Task Description	Days	Vessel (oper. mode)	Equipment	HP	Hours Used	Load Factor	BSFC (gal/Bhp)	Controls*	CEQA Emm?	PERP PERMIT	Const.	APCD Exempt
Debris Survey	1.0	M/V KAHU	Mains	2220	4	0.65	0.055	4	Y	N	Y	Y
			Gen Set	99	4	0.3	0.055	4	N	N	Y	Y
		Barge Siuslaw	Anchor Winches	720	4	0.3	0.055	1	N	N	Y	Y
			Manitowoc Crane	333	8	0.3	0.055	1	N	N	Y	Y
			Tool Comp	49	11	0.85	0.055	1	N	Y	Y	Y
			Tool Comp	80	10	0.85	0.055	1	N	Y	Y	Y
			Dive Compressor	40	6	0.85	0.055	1	N	Y	Y	Y
			Dive Compressor	20	6	0.85	0.055	1	N	Y	Y	Y
			37KW Generator	49	10	0.85	0.055	1	N	Y	Y	Y
			Welder	38	8	0.85	0.055	1	N	Y	Y	Y
			Water Blaster	230	6	0.85	0.055	1	N	Y	Y	Y
			Jet Pump	230	6	0.85	0.055	1	N	Y	Y	Y
		Tug Julie	Mains	800	4	0.65	0.055	2	Y	N	Y	Y
			Gen Set	40	4	0.3	0.055	1	N	N	Y	Y
Removing Anchors	1.0	M/V Larcona	Mains	2000	4	0.65	0.055	3	Y	N	Y	Y
			Gen Set	43	4	0.3	0.055	1	N	N	Y	Y
		M/V KAHU	Mains	2220	4	0.65	0.055	4	Y	N	Y	Y
			Gen Set	99	4	0.3	0.055	4	N	N	Y	Y
		Barge Siuslaw	Anchor Winches	720	4	0.3	0.055	1	N	N	Y	Y
			Manitowoc Crane	333	4	0.3	0.055	1	N	N	Y	Y
		Tug Julie	Mains	800	2	0.65	0.055	2	Y	N	Y	Y
			Gen Set	40	2	0.3	0.055	1	N	N	Y	Y

Total Project Duration 25.5

Exemptions Sited
202F.2. PERP
202.3 Construction

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Pier PRC-421 Revised Project
Emission Factors

	Emission Controls		Emission Factors							
Equipment Category	Type	Description	NOx	ROC	CO	SOx	PM	PM10	Units	References
Combustion - Engines	1	Uncontrolled	561	49	129.3	40.8	42.2	40.5	lb/1000 gal	
Combustion - Engines	2	Controlled TI	449	49	129.3	40.8	42.2	40.5	lb/1000 gal	
Combustion - Engines	3	Controlled Mains	337	16.8	78.3	28.2	33.0	31.7	lb/1000 gal	
Kahu	4	Electronically Cont	246	16.8	78.3	28.2	33.0	31.7	lb/1000 gal	

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Pier PRC-421 Revised Project

