4	0.5	1.4	4.6	794.3	0.1	0.0	0.0	0.1	17.5
									1.1	***0.1***	***0.2***	***0.5***	***110.3***
Suisun Associates (DS-10)	0	Cruising	2	14.7	0.7	1.7	5.3	1,273.3	0.0	0.0	0.0	0.0	-
		Cruising	2	23.5	1.0	2.5	7.7	1,989.9	0.0	0.0	0.0	0.0	-
		Cruising	2	16.2	0.7	1.9	6.3	1,392.8	0.0	0.0	0.0	0.0	-
									0.0	***0.0***	***0.0***	***0.0***	***0.0***
Suisun Associates (Jerico Barge)	11	Cruising	2	8.5	0.4	0.9	2.6	717.4	0.1	0.0	0.0	0.0	7.9
		Mining	5.5	1.9	0.1	0.3	0.9	177.2	0.1	0.0	0.0	0.0	5.4
		Unloading	12	0.9	0.0	0.1	0.7	105.1	0.1	0.0	0.0	0.0	6.9
									0.2	***0.0***	***0.0***	***0.1***	***20.2***
Jerico	44	Cruising	2	8.5	0.4	0.9	2.6	717.4	0.4	0.0	0.0	0.1	31.6
		Mining	5.5	1.9	0.1	0.3	0.9	177.2	0.2	0.0	0.0	0.1	21.4
		Unloading	12	0.9	0.0	0.1	0.7	105.1	0.2	0.0	0.0	0.2	27.7
									0.8	***0.0***	***0.1***	***0.4***	***80.7***
Total Emisisons (tons per year)									**18.2**	**1.0**	**2.5**	**8.0**	**1794.9**

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Emissions_REV_BASELINE_2002-07 vs Actual 2009-11 12_10_11.xls

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Table D12. Emission Factors for Mining Equipment (2014) with Required Airborne Toxic Control Measures.

Equipment Name	Type	Manufacture Year [a]	Horsepower [a]	Load Factor [b]	Emission Factor (g/bhp-hr) [c,d]					Emission Rate (lb/hr)				
					NOx	PM	ROG	CO	CO2	NOx	PM	ROG	CO	CO2
~~Hanson American River~~	~~Tug (2 engines)~~	2003	1,710	0.5	6.93	0.29	0.68	1.97	568.3	13.1	0.5	1.3	3.7	1,071.2
Hanson San Joaquin River	Tug (2 engines)	2001	2,600	0.5	6.93	0.1	0.68	3.73	568.3	19.9	0.3	1.9	10.7	1,628.8
	Barge - Main Engine	1983	1,000	0.52	3.92	0.1	0.68	3.73	568.3	4.5	0.1	0.8	4.3	651.5
	Barge - Generator (Aux)	1984	265	0.43	3.79	0.1	0.81	3.73	568.3	1.0	0.0	0.2	0.9	142.8
Hanson TS & G	Barge - Thruster (Aux)	1984	304	0.43	3.79	0.1	0.81	3.73	568.3	1.1	0.0	0.2	1.1	163.8
	~~Barge - Main Engine~~	2001	1,100	0.52	6.93	0.29	0.68	1.97	568.3	8.7	0.4	0.9	2.5	716.7
	~~Barge - Monitor Pump (Aux)~~	2002	440	0.43	6.93	0.26	0.81	2.78	568.3	2.9	0.1	0.3	1.2	237.0
	~~Barge - Flood Pump (Aux)~~	2002	440	0.43	6.93	0.26	0.81	2.78	568.3	2.9	0.1	0.3	1.2	237.0
~~Hanson DS-10~~	~~Barge - Generator (Aux)~~	1984	375	0.43	4.73	0.32	1.07	4.33	568.3	1.7	0.1	0.4	1.5	202.0
	Tug (2 engines)	2001	1,060	0.5	6.93	0.29	0.68	1.97	568.3	8.1	0.3	0.8	2.3	664.0
Jerico Tug	Tug (generator)	2000	64	0.31	6.93	0.46	1.18	3.59	568.3	0.3	0.0	0.1	0.2	24.9
	Barge Generator (Aux)	2004	99	0.43	4.62	0.46	1.18	3.59	568.3	0.4	0.0	0.1	0.3	53.3
Jerico Barge	Barge Pump (Aux)	2001	230	0.43	6.93	0.26	0.81	2.78	568.3	1.5	0.1	0.2	0.6	123.9
Jerico Loader	Loader	2007	195	0.43	4.83	0.12	0.81	3.73	568.3	0.9	0.0	0.1	0.7	105.1

[a] Provided by Project Applicants.

[b] Based on information provided in Appendix B - Emissions Estimation Methodology for Commercial Harbor Craft Operating in California, from CARB's *Technical Support Document: Initial Statement of Reason for Proposed Rule Making, Proposed Regulation for Commercial Harbor Craft,* September 2007.

[c] Assumes all Hanson engines manufactured in or prior to 2003 would meet USEPA Tier ~~2~~ 3 NOx + THC standard of ~~7.8~~ 4.6 grams per kilowatt-hour (~~5.8~~ 3.4 grams per brake-horsepower hour) by end of 2013. It is assumed that 100% of THC is ROC.

[d] CO2 emission factors derived from OFFROAD2007. Represents CO2 emission factors for diesel fueled engines.

Emissions_REV_BASELINE_2002-07 vs Actual 2009-11 12_10_11.xls

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cont.

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Table D13. Emission Rates by Activity (2014)

Equipment - Activity	Emission Rate (lb/hr-equipment)				
	NOx	PM	ROG	CO	CO2
Hanson TS&G 230 - Mining					
San Joaquin Tug	19.9	0.3	1.9	10.7	1,628.8
TS&G - Barge - Main	4.5	0.1	0.8	4.3	651.5
TS&G - Barge - Gen - Aux	1.0	0.0	0.2	0.9	142.8
Total	***25.3***	***0.4***	***2.9***	***15.9***	***2,423.0***
Hanson TS&G 230 - Cruising					
San Joaquin Tug	19.9	0.3	1.9	10.7	1,628.8
TS&G - Barge - Gen - Aux	1.0	0.0	0.2	0.9	142.8
Total	***20.8***	***0.3***	***2.2***	***11.6***	***1,771.5***
Hanson TS&G 230 - Unloading					
TS&G - Barge - Main	4.5	0.1	0.8	4.3	651.5
TS&G - Barge - Gen - Aux	1.0	0.0	0.2	0.9	142.8
Total	***5.4***	***0.1***	***1.0***	***5.2***	***794.3***
Hanson DS-10 - Mining					
American River Tug	13.1	0.5	1.3	3.7	1,071.2
DS-10 - Barge (Main)	8.7	0.4	0.9	2.5	716.7
DS-10 - Barge (Generator)	1.7	0.1	0.4	1.5	202.0
Total	***23.5***	***1.0***	***2.5***	***7.7***	***1,989.9***
Hanson DS-10 - Cruising					
American River Tug	13.1	0.5	1.3	3.7	1,071.2
DS-10 - Barge (Generator)	1.7	0.1	0.4	1.5	202.0
Total	***14.7***	***0.7***	***1.7***	***5.3***	***1,273.3***
Hanson DS-10 - Unloading					
Barge - Main	8.7	0.4	0.9	2.5	716.7
Barge - Monitor Pump - Aux	2.9	0.1	0.3	1.2	237.0
Barge - Flood Pump- Aux	2.9	0.1	0.3	1.2	237.0
Barge - Gen - Aux	1.7	0.1	0.4	1.5	202.0
Total	***16.2***	***0.7***	***1.9***	***6.3***	***1,392.8***
Jerico Barge - Mining					
Jerico Barge - Generator	0.4	0.0	0.1	0.3	53.3
Jerico Barge - Monitor	1.5	0.1	0.2	0.6	123.9
Total	***1.9***	***0.1***	***0.3***	***0.9***	***177.2***
Jerico Barge - Cruising					
Jerico Tug - Main	8.1	0.3	0.8	2.3	664.0
Jerico Barge - Generator	0.4	0.0	0.1	0.3	53.3
Total	***8.5***	***0.4***	***0.9***	***2.6***	***717.4***
Jerico Unloading					
Loader	0.9	0.0	0.1	0.7	105.1
Total	***0.9***	***0.0***	***0.1***	***0.7***	***105.1***

