ANNUAL REPORT TO THE CALIFORNIA LEGISLATURE FOR THE YEAR 2008

THE CALIFORNIA OIL TRANSFER AND TRANSPORTATION EMISSION AND RISK REDUCTION PROGRAM 2004 to 2009

Prepared by the California State Lands Commission
April 2009

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... **i**

PURPOSE OF THE PROGRAM **1**

THE OTTER DATABASE **3**

REPORT TO THE LEGISLATURE **3**

OIL TRANSFER AND TRANSPORTATION EMISSION AND RISK REDUCTION ACT **3**

STATISTICS FOR 2008 ..... **3**

ANNUAL SUMMARY 2008 – VOYAGES 3
ANNUAL STATISTICS TABLE 4
TANK VESSELS VOYAGES (2008) 5
AVERAGE DURATION OF VOYAGE BY TANK VESSELS 6
VOYAGE DISTRIBUTION BY VESSEL TYPE (2008) 7
DISTRIBUTION OF VOYAGES BY VESSEL TYPE (2004 – 2008) 8
VOYAGE DISTRIBUTION BETWEEN AREAS IN CALIFORNIA (2008) 9
OCEAN AND COASTAL VOYAGES (2008) 10
QUARTERLY AGGREGATE OF VOYAGES OF REFINED PRODUCTS AND CRUDE OIL (2008) 11
NUMBER OF VOYAGES FOR CRUDE AND REFINED OILS (2004-2008) 12
VOLUME OF OIL TRANSFERRED (2008) 13
TYPE OF OIL TRANSFERRED (2008) 14
VOLUMES OF PRODUCTS TRANSFERRED BETWEEN LOCATIONS (2004-2008) 15
VOLUMES OF OIL TRANSFERRED (2004-2008) 16

AIR EMISSIONS **17**

DISTRIBUTION OF EMISSIONS IN (2008) 17
DISTRIBUTION OF EMISSIONS (2004 to 2008) 18
NITROGEN OXIDE (NO_X) EMISSIONS (2008) 19
NITROGEN OXIDE (NO_X) EMISSIONS (2004-2008) 20
HYDROCARBON (HC) EMISSIONS (2008) 21
HYDROCARBON (HC) EMISSIONS (2004-2008) 22
PARTICULATE MATTER (PM) EMISSIONS (2008) 23
PARTICULATE MATTER (PM) EMISSIONS (2004-2008) 24
CARBON MONOXIDE (CO) EMISSIONS (2008) 25
CARBON MONOXIDE (CO) EMISSIONS (2004-2008) 26

PERTINENT ISSUES **27**

APPENDIX A: THE OIL TRANSFER AND TRANSPORTATION EMISSION AND RISK REDUCTION ACT OF 2002 ..... **29**

APPENDIX B: THE OIL TRANSFER AND TRANSPORTATION EMISSION AND RISK REDUCTION FORM **35**

EXECUTIVE SUMMARY

The Oil Transfer and Transportation Emission and Risk Reduction Act of 2002, Public Resources Code Sections 8780 through 8789, (Act) established the California Oil Transfer and Transportation Emission and Risk Reduction (OTTER) program under the direction of the California State Lands Commission (CSLC). The Act requires the CSLC to file a report with the legislature summarizing the information collected under the program. The copy of the Act is in Appendix A.

The OTTER program collects data related to the "internal shipment of oil" by marine vessels between facilities in the San Francisco Bay area and the Los Angeles/Long Beach area as defined by the Act (§ 8782(d)). The legislature found that current, accessible and accurate data regarding oil transportation is critical to having adequate information of the potential environmental quality, public health, and environmental justice consequences that must be analyzed. The information can be used by state and local agencies for environmental impact reports and statements, emergency response planning, permit issuance, and air quality mitigation efforts. It also declared that tracking trends in internal shipment of oil is necessary to promote public safety, health, and welfare, and to protect public and private property, wildlife, marine fisheries, and other ocean resources, and the natural environment in order to protect and preserve the ecological balance of California's coastal zone, coastal waters, and coastal economy.

To gather the necessary data as defined in the Act the CSLC was directed to develop the "Oil Transfer and Transportation Emission and Risk Reduction (OTTER) Form" to be completed by the owner of the oil involved in the internal shipment of oil. The form was developed and has been used by the responsible parties. The OTTER Form can be found in Appendix B.

The CSLC is required to aggregate and provide the reported OTTER information to the legislature in the form of annual reports for the years 2004 through 2009. The report is to discuss trends, provide specific information on air emissions and vessel types used as well as the number of transfers related to the shutdown of refineries.

This is the fifth in a series of annual reports to the legislature. The first, second, third and fourth annual reports to the California Legislature were prepared in April in 2005, 2006, 2007 and 2008 respectively. These reports can be accessed at: http://www.slc.ca.gov/Division_Pages/MFD/MFD_Programs/OTTER/OTTER.html

OTTER report forms for the year 2008 indicate:

Total number of internal voyages:	363
Number of voyages from San Francisco Bay Area to Los Angeles/Long Beach:	281
Number of voyages from Los Angeles/Long Beach to San Francisco Bay Area:	66
Number of voyages from Ellwood to Long Beach:	12
Number of voyages from Ellwood to San Francisco Bay Area:	4

Total volume of crude oil shipped as internal shipments:	1,002,283 barrels
Total volume of refined oil shipped as internal shipments:	35,802,873 barrels

All but one internal shipment of crude oil in 2008 was from the Ellwood marine terminal, off the Coast of Santa Barbara County.

Total air emissions resulting from internal shipments of oil:

Nitrogen Oxide (NO_x) emissions:	1171.10 short tons
Hydrocarbon (HC) emissions:	58.78 short tons
Particulate Matter (PM) emissions:	61.62 short tons
Carbon Monoxide (CO) emissions:	189.50 short tons

During the year 2008, there were no internal shipments reported due to refinery breakdowns.

The Act also required CSLC to report the amount and location of ballast discharge in the event that Sections 71200 through 71271 of the Public Resources Code are repealed. The Marine Invasive Species Act of 2003 has been reauthorized and it enhances the state's program to prevent the introduction of non-indigenous aquatic nuisance species through vessel's ballast water discharges. This report therefore contains no information regarding the discharge of ballast.

A percentage change in trends of key indicators from the data for 2004, 2005, 2006, 2007 and 2008 is summarized in the table below:

Key indicators in percentages	**2004 to 2008**	**2005 to 2008**	**2006 to 2008**	**2007 to 2008**
Number of voyages	-0.55	-12.74	-4.72	5.22
Volume of oil shipped as internal shipment	8.02	-8.40	-0.25	23.79
No_x emissions	-1.16	-5.59	-12.70	-5.22
HC emissions	-2.03	-7.97	-14.28	-1.57
PM emissions	-25.87	-16.89	11.11	51.29
CO emissions	7.72	18.02	-5.14	-5.23

There was a 5.22% increase in the number of internal shipments by sea in 2008 in comparison to the data of 2007. This translated to 110.00% increase in the voyages of tank ships and 4.76% decline in the voyages of barges. In 2007 tank ship voyage duration averaged 48.00 hours and barge voyages averaged 62.39 hours between San Francisco Bay area and Los Angeles/ Long Beach area. In 2008 the average time was 38.44 hours and 65.18 hours respectively.

The data reveals that approximately 83% of internal shipments of oil were by barge and 17% were by tank ship in the year 2008. There was a twofold increase in the use of tank ships from the previous year and a steady trend in the use of barges during internal shipments. The observed trend in the increased usage of tank ship voyages is probably due to reporting anomalies from the previous year and not seen as being indicative of any major trend.

All tank ships and some barges sail more than 25 miles from the coast. Most of the barges sail 12 to 15 miles from the coast using the internationally recognized Santa Barbara Channel Traffic Separation Scheme. 83% of the internal shipments were 12 to 15 miles from the coast and 17% of the shipments were more than 25 miles from the coast.

The usage of tank ships more than doubled from 2007 to 2008, while the average voyage times for tank ships fell in 2008. This correlates to the observed dramatic rise in PM, or particulate matter of slightly over 51%, while the coastal voyage (barges) PM fell by less than one percent, the PM for ocean voyages (tank ships) increased to slightly over 116%.

While there was an increase in the number of internal shipments in 2008 in comparison to the previous year, there was a 5.23% decrease in the CO; while the No_x, fell by 5.22%; the HC fell at 1.57% and the PM at a 51.29% increase reflected the greatest change from the previous year.

The OTTER program does not capture specific data that could reveal the reason for change in voyage durations. Total emissions are determined by the duration of the voyage.

The OTTER program captures data about a small but significant segment of air emissions along the coast of California. The trend shows the majority of internal voyages are taking place by barges, 12 to 15 miles from the coast, than by tank ships which sail more than 25 miles from the coast. The overall emissions trend reveals that PM emission increases are directly proportional to the increased usage of tank vessels. There were no shipments reported due to refinery shutdowns.

PURPOSE OF THE PROGRAM

The Oil Transfer and Transportation Emission and Risk Reduction Act of 2002, Public Resources Code Sections 8780 through 8789, (Act) established the California Oil Transfer and Transportation Emission and Risk Reduction (OTTER) program under the direction of the California State Lands Commission (CSLC). The Act requires the CSLC to develop a program to implement the requirements of the Act.

The purpose of the OTTER program is to collect data related to the internal shipments of oil by marine vessels between the San Francisco Bay area and the Los Angeles/Long Beach area. The legislature found that current, accessible and accurate data regarding oil transportation is critical to having adequate information of the potential environmental quality, public health, and environmental justice consequences that must be analyzed. The information can be used by state and local agencies, for environmental impact reports and statements, emergency response planning, permit issuance, and air quality mitigation efforts. It also declared that tracking trends in internal shipments of oil is necessary to promote public safety, health, and welfare, and to protect public and private property, wildlife, marine fisheries, and other ocean resources, and the natural environment in order to protect and to preserve the ecological balance of California's coastal zone, coastal waters, and coastal economy.

To gather the required data as defined in the Act, the CSLC was directed to develop the "Oil Transfer and Transportation Emission and Risk Reduction Form" to be completed by the owner of the oil or a designated responsible party engaged in the internal shipment of oil. The form was developed and has been used by the oil owners and responsible parties. The CSLC is required to aggregate the OTTER information and provide it to the legislature in the form of annual reports for the years 2004 through 2009.

INFORMATION REQUIREMENTS

The Act required the CSLC, in consultation with the industry, to develop an Oil Transfer and Transportation Emission and Risk Reduction Form for owners of oil or designated responsible parties to report information regarding the volume and types of oil, the routes and duration of voyages and the estimated quantities of air emissions associated with the internal shipments of oil.

Specifically, the Act requires that the form contain the following:

(1) The name, address, point of contact, and telephone number of the responsible party.

(2) The name of the vessel transporting the oil.

(3) The type and amount of oil being transported.

(4) The source of crude oil.

(5) The name and location of any terminal that loaded the vessel.

(6) The name and location of any terminal that discharged the tanker or barge.

(7) The dates of travel and the route.

(8) The type of engine and fuel used to power the tanker or barge-towing vessel.

(9) The estimated amount and type of air emissions. To the extent practicable, the emissions factors developed by the United States Environmental Protection Agency shall be used to estimate the amount of air emissions. The form shall be designed to ensure that charter vessel air emissions are not counted more than once.

(10) An indication of whether the reason for the internal shipping of oil was due to a temporary shutdown or partial shutdown of a key refinery facility.

(11) On and after January 1, 2004, if Division 36 (commencing with Section 71200) is repealed pursuant to Section 71271, the amount of any ballast discharged and the location of the discharge. (This requirement was not invoked as The Marine Invasive Species Act of 2003 reauthorized and enhanced the state's program to prevent the introduction of nonindigenous aquatic nuisance species through vessel's ballast water discharges).

Prior to the commencement of the reporting of internal shipments of oil, CSLC staff, in consultation with a Technical Advisory Group of industry participants, developed the OTTER form which is shown in Appendix B. Details of the collaboration with industry for development of the OTTER reporting form can be found in the first annual report for the year 2004.

