DRAFT 2010 UPDATE
SAN PEDRO BAY PORTS CLEAN AIR ACTION PLAN
TECHNICAL REPORT

Prepared by:

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FOREWORD

To effectively integrate common goals for air quality in the South Coast Air Basin, the Port of Los Angeles (POLA) and the Port of Long Beach (POLB) worked together in close coordination with the staff of the United States Environmental Protection Agency Region 9 (USEPA Region 9), the California Air Resources Board (CARB), and the South Coast Air Quality Management District (SCAQMD) to develop the 2006 San Pedro Bay Ports Clean Air Action Plan (CAAP). This plan was the first of its kind in the country, linking the emission reduction efforts and visions of the two largest ports in the United States with similar efforts and goals of the regulatory agencies responsible for ensuring compliance with air quality standards. The collaborative effort continues with this update of the CAAP.

The air agencies have extensively reviewed and commented on this draft CAAP Update and continue to support the collaborative process that has been established. By participating in the development and update of this CAAP, these regulatory agencies do not waive or forfeit their rights or obligations to continue to regulate emissions sources under their control. Participation in this process is voluntary by all parties and does not in any way inhibit or preclude the agencies from any legal authorities and responsibilities to meet federal, state, and local air quality standards. Participation does not mean that the agencies necessarily endorse each of the measures and concepts proposed in the CAAP Update.

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EXECUTIVE SUMMARY

In March 2006, a groundbreaking meeting occurred at the highest level between the Port of Long Beach (POLB), Port of Los Angeles (POLA), and the South Coast Air Quality Management District (SCAQMD) where all parties expressed the need to work jointly toward solutions to reduce emissions from port related operations. Shortly thereafter, the ports also engaged the California Air Resources Board (CARB) and the United States Environmental Protection Agency (USEPA) Region 9 in the spirit of cooperation to help the ports develop the original 2006 San Pedro Bay Ports Clean Air Action Plan (CAAP).

Since the release and implementation of the CAAP, the concepts presented in the plan and the actions taken by the ports have had a profound effect on the dialogue regarding a port's role in addressing port-related air quality issues on the local, national, and international levels. The CAAP has significantly redefined what port authorities can do to ensure that surrounding communities are not adversely impacted by port-related operations. Since its release, there are now published air quality plans in the Pacific Northwest, there are plans being developed in the Northeast and Gulf coasts of North America, and plans being discussed and prepared in Asia and Europe. Inquires about the CAAP have come from ports around the world. In recognition of the groundbreaking work and commitment by both ports, several awards and recognitions have been received, including in 2007, the ports received the 8th Annual National USEPA Clean Air Excellence Award for the CAAP.

Port's Commitment to CAAP

The ports recognize that their ability to accommodate the projected growth in trade will depend upon their ability to address adverse environmental impacts (and, in particular, air quality impacts) that result from such trade. The CAAP was designed to develop and implement strategies and programs necessary to reduce air emissions and health risks while allowing port development to continue. This remains the primary goal of the CAAP Update.

At this time, the ports have two planned terminal redevelopment projects, in addition to a number of infrastructure improvement projects that could be approved and implemented in the next five years. As with the terminal redevelopment projects that have been already approved since the CAAP was adopted, these upcoming projects present significant opportunities to implement the measures defined by the CAAP and satisfy the ports' twin goals of clean air and economic growth. The ports also anticipate lease amendments in the next five years, and through these opportunities, the ports will continue to implement the strategies defined in the CAAP. In short, the ports have already started to serve as a catalyst for rapid change towards reducing air pollution, proactively addressing the impacts to communities affected by port operations.

The CAAP is the ports' long-term commitment to reduce emissions associated with port activities. In November 2006, the first version of the CAAP was adopted at a historic joint meeting of each port's Board of Harbor Commissioners. The 2006 CAAP was a five-year action plan that highlighted the near-term goals, emissions reductions, and budgetary needs for fiscal years 2006 through 2011. Consistent with each port's air quality program goals, the 2006 CAAP focused primarily on reducing health risks to the local communities and reducing emissions of DPM, NOx and SOx.

As stated when the original CAAP was developed, the ports believe it is important to continuously update and improve upon the CAAP, where necessary, in order to monitor progress, plan for the future, and maximize success. Staffs from both ports meet regularly to evaluate progress towards meeting the CAAP goals, review status of existing control measures, evaluate new measures, and jointly develop updates to the CAAP as needed.

It should be emphasized that the air quality regulatory agencies, USEPA, CARB and SCAQMD, continue to fulfill their commitment to work with the staff of the two ports on their efforts associated with the implementation of the CAAP.

