

**ANNUAL REPORT TO THE CALIFORNIA LEGISLATURE FOR  
THE YEAR 2007**

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

**Prepared by the California State Lands Commission  
April 2008**

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## **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 to 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 the OTTER information and provide it 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 fourth in a series of annual reports to the legislature. The first, second and third annual reports to the California Legislature were prepared in April in 2005, 2006 and 2007 respectively. These reports can be accessed at:

[http://www.slc.ca.gov/Division\\_Pages/MFD/MFD\\_Programs/OTTER/OTTER.html](http://www.slc.ca.gov/Division_Pages/MFD/MFD_Programs/OTTER/OTTER.html)

OTTER report forms for the year 2007 indicate:

Total number of internal voyages:	345
Number of voyages from San Francisco Bay Area to Los Angeles/Long Beach:	252
Number of voyages from Los Angeles/Long Beach to San Francisco Bay Area:	68
Number of voyages from Ellwood to Long Beach:	8
Number of voyages from Ellwood to San Francisco Bay Area:	16

Total volume of crude oil shipped as internal shipments:	1,254,925 barrels
Total volume of refined oil shipped as internal shipments:	28,475,930 barrels

All internal shipments of crude oil in 2007 were from the Elwood marine terminal, off the Coast of Santa Barbara County.

Total air emissions resulting from internal shipments of oil:

Nitrogen Oxide (NO <sub>x</sub> ) emissions:	1,235.55 short tons
Hydrocarbon (HC) emissions:	59.70 short tons
Particulate Matter (PM) emissions:	40.72 short tons
Carbon Monoxide (CO) emissions:	199.94 short tons

During the year 2007, 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 and 2007 is summarized in the table below:

<b>Key indicators in percentages</b>	<b>2004 to 2007</b>	<b>2005 to 2007</b>	<b>2006 to 2007</b>
Number of voyages	-5.48	-17.07	-9.45
Volume of oil shipped as internal shipment	-12.74	-26.01	-19.42
No <sub>x</sub> emissions	4.28	-0.39	-7.89
HC emissions	-0.46	-6.51	-12.92
PM emissions	-51.00	-45.06	-26.56
CO emissions	13.66	24.54	0.10

There was a reduction in the number of internal shipments in 2007 in comparison to the previous year. There was a one percent increase in the CO at 13%; while the No<sub>x</sub>, at 80% fell by one percent; both the HC at 4% and PM at 3% remained unchanged from the previous year.

There was a 9.45% reduction in the number of internal shipments by sea in 2007 in comparison to the data of 2006. This translated to 44.44% decline in the voyages of tank ships and 3.67% decline in the voyages of barges. In 2006 tank ship voyage duration averaged 35.48 hours and barge voyages averaged 64.85 hours between San Francisco Bay area and Los Angeles/ Long Beach area. In 2007 the average time was 48.00 hours and 62.39 hours respectively. It is possible that the increase in the voyage times for tank ships in 2007 led to the increase in CO emissions despite fewer voyages. 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. One plausible reason for the longer voyages by tank vessels and some barges which sail the ocean route is that they are now required to conduct ballast water exchanges and replace their ballast in waters greater than 50 nautical miles to manage the transportation of nonindigenous marine organisms.

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. 87.62% of the internal shipments were 12 to 15 miles from the coast and 12.38% of the shipments were more than 25 miles from the coast.

The data shows that approximately 91% of internal shipments of oil were by barge and 9% were by tank ship in the year 2007. There is a declining trend in use of tank ships and a rising trend in use of barges in internal shipments.

The OTTER form does not capture information if the tank ships and tugs are retrofitted with new engines and use 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 tankage, or dock space and this information is also not captured on the report form.

## Conclusion

The OTTER program captures data about a small but significant segment of air emissions along the coast of California. The trends show more shipments 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. There were no shipments reported due to refinery shutdown. The trends indicate a leveling off in most emissions except CO, which increased slightly.

## **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 discharge 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 up 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 2007**

#### **ANNUAL SUMMARY 2007 – VOYAGES**

Total number of internal shipment voyages:	345
Number of voyages from San Francisco Bay to Los Angeles/Long Beach:	252
Number of voyages from Los Angeles/Long Beach to San Francisco Bay:	68
Number of voyages from Ellwood to Long Beach:	8
Number of voyages from Ellwood to San Francisco Bay:	16
Number of offshore voyages (O) : > 25 nautical miles from land	38
Number of coastal voyages (S): 12 to 15 nautical miles from land	307

The following table is a compilation of all submitted OTTER information for Calendar Year 2007. The table gives the annual statistical data of the OTTER program.



## ANNUAL OTTER REPORT 2007

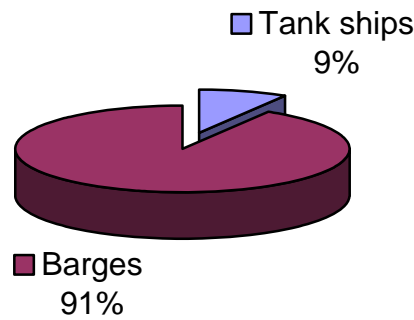
### ANNUAL STATISTICS TABLE

Items	1 <sup>st</sup> . Quarter	2 <sup>nd</sup> . Quarter	3 <sup>rd</sup> . Quarter	4 <sup>th</sup> . Quarter	Aggregate Year 2007
Total number of internal shipments of oil	83	88	82	92	345
Number of internal shipments by tanker	12	9	6	3	30
Number of internal shipments by barge/tug	71	79	76	89	315
Number of barrels of crude oil shipped	318,331	356,718	316,380	263,496	1,254,925
Number of barrels of refined oil shipped	5,938,113	7,627,578	6,994,291	7,915,948	28,475,930
Number of barrels of other oil shipped	0	0	0	0	0
Total NO <sub>x</sub> emissions in short tons	279.10	349.92	301.28	305.25	1,235.55
Total HC emissions in short tons	12.57	18.31	14.29	14.53	59.70
Total PM emissions in short tons	14.07	12.47	6.73	7.45	40.72
Total CO emissions in short tons	37.38	58.57	50.62	52.94	199.94
NO <sub>x</sub> emissions 25 miles from coastline in short tons	44.38	73.41	49.91	18.53	186.23
NO <sub>x</sub> emissions 12 to 15 miles from coastline in short tons	234.72	276.51	251.36	286.73	1,049.32
HC emissions 25 miles from coastline in short tons	3.55	6.17	3.96	1.47	15.15
HC emissions 12 to 15 miles from coastline in short tons	9.02	12.14	10.33	13.06	44.55
PM emissions 25 miles from coastline in short tons	9.91	6.05	1.47	0.54	17.97
PM emissions 12 to 15 miles from coastline in short tons	4.20	6.42	5.26	6.90	22.78
CO emissions 25 miles from coastline in short tons	8.01	19.26	14.68	5.45	47.40
CO emissions 12 to 15 miles from coastline in short tons	29.81	39.31	35.94	47.50	152.56
No. of internal shipments because of refinery shutdowns	0	0	0	0	0