VOYAGE ROUTES

The Act requires the reporting of vessel routes. Tank ships and barges typically travel on routes that are prescribed distances from shore based upon agreements between the oil industry and state government agencies. Most barges travel in the internationally designated Traffic Separation Scheme (TSS) in the Santa Barbara Channel and travel along the coast. On these voyages, tank barges are generally 12 to 15 nautical miles offshore. Most tank ships and some barges travel at a distance greater than 25 miles offshore. For simplicity of reporting it was decided to use the designation "S" for vessels utilizing the Santa Barbara Channel TSS. For the others, "O" is used to designate an offshore voyage. If a different type of route is used, it is to be reported by a notation to the OTTER Form.

THE OTTER DATABASE

The information received by CSLC is entered into an electronic database. At the end of each quarter, the information is aggregated and entered into a table. At the end of the year, the table enables staff to prepare the mandated annual report to the legislature. It also allows staff to compare quarterly and annual trends in the internal shipments of oil.

REPORT TO THE LEGISLATURE

The Act requires the CSLC to submit a report to the legislature and to make the report available to other parties requesting it. Annual reports are to be filed with the legislature on or before April 1, each year for the years 2004 to 2009.

The Act requires the Annual Reports to include, at a minimum, the following:

(1) A description of any trends in the total number of trips by oil type, amount of shipment, and source of oil.

(2) The number of transfers due to refinery shutdowns.

(3) The location of air emissions and ballast discharge, and the type of vessel used during those events.

(4) A discussion of any other pertinent issues that the Commission determines should be included.

OIL TRANSFER AND TRANSPORTATION EMISSION AND RISK REDUCTION ACT

STATISTICS FOR 2008

ANNUAL SUMMARY 2008 – VOYAGES

Total number of internal shipment voyages:	363
Number of voyages from San Francisco Bay to Los Angeles/Long Beach:	281
Number of voyages from Los Angeles/Long Beach to San Francisco Bay:	66
Number of voyages from Ellwood to Long Beach:	12
Number of voyages from Ellwood to San Francisco Bay:	4
Number of offshore voyages (O) : > 25 nautical miles from land	63
Number of coastal voyages (S): 12 to 15 nautical miles from land	300

The following table is a compilation of all submitted OTTER information for Calendar Year 2008. The table gives the annual statistical data of the OTTER program.

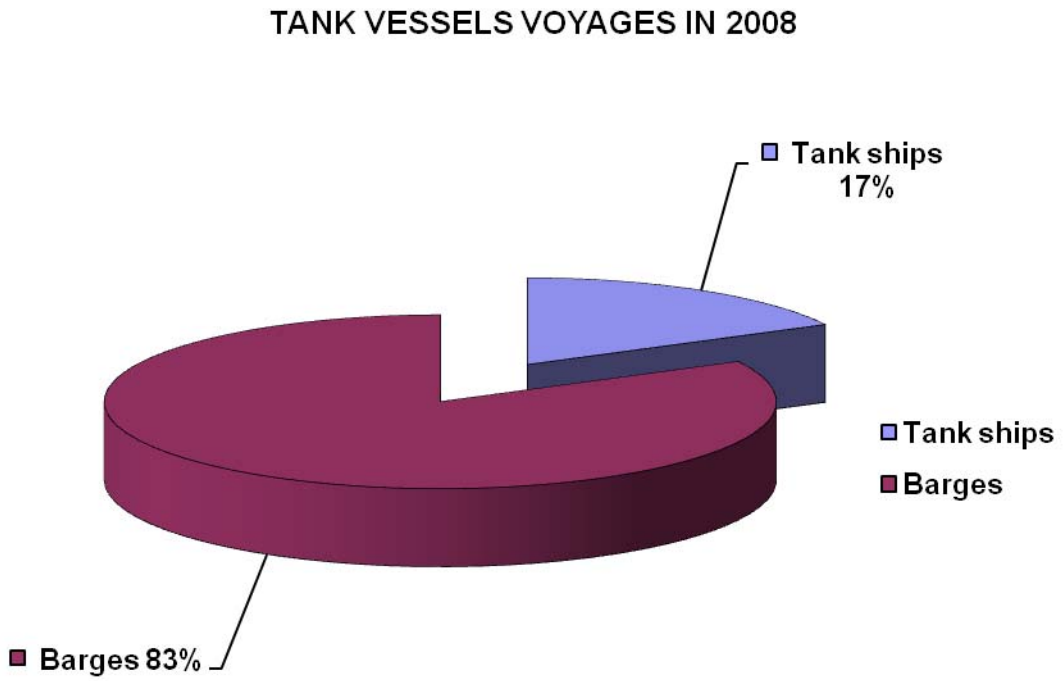
ANNUAL OTTER REPORT 2008

ANNUAL STATISTICS TABLE

Items	1st. Quarter	2nd. Quarter	3rd. Quarter	4th. Quarter	Aggregate Year 2008
Total number of internal shipments of oil	100	89	66	108	363
Number of internal shipments by tanker	14	18	10	21	63
Number of internal shipments by barge/tug	86	71	56	87	300
Number of barrels of crude oil shipped	250,004	161,863	108,625	481,791	1,002,283
Number of barrels of refined oil shipped	10,238,766	8,945,107	6,388,659	10,230,341	35,802,873
Number of barrels of other oil shipped	0	0	0	0	0
Total NO_x emissions in short tons	323.29	290.67	213.73	343.39	1,171.10
Total HC emissions in short tons	16.70	15.11	9.89	17.06	58.78
Total PM emissions in short tons	14.92	15.64	9.64	21.40	61.62
Total CO emissions in short tons	53.02	46.16	35.14	55.16	189.50
NO_x emissions 25 miles from coastline in short tons	49.77	44.00	20.06	52.65	166.49
NO_x emissions 12 to 15 miles from coastline in short tons	273.51	246.67	193.67	290.74	1,004.60
HC emissions 25 miles from coastline in short tons	3.89	3.99	2.01	5.38	15.28
HC emissions 12 to 15 miles from coastline in short tons	12.81	11.11	7.88	11.68	43.50
PM emissions 25 miles from coastline in short tons	8.35	10.02	5.33	15.19	38.90
PM emissions 12 to 15 miles from coastline in short tons	6.57	5.62	4.30	6.21	22.72
CO emissions 25 miles from coastline in short tons	8.31	6.85	3.06	7.32	25.55
CO emissions 12 to 15 miles from coastline in short tons	44.70	39.31	32.08	47.84	163.94
No. of internal shipments because of refinery shutdowns	0	0	0	0	0

TANK VESSELS VOYAGES (2008)

Total number of internal shipment voyages:	363
Voyages by tank ships:	63
Voyages by barges:	300

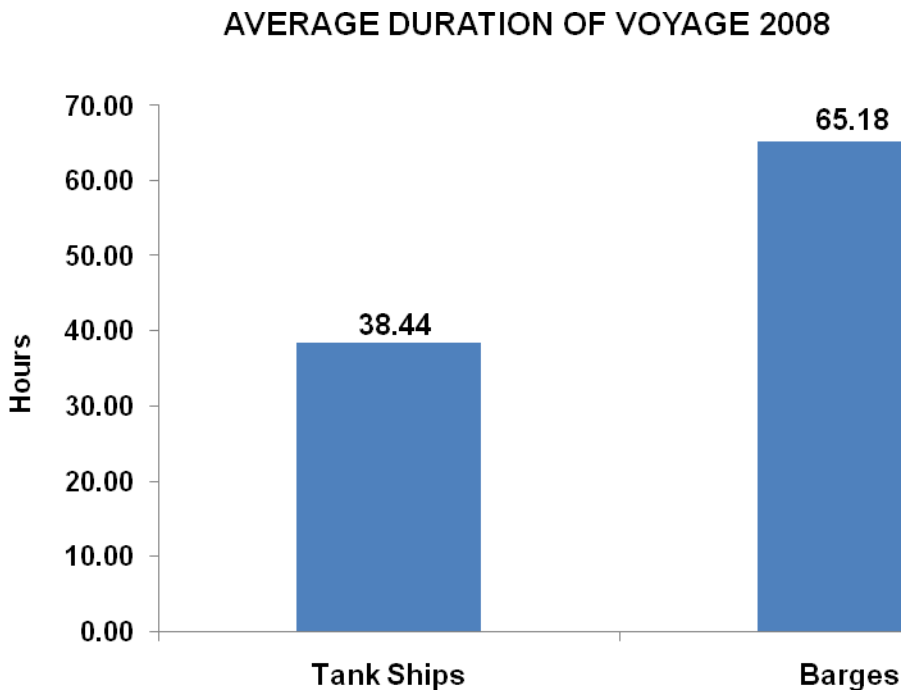


The data reveals that approximately 83% of internal shipments of oil were by barges and 17% were by tank ships in the year 2008.

Year	2004	2005	2006	2007	2008
Tank Ships	25.75%	20.19%	14.1%	9%	17%
Barges	74.25%	79.81%	85.90%	91%	83%

The table shows the yearly percentages of internal shipments of oil by tank ships and barges since the inception of the OTTER program. Note the definite increase in the utilization of tank ships for internal shipments during the reporting year.

AVERAGE DURATION OF VOYAGE BY TANK VESSELS



The 2008 data shows that on the average a tank ship took 38.44 hours and a barge took 65.18 hours to complete the voyage between the San Francisco Bay Area and Los Angeles/Long Beach Port Complex.

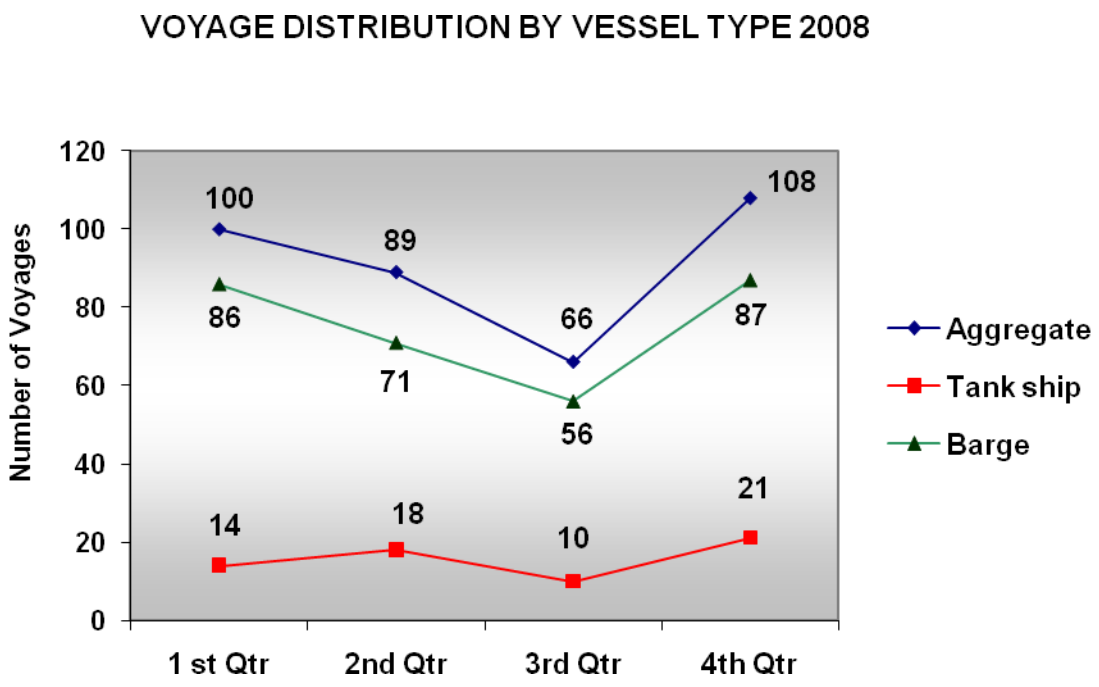
Total emissions are determined by the duration of the voyage.

Yearly Averages (hours)	2004	2005	2006	2007	2008
Tank Ships	31.53	33.32	35.48	48.00	38.44
Barges	57.42	62.92	64.85	62.39	65.18

The table shows the yearly average duration of voyages for both tank ships and barges in hours. The figures show that both barge and tank vessel voyage durations have been increasing slightly. A plausible reason for the increase in tank vessel voyage duration via the ocean voyage route from 2006 to 2007 is that in 2007 they were required to start conducting ballast water exchanges in waters greater than 50 nautical miles from the nearest coast. Again a plausible reason for the 20% drop in duration time for tank ships from 2007 may be related to better ballast management in 2008 by these vessels.