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Emissions_REV_BASELINE_2002-07 vs Actual 2009-11 12_10_11.xls

Table D14. Annual Emissions (2014) with Required Toxic Control Measures for Diesel Engines

Barge	Mining Events	Activity	Hours	Emission Rates (lb/hr)					Annual Emissions (tons per year)				
				NOx	PM	ROG	CO	CO2	NOx	PM	ROG	CO	CO2
Hanson (TS&G 230)	0	Cruising	2	20.8	0.3	2.2	11.6	1,771.5	0.0	0.0	0.0	0.0	-
		Mining	5.5	25.3	0.4	2.9	15.9	2,423.0	0.0	0.0	0.0	0.0	-
		Unloading	4	5.4	0.1	1.0	5.2	794.3	0.0	0.0	0.0	0.0	-
									0.0	*0.0*	*0.0*	*0.0*	*0.0*
Hanson (DS-10)	0	Cruising	2	14.7	0.7	1.7	5.3	1,273.3	0.0	0.0	0.0	0.0	-
		Mining	5.5	23.5	1.0	2.5	7.7	1,989.9	0.0	0.0	0.0	0.0	-
		Unloading	4	16.2	0.7	1.9	6.3	1,392.8	0.0	0.0	0.0	0.0	-
									0.0	*0.0*	*0.0*	*0.0*	*0.0*
Suisun Associates (TS&G 230)	0	Cruising	2	20.8	0.3	2.2	11.6	1,771.5	0.0	0.0	0.0	0.0	-
		Mining	5.5	25.3	0.4	2.9	15.9	2,423.0	0.0	0.0	0.0	0.0	-
		Unloading	4	5.4	0.1	1.0	5.2	794.3	0.0	0.0	0.0	0.0	-
									0.0	*0.0*	*0.0*	*0.0*	*0.0*
Suisun Associates (DS-10)	0	Cruising	2	14.7	0.7	1.7	5.3	1,273.3	0.0	0.0	0.0	0.0	-
		Cruising	2	23.5	1.0	2.5	7.7	1,989.9	0.0	0.0	0.0	0.0	-
		Cruising	2	16.2	0.7	1.9	6.3	1,392.8	0.0	0.0	0.0	0.0	-
									0.0	*0.0*	*0.0*	*0.0*	*0.0*
Suisun Associates (Jerico Barge)	0	Cruising	2	8.5	0.4	0.9	2.6	717.4	0.0	0.0	0.0	0.0	-
		Mining	5.5	1.9	0.1	0.3	0.9	177.2	0.0	0.0	0.0	0.0	-
		Unloading	12	0.9	0.0	0.1	0.7	105.1	0.0	0.0	0.0	0.0	-
									0.0	*0.0*	*0.0*	*0.0*	*0.0*
Jerico	0	Cruising	2	8.5	0.4	0.9	2.6	717.4	0.0	0.0	0.0	0.0	-
		Mining	5.5	1.9	0.1	0.3	0.9	177.2	0.0	0.0	0.0	0.0	-
		Unloading	12	0.9	0.0	0.1	0.7	105.1	0.0	0.0	0.0	0.0	-
									0.0	*0.0*	*0.0*	*0.0*	*0.0*
Total Emisisons (tons per year)									**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

0

Emissions_REV_BASELINE_2002-07 vs Actual 2009-11 12_10_11.xls

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cont.

Comment Letter L

RESPONSE TO COMMENT SET L: APPLICANTS

L-1 This comment introduces the topics covered in the comment letter. Please see the following responses.

L-2 The Applicants assert that there is an important difference between a "lease renewal" and a "new lease." The latter term is used consistently in the Environmental Impact Report (EIR) to characterize the Project. It is clearly stated, and implicit throughout the analysis, that sand mining is an ongoing activity, and that the proposed Project would be a continuation of mining activities. If the Project is approved, however, the California State Lands Commission (CSLC) would write new lease agreements, with new terms and conditions. Therefore, the use of the term "new lease" is logical and appropriate. The use of this term has no bearing on the selection of the baseline for the analysis, or of any impact conclusion.

L-3 The minor changes in mining methods and equipment described in this comment do not result in the potential for a new or more significant impact. The EIR text in Section 2.0, Project Description, has been clarified to reflect these minor changes.

L-4 The Applicants reference the Hanson Environmental (2006) entrainment study conducted pursuant to a requirement of the National Marine Fisheries Service (NMFS) 2006 Biological Opinion. The referenced study was designed to assess whether juvenile salmon and/or steelhead are entrained into the hydraulic suction when it is positioned 3 feet off the bayfloor; it did not monitor fish and invertebrate entrainment during all phases of actual sand mining, comparable to the U.S. Army Corps of Engineers (ACOE) crab and fish entrainment monitoring studies of maintenance dredging in the Pacific Northwest (Armstrong 1981), or more recent studies by Woodbury (2008) at the Port Sonoma marina, by the ACOE in the Sacramento and Stockton ship channels (Mari-Gold Environmental Consulting, Inc. and Novo Aquatic Sciences, Inc. 2010, 2011), and by Applied Marine Science (AMS) et al. (2011) in the San Francisco Bay-Delta. As such, the Hanson Environmental (2006) study findings do not reflect actual sand mining impacts. Please see also the response to Comment L-6.

L-5 The commenter's assertion that the biological resources analysis in the EIR relies on an improper baseline is incorrect. The purpose of the referenced assessment of potential entrainment of marine fish and invertebrates from sand mining performed by AMS (2009b) and included in the EIR (Appendix E) was to determine (1) whether entrainment of fish and invertebrate species present in the sand mining lease areas had a reasonable likelihood of occurring and (2) if so, the relative magnitude of that entrainment relative to the regional population of that taxa, or, in the case of commercially important species, to its annual catch. The impact analysis contained in Section 4.1, Biological Resources, relies on this

analysis to determine whether the Project would have the potential for a significant impact on the environment, per the stated significance criteria.

The significance criteria concerning impacts to special-status species do not provide for an allowable limit of "take" before an impact is considered significant. Thus, even though current sand mining activities may be federally permitted to "take" a specified number of protected fish such as Chinook salmon, the identified loss of salmon may be potentially significant under the California Environmental Quality Act (CEQA). The significance criteria state that a biological resource impact is considered significant if "there is a potential for any part of the population of a special status species (such as State or federally endangered species) to be directly affected or indirectly harmed through the disturbance or loss of its habitat" (Section 4.1.4, Biological Resources). Thus, the significance criteria used in the EIR Biological Resources chapter require that any direct or indirect impacts to special-status species, sensitive biological habitat, fish movement and migration corridors, and fish populations that result from the proposed Project be considered significant.