Project Emissions

Task Description	Vessel	Equipment	Estimated Maximum Emissions (lb.) NOx	ROC	CO	SOx	PM	PM10
Transit Siuslaw From Long Beach	M/V KAHU	Mains	214.8	14.7	68.4	24.6	28.8	27.7
		Gen Set	4.4	0.3	1.4	0.5	0.6	0.6
	M/V Larcona	Mains	264.8	13.2	61.6	22.2	26.0	24.9
		Gen Set	4.4	0.4	1.0	0.3	0.3	0.3
	Barge Siuslaw	None						
Anchoring & Removing Anchors	M/V Larcona	Mains	24.1	1.2	5.6	2.0	2.4	2.3
(one day each way)		Gen Set	0.4	0.0	0.1	0.0	0.0	0.0
	M/V KAHU	Mains	19.5	1.3	6.2	2.2	2.6	2.5
		Gen Set	0.4	0.0	0.1	0.0	0.1	0.1
	Barge Siuslaw	Anchor Winches	6.7	0.6	1.5	0.5	0.5	0.5
		Manitowoc Crane	3.1	0.3	0.7	0.2	0.2	0.2
	Tug Julie	Mains	12.8	1.4	3.7	1.2	1.2	1.2
		Gen Set	0.4	0.0	0.1	0.0	0.0	0.0
Remove Topsides	M/V KAHU	Mains	117.1	8.0	37.3	13.4	15.7	15.1
		Gen Set	9.6	0.7	3.1	1.1	1.3	1.2
	Barge Siuslaw	Anchor Winches	26.7	2.3	6.1	1.9	2.0	1.9
		Manitowoc Crane	92.5	8.1	21.3	6.7	7.0	6.7
		Tool Comp	30.8	2.7	7.1	2.2	2.3	2.2
		Tool Comp	50.4	4.4	11.6	3.7	3.8	3.6
		Dive Compressor	0.0	0.0	0.0	0.0	0.0	0.0
		Dive Compressor	0.0	0.0	0.0	0.0	0.0	0.0
		37KW Generator	30.8	2.7	7.1	2.2	2.3	2.2
		Welder	23.9	2.1	5.5	1.7	1.8	1.7
		Water Blaster	0.0	0.0	0.0	0.0	0.0	0.0
		Jet Pump	0.0	0.0	0.0	0.0	0.0	0.0
	Tug Julie	Mains	154.0	16.8	44.4	14.0	14.5	13.9
		Gen Set	4.4	0.4	1.0	0.3	0.3	0.3
Seabed Debris/Wellhead & Jetting	M/V KAHU	Mains	39.0	2.7	12.4	4.5	5.2	5.0
		Gen Set	9.6	0.7	3.1	1.1	1.3	1.2
	Barge Siuslaw	Anchor Winches	26.7	2.3	6.1	1.9	2.0	1.9
		Manitowoc Crane	123.3	10.8	28.4	9.0	9.3	8.9
		Tool Comp	41.1	3.6	9.5	3.0	3.1	3.0
		Tool Comp	67.1	5.9	15.5	4.9	5.1	4.8
		Dive Compressor	25.2	2.2	5.8	1.8	1.9	1.8
		Dive Compressor	12.6	1.1	2.9	0.9	0.9	0.9
		37KW Generator	30.8	2.7	7.1	2.2	2.3	2.2
		Welder	0.0	0.0	0.0	0.0	0.0	0.0
		Water Blaster	144.8	12.6	33.4	10.5	10.9	10.5
		Jet Pump	144.8	12.6	33.4	10.5	10.9	10.5
	Tug Julie	Mains	205.4	22.4	59.2	18.7	19.3	18.5
		Gen Set	5.9	0.5	1.4	0.4	0.4	0.4
Topple Columns	M/V KAHU	Mains	0.0	0.0	0.0	0.0	0.0	0.0
		Gen Set	9.6	0.7	3.1	1.1	1.3	1.2
	Barge Siuslaw	Anchor Winches	26.7	2.3	6.1	1.9	2.0	1.9
		Manitowoc Crane	12.3	1.1	2.8	0.9	0.9	0.9
		Tool Comp	5.1	0.4	1.2	0.4	0.4	0.4
		Tool Comp	4.2	0.4	1.0	0.3	0.3	0.3
		Dive Compressor	6.3	0.5	1.5	0.5	0.5	0.5
		Dive Compressor	3.1	0.3	0.7	0.2	0.2	0.2
		37KW Generator	5.1	0.4	1.2	0.4	0.4	0.4
		Welder	0.0	0.0	0.0	0.0	0.0	0.0
		Water Blaster	24.1	2.1	5.6	1.8	1.8	1.7
		Jet Pump	24.1	2.1	5.6	1.8	1.8	1.7
	Tug Julie	Mains	77.0	3.8	17.9	6.5	7.6	7.2
		Gen Set	2.7	0.1	0.6	0.2	0.3	0.3