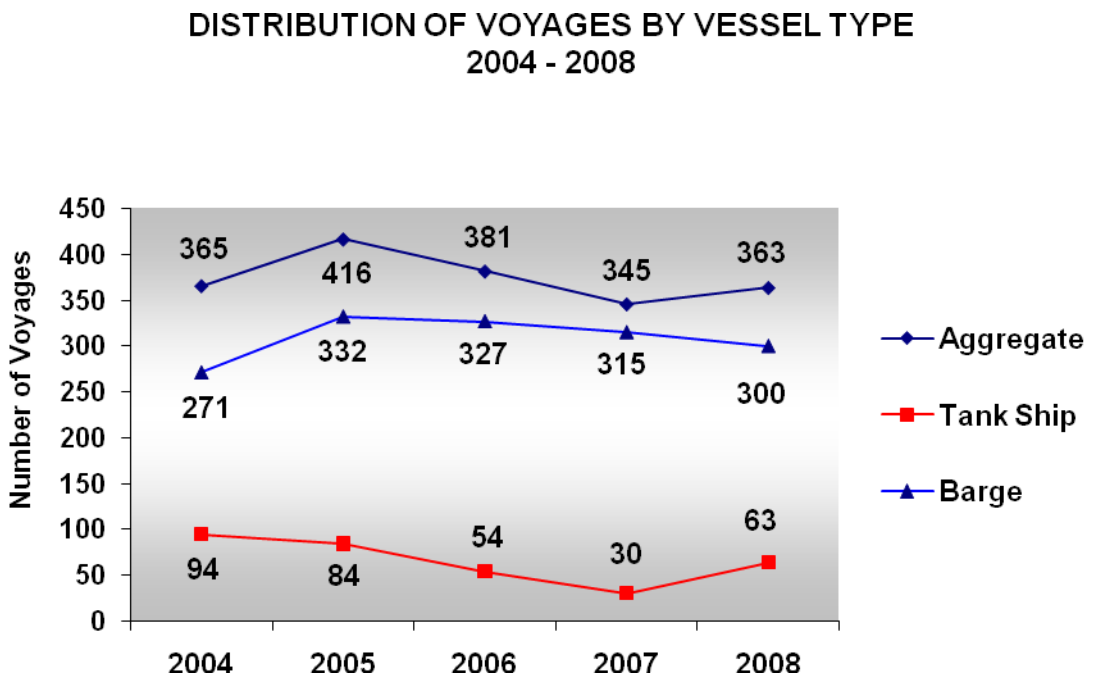
Another point to mention here is that voyages traveling up the coast will take more time and utilize more fuel, which produce more emissions, than the same voyage traveling down the coast. This is due to the prevailing current and swell direction that moves from the North and West respectively. The local vessel Masters refer to travelling “uphill” when going north and traveling “downhill” when travelling south.

VOYAGE DISTRIBUTION BY VESSEL TYPE (2008)



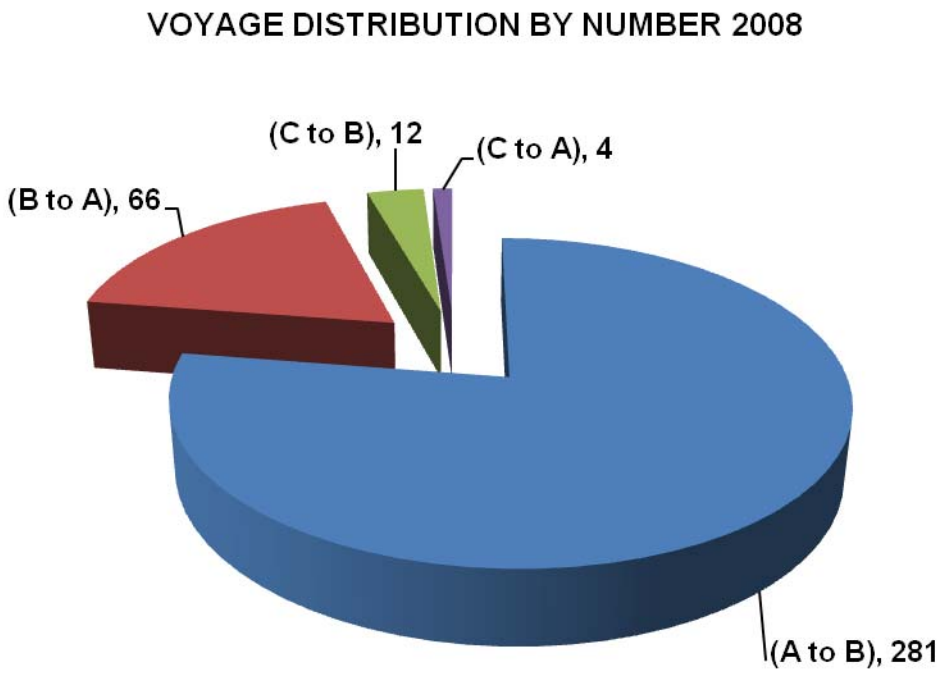
The maximum number of internal voyages for both tank ships and barges was in the fourth quarter and the minimum number was in the third quarter. The data for the barges followed the path of the aggregate, while the tank ships reveal a much lower and almost static trend line.

DISTRIBUTION OF VOYAGES BY VESSEL TYPE (2004 – 2008)



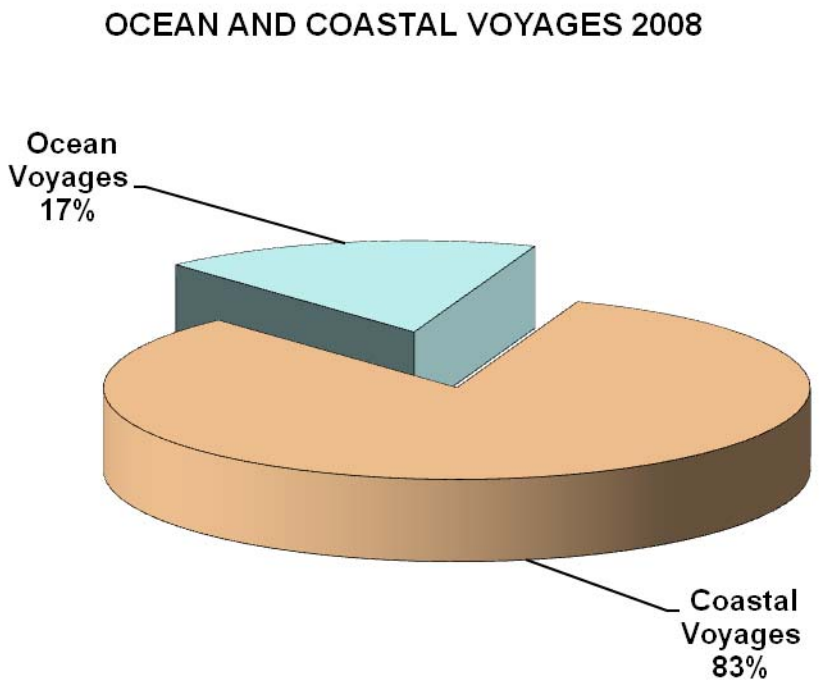
In comparison of the data of 2008 with 2007 there were 110% more voyages by tank ships and 4.76% less voyages by barges. When data of 2008 is compared with the data of year 2004, there were 32.98% less voyages by tank ships and 10.70% more voyages by barges. Overall the trend line shows that the utilization of tank ships was on a steady decline until 2007 with a doubling through 2008. The utilization of barges has remained steady with an increase of almost 11% from 2004. Total voyages in the aggregate have remained steady over the tracking period, with only a small decrease of less than 1% overall. The doubling of the observed utilization of tank ships from 2007 to 2008 may be the result of reporting anomalies from the previous year, which may have skewed the data.

VOYAGE DISTRIBUTION BETWEEN AREAS IN CALIFORNIA (2008)



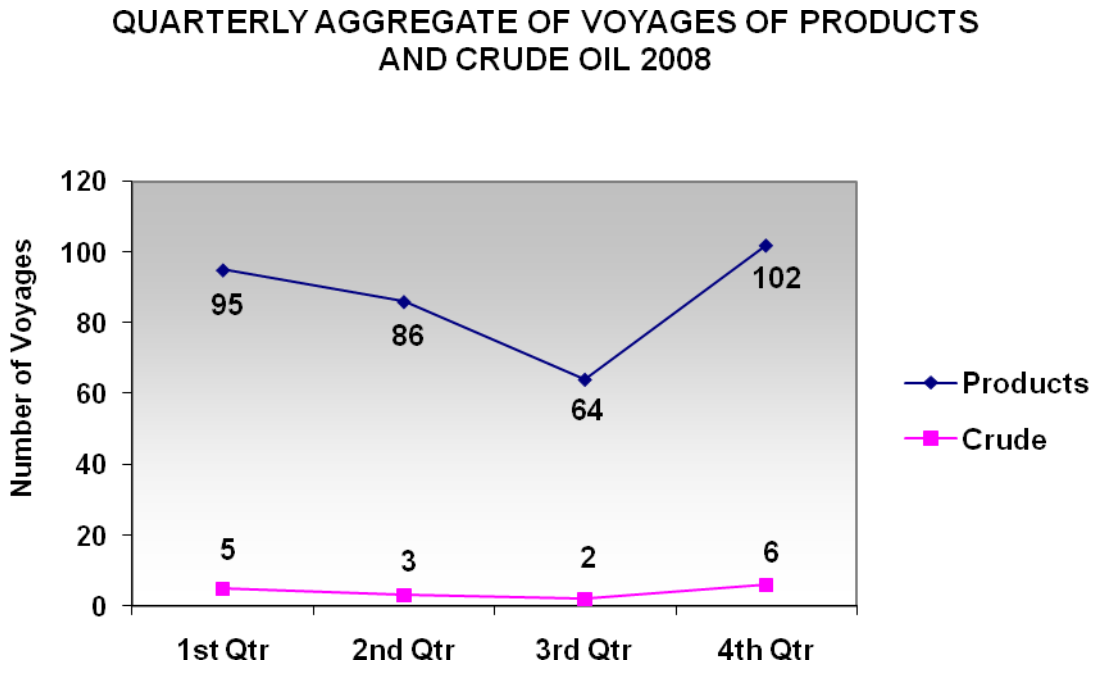
A to B: San Francisco Bay to Los Angeles/Long Beach
B to A: Long Beach/Los Angeles to San Francisco Bay
C to A: Ellwood to San Francisco Bay
C to B: Ellwood to Los Angeles/Long Beach

OCEAN AND COASTAL VOYAGES 2008



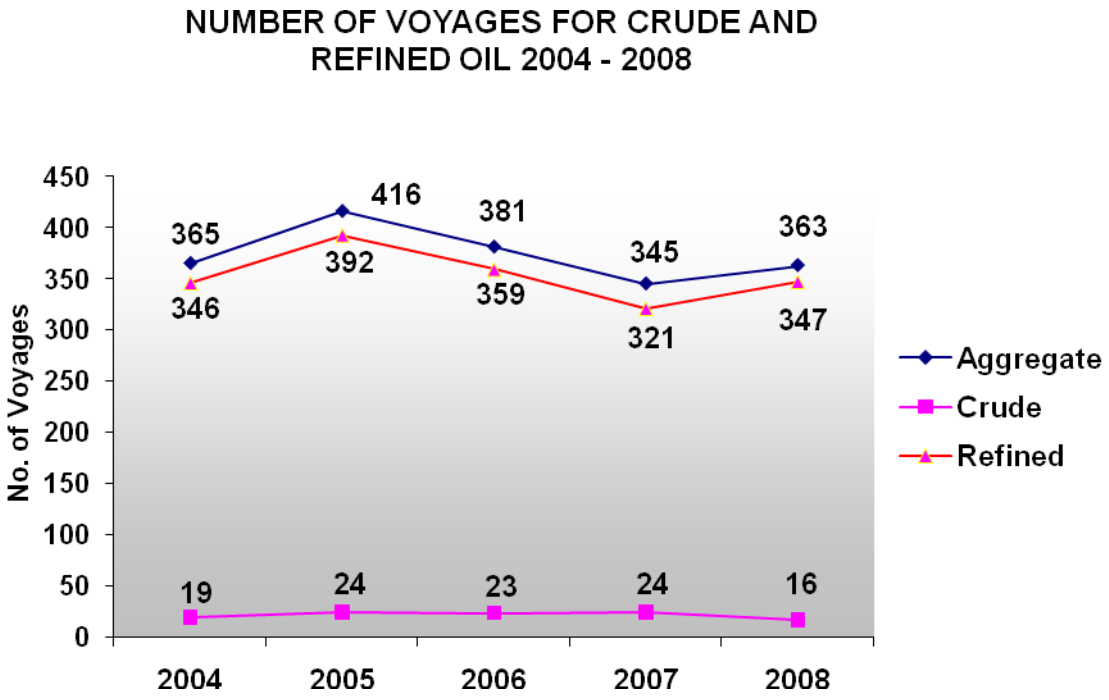
Of the total reported voyages in 2008, 17% were by the offshore ocean route, generally by tank ships. This ocean route keeps the tank ships 25 or more nautical miles from the coast. The coastal route utilized by barges accounted for 83% of the total voyages. The coastal route is defined as being 12 to 15 nautical miles from the coast. This is the first reporting year in which all ocean voyages were conducted by tank ships and all coastal voyages were conducted by barges.