L-6 The entrainment estimates presented in Section 4.1, Biological Resources, and detailed in Appendix E, were developed as part of the process of assessing whether entrainment from sand mining operations posed a significant risk to benthic and pelagic taxa inhabiting the mining leases and the Bay-Delta ecosystem as a whole. The entrainment assessment performed by AMS (Appendix E) takes the form of a literature review and preparation of entrainment estimates based upon available data and reasonable assumptions. This investigation did not include an empirical study of sand mining operations as a means to gauge the representativeness of the estimates. While a properly designed empirical study would be a valuable tool to better understand entrainment numbers and species associated with sand mining operations, conducting a field investigation of this nature and complexity was not performed at the outset of EIR scoping effort due to the high cost it would entail. Instead, AMS used available California Department of Fish and Game (CDFG) and other recent Bay-Delta data and sand mining operational information to develop an adequate understanding of potential entrainment of fish and invertebrates from sand mining dredging. As a result, AMS developed spreadsheet models to estimate potential entrainment of special-status species, commonly occurring species, and economically important fish and invertebrate taxa inhabiting Bay-Delta sand mining leases.

In Appendix E, AMS acknowledges that the data used in the modeling effort were not collected for this purpose; however, in the absence of sufficient directly applicable entrainment studies, these data were deemed to be both the best available and sufficient for the purpose of developing insight into potential entrainment occurring from sand mining dredging. The uncertainty associated with the model and its data sources is clearly summarized in the following passage from Appendix E, Section 2.1, page 2-1:

> "…because of the inherent uncertainty present in any fish sampling program regarding representativeness of data collected, the direct applicability of study results that reflect highly site specific environmental and biological community conditions, and the assumptions used to estimate entrainment numbers that must reflect multiple operational, seasonal, and natural life history difference, the entrainment estimates presented in this report should only be considered as "order-of-magnitude" estimates. It is because of this uncertainty in calculated estimates that AMS scientists have employed a preponderance of evidence approach, wherever feasible, to bracket or frame calculated entrainment estimates and the evaluation of the potential environmental impact resulting from sand mining entrainment."

For these reasons the model results are consistently referred to in the EIR, including Appendix E, as "estimates."

The entrainment estimates do not represent worst case loss estimates resulting in inflated projections of entrainment and overstating impacts. In both data input and model output, the modeling used averaging and other statistical methods to capture the expected range in environmental conditions, including fish populations. Similarly, the models used averages of past dredged area data generated from multiple years over the baseline period as well as catch per unit effort (CPUE) data from the entire year, rather than just from the periods when specific fish or invertebrate species are most abundant. As such, entrainment estimates do not represent an extreme case, but a reasonable and conservative expectation of the potential effect of entrainment of specific fish and invertebrate species by future sand mining activities.

In summary, the entrainment estimates presented in Appendix E and referenced in Section 4.1, Biological Resources, were used in the EIR impact analysis as indicators of whether entrainment is occurring, and where identified, the relative magnitude of that entrainment. These estimates are sufficient for the purpose of determining the significance of project impacts and whether mitigation is therefore required.

L-7 The EIR represents fish entrainment projections as estimates that have not been validated against actual fish entrainment figures that occur during sand mining. The projections of sand mining fish entrainment presented in the EIR represent the best available scientific data based on fish distribution within the San Francisco Bay-Delta, and reasonable assumptions, which are clearly stated in the entrainment study (Appendix E). The conclusion of a significant unavoidable impact to delta smelt and longfin smelt (Impact BIO-8) is based on the lack of a clear scientific and regulatory path to full mitigation of potential impacts to these species.

It should be noted that the impact analysis and many of the special-status fish protection measures presented in the EIR were developed either directly by, or in close coordination with, federal (NMFS and U.S. Fish and Wildlife Service [USFWS]) and/or State (CDFG) resource agencies. It should also be noted that fish entrainment monitoring conducted aboard the ACOE dredge ship *Essayons* in 2011, which also uses hydraulic dredging, entrained both longfin and delta smelt while actively dredging offshore Richmond, Pinole, and Suisun Bay (AMS et al. 2011), indicating that hydraulic suction dredging can and does entrain these species.

L-8 The sand lance, as discussed in both the entrainment assessment (Appendix E) and then repeated in Section 4.1, Biological Resources, is a species that lives in burrows in the seafloor and when threatened, takes refuge in its burrow. As a result, they are rarely caught in fish trawls but are readily entrained in suction dredging along with their burrow and all the sediment around it. As documented in the Gray's Harbor entrainment study (McGraw and Armstrong 1990), this species of fish can be entrained in substantial numbers. They occur as larvae in the Bay's plankton in very high numbers so can be expected to be a dominant species in Central Bay waters, but are not a dominant species in CDFG trawl data. Since the McGraw and Armstrong study is the only study to document the disparity between trawl data typically used to characterize fisheries populations and what species (such as the sand lance) that hydraulic dredging may impact, extrapolation of their findings to the Bay-Delta is appropriate. This case clearly demonstrates that the entrainment estimates for any one species based on CDFG trawl data can both under-estimate and over-estimate potential entrainment effects, and the estimates must be interpreted with this in mind. Other studies external to the Bay-Delta that were discussed in the entrainment assessment (Appendix E) and in Section 4.1, Biological Resources, provide additional context to support interpretation of the AMS entrainment model results.

The use of several significant figures in the Appendix E tables is not intended to suggest a higher level of accuracy that the entrainment study warrants, given the methodology used. As stated, the entrainment figures should be considered order-of-magnitude estimates.

L-9 The relationship between capture effectiveness by a trawl for a given fish or invertebrate species and the potential for entrainment by a suction dredge is unknown. It has been documented that the comparison of the two appears to be highly location- and species-specific, as demonstrated by the discussion of the sand lance in the previous response. Some species can avoid entrainment and some species cannot. Likewise, an adult salmon may have the speed and energy to escape entrainment, but a juvenile may not. Finally, as McGraw and Armstrong (1990) mention, habitat utilization plays a role and can account for why some fish may not be entrained by suction dredging and yet show up in trawl data and vice versa. Applying hypothetical and untested correction factors,

as suggested, would add additional complexity and uncertainty into the entrainment estimate. The computer models used to assess potential entrainment of fish and invertebrates were designed to provide order-of-magnitude estimates that could be placed into context with abundance estimates, commercial fish harvesting numbers, and other anthropogenic activities that entrain fish and invertebrates to determine the potential for significant impacts, as discussed in Section 4.1, Biological Resources.

L-10 and L-11 Habitat conditions at the proposed desalination facility and the power plant may be different than those encountered at the sand mining leases. However, plankton move and mix as a result of prevailing tidal currents in the Bay-Delta and are only partially influenced by local conditions. Where local site conditions might influence the presence or magnitude of a particular larval species, the issue was discussed in the entrainment assessment, as in the case of Pacific herring. Differences in salinity or other physical conditions can be expected to have some effect on plankton populations that are less tolerant of a range of conditions, but the main fish species for which entrainment estimates were calculated are found throughout the Bay, both in adult, juvenile, and larval life stages.

L-12 Please see the response to Comment L-6.

L-13 Please see the response to Comment L-6.

L-14 Please see the response to Comment L-6.