**TANK VESSELS VOYAGES (2007)**

Total number of internal shipment voyages:	345
Voyages by tank ships:	30
Voyages by barges:	315

**Tank Vessels Voyages in 2007**

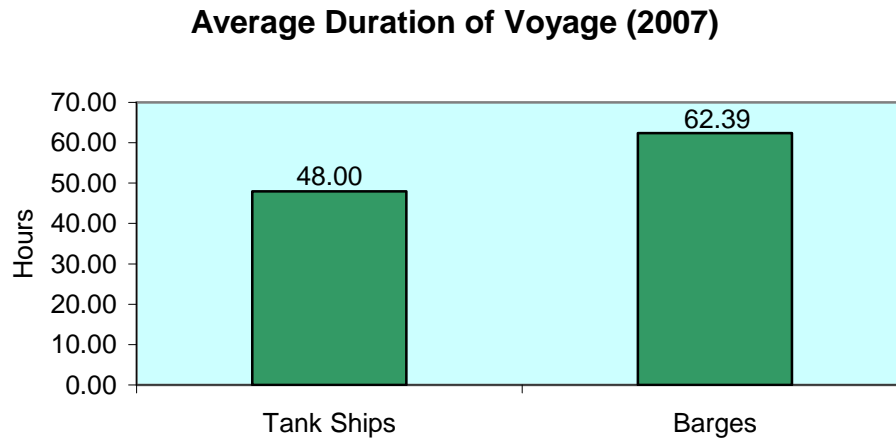


The data shows that approximately 91% of internal shipments of oil were by barges and 9% were by tank ships in the year 2007.

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

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 barges and the decrease in tank ships for the internal shipments of oil.

## AVERAGE DURATION OF VOYAGE BY TANK VESSELS



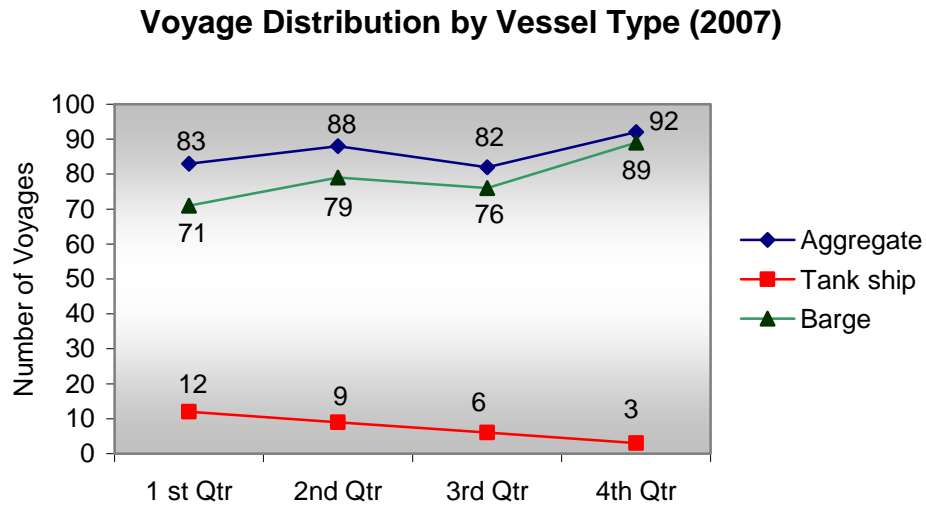
The data of 2007 shows that on an average a tank ship took 48 hours and a barge took 62.39 hours to complete the voyage between Bay Area and Los Angeles or Long Beach.

Total emissions are determined by the duration of the voyage.

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

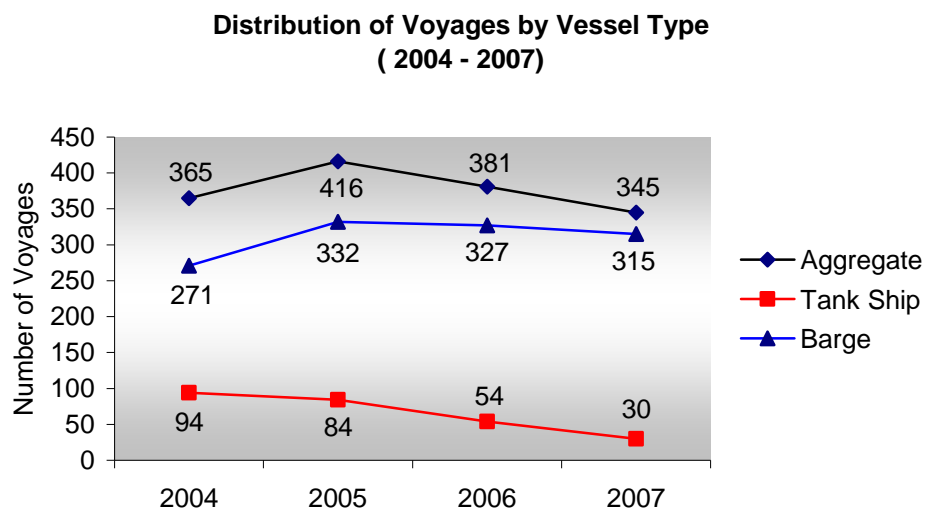
The table shows the yearly average duration of voyages for both the tank ships and barges in hours. The figures show that while the barge voyage duration has remained basically static, the tank vessel voyage durations have risen steadily over the tracked period. A plausible reason for the longer voyage durations of tank vessels that utilize the ocean route is that they are now required to conduct ballast water exchanges in waters greater than 50 nautical miles from the nearest coast.