QUARTERLY AGGREGATE OF VOYAGES OF REFINED PRODUCTS AND CRUDE OIL (2008)



The number of voyages for the transfer of refined products showed an overall upward trend, while the voyages for crude oil transfers reflect a slight midyear decline in 2008. The reason for this is that there was a four month reporting void during the second and third quarters due to maintenance activity conducted on the lone vessel that services the crude facility at location C (Ellwood).

NUMBER OF VOYAGES FOR CRUDE AND REFINED OILS (2004-2008)



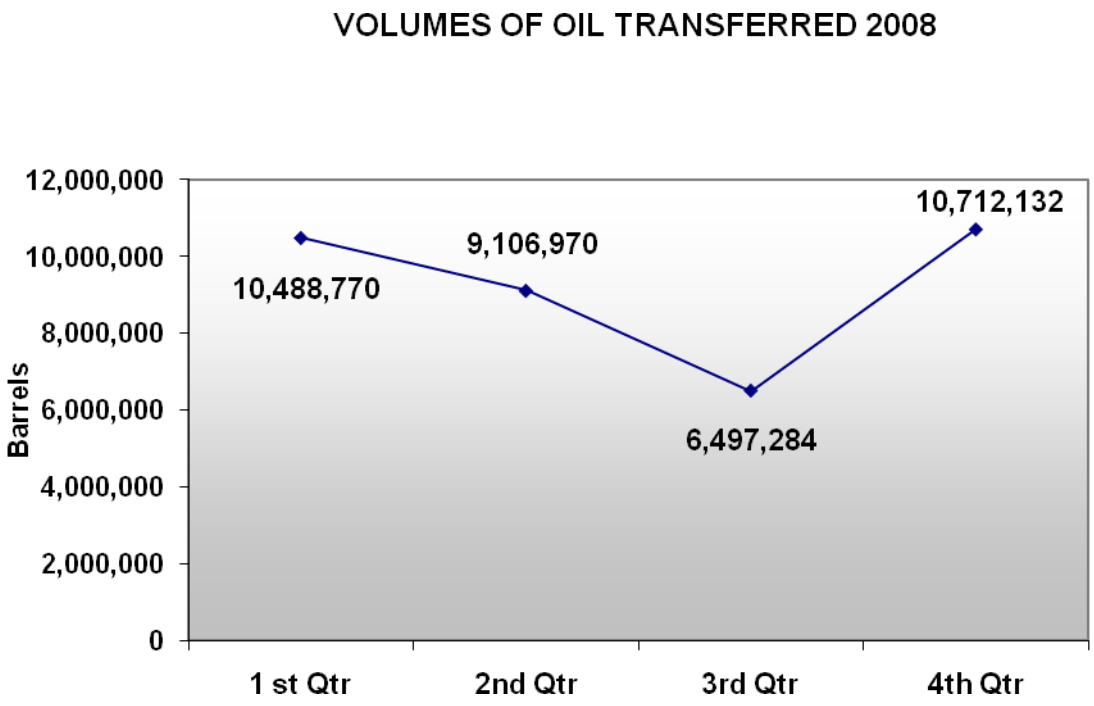
There was an increase of 5.22% in the aggregate number of voyages in 2008 when compared with the data of 2007. In comparison of the aggregate data of 2008 with the data of 2004 there was a barely perceptible decrease of 0.55% in the number of overall voyages.

The number of voyages for refined oils followed the trend of the aggregate, which showed a slight increase from the previous year. The voyages of crude oil reflect a perceived decreasing trend after four years of a plateau. This decrease was caused by a four month reporting void due to maintenance conducted on the sole vessel that transports crude oil from location point C to either A or B locations.

Furthermore, for the first time this data has been tracked, a tank ship transported crude oil from location A to B, while also transporting an incidental shipment of refined product. The refined oil transported was incidental when compared to the amount of crude oil transported.

VOLUME OF OIL TRANSFERRED (2008)

Total Volume:	36,805,156 barrels
Crude Oil:	1,002,283 barrels
Refined Oil:	35,802,873 barrels

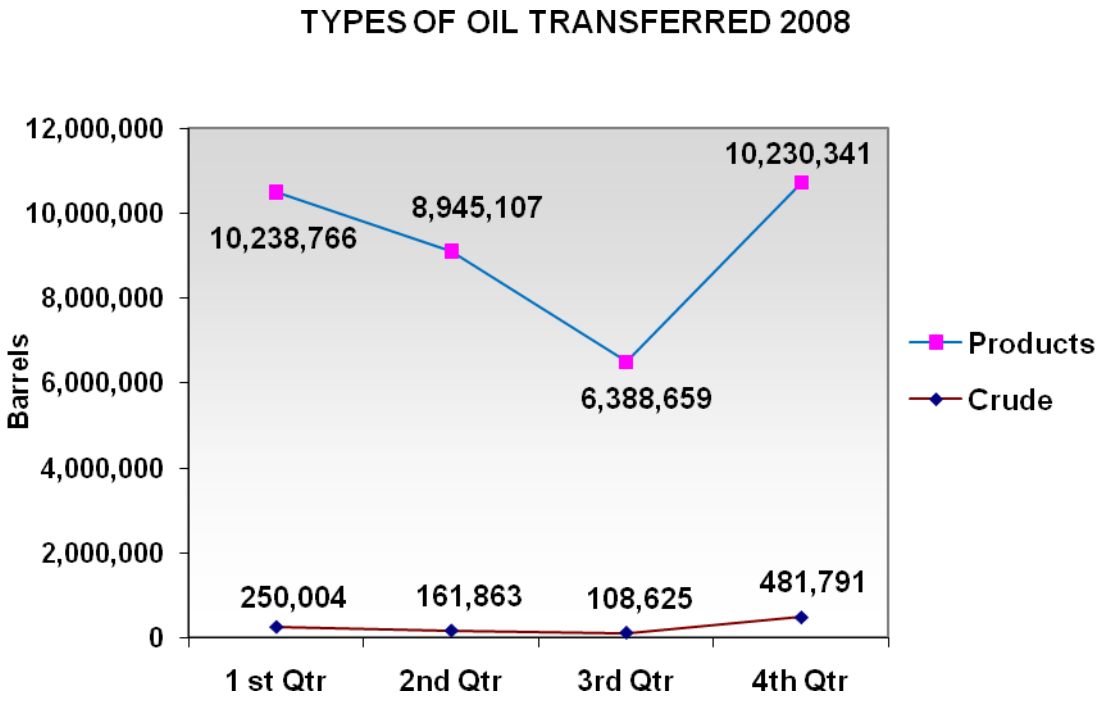


During 2008, all of the oil transported between the ports of the San Francisco Bay area and the Los Angeles/Long Beach area were refined products, except for one voyage. There was one voyage by tank ship from the San Francisco Bay area to Los Angeles/Long Beach which transported crude, no other voyage transporting crude oil was shipped directly between these two areas.

All but one of the internal shipments of crude oil in 2008 was from the Ellwood marine terminal, off the Coast of Santa Barbara County.

The trend shows the largest increase in the total volumes of oil transferred in the fourth quarter and the least amount in the third quarter. From the first quarter, to the fourth quarter there was a small 2.09% increase in volumes of oil transported. From the third quarter to the fourth quarter, there was an increase in the aggregate of approximately four million barrels, or a difference of approximately 39%.

TYPE OF OIL TRANSFERRED (2008)

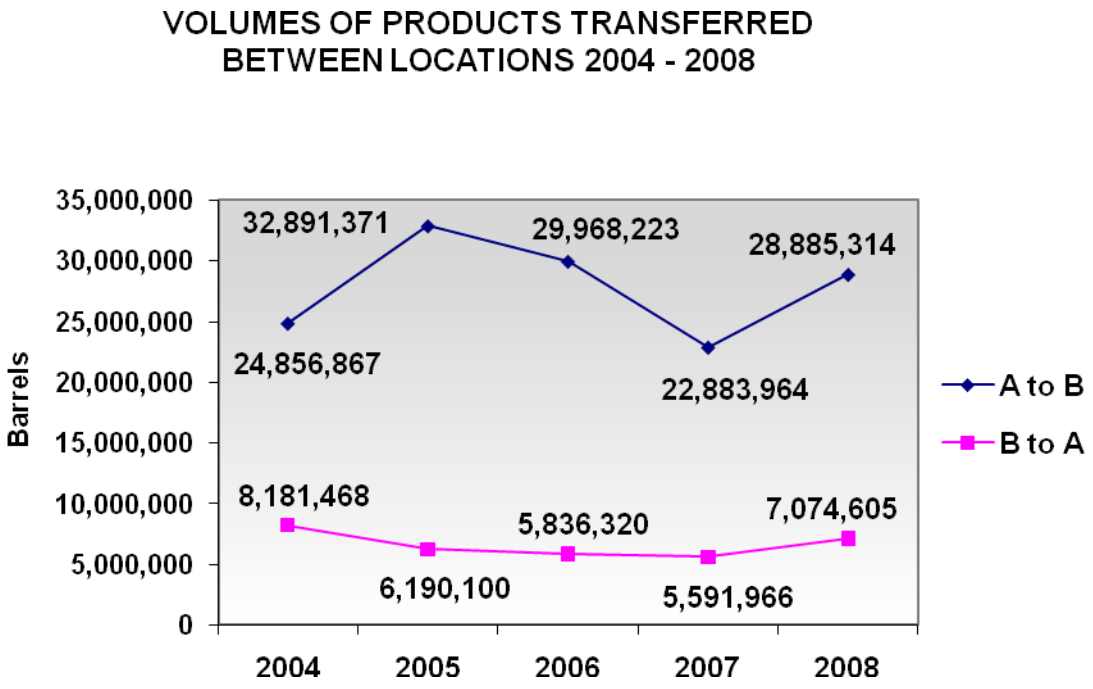


Products: The maximum volume of refined oil was transferred during the first quarter at 10,238,766 barrels and the least volume was transferred during third quarter at 6,388,659 barrels.

Crude Oil: The maximum volume of crude oil transferred was in the fourth quarter at 481,791 barrels and minimum was during the third quarter at 108,625 barrels.

The pattern indicates that refined product volumes had a progressive decrease toward the third quarter and then a steep rise during the fourth quarter to almost the amount of the first quarter. The crude oil volumes reflect a shallow low during the second and third quarters, which are explained as a non-reporting maintenance period. The increase in crude barrels transported during the fourth quarter was seen as a reporting anomaly, as a tank ship transported 157,046 barrels of crude oil from the San Francisco bay area to the Los Angeles/Long Beach Port Complex in one voyage.