L-15 Crabs and shrimp are capable of avoiding capture in CDFG trawls, and use of CDFG trawl data to generate population estimates may therefore underestimate the actual population sizes of these taxa. As noted in the comment and detailed in the entrainment assessment (Appendix E) and in Section 4.1, Biological Resources, these catch efficiency factors are highly site specific and can vary greatly from one location to another. The commenter suggests that employing the Dredge Impact Model (DIM) entrainment-estimating methodology used in the Gray's Harbor Dungeness crab entrainment study (Wainwright et al. 1992, McGraw and Armstrong 1990) should have been used and a comparison of results provided. The entrainment analysis did precisely that for Dungeness crabs using the DIM model and the Gray's Harbor catch efficiency factor of 0.27 (Appendix E, page 2-13), which may or may not be appropriate for San Francisco Bay-Delta. It should be noted that entrainment results using the DIM model were more than ten times greater than the results from the model developed by AMS (Appendix E, page 4-13, Table 4-10). This higher estimate of entrainment for Dungeness crab using the DIM model is not surprising since the catch efficiency factor is based on the number of adult crabs present in the dredged main channel of Gray's Harbor Washington, which is the primary path for crab movements in and out of the estuary. No such comparable dredged shipping channel exists at the mouth of San Francisco Bay and migrating crabs

move in and out of the Bay along a much broader estuary entrance. As such, it is logical to assume that possible entrainment by sand mining operations in Central Bay would be lower than that estimated using the DIM model and employing the Gray's Harbor catch efficiency factor. The entrainment estimates from both models represent a small amount, less than one-tenth of one percent, of the average annual commercial catch over the period of 2000-2006.

Please see also the response to Comment L-6.

L-16 Please see the response to Comment L-6.

L-17 The statement that data collected in the entrainment study of salmon and steelhead, which was conducted for the Applicants (Hanson Environmental 2006) in compliance with a ACOE/NMFS permit requirement that showed no statistically significant differences between day and night sampling, is misleading. None of the sampling dates reported in that study coincided with the two-week peak salmon run in 2006 (Hanson Environmental 2006, page 22, Figure 6), and findings relative to entrainment during the peak salmon migration period are therefore viewed as inconclusive. Of the eight juvenile salmon entrained as reported in that study, seven were entrained at night and only one during daylight hours. Additionally, the sand mining methodologies employed by CEMEX, although not currently used by Hanson, are very similar to the revised mining method currently in use by Jerico Products, as stated in Comment L-3, and are not precluded from use by either company in future sand mining efforts.

The entrainment assessment conducted for this EIR (Appendix E) determined that there is the potential for entrainment of salmon. The NMFS Biological Opinion (NMFS 2006) stated that juvenile Chinook salmon are known to congregate in the deeper channels of the Bay-Delta where sand mining dredging occurs during the night, and forage in the shallower areas of the estuary during the day. As a result, the potential for entrainment by sand mining dredging is likely to be elevated at night. The study prepared for the Applicants (Hanson Environmental 2006) documented that entrainment of salmon can occur when salmon are present at the sand mining location and that when it occurs, there is a greater likelihood of it occurring at night, as stated in the NMFS Biological Opinion (NMFS 2006).

Restricting sand mining dredging at night during the Chinook salmon migration time period was determined to be an effective, feasible mitigation measure. The NMFS Biological Opinion (NMFS 2006) included the suspension of nighttime dredging during the spring salmon migration period as one of many potential actions that could help reduce the potential for entrainment of salmon.

L-18 The conclusion of a potentially significant impact for State and Federal listed salmon, steelhead, and green sturgeon was based on multiple sources, including the entrainment assessment prepared for this EIR (Appendix E), the natural

history of the species, and the NMFS Biological Opinion (NMFS, 2006). It was determined that the Project has the potential for entrainment, and therefore the loss, of a portion of the population of a protected species.

The NMFS Biological Opinion was prepared in response to a request from the ACOE under the requirements of the Federal Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Management and Conservation Act, and not CEQA. The determination in Impact BIO-9 of the potential for significant impact to these species is consistent with the significance criteria used for biological resources (In Section 4.1, Biological Resources). The mitigation measures are similarly consistent, appropriate, proportional, and necessary to reduce identified potential significant impacts to migrating salmon.

L-19 The EIR text identified by the commenter (page 4.1-12, lines 12-24) was included at this point in the document to establish the general water depths that sand mining occurs within under current permit conditions. The intent was not to include a listing of all sand mining permit conditions that limit the locations where sand mining can legally occur within the Bay-Delta. That information is provided at other locations within the EIR. Please see EIR Section 1.3.2, Current Permits and Permit Conditions, in Section 1.0, Introduction.

L-20 In response to this comment, the text under "Special Status Species" of Section 4.1.1, Environmental Setting, in Section 4.1, Biological Resources, has been revised as follows:

> **Delta smelt (*Hypomesus transpacificus*).** Delta smelt is listed as a threatened species under the Federal ESA and an endangered species under the California ESA. The delta smelt is a small, slender-bodied fish that is able to tolerate a wide salinity range and is native to the Sacramento-San Joaquin Estuary. This species, which has a one-year life span, inhabits Delta waters between Cache Slough and the Sacramento Deep Water Ship Channel (upstream of Rio Vista) to San Pablo Bay. Juveniles and adults inhabit the brackish lower-salinity waters of the Sacramento-San Joaquin Delta, ~~lives primarily~~ along the freshwater edge of the saltwater-freshwater interface (approximately 2 ppt salinity). ~~of the Sacramento-San Joaquin Delta.~~

These revisions do not change the analysis or alter the conclusions regarding project impacts on biological resources.

L-21 In response to this comment, the EIR text regarding Delta smelt under "Special Status Species" in Section 4.1.1, Environmental Setting, in Section 4.1, Biological Resources, has been revised as follows:

> It is critical to note that the survival or abundance of multiple biological populations in the San Francisco Estuary, including delta smelt

populations, ~~is positively~~ exhibits a positive correlation ~~related to~~ with salinity levels, which are directly affected by the amount of freshwater flow reaching the western Delta~~,~~. The critical salinity level of Delta waters is frequently identified and referred to as ~~a relationship which is described in terms of~~ "X2", where "X" is the distance from the Golden Gate Bridge and "2" is where the salinity at the bottom of the water column is 2 practical salinity units (psu=ppt) (Hollibaugh 1996).

These revisions do not change the analysis or alter the conclusions regarding project impacts on biological resources.

L-22 The referenced statement is incorrect and was the result of a typographical/ editing error. The referenced EIR text regarding Delta smelt, under "Special Status Species" in Section 4.1.1, Environmental Setting, in Section 4.1, Biological Resources, has been revised as follows:

Page 4.1-17, Line 27: The species has been collected in large quantities in Suisun Bay and the western Delta ~~Central Bay~~.

Page 4.1-18, Line 1: This species was detected during CDFG surveys in ~~Central~~ Suisun Bay (CDFG 2000-2007).

These revisions do not change the analysis or alter the conclusions regarding project impacts on biological resources.

L-23 The referenced statement in the EIR does describe presence of longfin smelt in Central Bay.

L-24 The referenced statement is incorrect and was the result of a typographical/ editing error. The EIR text regarding Sacramento splittail under "Special Status Species" in Section 4.1.1, Environmental Setting has been revised as follows:

CDFG trawling records indicate that splittail occur in all portions of the Project area including Suisun ~~Central~~ Bay (Table 4.1-2) and the western Delta (Table 4.1-4) (CDFG 2000-2007).

These revisions do not change the analysis or alter the conclusions regarding project impacts on biological resources.

L-25 In response to this comment, the EIR text regarding Sacramento splittail under "Special Status Species" in Section 4.1.1, Environmental Setting has been revised as follows:

Remnant populations of splittail in the Delta require adequate freshwater outflow and periodic floodplain inundation. This species was formerly

listed as a Federal threatened species and was delisted in 2003~~ despite a strong consensus by scientists that it should retain its protected status~~.

These revisions do not change the analysis or alter the conclusions regarding project impacts on biological resources.