## VOYAGE DISTRIBUTION BY VESSEL TYPE (2007)



The maximum number of tank voyages was in the first quarter and the minimum number was in the fourth quarter. The maximum number of barge voyages was in the fourth quarter and the minimum number was in the first quarter of 2007. The trend shows a gradual rise in the use of barges and a decline in the use of tank ships for the transportation of oil.

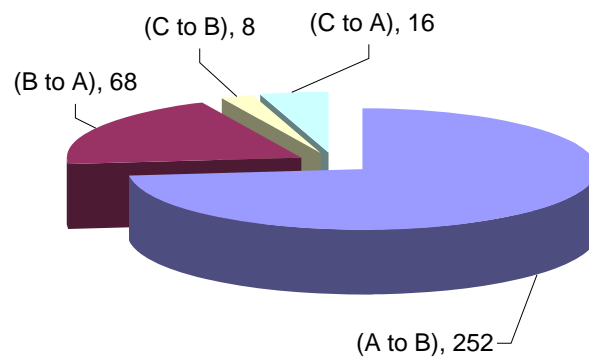
## DISTRIBUTION OF VOYAGES BY VESSEL TYPE (2004 – 2007)



In comparison of the data of 2007 with 2006 there were 44.44% less voyages by tank ships and 3.67% less voyages by barges. When data of 2007 is compared with the data of year 2004 there were 68.09% less voyages by tank ships and 16.24% more voyages by barges. Overall the trend line shows that the utilization of tank ships is on a steady decline, while the use of barges is on a plateau with a very subtle decline within the last few reporting cycles. Total voyages are trending downward from the 2005 to 2007 report period.

## VOYAGE DISTRIBUTION BETWEEN AREAS IN CALIFORNIA (2007)

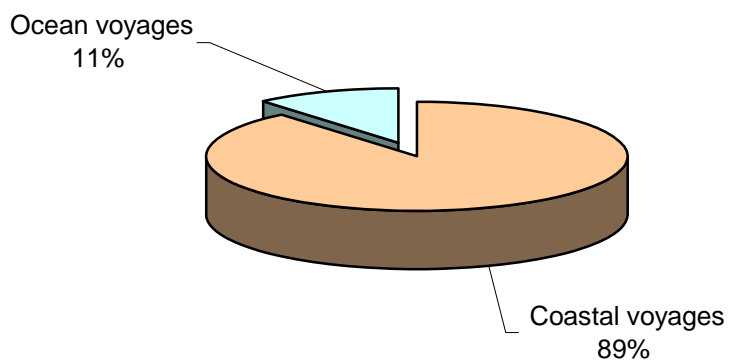
Voyage Distribution by Number (2007)



**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**

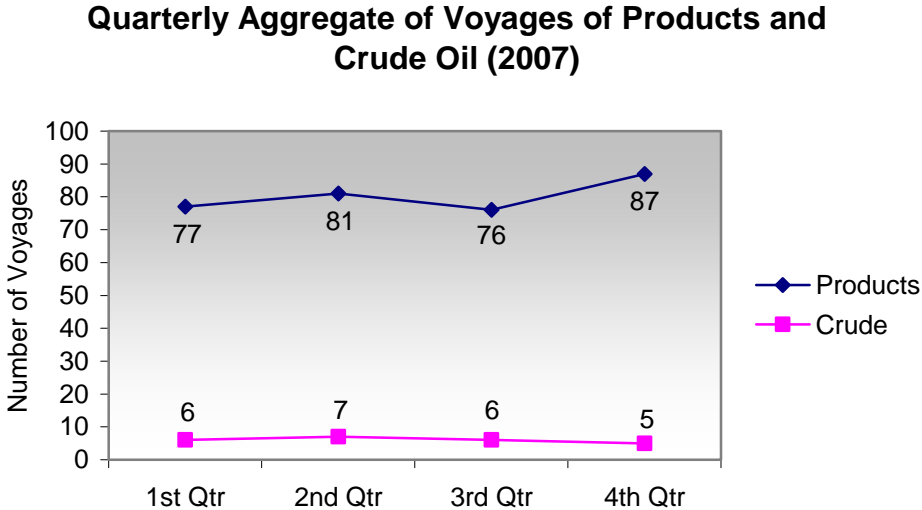
## OCEAN AND COASTAL VOYAGES 2007

### Ocean and Coastal Voyages (2007)



Of the total reported voyages in 2007, 11% 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 89% of the total voyages. The coastal route is defined as being 12 to 15 nautical miles from the coast.

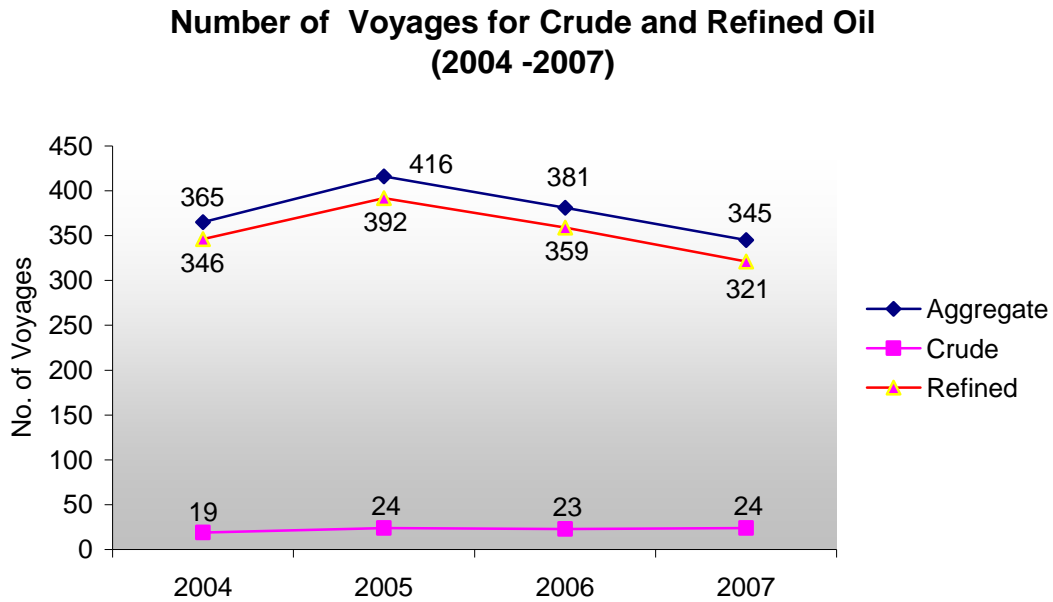
**QUARTERLY AGGREGATE OF NUMBER OF VOYAGES OF REFINED PRODUCTS AND CRUDE OIL (2007)**



The number of voyages for the transfer of refined products showed an upward trend, while the voyages for crude oil transfers showed a slight declining trend in 2007.