Enhancements to the CAAP

There are three categories of major enhancements in the updated version of the CAAP: Measure Changes, San Pedro Bay Standards, and CAAP Progress Tracking. Highlights of these enhancements are as follows:

- **Measure Changes –** Several of the measures have been updated to include information on the implementation details and measureable results for programs that have been developed or improved since the original CAAP was adopted. Further, some measures have been updated to reflect regulatory changes that have occurred over the past several years. The most significant changes to the measures are associated with ocean-going vessel (OGV) main engines and line haul rail locomotives.

    - A new measure has been introduced as OGV5 which seeks to maximize the early introduction and preferential deployment of vessels to the San Pedro Bay ports with cleaner/newer engines meeting the new International Maritime Organization (IMO) oxides of nitrogen (NO_x) standard for Emission Control Areas. The previous OGV5, Main & Auxiliary Engine Emissions Improvements, has been re-classified as OGV6, with the focus of reducing diesel particulate matter (DPM) and NOx emissions from the existing fleet of vessels through the identification of new effective technologies. Numerous emission reduction technologies are being evaluated for integration into vessel new builds and use of these technologies as a retrofit for existing vessels will be explored. The ports intend to work cooperatively with vessel owners and engine and technology manufacturers to advance these efforts. This strategy will be coupled with the Technology Advancement Program and will include a systematic outreach, evaluation and demonstration effort.

- Measure RL3, New and Redeveloped Near-Dock Rail Yards, has been revised to reflect the new locomotive engine standards promulgated by USEPA and supports achievement of CARB's stated goal of a state-wide fleet of 95% Tier 4 locomotive engines by 2020, contained in CARB's "Staff Recommendations to Provide Further Locomotive and Railyard Emission Reductions" adopted in September 2009.

- **San Pedro Bay Standards** – The San Pedro Bay Standards are perhaps the most significant addition to the CAAP and are a statement of the ports' commitments to significantly reduce the air quality impacts from port operations. Achievement of the Standards listed below will require diligent implementation of all of the known CAAP measures and aggressive action to seek out further emissions and health risk reductions from port-related sources from strategies that will emerge over time.

  Health Risk Reduction Standard. To complement the CARB's Emission Reduction Plan, the ports of Long Beach and Los Angeles have developed the following standard for reducing overall port-related health risk impacts, relative to 2005 conditions:

  - By 2020, reduce the population-weighted cancer risk of ports-related DPM emissions by 85%, in highly-impacted communities located proximate to port sources and throughout the residential areas in the port region.

  Emissions Reduction Standard. Consistent with the ports' commitment to meet their fair-share of mass emission reductions of air pollutants, the ports of Long Beach and Los Angeles have developed the following standards for reducing air pollutant emissions of ports-related activities, relative to 2005 levels:

  - By 2014, reduce emissions by 22% for NOx, 93% for sulfur oxides (SOx), and 72% for DPM to support attainment of the federal fine particulate matter (PM2.5) standards.
  - By 2023, reduce emissions by 59% for NOx to support attainment of the federal 8-hour ozone standard. The corresponding SOx and DPM reductions in 2023 are 92% and 77%, respectively.

  The ports will strive to exceed the 2014 NOx standard of 22% reduction, potentially exceeding 40% reduction, given the forecasted cargo volumes and efforts to implement new technologies.

- **CAAP Progress Tracking** - The original CAAP was published in November of 2006, prior to the establishment of the San Pedro Bay Standards. In the absence of San Pedro Bay Standards, the progress and effectiveness of the plan were forecasted through 2011 by estimating the growth in emissions due to anticipated cargo activity increases and then applying the effectiveness of the various control measures. The resulting controlled emission forecasts were compared with the same year's uncontrolled forecasted emissions grown from the CAAP 2005 emission estimates. Now that the San Pedro Bay Standards have been established, on-going CAAP progress and effectiveness will be measured against the Standards which consist of reductions as compared to 2005 published inventories.