L-26 The CSLC has an independent duty as the lead agency to avoid or substantially lessen identified significant effects. The CSLC cannot defer the formulation of mitigation measures to other agencies; lead agencies must do all that is feasible on their part to address significant impacts even where a subsequent permit from another agency is necessary, pursuant to State CEQA Guidelines section 15126.4.

As stated in both Mitigation Measures (MMs) BIO-8a and MM BIO-8b, it is anticipated that the details of measures required to mitigate the take of delta smelt and longfin smelt will be specified in an Incidental Take Permit (ITP) that can only be issued by the CDFG. The CSLC staff finds the Applicants' suggestions for altering MMs BIO-8a and MM BIO-8b to be infeasible, since accepting the requested revisions would constitute impermissible deferral of mitigation.

First, MM BIO-8a does not, as the Applicants suggest, foreclose the possibility that other measures may be used to minimize take. CSLC staff acknowledges that the actual suite of measures to minimize take, as well as the specific parameters of seasonal and spatial limitations on sand mining, will be specified in the ITP. MM BIO-8a was developed through direct consultation with CDFG, as required by State CEQA Guidelines section 15086. Furthermore, the Applicants' suggested revisions to MMs BIO-8a and BIO-8b are infeasible, because the CSLC cannot compel the Applicants to apply for an ITP, nor can the CSLC compel the CDFG to issue an ITP. The determination of whether an ITP can be issued rests solely with the CDFG and therefore, the CSLC must do all that it can to apply measures independently. The CSLC cannot condition its approval on a mitigation measure that relies on the completion of a process over which the CSLC has no control; therefore, MM BIO-8a was developed to provide for minimization of take of listed species to the extent practicable and feasible at this time, while allowing CDFG the flexibility to set the specific parameters of this measure in any ITP that may be developed.

L-27 As noted in the response above, details of measures required to mitigate the take of Chinook salmon may be specified in an ITP issued for this Project by the CDFG. CSLC staff has consulted with the CDFG regarding the feasibility of MM BIO-9b (seasonally restricting sand mining to daylight hours) and believes it to be feasible and necessary to avoid potential take of listed species. As described in the previous response, the CSLC has an independent duty as the lead agency to avoid or substantially lessen identified significant effects. The CSLC cannot defer the formulation of mitigation measures to other agencies; lead agencies must do

all that is feasible on their part to address significant impacts even where a subsequent permit from another agency is necessary, pursuant to of the State CEQA Guidelines section 15126.4. Accepting the requested revisions would constitute impermissible deferral of mitigation.

L-28 This comment accurately reflects the assumptions and conclusions of the air quality analysis presented in EIR Section 4.5, Air Quality.

L-29 and L-30 These comments contain new information that alters the project description and the air quality analysis provided in the Revised Draft EIR. Consequently, the text of the Revised Draft EIR is revised as shown below. This is not "significant new information," as defined in State CEQA Guidelines section 15088.5, because it would not cause a new significant environmental impact or increase the severity of an impact previously identified in the EIR: there would be no increase in mining activity above baseline levels until 2014, at which time the Applicants would complete engine upgrades. Therefore, these changes do not trigger the requirement to recirculate the Draft EIR.

EIR Section 2.3.1, Project Action, is revised as follows and Table 2-1 is revised to include the new information:

> As Table 2-1 indicates, the Applicants are proposing adjustments to the allowed annual volume of sand that may be mined from each lease area, relative to the permitted annual mining volumes during the previous 10-year lease period. Overall, the Applicants are proposing an increase in permitted mining volume of 350,000 cy/yr from the CSLC lease areas. The Applicants are also proposing a decrease in permitted mining volume of 550,000 cy/yr from the private lease area. The net change from all lease areas, including both the CSLC lease areas and the private lease area, would be a decrease of 200,000 cy/yr in the allowed mining volume. This EIR, however, uses the actual mining volumes based on the years 2002 to 2007 as the baseline for the impact analysis, as discussed in Section 1.0, Introduction. <u>The Applicants are proposing to mine no more than the baseline level of 1,426,650 cy/yr until 2014, when upgrades to diesel engines used to power mining equipment are required to be completed (see Section 4.5, Air Quality). Beginning in 2014, the Applicants are proposing to mine up to the full amount indicated in Table 2-1, that is, 2,040,000 cy/yr if approved by the Commission.</u>

The same changes are made to the Executive Summary (under "Description of Proposed Project" and in Table ES-1).

In addition, Impact AIR-1, in Section 4.5.4, Impact Analysis and Mitigation, of Section 4.5, Air Quality, is revised as follows:

Impact AIR-1: Emissions of criteria pollutants

Sand mining activities would result in emissions of criteria air pollutants that may conflict with or obstruct implementation of an applicable air quality plan or may violate an air quality standard or contribute significantly to an existing violation (Less than Significant, Class III).

Tugboat engines, barge engines, and auxiliary engines/generators used during mining and offloading events would generate emissions of criteria pollutants. Criteria pollutants from these sources were evaluated based on emission factors derived from the California Air Resources Board's (CARB's) OFFROAD model, CARB's recommended methodologies for estimating emissions for commercial harbor craft (CARB 2007c), and detailed operational information provided by the Applicants. Pursuant to Title 17 of the California Code of Regulations, section 93118.5, both Hanson and Jerico would be required to upgrade their marine vessel engines according to CARB's compliance schedule, as shown in Table 4.5-6.

Table 4.5-6. Sand Mining Equipment Replacement Compliance Dates as Required by CARB

Equipment (Applicant)	Model Year/Tier	CARB Compliance Date
Hanson		
American River Tug	2003/Tier 1	12/31/2018
San Joaquin River Tug	2001/Tier 1	12/31/2017
TS&G Dredge Barge – Main Engine	1983/Tier 0	12/31/2013
TS&G Dredge Barge – Generator	1984/Tier 0	12/31/2013
TS&G Dredge Barge – Thruster Pump	1984/Tier 0	12/31/2013
DS-10 Dredge – Main Engine	2001/Tier 0	12/31/2017
DS-10 Dredge – Monitor Pump (Hanson)	2002/Tier 1	12/31/2017
DS-10 Dredge – Flood Pump	2002/Tier 1	12/31/2017
DS-10 Dredge – Main Generator	1984/Tier 0	12/31/2013
Jerico		
Tug – Main Engine	2001/Tier 1	12/31/2017
Tug – Generator	2000/Tier 1	12/31/2015
Dredge Barge – Generator	2004/Tier 2	Not Applicable
Dredge Barge – Pump	2001/Tier 1	12/31/2017

Hanson has withdrawn its proposal to install the CleanAIR Systems E-POD technology (CleanAIR Systems 2011a) that would be supplied by Caterpillar. ~~Hanson has committed to installing new emission reduction retrofits on the San Joaquin River Tug and TS&G Barge propulsion engines by the third quarter of 2012, which would be in advance of the applicable replacement compliance dates.~~

~~The planned retrofits would include the CleanAIR Systems E-POD technology (CleanAIR Systems 2011a) that would be supplied by Caterpillar. E-POD combines a selective catalytic reduction system with either oxidation catalysts, diesel particulate filters, or diesel oxidation catalysts. The technology uses an ammonia-based reductant that reacts over a catalyst to convert NO_x to N_2 and H_2O. CleanAIR Systems estimates that the E-POD emission control system would reduce Hanson's Tier 0 vessel propulsion engine NO_x emissions by approximately 80 percent (CleanAir Systems 2011b). Hanson's planned engine retrofits are considered "Applicant Proposed Measures" (see Section 4.0, Environmental Analysis) and are considered a part of the Project design.~~