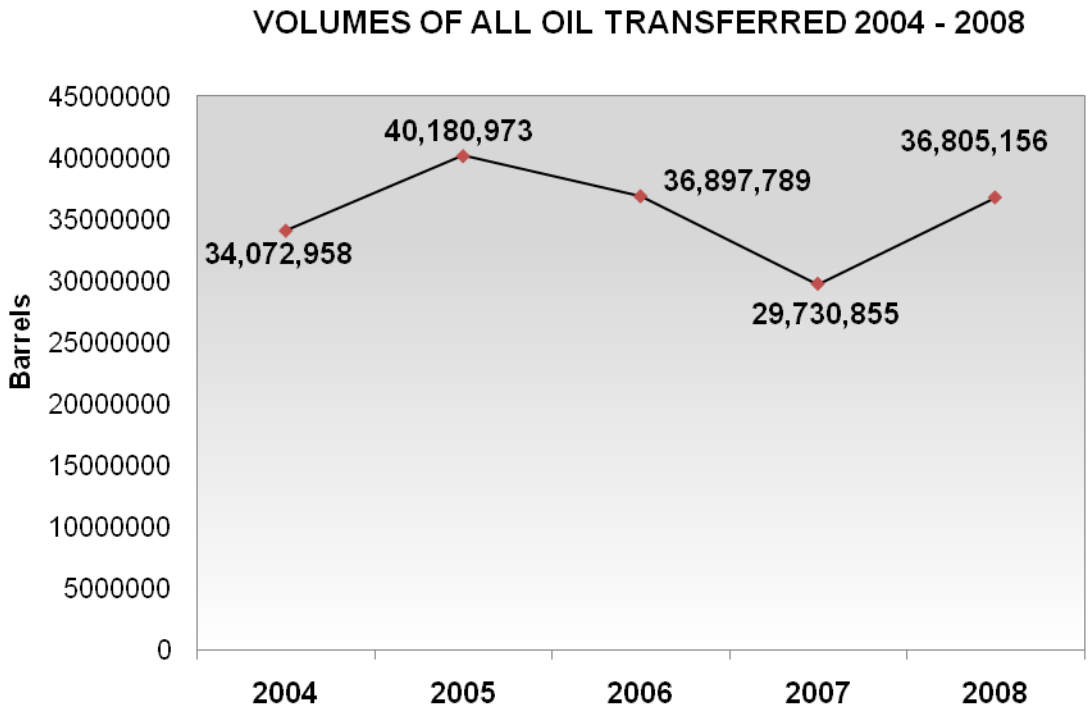
VOLUMES OF PRODUCTS TRANSFERRED BETWEEN LOCATIONS (2004-2008)



A to B: San Francisco Bay area to Los Angeles/Long Beach
B to A: Los Angeles/Long Beach to San Francisco Bay area

The trend indicates that there are higher volumes of products transferred from San Francisco Bay area to Los Angeles/Long Beach area and comparatively lower volumes transferred from Los Angeles/Long Beach area to San Francisco Bay area. The trend observed reflects the fact that there is greater refining capacity in the Bay area in comparison to the refining capacity in Los Angeles/Long Beach area.

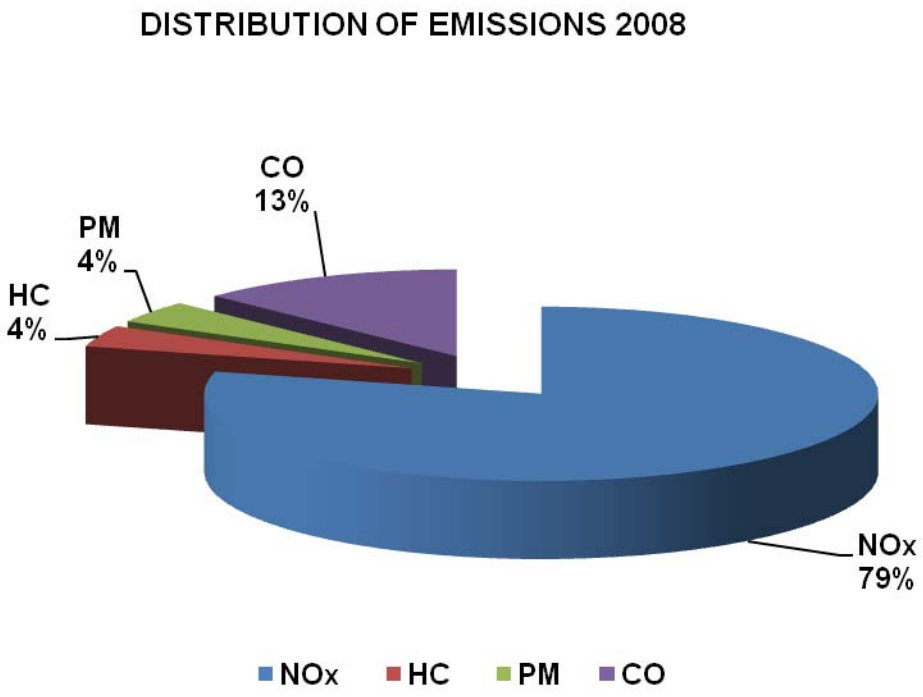
VOLUMES OF ALL OIL TRANSFERRED (2004-2008)



A comparison of volumes of 2008 with 2007 shows an increase of 7,074,301 barrels, an increase of 23.79%. The comparison of volumes of years 2008 with 2005 shows there were 3,375,817 barrels less transferred by internal shipments in 2008. This was a decrease of 8.40% in 2008 from the 2005 reporting year. The comparison of volumes of years 2008 with 2004 shows there was a higher volume of 2,732,198 barrels shipped in 2008. This was an increase of 8.02% over the volume of 2004. The comparison of volumes of years 2008 with 2006 reflects only a minuscule decrease of 92,633 barrels, or 0.25%. The trend shows a steady two year decline from a rise in the highest reported transfer year of 2005 to an increase from 2007 to 2008.

AIR EMISSIONS

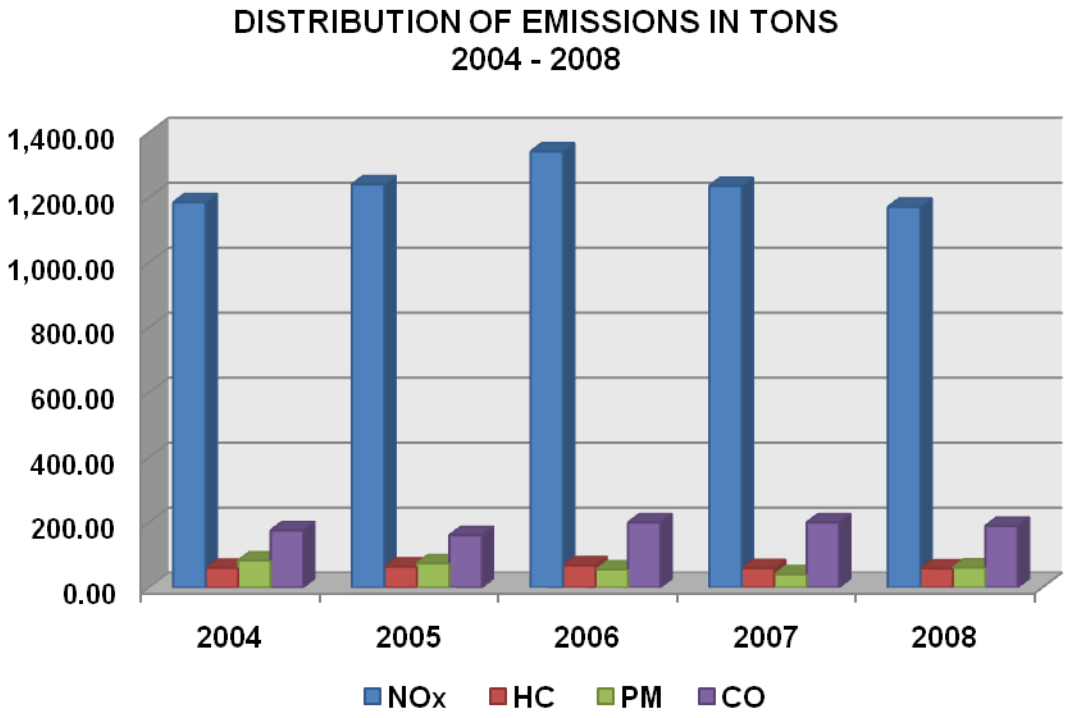
DISTRIBUTION OF EMISSIONS IN 2008



Nitrogen Oxide (NO_x) was 79% of the total emissions, followed by Carbon Monoxide (CO) at 13%. Hydrocarbon (HC) gases and Particulate Matter (PM) were both at 4% of the total emissions.

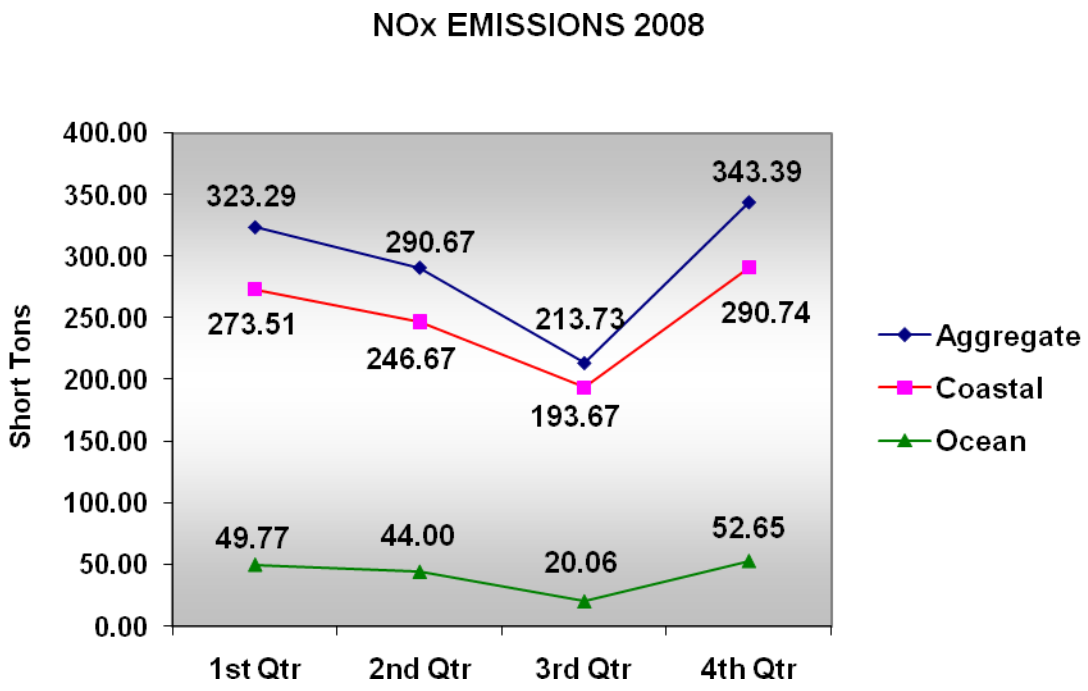
NO_x emission:	1,171.10 short tons or 79% of total emissions
HC emissions:	58.78 short tons or 4% of total emissions
PM emissions:	61.62 short tons or 4% of total emissions
CO emissions:	189.50 short tons or 13% of total emissions

DISTRIBUTION OF EMISSIONS (2004 to 2008)



Note: the order of the legend is representative of the emissions in the individual emission bars for each year. The NO_x shows a gradual tapering off from the high point of 2006. The HC is shown to be minimal and at a plateau. The PM shows as being on a slow decline since the start of reporting, while the CO is shown as on plateau since 2006.