## NUMBER OF VOYAGES FOR CRUDE AND REFINED OILS (2004-2007)



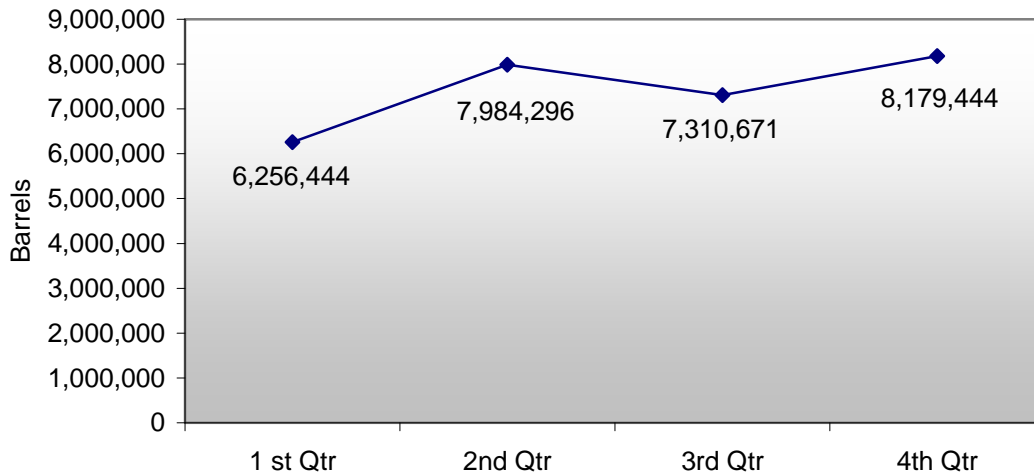
There was a decrease of 9.45% in the aggregate of number of voyages in 2007 when compared with the data of 2006. In comparison of the aggregate data of 2007 with the data of 2004 there was a moderate decrease of 5.48% in the number of overall voyages.

The number of voyages for refined oils followed the trend of the aggregate, which showed a slight decline. The voyages of crude oil showed a consistent pattern with an almost leveling off trend.

## VOLUME OF OIL TRANSFERRED (2007)

Total Volume:	29,730,855 barrels
Crude Oil:	1,254,925 barrels
Refined Oil:	28,475,930 barrels

**Volumes of Oil Transferred  
(2007)**

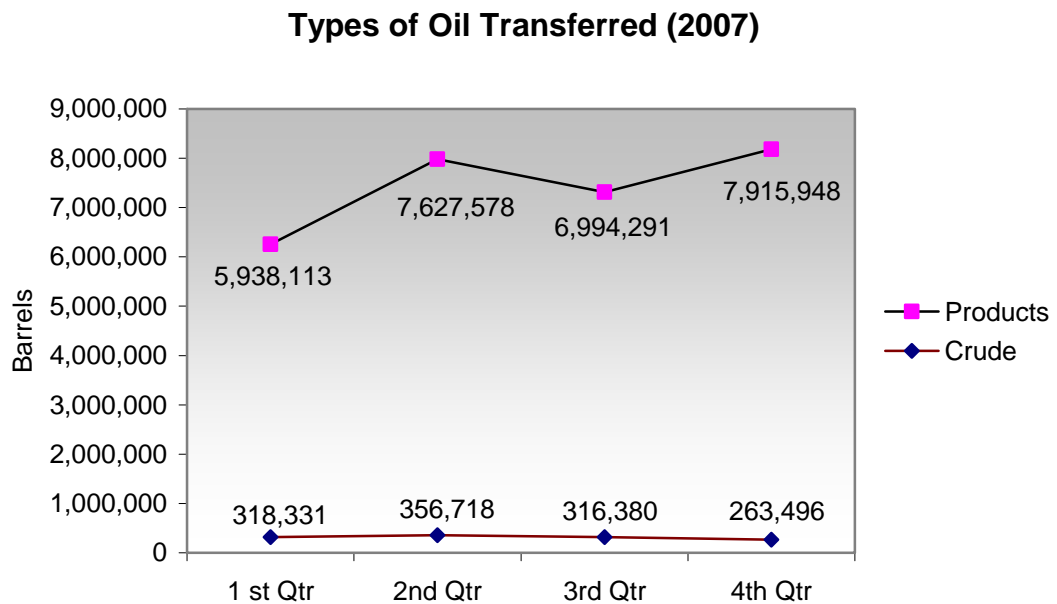


During 2007, all of the oil transported between the ports of the San Francisco Bay area and the Los Angeles/Long Beach area were refined products. No crude oil was shipped directly between these areas.

All internal shipments of crude oil in 2007 were 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 first quarter. From the first quarter to the fourth quarter there was a 24% increase in volumes of oil transported, or almost two million barrels.

## TYPE OF OIL TRANSFERRED (2007)

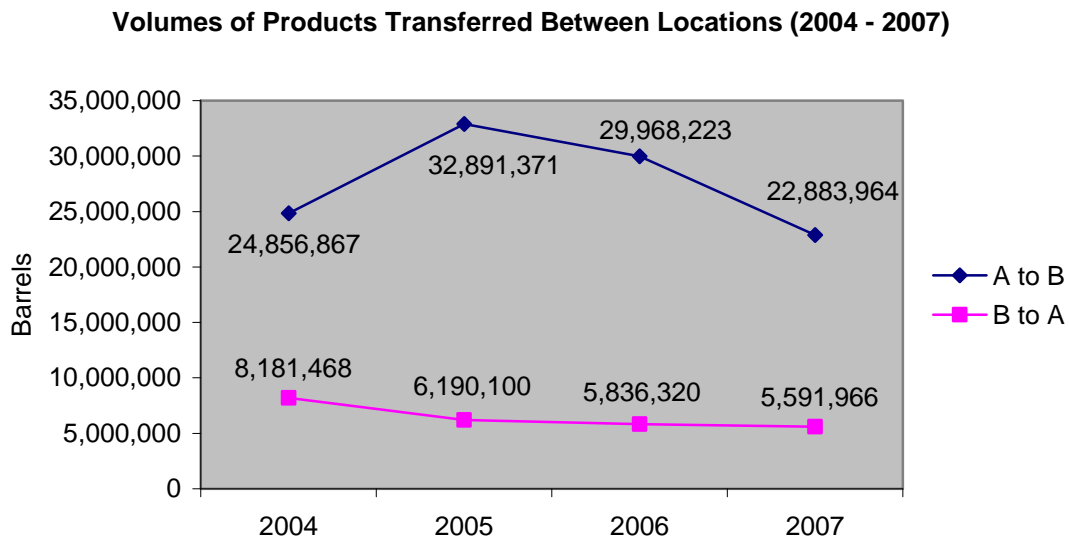


**Products:** The maximum volume was transferred during the fourth quarter at 7,915,948 barrels and the least volume was transferred during first quarter at 5,938,113 barrels.