Task Description	Vessel	Equipment	Estimated Maximum Emissions (lb.) NOx	ROC	CO	SOx	PM	PM10
Recover Debris - Nearshore Wellhead	M/V KAHU	Mains	195.2	13.3	62.1	22.4	26.2	25.1
		Gen Set	9.6	0.7	3.1	1.1	1.3	1.2
	Barge Siuslaw	Anchor Winches	66.6	5.8	15.4	4.8	5.0	4.8
		Manitowoc Crane	123.3	10.8	28.4	9.0	9.3	8.9
		Tool Comp	41.1	3.6	9.5	3.0	3.1	3.0
		Tool Comp	67.1	5.9	15.5	4.9	5.1	4.8
		Dive Compressor	25.2	2.2	5.8	1.8	1.9	1.8
		Dive Compressor	12.6	1.1	2.9	0.9	0.9	0.9
		37KW Generator	41.1	3.6	9.5	3.0	3.1	3.0
		Welder	23.9	2.1	5.5	1.7	1.8	1.7
		Water Blaster	144.8	12.6	33.4	10.5	10.9	10.5
		Jet Pump	144.8	12.6	33.4	10.5	10.9	10.5
	Tug Julie	Mains	154.0	16.8	44.4	14.0	14.5	13.9
		Gen Set	5.9	0.5	1.4	0.4	0.4	0.4
Nest Columns	M/V KAHU	Mains	234.3	16.0	74.6	26.9	31.4	30.2
		Gen Set	9.6	0.7	3.1	1.1	1.3	1.2
	Barge Siuslaw	Anchor Winches	80.0	7.0	18.4	5.8	6.0	5.8
		RB-97 Hoisting Winch	50.0	4.4	11.5	3.6	3.8	3.6
		Tool Comp	0.0	0.0	0.0	0.0	0.0	0.0
		Tool Comp	25.2	2.2	5.8	1.8	1.9	1.8
		Dive Compressor	25.2	2.2	5.8	1.8	1.9	1.8
		Dive Compressor	12.6	1.1	2.9	0.9	0.9	0.9
		37KW Generator	15.4	1.3	3.6	1.1	1.2	1.1
		Welder	0.0	0.0	0.0	0.0	0.0	0.0
		Water Blaster	108.6	9.5	25.0	7.9	8.2	7.8
		Jet Pump	0.0	0.0	0.0	0.0	0.0	0.0
	Tug Julie	Mains	154.0	16.8	44.4	14.0	14.5	13.9
		Gen Set	4.4	0.4	1.0	0.3	0.3	0.3
Drive Piles	M/V KAHU	Mains	156.2	10.7	49.7	17.9	21.0	20.1
		Gen Set	3.2	0.2	1.0	0.4	0.4	0.4
	Barge Siuslaw	Anchor Winches	53.3	4.7	12.3	3.9	4.0	3.9
		Manitowoc Crane	74.0	6.5	17.1	5.4	5.6	5.3
		Tool Comp	28.3	2.5	6.5	2.1	2.1	2.0
		Tool Comp	42.0	3.7	9.7	3.1	3.2	3.0
		Dive Compressor	12.6	1.1	2.9	0.9	0.9	0.9
		Dive Compressor	6.3	0.5	1.5	0.5	0.5	0.5
		37KW Generator	25.7	2.2	5.9	1.9	1.9	1.9
		Welder	15.9	1.4	3.7	1.2	1.2	1.2
		Water Blaster	72.4	6.3	16.7	5.3	5.4	5.2
		Jet Pump	72.4	6.3	16.7	5.3	5.4	5.2
	Tug Julie	Mains	308.1	33.6	88.8	28.0	29.0	27.8
		Gen Set	8.9	0.8	2.0	0.6	0.7	0.6
	Pile Driver	Main Power	110.7	9.7	25.5	8.1	8.3	8.0
Place Quarry Rock	M/V Larcona	Mains	193.5	13.2	61.6	22.2	26.0	24.9
(includes transit from Catalina)		Gen Set	1.9	0.1	0.6	0.2	0.3	0.2
	M/V KAHU	Mains	641.3	32.0	149.1	53.7	62.9	60.3
		Gen Set	13.2	0.7	3.1	1.1	1.3	1.2
	Barge Siuslaw	Anchor Winches	160.0	14.0	36.9	11.6	12.0	11.6
		Manitowoc Crane	74.0	6.5	17.1	5.4	5.6	5.3
		Tool Comp	42.4	3.7	9.8	3.1	3.2	3.1
		Tool Comp	62.9	5.5	14.5	4.6	4.7	4.5
		Dive Compressor	18.9	1.6	4.4	1.4	1.4	1.4
		Dive Compressor	9.4	0.8	2.2	0.7	0.7	0.7
		37KW Generator	38.6	3.4	8.9	2.8	2.9	2.8
		Welder	23.9	2.1	5.5	1.7	1.8	1.7
		Water Blaster	108.6	9.5	25.0	7.9	8.2	7.8
		Jet Pump	108.6	9.5	25.0	7.9	8.2	7.8
	Cat 98F Loader	Main Power	76.6	6.7	17.7	5.6	5.8	5.5
	Tug Julie	Mains	231.0	25.2	66.6	21.0	21.7	20.9
		Gen Set	6.7	0.6	1.5	0.5	0.5	0.5