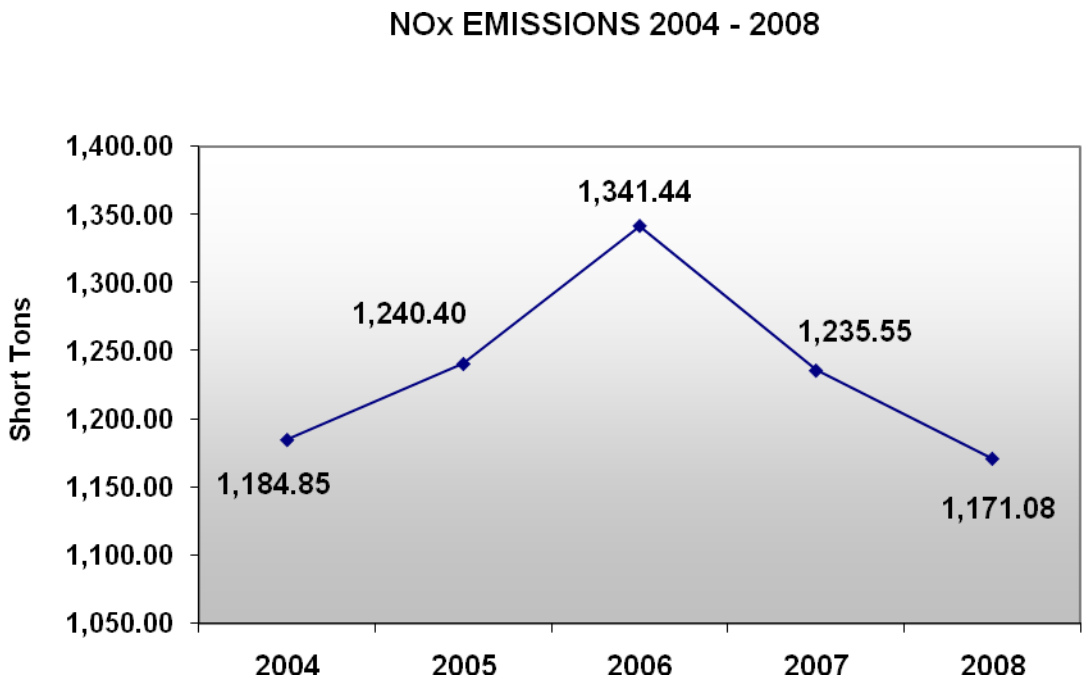
NITROGEN OXIDE (NO_x) EMISSIONS (2008)



The aggregate NO_x emissions were the highest in the fourth quarter during which there were 108 internal shipments of oil, which are only eight more shipments than the first quarter with 100 shipments. The third quarter reflects the lowest amount of NO_x and had the lowest amount of total voyages at only 66.

The NO_x emissions for the ocean voyages are on a similar track as that of the aggregate and coastal voyages, but gradual and not quite as pronounced.

NITROGEN OXIDE (NO_x) EMISSIONS (2004-2008)



The comparison of data for the year 2008 with 2007 indicates a decrease of 5.22% in NO_x emissions with an increase of 5.22% in the number of voyages.

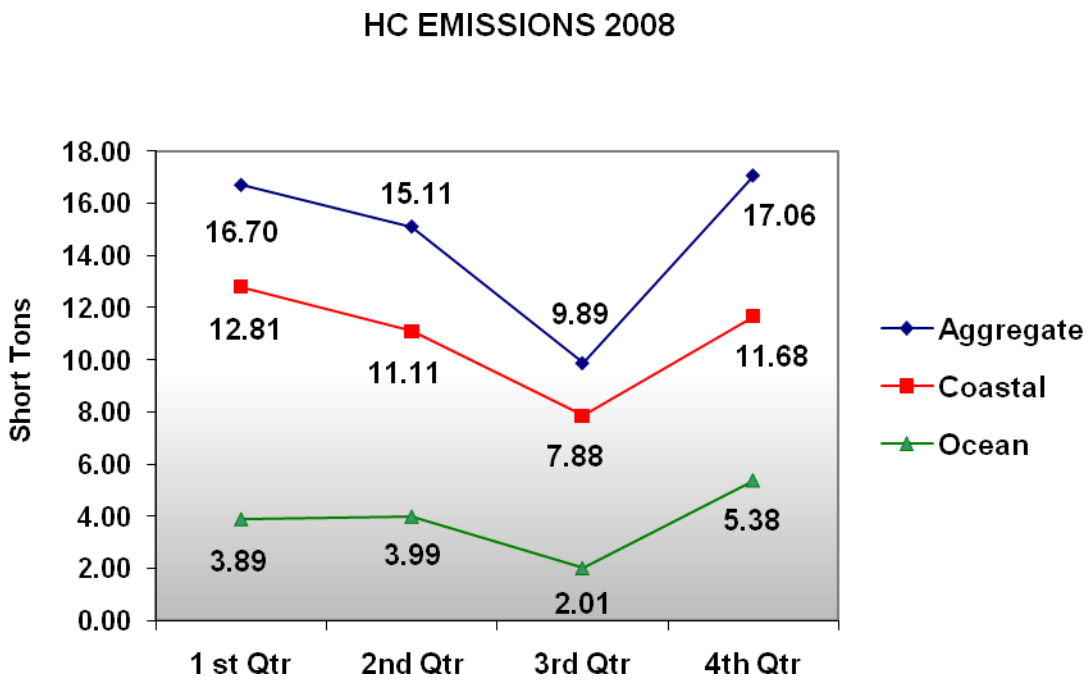
The comparison of data for the year 2008 with 2005 shows there was 5.59% decrease in No_x with a 12.74% decrease in number of voyages. The generation of No_x has shown a relatively small 13.5 ton net decrease on a year to year comparison, since the inception of the reporting.

The table below indicates the average of NO_x emission per voyage in short tons since the program commenced in 2004.

Type of Voyage	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008
Ocean Voyage	4.33	2.32	2.91	4.90	2.64
Coastal Voyage	2.39	3.30	3.72	3.42	3.35

The year 2008 showed a decrease in NO_x emissions per ocean and coastal voyages.

HYDROCARBON (HC) EMISSIONS (2008)



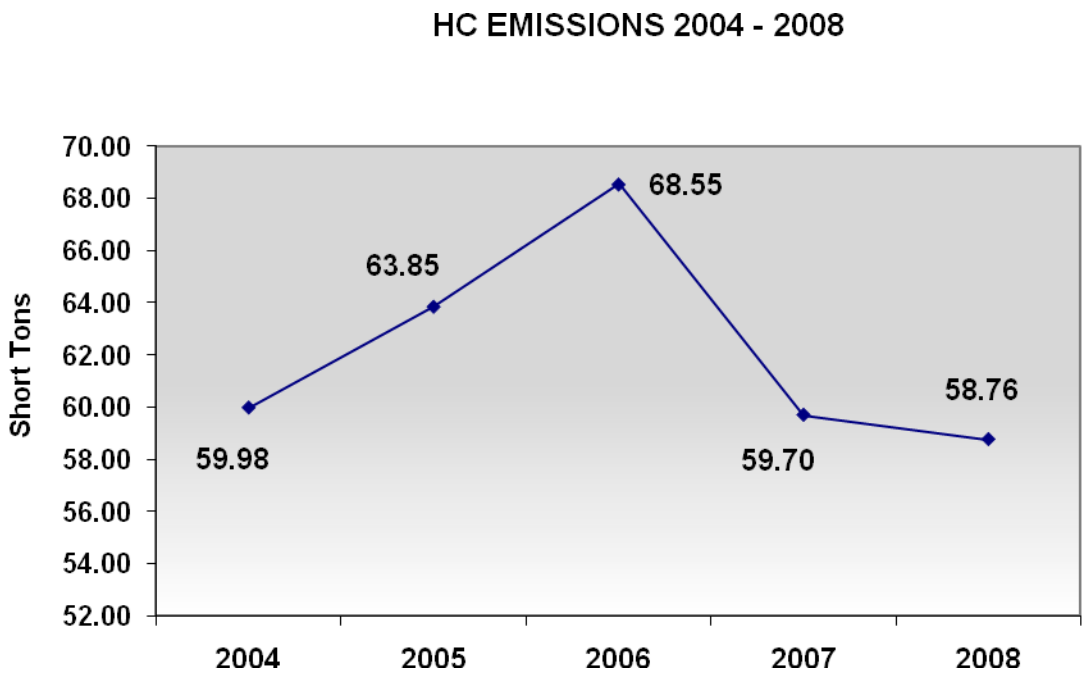
The aggregate HC emissions were the highest in the fourth quarter in which there were 108 internal shipments of oil. The third quarter which relatively had the lowest reported HC emissions had 42 fewer shipments than in the fourth quarter.

The coastal HC emissions that were generated mirrored that of the aggregate. The ocean HC emissions generated during the year seems to mirror that of both the aggregate and coastal HC emissions generated during the year.

The table below indicates the average of HC emission per voyage in short tons since the program commenced in 2004.

Type of Voyage	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008
Ocean Voyage	0.24	0.19	0.24	0.40	0.24
Coastal Voyage	0.11	0.14	0.16	0.15	0.14

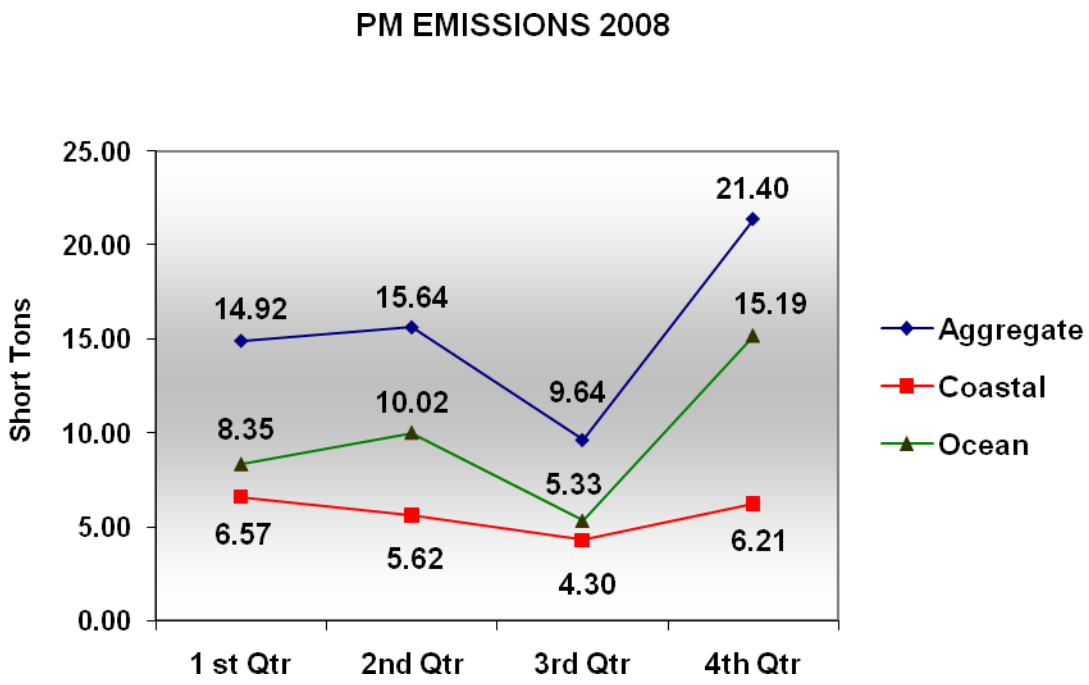
HYDROCARBON (HC) EMISSIONS (2004-2008)



The comparison of data of the years 2008 and 2007 indicates a slight decrease of 1.57% in HC emissions along with an increase of 5.22% in the number of voyages. The comparison of data of the year 2008 with 2004 shows there was 2.03% decrease in HC along with a 0.55% decrease in number of voyages.

The generation of HC has remained steady with a net decrease of 2.01% over the five year report period, while the number of internal shipments has fallen slightly at 0.55%.

PARTICULATE MATTER (PM) EMISSIONS (2008)

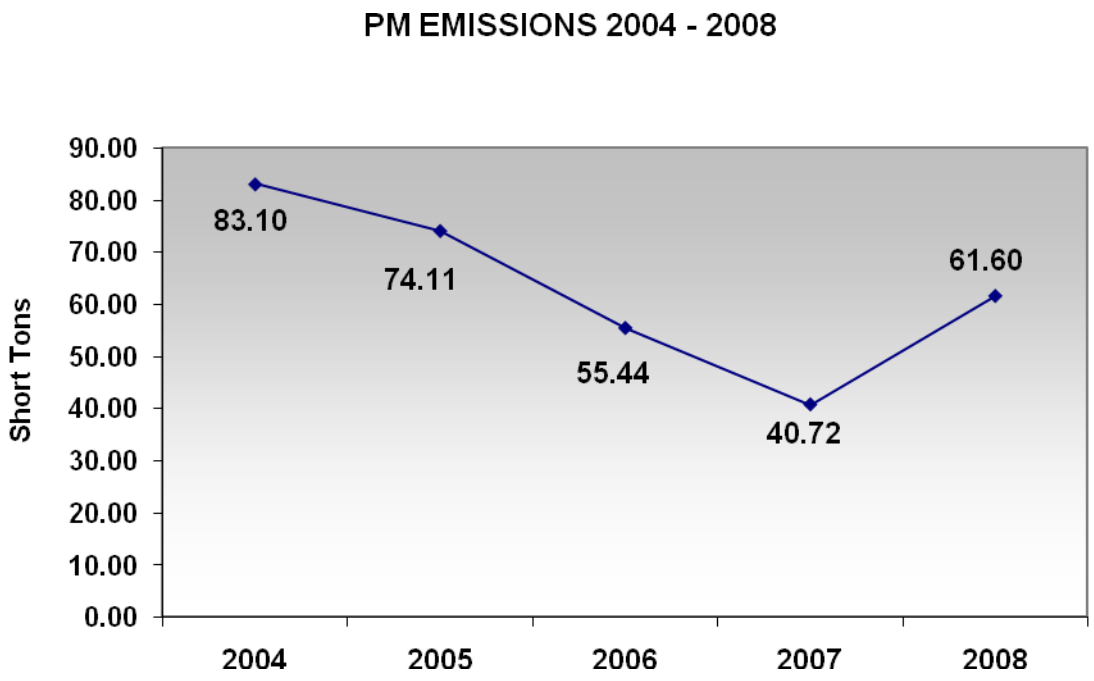


PM emissions in the aggregate were highest in the fourth quarter and were the lowest in the third quarter. The trend line of the ocean PM mirrored that of the aggregate, while that of the coastal PM decreased slightly at less than one percent over the year. The increased generation of this individual emission is directly proportional to tank ship voyages. Tank vessel voyages (ocean route) were17% of that of the aggregate, but generated 63.17% more PM emissions.