**Crude Oil:** The maximum volume of crude oil transferred was in the second quarter at 356,718 barrels and minimum was during the fourth quarter at 263,496 barrels.

The pattern indicates that refined products volumes had a progressively rising trend in 2007. The crude oil volumes are showing a gradual falling trend.

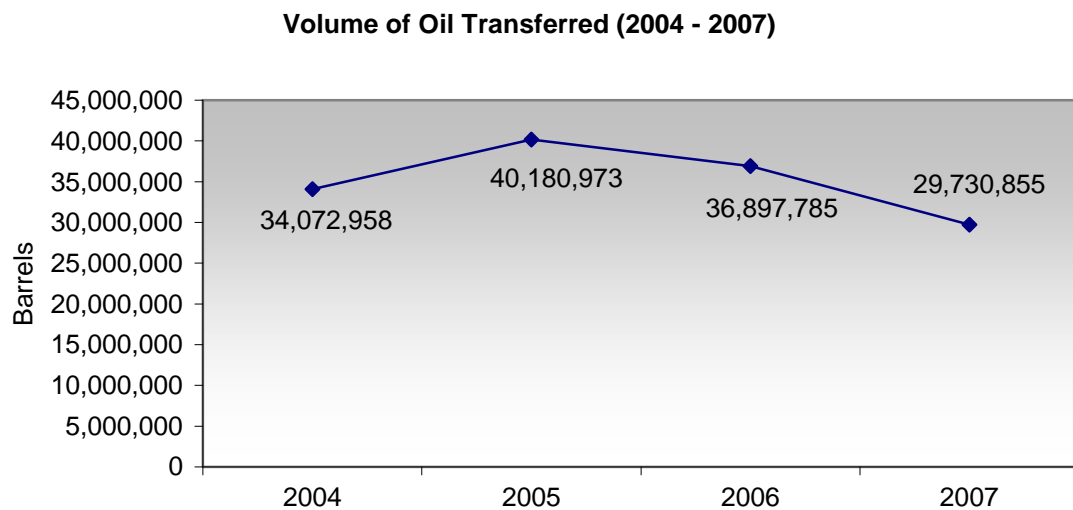
## VOLUMES OF PRODUCTS TRANSFERRED BETWEEN LOCATIONS (2004-2007)



**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. This could be due to greater refining capacity in the Bay area in comparison to the refining capacity in Los Angeles/Long Beach area.

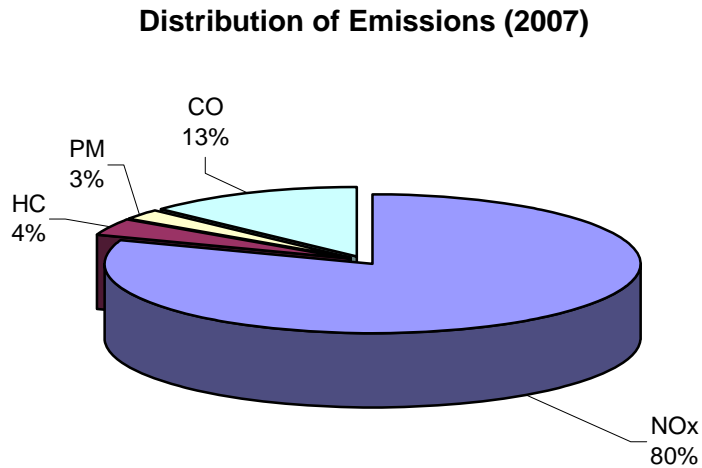
## VOLUME OF OIL TRANSFERRED (2004-2007)



A comparison of volumes of 2007 with 2006 shows a reduction of 7,166,934 barrels, a decline of 19.42%. The comparison of volumes of years 2007 with 2005 shows there were 10,450,118 barrels less transferred by internal shipments in 2007. This was a decrease of 24.00% in 2007 from the 2005 reporting year. The comparison of volumes of years 2007 with 2004 shows there was a lower volume of 4,342,103 barrels shipped in 2007. This was a decrease of 12.74% over the volume of 2004. The trend shows a steady two year decline from a rise in the highest reported transfer year of 2005.

## AIR EMISSIONS

### DISTRIBUTION OF EMISSIONS IN 2007

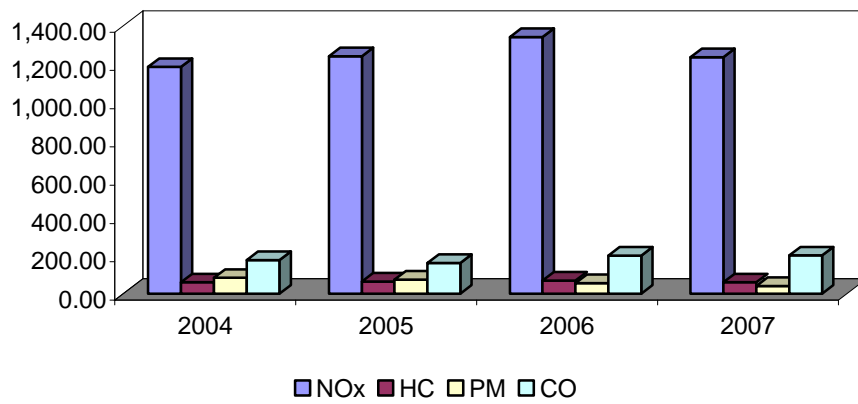


Nitrogen Oxide (NO<sub>x</sub>) was 80% of the total emissions, followed by Carbon Monoxide (CO) at 13%. Hydrocarbon (HC) gases and Particulate Matter (PM) remained at 4 and 3% of the total emissions respectively.