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Task Description	Vessel	Equipment	Estimated Maximum Emissions (lb.)					
			NOx	ROC	CO	SOx	PM	PM10
Install Roosting Platforms	M/V KAHU	Mains	156.2	10.7	49.7	17.9	21.0	20.1
		Gen Set	3.2	0.2	1.0	0.4	0.4	0.4
	Barge Siuslaw	Anchor Winches	53.3	4.7	12.3	3.9	4.0	3.9
		Manitowoc Crane	37.0	3.2	8.5	2.7	2.8	2.7
		Tool Comp	28.3	2.5	6.5	2.1	2.1	2.0
		Tool Comp	42.0	3.7	9.7	3.1	3.2	3.0
		Dive Compressor	12.6	1.1	2.9	0.9	0.9	0.9
		Dive Compressor	6.3	0.5	1.5	0.5	0.5	0.5
		37KW Generator	25.7	2.2	5.9	1.9	1.9	1.9
		Welder	15.9	1.4	3.7	1.2	1.2	1.2
		Water Blaster	72.4	6.3	16.7	5.3	5.4	5.2
		Jet Pump	72.4	6.3	16.7	5.3	5.4	5.2
	Tug Julie	Mains	102.7	11.2	29.6	9.3	9.7	9.3
		Gen Set	3.0	0.3	0.7	0.2	0.2	0.2
Debris Survey	M/V KAHU	Mains	78.1	5.3	24.9	9.0	10.5	10.1
		Gen Set	1.6	0.1	0.5	0.2	0.2	0.2
	Barge Siuslaw	Anchor Winches	26.7	2.3	6.1	1.9	2.0	1.9
		Manitowoc Crane	24.7	2.2	5.7	1.8	1.9	1.8
		Tool Comp	14.1	1.2	3.3	1.0	1.1	1.0
		Tool Comp	21.0	1.8	4.8	1.5	1.6	1.5
		Dive Compressor	6.3	0.5	1.5	0.5	0.5	0.5
		Dive Compressor	3.1	0.3	0.7	0.2	0.2	0.2
		37KW Generator	12.9	1.1	3.0	0.9	1.0	0.9
		Welder	8.0	0.7	1.8	0.6	0.6	0.6
		Water Blaster	36.2	3.2	8.3	2.6	2.7	2.6
		Jet Pump	36.2	3.2	8.3	2.6	2.7	2.6
	Tug Julie	Mains	51.3	5.6	14.8	4.7	4.8	4.6
		Gen Set	1.5	0.1	0.3	0.1	0.1	0.1
Removing Anchors	M/V Larcona	Mains	96.3	4.8	22.4	8.1	9.4	9.1
		Gen Set	1.6	0.1	0.4	0.1	0.1	0.1
	M/V KAHU	Mains	78.1	5.3	24.9	9.0	10.5	10.1
		Gen Set	1.6	0.1	0.5	0.2	0.2	0.2
	Barge Siuslaw	Anchor Winches	26.7	2.3	6.1	1.9	2.0	1.9
		Manitowoc Crane	12.3	1.1	2.8	0.9	0.9	0.9
	Tug Julie	Mains	25.7	2.8	7.4	2.3	2.4	2.3
		Gen Set	0.7	0.1	0.2	0.1	0.1	0.1
		Totals (tons)	**3.97**	**0.33**	**1.02**	**0.34**	**0.37**	**0.36**