The table below indicates the average of PM emissions *per voyage type* in short tons since the program commenced in 2004.

Type of Voyage	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008
Ocean Voyage	0.35	0.39	0.32	0.47	0.62
Coastal Voyage	0.13	0.08	0.09	0.07	0.08

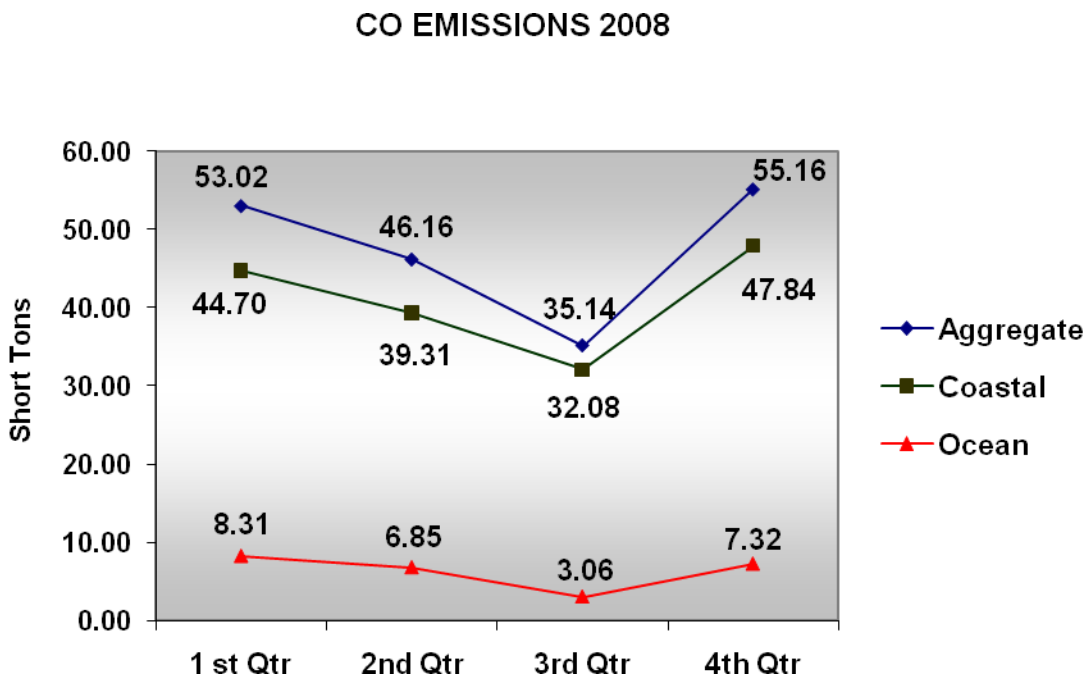
PARTICULATE MATTER (PM) EMISSIONS (2004-2008)



The comparison of data of the years 2008 and 2007 indicates the largest rise of 51.29% in PM emissions with only an increase of 5.22% in the number of voyages. The comparison of data of the years 2008 with 2004 shows there was 25.87% drop in PM, with an overall decrease of only 0.55% in the number of voyages.

The generation of PM had been following a downward trend since the start of the program. The trend line shows an increase of PM in the 2008 reporting year. Since the inception of the program however, the amount of qualifying voyages has remained steady with less than one percent difference, while the PM has actually decreased by 25% overall.

CARBON MONOXIDE (CO) EMISSIONS (2008)



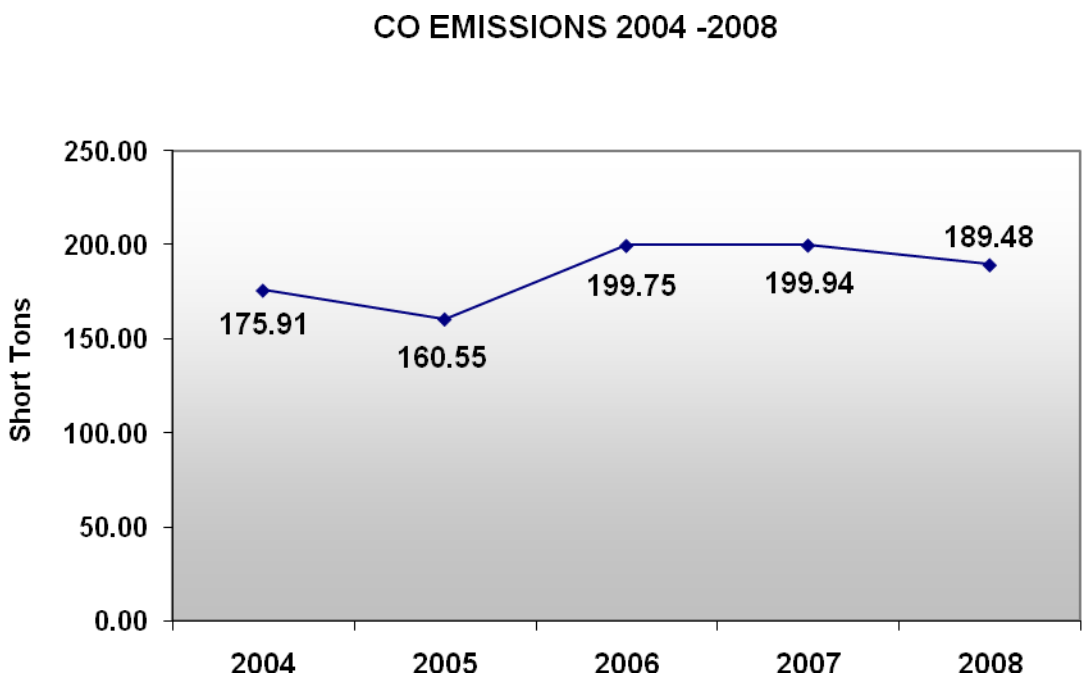
Aggregate CO emissions were highest in the fourth quarter, and lowest in the third quarter. In the fourth quarter there were 21 ocean voyages and 87 coastal voyages. During the third quarter, there were 10 ocean voyages and 56 coastal voyages.

The pattern that emerges shows a proportional rise and fall in the amount of CO emissions generated between the types and number of voyages the vessels utilize.

The table below indicates the average CO emission in short tons per voyage since the program commenced in 2004.

Type of Voyage	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008
Ocean Voyage	0.67	0.39	0.79	1.25	0.41
Coastal Voyage	0.33	0.39	0.44	0.50	0.55

CARBON MONOXIDE (CO) EMISSIONS (2004-2008)



The comparison of data of the years 2008 and 2007 indicates a decrease of 5.23% in CO emissions with an increase of 5.22% in the number of overall voyages. The comparison of data of the years 2008 with 2004 indicates there was a 7.72% increase in CO with 0.55% decrease in the overall number of voyages. CO emissions have shown a rising trend from 2005 to 2007, with 2006 and 2007 trending in a static line. Even though the CO amount dropped slightly in 2008 the trend line has remained above the low recorded in 2005.

PERTINENT ISSUES

The marine transportation sector has traditionally used blends of intermediate residual oils after the lighter distillates have been taken for the non-marine sector. This left a higher concentration of sulfur and organic compounds in the blend of residual oils used in the marine sector. The marine transportation sector needs fuels that are low in sulfur, organic compounds and burn more efficiently. Title 19, California Code of Regulations § 2299.1(e)(A) requires the use of low sulfur diesel for auxiliary engines effective January 1, 2007. Harbor craft in California are now mandated to use diesel fuels that were traditionally used in the land transportation sector, both for propulsion and auxiliary engines. As per regulations made by the California Air Resources Board, ships operating within 24 miles of the California coast will have to use fuel with a1.5% sulfur content until 2012, and then the maximum sulfur content will be lowered even further to 0.5%. Sulfur oxides are produced by the oxidation of its available sulfur in fuel. Nitrogen oxides and sulfur oxides are important constituents of harmful acid rains, which impacts plant and animal life.

The OTTER form does not capture information regarding tank ships and tugs that have been retrofitted with new engines and the usage of cleaner fuels. The emissions during loading and unloading of oil from the tank vessels are not reported on the form. There are often delays waiting at anchorage for the availability of shore tank capacity, or dock space and this information is also not captured on the report form.

The United States Congress passed the Maritime Pollution Prevention Act of 2008, which was signed into law by the President on July 21, 2008. The marine transportation sector has traditionally used blends of intermediate residual oils after the lighter distillates have been taken for the non-marine sector. This is gradually changing due to two reasons. Firstly, Title 19 of CCR 22991(e) requires use of low sulfur fuels in the propulsion and auxiliary engines of vessels when within 24 miles of the California coast. Secondly, in July 2008, U.S. ratified Annex VI of International Convention for the Prevention and Pollution from Ships (Marpol 73/78). This international law will have wide ranging, effects from control of air emissions to application of more stringent standards in Emission Control Areas (ECA) that meet the specified criteria established by International Maritime Organization (IMO).

The U.S. Environmental Protection Agency has published the rule on emission standards for marine diesel engines of less than 30 liters per cylinder. The emission standard for larger marine engines is still under development, and it is expected that the final rule will be adopted December 17, 2009. The Final rule will be in harmonization with the standards, as implemented by the IMO.

There are technical limitations when introducing new fuels to existing, very large marine engines used in oceangoing vessels. The marine engines have a typical life span of approximately 25 years. The current engines were not originally designed to use low sulfur fuels. Low sulfur fuels do not provide the proper lubricity for the engines moving parts and may reduce the life span of the engines. The engines that can use more environmentally friendly fuels are in the process of development.

Until new marine engines are developed and installed on vessels, use of suitable cleaner fuel and reduction of speed up to a reasonable distance from port will provide some reduction in emissions. The idling time of vessels in port could be reduced by better planning and utilization of berths, so that vessels berth as soon as possible after arrival.

CONCLUSION

This is the fifth in a series of annual reports to the California State Legislature.

The first report included statistics of the number of internal shipments, the quantities of crude oil and refined products, the numbers of coastal and offshore voyages and the quantities of Nox, HC, PM and CO emissions into the coastal and offshore regions of California for the year 2004. Prior to the first report, the information collected by the OTTER Program did not exist. Starting with the report of 2005, planning organizations, State and Federal Agencies and organizations developing information, particularly for environmental documentation, are getting a much more complete picture of the movement of oil along the California coast and its quarterly and annual trends. Continued collection of OTTER information will allow future reports to look at trends and changes in oil transportation, estimates of vessel air emissions along our central coast and will allow planners to examine the impacts of moving oil by marine vessels.

More shipments are taking place by barges and 79% of shipments take place 12 to 15 miles from the coast. There were no shipments as result of refinery shutdown. As per the data collected, No_x needs to be controlled to make a significant change in the air quality.

APPENDIX A:

THE OIL TRANSFER AND TRANSPORTATION EMISSION AND RISK REDUCTION ACT OF 2002

(AB 2083)

8780 THROUGH 8789, PUBLIC RESOURCES

LEGISLATIVE COUNSEL'S DIGEST

AB 2083, Jackson. Public resources: oil spill prevention and response. Existing law establishes oil spill prevention, inspection, response, containment, and cleanup programs.