NO <sub>x</sub> emission:	1,235.55 short tons or 80% of total emissions
HC emissions:	59.70 short tons or 4% of total emissions
PM emissions:	40.72 short tons or 3% of total emissions
CO emissions:	199.94 short tons or 13% of total emissions

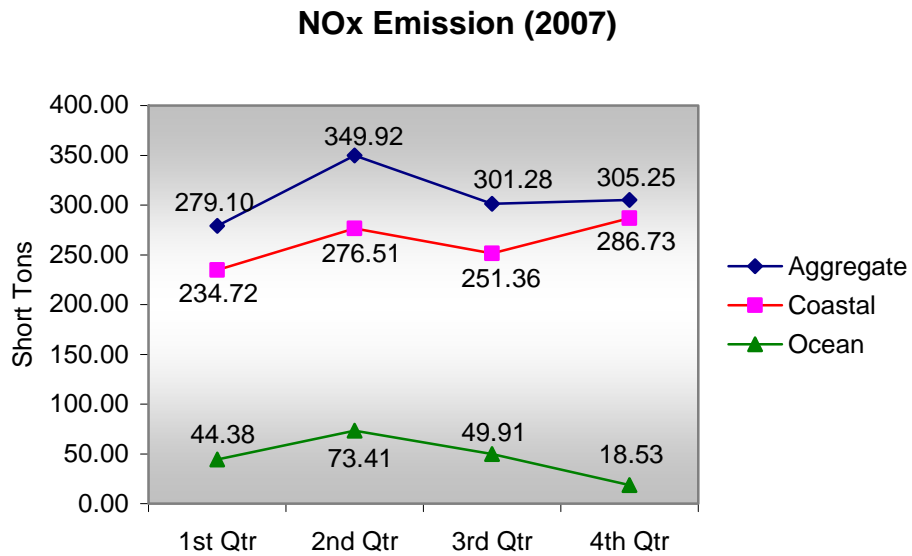
## DISTRIBUTION OF EMISSIONS (2004 to 2007)

Distribution of Emissions in Tons (2004 - 2007)



The CO, HC and NO<sub>x</sub> have shown a leveling pattern, while the PM has shown a slight declining pattern.

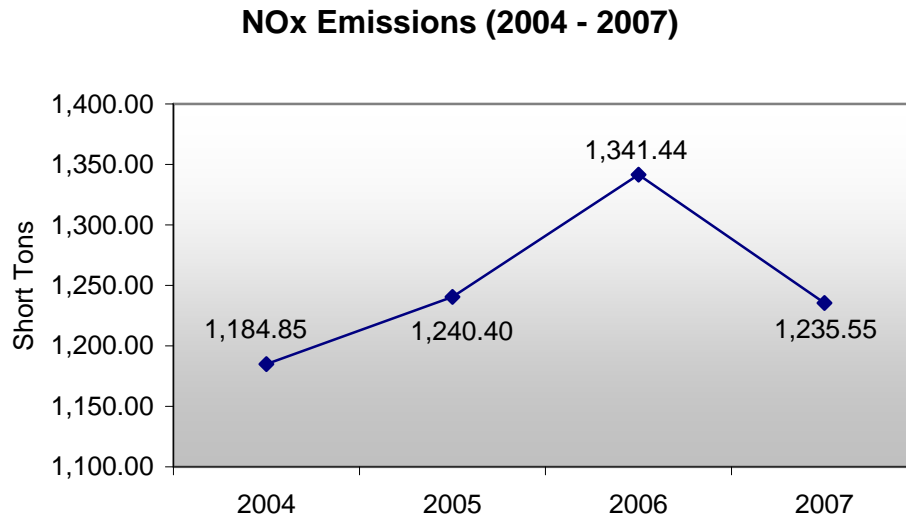
## NITROGEN OXIDE (NO<sub>x</sub>) EMISSIONS (2007)



The aggregate NO<sub>x</sub> emissions were the highest in the second quarter during which there were 88 internal shipments of oil, which is only four shipments less than the fourth quarter, which had the highest amount of voyages, but 45 less tons of NO<sub>x</sub> emissions.



## NITROGEN OXIDE (NO<sub>x</sub>) EMISSIONS (2004-2007)



The comparison of data for the year 2007 with 2006 indicates a decrease of 7.89% in NO<sub>x</sub> emissions with the decrease of 9.45% in the number of voyages.

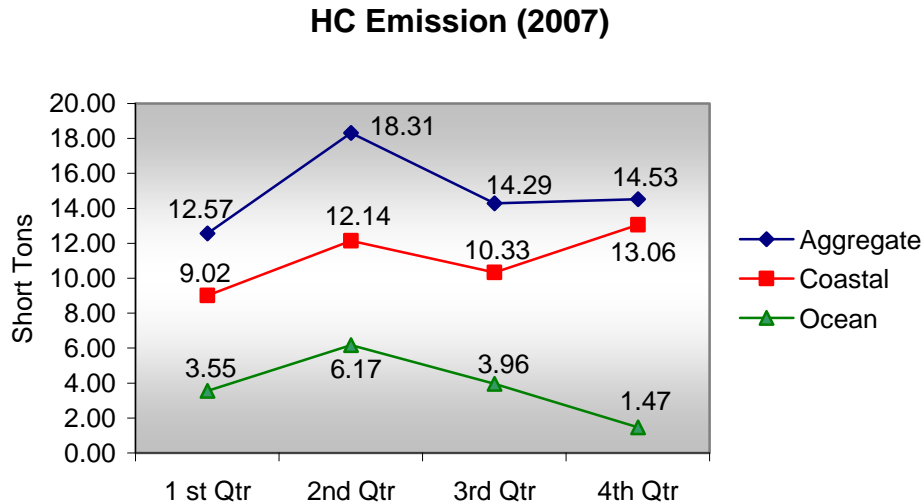
The comparison of data for the year 2007 with 2005 shows there was 0.39% decrease in No<sub>x</sub> with a 17.07% decrease in number of voyages. The generation of No<sub>x</sub> has shown only a 50 ton net gain on a year to year comparison, since the inception of the reporting.

The table below indicates the average of NO<sub>x</sub> emission per voyage in short tons since the program commenced in 2004.