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ARCO

Pier PRC-421 Revised Project
Project Emissions Summary

Task Description	Estimated Maximum Emissions (lb.)					
	NOx	ROC	CO	SOx	PM	PM10
Transit Siuslaw From Long Beach	488.4	28.6	132.4	47.6	55.7	53.5
Anchoring &	67.4	4.9	18.1	6.2	7.0	6.7
Remove Topsides	540.3	48.1	144.5	47.4	51.0	49.0
Seabed Debris/Wellhead & Jetting	876.4	80.1	218.1	69.5	72.7	69.7
Topple Columns	200.5	14.3	47.2	15.9	17.5	16.8
Recover Debris - Nearshore Wellhead	1055.4	91.6	270.1	88.1	94.4	90.6
Nest Columns	719.3	61.5	196.1	65.3	71.4	68.5
Drive Piles	989.9	90.2	259.9	84.3	89.6	86.1
Place Quarry Rock	1811.5	135.0	449.3	151.4	167.0	160.4
Install Roosting Platforms	630.9	54.3	165.3	54.4	58.8	56.4
Debris Survey	321.6	27.7	84.1	27.7	29.9	28.7
Removing Anchors	243.0	16.7	64.7	22.5	25.7	24.6
Totals (tons)	**3.97**	**0.33**	**1.02**	**0.34**	**0.37**	**0.36**

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M. F. Strange & Associates
AIR QUALITY AND ENVIRONMENTAL STUDIES

Memorandum

To: Donna Hebert
Padre Associates

From: Marianne Strange

Date: January 12, 2004

Subject: PRC 421

A comment during the CEQA review of the PRC 421 project requests justification regarding the use of load factors when calculating the worst case emission scenario.

Industry and SBCACPD have established load factors for use when calculating emissions from internal combustion processes. Equipment is not operated at full load (100%) of maximum operating potential. This has been documented by the SBCAPCD during operation of many sources and the observation of short-term projects including de-commissioning. Many engines, both stationary and in marine vessels have been source tested and found to be in compliance by load and fuel consumption. Marine vessel studies were conducted by the APCD and operating loads for the main engines were documented to be less than 65%. Small engines tend to run at a higher RPM; thus 85% load is justified. Load factors were accepted during the decommissioning of the Chevron 4H Platform removal project. Even with the use of these factors, the estimated fuel consumption was grossly over estimated from actual. Load factors are also used by the SBCAPCD when permitting the worst case emission scenarios. The load factors used for calculating the emissions for this project are acceptable and within the normal permitting practice of the agency.

Thank you.

Marianne Strange

P. O. BOX 1484 SANTA BARBARA, CA 93102 PHONE: (805) 564-6590 FAX: (805) 963-0096