This bill would require the State Lands Commission to develop a form that is to be completed by the responsible party, as defined, engaged in the internal shipment of oil. The form would be designed to enable the commission to obtain and track the amount and type of oil transported, as well as the name of the vessel, the vessel's route, and air emissions relating to the internal shipment of that oil.

The bill would require the commission, on or before April 1 of each year, for the calendar years 2004 to 2009, inclusive, to file a report with the Legislature summarizing certain information and transmit a copy of the report to any interested agency or member of the public, upon request.

The bill would require the commission to consult with the administrator for oil spill response, other state agencies, and agencies of the federal government, including the United States Coast Guard and the federal Department of Transportation, to the maximum extent feasible, before undertaking actions under these provisions.

The bill would require the administrator to reimburse the commission for the costs of administering these provisions from the Oil Spill Prevention and Administration Fund.

These provisions would be repealed on January 1, 2010.

DIVISION 7.9. OIL TRANSFER AND TRANSPORTATION EMISSION AND RISK REDUCTION ACT OF 2002

8780. This division shall be known and may be cited as the Oil Transfer and Transportation Emission and Risk Reduction Act of 2002.

8781. The Legislature finds and declares all of the following:

(a) Thirty years ago the people of California passed the California Coastal Zone and Conservation Act of 1972 after a disastrous oil spill that affected hundreds of miles of coast and severely affected the coastal economy.

(b) A clean and healthy coastal environment is critical to maintaining a vibrant coastal economy, including opportunities for sustainable fisheries, flourishing tourism, and healthy recreation.

(c) The coastal communities contribute billions of dollars and hundreds of thousands of jobs to the state economy.

(d) Much of the oil extracted off California's coast is highly viscous, the refining of which results in heavy byproducts such as fuel oil and coke, which tend to be shipped to overseas markets. The storage and shipment of such byproducts will also have air quality impacts.

(e) There is significant internal shipment of oil by vessel between the San Francisco Bay area and the Los Angeles area.

(f) Although vessels transporting oil are eventually required to be double hulled, this will not be completed until January 1, 2015.

(g) The thousands of sea birds that have been injured or killed in 2001 and 2002 by oil leaking from a freighter that sank off California's coast in 1953 are a strong reminder of the serious consequences of vessel mishaps.

(h) One of the results of vessel traffic along the central coast and into the ports of the Los Angeles and San Francisco areas is tons of oxides of nitrogen emitted into the air each day, which could negate efforts made on land to meet federal ozone standards and other public health air quality goals.

(i) Current, accessible and accurate data regarding oil transportation is critical to having adequate information of the potential environmental quality, public health, and environmental justice consequences that must be analyzed by state and local agencies for environmental impact reports and statements, emergency response planning, permit issuance, and air quality mitigation efforts.

(j) Tracking trends in internal shipment of oil is necessary to promote public safety, health, and welfare, and to protect public and private property, wildlife, marine fisheries, and other ocean resources, and the natural environment in order to protect and to preserve the ecological balance of California's coastal zone, coastal waters, and coastal economy.

8782. Unless the context requires otherwise, the following definitions govern the construction of this division:

(a) "Administrator" means the administrator for oil spill response appointed by the Governor under Section 8670.4 of the Government Code.

(b) "Barge" means any vessel that carries oil in commercial quantities as cargo but is not equipped with a means of self-propulsion.

(c) "Commission" means the State Lands Commission.

(d) "Internal shipment of oil" means the loading, transporting by vessel, and offloading of oil that originates and terminates at the San Francisco Bay area and the Los Angeles and Long Beach area, or points in between. Internal shipment of oil does not include lightering, as defined in paragraph (4) of subdivision (l) of Section 790 of Title 14 of the California Code of Regulations.

(e) "Marine facility" means any facility of any kind, other than a vessel, that is or was used for the purpose of exploring for, drilling for, producing, storing, handling, transferring, processing, refining, or transporting oil and is located in marine waters, or is located where a discharge could impact marine waters, unless the facility (1) is subject to Chapter 6.67 (commencing with Section 25270) or Chapter 6.75 (commencing with Section 25299.10) of Division 20 of the Health and Safety Code or (2) is placed on a farm, nursery, logging site, or construction site and does not exceed 20,000 gallons in a single storage tank. A drill ship, semi submersible drilling platform, jack-up type drilling rig, or any other floating or temporary drilling platform is a "marine facility." A small craft refueling dock is not a "marine facility."

(f) "Marine terminal" means any facility used for transferring oil to or from tankers or barges. A marine terminal includes all piping not integrally connected to a tank facility as defined in subdivision (k) of Section 25270.2 of the Health and Safety Code.

(g) "Oil" means any kind of petroleum, liquid hydrocarbons, or petroleum products or any fraction or residues therefrom, including, but not limited to, crude oil, bunker fuel, gasoline, diesel fuel, aviation fuel, oil sludge, oil refuse, oil mixed with waste, and liquid distillates from unprocessed natural gas.

(h) "Operator," when used in connection with a vessel means any person or entity that owns, has an ownership interest in, charters, leases, rents, operates, participates in the operation of, or uses, that vessel.

(i) "Person" means an individual, trust, firm, joint stock company, or corporation, including, but not limited to, a government corporation, partnership, or association. "Person" also includes any city, county, city and county, district, commission, the state or any department, agency, or political subdivision thereof, and the federal government or any department or agency thereof to the extent permitted by law.

(j) "Responsible party" or "party responsible" means the "Responsible party" or "Party responsible" means the owner of the oil or a person or entity who accepts responsibility for the oil for purposes of this division.

(k) "Tanker" means any self-propelled, waterborne vessel, constructed or adapted for the carriage of oil in bulk or in commercial quantities as cargo.

(l) "Vessel" means a tanker or barge as defined in this section.

8783. (a) The commission shall develop a form that is to be completed by the responsible party engaged in the internal shipment of oil. The form shall be known as the "Oil Transfer and Transportation Emission and Risk Reduction Form." The form shall be designed to enable the commission to obtain and track the amount and type of oil transported, as well as the name of the vessel, the vessel's route, and air emissions relating to the internal shipment of that oil.

(b) The form shall contain, but need not be limited to, all of the following information:

(1) The name, address, point of contact, and telephone number of the responsible party.

(2) The name of the vessel transporting the oil.

(3) The type and amount of oil being transported.

(4) The source of crude oil.

(5) The name and location of any terminal that loaded the vessel.

(6) The name and location of any terminal that discharged the tanker or barge.

(7) The dates of travel and the route.

(8) The type of engine and fuel used to power the tanker or barge-towing vessel.

(9) The estimated amount and type of air emissions. To the extent practicable, the emissions factors developed by the United States Environmental Protection Agency shall be used to estimate the amount of air emissions. The form shall be designed to ensure that charter vessel air emissions are not counted more than once.

(10) An indication of whether the reason for the internal shipping of oil was due to a temporary shutdown or partial shutdown of a key refinery facility.

(11) On and after January 1, 2004, if Division 36 (commencing with Section 71200) is repealed pursuant to Section 71271, the amount of any ballast discharge and the location of the discharge.

(c) The form shall be filed with the commission on a quarterly basis by the responsible party engaged in the internal shipment of oil for the activities of the preceding quarter.

(d) In developing the form and the reporting process, the commission shall consult with the interested parties including operators, responsible parties, and the International Maritime Organization.

8784. (a) On or before April 1 of each year, for the calendar years 2004 to 2009, inclusive, the commission shall file a report with the Legislature summarizing the information and including all of the following:

(1) A description of any trends in the total number of trips by oil type, amount of shipment, and source of oil.

(2) The number of transfers due to refinery shutdowns.

(3) The location of air emissions and ballast discharge, and the type of vessel used during those events.

(4) A discussion of any other pertinent issues that the commission determines should be included.

(b) The commission shall transmit a copy of the report to any interested agency or member of the public, upon request.

8785. The commission shall consult with the administrator, other state agencies, and agencies of the federal government, including, but not limited to, the United States Coast Guard and the federal Department of Transportation, to the maximum extent feasible, before undertaking actions under this division.

8786. The administrator shall reimburse the commission for the costs of administering this division from the Oil Spill Prevention and Administration Fund, pursuant to paragraph (8) of subdivision (e) of Section 8670.40 of the Government Code.

8787. This division applies to all terminals, pipelines, vessels, and activities in the state, whether on lands that has been granted by the Legislature to local governments or on lands that remain un-granted.

8788. Any information collected under this division for the purpose of explaining why oil was transferred shall be kept confidential and reported only in the aggregate by the commission, in a manner that protects the competitive nature of the information.

8789. This division shall remain in effect only until January 1, 2010, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 2010, deletes or extends that date.

SEC. 3. Section 1.5 of this bill incorporates amendments to Section 8670.40 of the Government Code proposed by both this bill and SB 849. It shall only become operative if (1) both bills are enacted and become effective on or before January 1, 2003, (2) each bill amends Section 8670.40 of the Government Code, and (3) this bill is enacted after SB 849, in which case Section 1 of this bill shall not become operative.

APPENDIX B:

THE OIL TRANSFER AND TRANSPORTATION EMISSION AND RISK REDUCTION FORM

OIL TRANSFER AND TRANSPORTATION EMISSION AND RISK REDUCTION FORM

Public Resources Code - Sections 8780 through 8789
1/1/2004
Submission Date:

Name of Vessel/Barge	IMO/Vessel ID No.

Name of Loading Terminal	Location
1.	
2.	
3.	

Cargo Transported	Quantity (BBLS)	Source (Crude only)
1.		
2.		
3.		

Name of Discharge Terminal	Location
1.	
2.	
3.	

Dates of Travel				
Departure	Time	Route	Arrival	Time

Engine Type (Tanker)	Engine Type (Barge/Tug)	Engine Fuel

Engine Air Emissions (g/kw-hr)			
NO_x	HC	PM	CO

Was the reason for shipping this cargo due to a temporary or partial shutdown of a key refinery facility?	Yes ☐	No ☐

Point of Contact	
Address	
Telephone No.	
Signature of Responsible Party	

INSTRUCTIONS

1. The responsible party of an "internal shipment" {Public Resources Code §8782(d)} of oil from either the San Francisco Bay area or Los Angeles/Long Beach areas or ports in between shall be responsible for filing the form with the California State Lands Commission's Marine Facilities Division. As provided by Public Resources Code §8788, the information provided by the responsible party through the form shall be kept confidential and reported only in the aggregate by the Commission, as provided by Public Resources Code §8784, in a manner that protects the competitive nature of the information.

2. **Loading Terminal** - The name of each terminal loading an internal shipment of oil.

3. **Location of Terminal** - Either 'A' - San Francisco Bay area; 'B' - Los Angeles/Long Beach area; or 'C' - name of port if not 'A' or 'B'.

4. **Cargo Transported** - Types indicated in broad categories, such as: CRUDE OIL, REFINED OIL, or OTHER (please specify).

5. **Source** - The source or origin of oil should be entered only if the oil shipped is crude oil.

6. **Dates of Travel** - The date and time of departure from the last loading terminal in areas 'A' or 'B' or 'C' *(see 3. above)* and the date and time of arrival at the first discharge terminal of the internal shipment.

7. **Route** - 'S' - Standard route using the Santa Barbara Channel Traffic Separation Schemes; 'O' - Offshore route at least 25 miles from the coastline; if neither 'S' nor 'O', a brief explanation.

8. **Engine Type** - The types of engines for main propulsion. Types include INTERNAL COMBUSTION, GAS TURBINE and STEAM.

9. **Engine Fuel** - The type of fuel used by the tanker or tug, e.g., DIESEL, FUEL OIL, HEAVY FUEL OIL, BUNKER 'C' or GAS OIL.

10. **Air Emissions** - For estimating air emissions, use either individual vessel emission factors or those found in USEPA's Document "Compilation of Air Pollutant Emission Factors, AP-42." Reported emissions are for main propulsion unit only and for the transit time of vessel or barge.

11. The responsible party should submit completed forms by mail or fax within 45 days of the end of each calendar quarter to: California State Lands Commission, Marine Facilities Division, 200 Oceangate, Suite 900, Long Beach, CA 90802. Fax (562) 499-6317.