Based on the Applicants' proposal (as revised in Applicants' comments on the RDEIR), ~~T~~this emissions analysis assumes that the mining levels will not exceed the annual baseline level of 1,426,650 cubic yards per year (cy/yr) until 2014, when upgrades to the TS&G barge engines are required to be completed, as indicated in Table 4.5-6. Beginning in 2014, the mining volume could increase to the full amount proposed by the Applicants, that is, 2,040,000 cy/yr if approved by the CSLC and other regulatory agencies. ~~includes several scenarios for comparison, including the future (2012) with no new emission controls (for informational purposes only), future (2012) with Hanson's planned retrofits for half the year only, future (2013) with Hanson's planned retrofits for the entire year, and future (2014) with required regulatory minimum upgrades only, but without Hanson's planned engine retrofits (for informational purposes only). To determine the net change in emissions that would result from the proposed Project, b~~ Baseline emissions were calculated based on the annual average level of mining that occurred during the five-year period between July 2002 and June 2007 (approximately 1,426,650 cy/yr). Project emissions were based on ~~and~~ the proposed mining volume of 2,040,000 cy/yr beginning in 2014.

Based on ~~these data and~~ the assumption that approximately 2,000 cubic yards of sand ~~would be~~ are mined during a single mining event, the annual average baseline is approximately 713 mining events and there could eventually be as many as 1,021 mining events under the proposed Project, beginning in 2014. Therefore, the proposed Project could eventually result in a net increase of 308 mining events per year above baseline conditions. To determine offloading emissions that would be

associated with a single mining event, it was assumed that offloading would take between four and 12 hours per event.

Emission estimates are presented in Table 4.5-7 below. Because, as proposed by the Applicants, the mining volume would not exceed the baseline level until 2014, emissions before 2014 would not exceed baseline levels. ~~Assuming the Project would commence operations in 2012, increases in NOx emissions would violate the BAAQMD threshold in effect at the time of the Project NOP (15 tons per year) (BAAQMD 1999) if the planned emission control retrofits were not implemented. However, with Hanson's planned emission retrofits that would be installed on the engines of the San Joaquin River Tug and the TS&G Barge by the third quarter of 2012, emissions of NOx would be reduced substantially. Even with only one half year of the planned retrofit emission reductions, annual increases in NOx emissions in 2012 would be 11.7 tons per year (below the threshold of 15 tons per year), and starting in 2013, the planned retrofits would result in net NOx reductions of approximately 35 tons per year compared to the annual average baseline. At these levels, the emissions would be less than significant and no additional mitigation would be required.~~

By December 31, 2013, all engines manufactured in or prior to the year 1985 would have to be upgraded to meet U.S. EPA Tier 2 standards as required by CARB and shown in Table 4.5-6. ~~For informational purposes only,~~ Table 4.5-7 ~~also~~ shows the maximum ~~NO_x~~ emissions that would occur in 2014~~, without Hanson's planned engine retrofits, but~~ with the required upgrade to Tier 2 standards, and the increase in mining volume to the full amount proposed by the Applicants, 2,040,000 cy/yr if approved by the CSLC and other regulatory agencies. With the upgrade to Tier 2 standards, and even with the potential increase in mining volume, NO_x emissions would be a maximum of 12 tons per year higher than the baseline, which is less than the BAAQMD significance threshold of 15 tons per year. As shown in Table 4.5-7, increases in emissions of other criteria pollutants would also be below the BAAQMD significance threshold. Future engine upgrades, according to the schedule shown in 4.5-6, would further reduce Project emissions. The impact is therefore less than significant. ~~.Therefore, without Hanson's planned installation of the CleanAIR Systems retrofits, emissions would be considered significant until 2014, when mandatory engine upgrades would be in place.~~

Table 4.5-7. Estimated Annual Project Criteria Pollutant

~~Scenario~~	~~Annual Emissions (tons per year)~~			
	~~NO_x~~	~~PM~~	~~ROG~~	~~CO~~
~~**Annual Average (2002 – 2007) Baseline**~~				
~~Hanson (TS&G)~~	~~42.7~~	~~1.5~~	~~3.7~~	~~11.7~~
~~Hanson (DS-10)~~	~~32.6~~	~~1.3~~	~~3.3~~	~~10.4~~
~~Suisun Assoc. (TS&G)~~	~~1.8~~	~~0.1~~	~~0.2~~	~~0.5~~
~~Suisun Assoc. (DS-10)~~	~~0.7~~	~~0.0~~	~~0.1~~	~~0.2~~
~~Suisun Assoc. (Jerico)~~	~~0.4~~	~~0.0~~	~~0.1~~	~~0.2~~
~~Jerico~~	~~1.9~~	~~0.1~~	~~0.3~~	~~0.9~~
~~Cemex~~	~~4.8~~	~~0.2~~	~~0.4~~	~~1.4~~
~~*TOTAL*~~	~~*84.8*~~	~~*3.1*~~	~~*8.0*~~	~~*25.3*~~
~~**Future (2012) – No New Emission Controls**~~				
~~Hanson (TS&G)~~	~~128.1~~	~~4.4~~	~~11.2~~	~~35.1~~
~~Hanson (DS-10)~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
~~Suisun Assoc. (TS&G)~~	~~12.1~~	~~0.4~~	~~1.1~~	~~3.3~~
~~Suisun Assoc. (DS-10)~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
~~Suisun Assoc. (Jerico)~~	~~1.4~~	~~0.1~~	~~0.2~~	~~0.7~~
~~Jerico~~	~~1.4~~	~~0.1~~	~~0.2~~	~~0.7~~
~~*TOTAL*~~	~~143.1~~	~~4.9~~	~~12.6~~	~~39.9~~
~~*Change from Existing*~~	~~*58.3*~~	~~*1.8*~~	~~*4.6*~~	~~*14.5*~~
~~**Future (2012) - With Hanson Proposed Retrofits for Half Year Only**~~				
~~*TOTAL*~~	~~96.4~~	~~--~~	~~--~~	~~--~~
~~*Change from Existing*~~	~~*-11.7*~~	~~*Further Reductions*~~		~~N.A.~~
~~BAAQMD Threshold~~	~~15~~	~~15~~	~~15~~	~~N.A.~~
~~Significant?~~	~~No~~	~~No~~	~~No~~	~~No~~
~~**Future (2013) - With Hanson Proposed Retrofits for All Year**~~				
~~*TOTAL*~~	~~*49.7*~~	~~--~~	~~--~~	~~--~~
~~*Change from Existing*~~	~~*-35.0*~~	~~*Further Reductions*~~		~~N.A.~~
~~Significant?~~	~~No~~	~~No~~	~~No~~	~~No~~
~~**Future (2014) – With Required Regulatory Minimum Upgrades Only**~~				
~~*TOTAL*~~	~~*96.7*~~	~~--~~	~~--~~	~~--~~
~~*Change from Existing*~~	~~*12.0*~~	~~*Further Reductions*~~		~~N.A.~~
~~Significant?~~	~~No~~	~~No~~	~~No~~	~~No~~

~~Notes: see Appendix D for all emissions factors and other assumptions used to estimate emissions.~~
~~N.A.: Not applicable.~~