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

A plausible explanation for the 2007 increase in NO<sub>x</sub> emissions per ocean voyage is that the tank ships had taken longer to complete their voyages between San Francisco and the Los Angeles/Long Beach ports.

## HYDROCARBON (HC) EMISSIONS (2007)



The aggregate HC emissions were the highest in the second quarter in which there were 88 internal shipments of oil, 4 shipments less than the fourth quarter, which had relatively fewer HC emissions. The least quarterly emissions occurred during the first quarter, where there were 83 internal shipments, 6 shipments less than the second quarter.

There were only 3 voyages by tank ships during the fourth quarter. This number was lower than any other quarter. A plausible reason for lower HC emissions in the fourth quarter could be that tank ships generate more HC emissions than barges. The trend toward fewer tank ship voyages overall may have led to lower HC emissions in the aggregate.

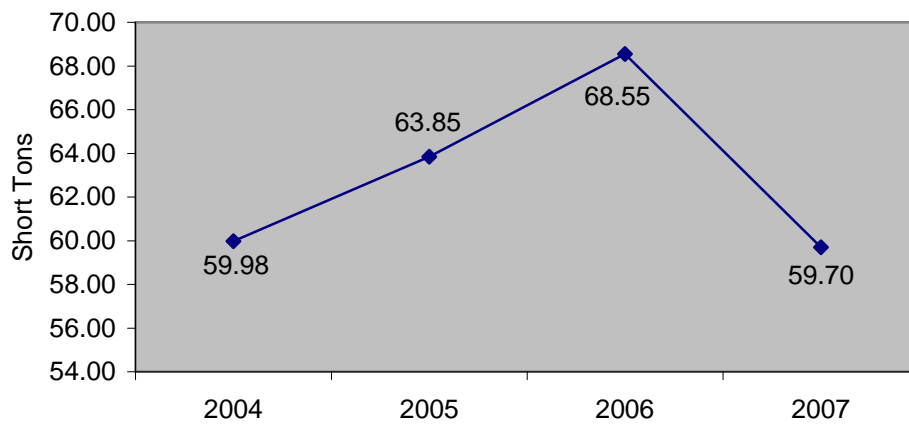
The table below indicates the average of HC emission per voyage in short tons since the program commenced in 2004.

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

Note: The staff found that the coastal voyage HC emission per voyage as reported on page 20 of the OTTER report of 2006 was in error, due to a typographical error. The correct data is shown in the table above.

## HYDROCARBON (HC) EMISSIONS (2004-2007)

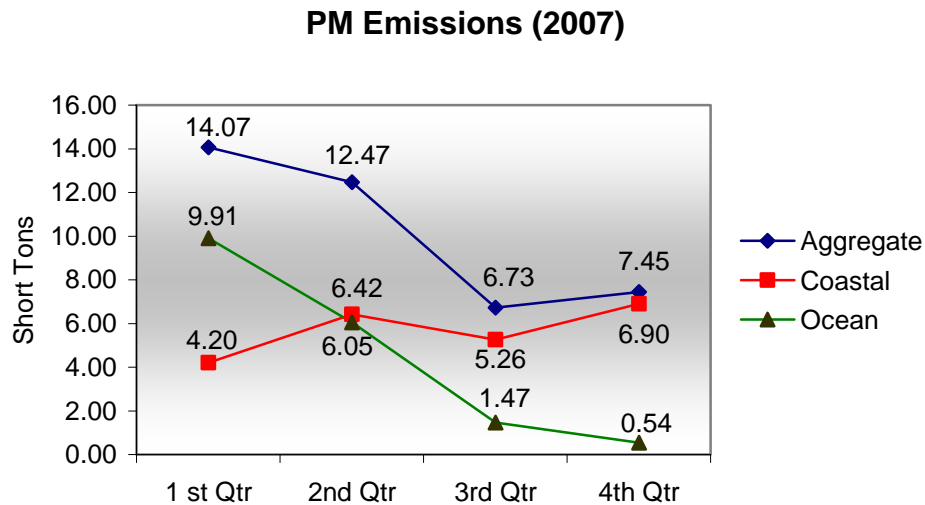
HC Emissions ( 2004 - 2007)



The comparison of data of the years 2007 and 2006 indicates a decrease of 12.92% in HC emissions along with a decrease of 9.45% in the number of voyages. The comparison of data of the year 2007 with 2004 shows there was 0.46% increase in HC with 5.48% decrease in number of voyages.

The generation of HC has remained steady with only a net increase of 0.46% over the four year report period, while the number of voyages has fallen slightly.

## PARTICULATE MATTER (PM) EMISSIONS (2007)



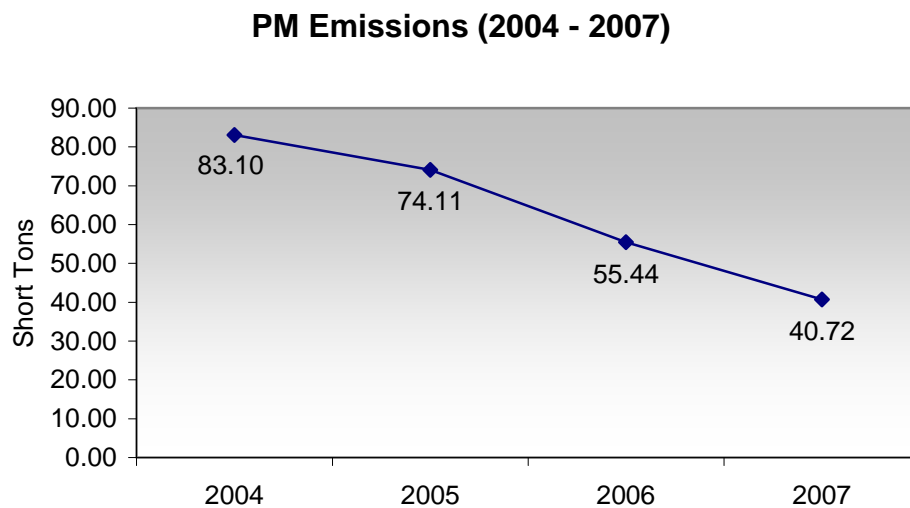
PM emissions in the aggregate were highest in the first quarter and fell after that toward the second, third and fourth quarters to almost half of the initial amount of the first quarter. The trend line of the ocean PM mirrored that of the aggregate, while that of the coastal PM increased slightly at less than one percent.