Scenario	Annual Emissions (tons per year)			
	NO_x	**PM**	**ROG**	**CO**
Annual Average (2002 – 2007) Baseline				
Hanson (TS&G)	42.7	1.5	3.7	11.7
Hanson (DS-10)	32.6	1.3	3.3	10.4
Suisun Assoc. (TS&G)	1.8	0.1	0.2	0.5
Suisun Assoc. (DS-10)	0.7	0.0	0.1	0.2
Suisun Assoc. (Jerico)	0.4	0.0	0.1	0.2
Jerico	1.9	0.1	0.3	0.9
Cemex	4.8	0.2	0.4	1.4
TOTAL	*84.8*	*3.1*	*8.0*	*25.3*
Future (2014) – With Required Regulatory Minimum Upgrades Only				
Hanson (TS&G)	85.7	4.4	11.2	35.1
Hanson (DS-10)	0.0	0.0	0.0	0.0
Suisun Assoc. (TS&G)	8.1	0.4	1.1	3.3
Suisun Assoc. (DS-10)	0.0	0.0	0.0	0.0
Suisun Assoc. (Jerico)	1.4	0.1	0.2	0.7
Jerico	1.4	0.1	0.2	0.7
TOTAL	*96.7*	*4.9*	*12.6*	*39.9*
Change from Existing	***12.0***	***1.8***	***4.6***	***14.5***
BAAQMD Significance Threshold	15	15	15	N.A.
Significant?	No	No	No	No

Notes: Please see Appendix D for all emissions factors and other assumptions used to estimate emissions.
N.A.: Not applicable.

L-31 MM AIR-2 is required to ensure that the Applicants track Project greenhouse gas (GHG) emissions accurately and establish a plan for emissions reduction, and is, therefore, appropriate as written.

L-32 The significance criteria or thresholds of significance for special status species used in the EIR are not unusual. Commonly accepted standards of practice under CEQA generally regard any loss of special status species and their habitat as a significant impact. As the lead agency under CEQA, the CSLC has the authority to establish significance criteria on a case-by-case basis. (*Oakland Heritage Alliance v. City of Oakland* (2011) 195 Cal.App.4th 884, 896.) The EIR used significance criteria appropriate for the Project.

The State CEQA Guidelines do not contain recommended thresholds of significance for analyzing impacts in an EIR. The mandatory findings of significance contained in State CEQA Guidelines section 15065 and the "discretionary thresholds" from Appendix G to the State CEQA Guidelines are not applicable. The mandatory findings are used to determine whether, as an initial matter, an EIR must be prepared, not to evaluate impacts in the EIR: "A lead

agency shall find that a project may have a significant effect on the environment and thereby *require an EIR to be prepared* for the project" where any of several conditions may occur. (Emphasis added.) (1 and 2 Kostka & Zischke, Practice Under the California Environmental Quality Act (Cont.Ed.Bar 2011) sections 13.12, 20.65).

The Environmental Checklist Form contained in Appendix G to the State CEQA Guidelines contains questions about numerous environmental factors that may be affected by a project. The checklist is a suggested form for meeting the requirements of an initial study but its use is not required. As stated in the Note at the beginning of the checklist, the questions "do not necessarily represent thresholds of significance," and nowhere in the State CEQA Guidelines is their use as significance criteria recommended. In many cases the questions do not provide specific criteria for determining whether impacts are significant.

Regarding special status species, the first Appendix G checklist question under Biological Resources asks "Would the project: a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?" It does not specify the level of impact that would be significant.

The pertinent significance criterion in the EIR quantifies the level of impact considered significant as any take of a special status species: "A biological resource impact is considered significant if there is a potential for the Project to 'take' any part of the population of a special status species (such as State or federally endangered species) through direct effects or indirect harm through the disturbance or loss of its habitat." Further, it is reasonable to conclude that entrainment of a special status species is a direct substantial adverse effect under the Appendix G checklist question quoted above. Therefore, the significance criterion in the EIR is consistent with the Appendix G checklist question and provides the necessary specificity of when an impact is significant.

L-33 Please see the response to Comment L-26. Because the Project's significant impacts on longfin and delta smelt will not be fully mitigated under CEQA at the time the EIR is considered for certification by the CSLC, it would be necessary for the CSLC to adopt a Statement of Overriding Considerations to approve the Project. CSLC staff acknowledges that for CDFG to issue an ITP, the impacts of the authorized take must be minimized and fully mitigated. However, the CSLC cannot control whether an ITP is actually issued in the future and therefore cannot rely on that future event to reach its significance determination in the EIR.

While the CSLC staff has proposed all that is feasible at this time to avoid or lessen the significant impact by imposing the mitigation specified in MMs BIO-8a and 8b, CDFG is the agency with the appropriate expertise and jurisdiction to

determine whether there are feasible conditions of an ITP that would fully mitigate the impact of the taking. CSLC staff expects that CDFG would develop measures through the ITP process that fully mitigate the impacts of the taking, and presumably reduce the CEQA impacts to a less-than-significant level. Therefore, although the CSLC would be required to adopt a Statement of Overriding Considerations to approve the Project, CDFG would not be bound to make the same significance determination, and, in all likelihood, would not be required to adopt a Statement of Overriding Considerations, if it finds that the measures it develops and includes in an ITP minimize and fully mitigate the impacts of the authorized take.

As explained in Response L-32, the "established significance thresholds" referred to in Section 6.2 of EIR Section 6.0 are those listed in Section 4.1.3 of the EIR. The following clarification has been added to the text of Section 6.2:

> **6.2 SIGNIFICANT ENVIRONMENTAL EFFECTS OF PROPOSED PROJECT THAT CANNOT BE AVOIDED AND CANNOT BE MITIGATED TO A LESS-THAN-SIGNIFICANT LEVEL**
>
> Section 4.0, Environmental Analysis, presents the analysis of the potential environmental impacts associated with the proposed San Francisco Bay and Delta Sand Mining Project (Project) over the next 10 years. Effects on all potentially affected environmental resources were evaluated to determine any impacts that would remain significant after mitigation. Implementation of all mitigation measures (MMs) identified in Section 4.0, Environmental Analysis, would reduce most significant impacts to less-than-significant levels. The Project would result in a significant impact to delta smelt and longfin smelt as a result of entrainment and mortality during sand mining operations that impacts adult life stages of the delta smelt and longfin smelt, thereby exceeding the established significance thresholds <u>stated in Section 4.1.3.</u>

The comment states that a lead agency can rely on existing legal standards to support a less-than-significant finding, citing *Tracy First v. City of Tracy* (2009) 177 Cal.App.4th 912, 933. In that case, the court held that it was sufficient to rely on building energy efficiency standards to determine whether an energy impact was significant. Building codes and standards should be distinguished from the conditions listed in section 2081(b), which are repeated below, are not standards that can be implemented like a formula in a building code:

(1) The take is incidental to an otherwise lawful activity.

(2) The impacts of the authorized take shall be minimized and fully mitigated…

(3) The permit is consistent with any regulations adopted pursuant to Sections 2112 and 2114.

(4) The Applicant shall ensure adequate funding to implement the measures required by paragraph (2), and for monitoring compliance with, and effectiveness of, those measures.

To issue an ITP, the CDFG must develop specific measures on a case-by-case basis that satisfy the conditions above. It would be inappropriate to rely on measures that have not yet been developed to determine that the legal standard has been met.

The comment also raises the issue of allowing individual mitigation measures to rely on specific performance criteria. The general rule according to the State CEQA Guidelines is that formulation of mitigation measures should not be deferred to a future date. However, it is not considered an impermissible deferral if performance standards are specified that would mitigate the significant effect of the project and they may be accomplished in more than one specified way (State CEQA Guidelines, § 15126.4, subd. (a)(1)(B)).