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

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

Note: The staff found that the coastal PM emission per voyage for the year 2004, on page 22 of the OTTER report of 2006 contained a typographical error. The correct data is shown in the table above.

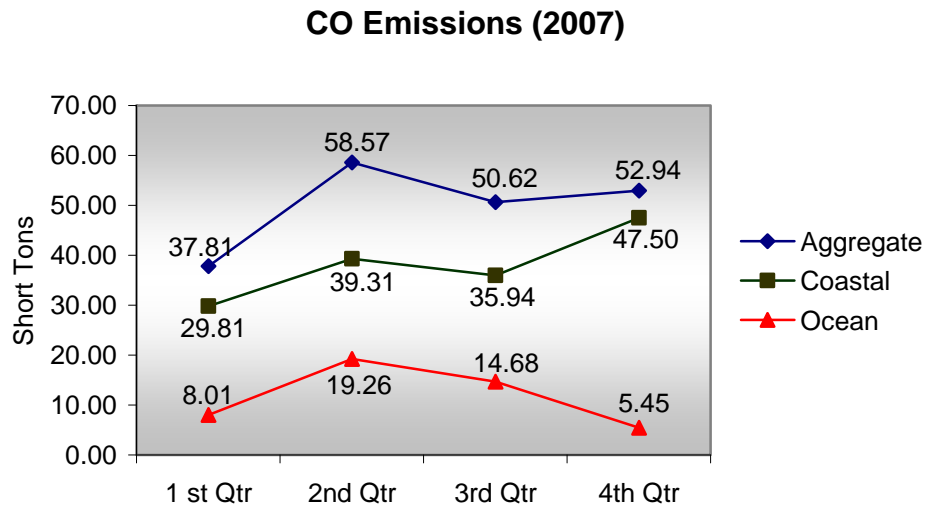
## PARTICULATE MATTER (PM) EMISSIONS (2004-2007)



The comparison of data of the years 2007 and 2006 indicates a drop of 26.56% in PM emissions with the decrease of 9.45% in the number of voyages. The comparison of data of the years 2007 with 2004 shows there was 51.00% drop in PM and an overall decrease of 5.48% in the number of voyages.

The generation of PM has been following a downward trend. The plausible reason of the downward trend could be that vessels are now using cleaner fuels.

## CARBON MONOXIDE (CO) EMISSIONS (2007)



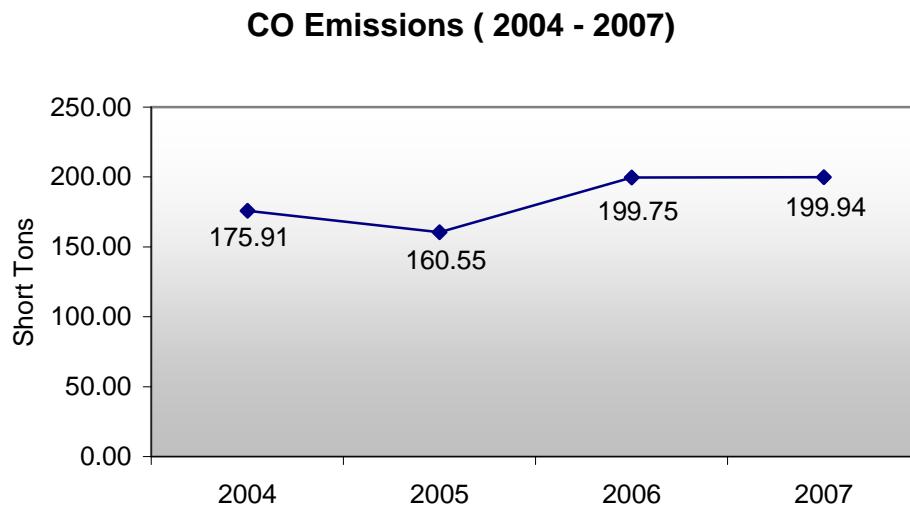
Aggregate CO emissions were highest in the second quarter and lowest in the first quarter. In the first quarter there were 20 ocean voyages and 63 coastal voyages. During the second quarter there were 9 ocean voyages and 79 coastal voyages. The CO emissions generated in the third quarter fell slightly with 6 ocean voyages and 76 coastal voyages. In the fourth quarter there were 3 ocean voyages and 89 coastal voyages

Up to the third quarter, CO emissions from vessels using both ocean and coastal voyages paralleled each other. Approaching the fourth quarter the two diverged from one another, with the CO from coastal voyages rising and the CO from ocean voyages decreasing. The pattern that emerged shows a proportional rise and fall in the amount of CO emissions generated between the types and amount 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
Ocean Voyage	0.67	0.39	0.79	1.25
Coastal Voyage	0.33	0.39	0.44	0.50

## CARBON MONOXIDE (CO) EMISSIONS (2004-2007)



The comparison of data of the years 2007 and 2006 indicates a nearly imperceptible increase of 0.10% in CO emissions with the decrease of 9.45% in the number of overall voyages. The comparison of data of the years 2007 with 2004 indicates there was a 13.66% increase in CO with 5.48% 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.

## **PERTINENT ISSUES**

The marine transportation sector has traditionally used blends of intermediate residual oils after the lighter distillates have been taken for non-marine sector. This left 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 use of low sulfur diesel for auxiliary engines effective January 1, 2007. Harbor craft in California now use diesel fuels used in the land transportation sector, both for propulsion and auxiliary engines.

The U.S. Environmental 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.

There are technical limitations when introducing new fuels in existing, very large marine engines used in oceangoing vessels. The marine engines have a life span of 25 years. 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 would provide some reduction in emissions.

The idling time of vessels in ports could be reduced by better planning of berths, so that vessels berth as soon as possible after arrival.

## **CONCLUSION**

This is the fourth 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 No<sub>x</sub>, HC, PM and CO emissions into the coastal and offshore regions off 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, will have 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 89% of shipments take place 12 to 15 miles from the coast. There were no shipments as result of refinery shutdown.



**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 <sub>x</sub>	HC	PM	CO

Was the reason for shipping this cargo due to a temporary or partial shutdown of a key refinery facility?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
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<b>Point of Contact</b>	
<b>Address</b>	
<b>Telephone No.</b>	
<b>Signature of Responsible Party</b>	



## 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.**