The case cited in the comment, *Defend the Bay v. City of Irvine* (2004) 119 Cal.App.4th 1261, is distinguishable from the situation here. In *Defend the Bay*, the EIR was for a General Plan amendment and zoning change. The court explained that at that early stage of the planning process, it was sufficient to specify the criteria to be met when mitigation was known to be feasible for the project's significant effects and the agency committed to that mitigation (*Id*. at p. 1276).

In the situation with sand mining, the EIR is not analyzing a project in the early planning stage; instead, it evaluates a project-specific activity that is likely to entrain delta and longfin smelt. As described in the EIR's Residual Impacts section for MMs BIO-8a and 8b, there are currently no broadly applied programs for mitigating impacts to these species and therefore the success of the mitigation measures is not known with certainty. The CSLC staff consulted with the CDFG to develop MMs BIO-8a and 8b. Implementation of these measures is expected to both reduce and offset impacts related to incidental take through entrainment, but not enough to ensure the impacts would be reduced to a less-than-significant level under CEQA.

While it is expected that the CDFG will, in its permitting process for an ITP, develop specific measures that will fully mitigate the impacts identified in the EIR (assuming the EIR is certified), unlike the situation in *Defend the Bay*, there are no other feasible mitigation measures known to the CSLC available at this time to ensure impacts would be reduced to a less-than-significant level under CEQA. It should be noted that the regulations for ITPs allow "the use of new measures or other measures without an as yet established record of success which have reasonable basis for utilization and a reasonable prospect for success." (Cal. Code Regs., tit. 14, § 783.4, subd. (c)). Because longfin smelt was listed relatively recently, the CDFG may need to rely on this provision in issuing an ITP. Under CEQA, compliance with the law, in this case the ITP process, is not

necessarily sufficient to make a finding that that the impact is less than significant (*Californians for Alternatives to Toxics v. Dept. of Food and Agriculture* (2005) 136 Cal.App.4th 1, 10).

CSLC staff acknowledges there is uncertainty concerning the estimates of entrainment losses provided in the entrainment study, *Assessment and Evaluation of Fish and Invertebrate Entrainment Effects from Commercial Aggregate Sand Mining in San Francisco Estuary* (Entrainment Study) (EIR, Appendix E). The study clearly acknowledged this uncertainty regarding the data on page E-14, last paragraph:

> However, because of the inherent uncertainty present in any fish sampling program regarding representativeness of data collected, the direct applicability of study results that reflect highly site specific environmental and biological community conditions, and the assumptions used to estimate entrainment numbers that must reflect multiple operational, seasonal, and natural life history difference, the entrainment estimates presented in this report should only be considered as "order-of-magnitude" estimates. It is because of this uncertainty in calculated estimates that AMS scientists have employed a preponderance of evidence approach, wherever feasible, to bracket or frame calculated entrainment estimates and the evaluation of the potential environmental impact resulting from sand mining entrainment.

Additional disclosure concerning the uncertainty of the data is explained on page E-29, first paragraph:

> There are two main areas of uncertainty in using the CDFG trawl data and calculated abundance indices in place of population estimates: (1) the sampling does not follow a randomized design, and (2) the collection efficiency of an individual trawl relative to what would be entrained via dredging operations is unknown. However, lacking better data or estimates of abundance for target species for the time period during which these calculations are being estimated, it was determined that using the CDFG data to calculate abundance indices was the best available approach and that comparisons of entrained fish or macroinvertebrates to these abundance indices would provide a meaningful approximation of the severity of the potential impact.

The purpose of the Entrainment Study was to analyze the potential for the Project to result in the entrainment of species, and to support the CEQA analysis of biological resource impacts. The Entrainment Study does not itself assess whether the entrainment of species would cause a significant impact under CEQA. Impact BIO-8 in Section 4.1, Biological Resources, relies on the analysis in the Entrainment Study and applies the stated significance criteria to reach a conclusion of significance. Because there is uncertainty in the calculated

estimates in the Entrainment Study as described above, the EIR takes the conservative and reasonable approach of analyzing the potential effects of the Project's permitted mining volume, rather than the incremental impact that would result from the increase over baseline conditions.

L-34 The discussion of the Environmentally Superior Alternative referenced in the comment, in Section 6.0, Other Required CEQA Sections and Environmentally Superior Alternative, fulfills the CEQA requirement to identify the Environmentally Superior Alternative from among the alternatives examined in the EIR. Through careful consideration of the likely significance and severity of the impacts associated with each alternative, the CSLC staff has concluded that the Reduced Project Alternative is the Environmentally Superior Alternative, as discussed in Section 6.4, Environmentally Superior Alternative.

L-35 This comment reviews some of the findings of the bathymetric and hydrodynamic study presented in Appendix G and Sections 4.2, Mineral Resources, and 4.3, Hydrology and Water Quality, of the EIR, and expresses concurrence with some of the conclusions of less than significant impacts.

L-36 The bathymetric and hydrodynamic study presented in Appendix G of the EIR clearly states that the estimate of remaining resource is based on a calculation of the volume of sediment above -90 ft MLLW and below -3 ft MLLW. As stated in Section 2.0, Project Description, 90 feet is the maximum depth at which the existing mining equipment can operate.

L-37, L-38, and L-39 The surveys used in the bathymetry change analysis were of adequate quality and consistency, covered a long time period, and showed consistent trends in bathymetry change over time.

Modeling results do not show "deepening of the southern, mined part of the lease." Modeling results shown in Figure 4-39 of Appendix G in the EIR show deepening of the shallow area to the west (downstream) of the mined area (i.e., the mining hole), not deepening within the mining hole. This is consistent with typical bottom erosion/accretion trends observed for bedload transport; sediment is deposited at the upstream end of the hole, and is mobilized at the downstream end.

L-40, L-41, and L-42 CEQA requires that a lead agency identify feasible mitigation measures capable of reducing or eliminating identified significant impacts (State CEQA Guidelines § 15126.4). The Applicants have not provided an economic analysis to substantiate their claims that BIO-8a, BIO-9a, and BIO-9b are infeasible. The statement in the comment that "MM BIO-8a recommends *prohibiting* sand mining form December 1 to June 30…" (emphasis added) is incorrect. MM BIO-8a does not say "prohibit;" it says "restrict." Further, this measure leaves the specific parameters of this restriction, in terms of degree, location, and duration, to the expert judgment of the CDFG. Because of this, the

commenter's assertion of economic infeasibility is unsupported by fact. Please also see the responses to Comments L-26 and L-27.

L-43 Please see the response to Comments L-40, L-41, and L-42.

L-44 Please see responses to Comments L-45 through L-51.

L-45 As stated in the discussion of Impact BIO-6 in Section 4.1, Biological Resources, operation of the sand mining dredge near Harding, Shag, and Arch rocks, could cause mechanical damage to the benthic community inhabiting the hard substrate areas, which could result in a significant impact to these biotic communities. MM BIO-6 is necessary to mitigate this impact. These hard substrate features are well-known and shown on navigational charts. The requirement to maintain a 100-foot buffer around these features is therefore clear, feasible, and necessary.

L-46 and L-47 Please see the responses to Comments L-26 and L-40, L-41, and L-42.

L-48 and L-49 Please see the responses to Comments L-27 and L-40, L-41, and L-42.

L-50 Please see the response to Comment L-31.

L-51 Please see the responses to Comments L-41, L-42, and L-43, and to L-45 through L-50.

L-52 This comment contains air emissions calculations prepared by the Applicants, and in support of Comment L-30. These calculations are not used in the determination of air quality impacts or mitigation measures.

REFERENCES CITED IN RESPONSES TO COMMENT SETS A-L (INCLUDES ONLY NEW REFERENCES NOT CITED IN THE REVISED DRAFT EIR)

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