Measures & Strategies Recap

Since the original CAAP was adopted in late-2006, staff of both ports have been diligently working together to develop, implement and operate the various ground breaking measures and initiatives of the CAAP. The initiatives that the ports of Long Beach and Los Angeles have been working on together since the adoption of the 2006 CAAP and will continue to implement over the next five years include:

- **Heavy-Duty Vehicle Control Measures** – The Clean Trucks Program (CTP) will produce 80% emission reductions by 2012 from all port trucks serving both ports. This will be accomplished through a port tariff that will gradually limit access to all but the cleanest on-road trucks meeting the USEPA's 2007+ on-road truck emissions standards. Older trucks will be banned according to the following schedule:

  - Phase 1: By October 1, 2008, all pre-1989 MY engines are banned from operation in the ports.
  - Phase 2: By January 1, 2010, all 1989 to 1993 MY engines are banned from operation in the ports. Further, all 1994-2003 MY engines will be required to achieve an 85 percent DPM reduction and a 25 percent NOx reduction through the use of a CARB approved level 3 plus NOx VDECS.
  - Phase 3: By January 1, 2012, all drayage truck engines that do not meet 2007 federal on-road standards will be banned from the ports.

  Milestones reached in the CTP include:

  - In 2007, both ports worked together to develop the Clean Trucks Program. Each port's Board of Harbor Commissioners approved the Clean Trucks Program Tariff in November 2007.
  - In October 2008, the first ban date for the oldest trucks (pre-1989) was successfully implemented.
  - In February 2009, the Truck Environmental Fee was initiated for all non-exempt trucks and all trucks operating in the ports were required to be registered in the Drayage Truck Registry.

- As of September 2009, the first anniversary of the Clean Truck Program, over half of all truck trips were made by clean trucks which meet the 2007 USEPA on-road standards.
- Participation rates for the Clean Truck Program have exceeded the goals set forth in the original plan. Since February 2010, the Port of Los Angeles (POLA) reported that 84% of container cargo moves at its terminals were made by clean trucks. Similarly, the Port of Long Beach (POLB) reported that 77% of all container cargo moves were made by clean trucks.

- **Ocean-Going Vessels Control Measures** – These measures include: vessel speed reduction; shore-power/alternative maritime power; fuel improvements for main engines, auxiliary engines, and auxiliary boilers; cleaner OGV engines; and technology improvements for OGV engines.

  Milestones reached in the OGV measures include:

  - The POLB Green Flag Program has been in place since late 2005. POLA approved a Vessel Speed Reduction Incentive Program in June 2008. In 2009, the POLB Green Flag Program compliance rate to 20 nautical miles (nm) from the port was 95%; POLA's compliance to 20 nm was 90%. Starting in 2009, POLB expanded its Green Flag Program to 40 nm from the port, and throughout 2009, the compliance rate to 40 nm was up to 72% of all vessels. POLA expanded their incentive program to 40 nm starting late-September 2009.
  - In March 2008, the ports approved the Vessel Main Engine Fuel Inventive Program to provide a monetary incentive for the use of low-sulfur marine fuel in vessel main engines, for the period from July 1, 2008 through June 30, 2009. During the program, approximately 15% of all calls at the two ports used low sulfur fuel in the main engines for arrivals and departures. The CARB vessel fuel regulation, requiring low sulfur fuel in main and auxiliary engines and boilers, went into effect on July 1, 2009, at which time the ports' fuel incentive program ended.
  - Both ports are continuing to move forward with design, construction and commissioning of shore power infrastructure at their container, cruise and one tanker terminals. As of 4th Quarter 2009, Alternative Maritime Power (AMP) infrastructure is operational at two terminals in POLA with another two terminals anticipated to be active by 2nd Quarter 2010. Shore power infrastructure is currently operational at three terminals in POLB and is currently in construction at a fourth terminal. Remaining port cruise and container terminals at both ports will be outfitted with shore power infrastructure by 2014.

- **Cargo Handling Equipment (CHE) Control Measures** - Performance standards for CHE which call for progressive replacement with equipment meeting cleaner engine standards as implemented through lease conditions, and port assistance for securing grant funding for equipment replacements, repowers and retrofits, in conjunction with CARB regulations, continue to be effective strategies for reducing emissions from this source category.

- **Harbor Craft (HC) Control Measures** - Performance standards for HC which establish goals for early replacement of harbor craft engines with engines meeting cleaner standards, and port assistance for securing grant funding for engine repowers, in conjunction with CARB regulations, continue to be effective strategies for reducing emissions from this source category.

- **Railroad Locomotive Control Measures –** Engine modernization for the rail switch operations in the port complex has been successfully completed, upgrading 16 locomotives to Tier 2 engine standards. Six additional gen-set locomotives that meet the more stringent Tier 3 standards have also been added to the ports' switching fleet. By 2010, all Class 1 locomotives operating in the ports will meet the emissions equivalent of Tier 2 standards in accordance with the CARB's South Coast Air Basin (SoCAB) MOU. Additional requirements will be implemented through any new or redeveloped railyard projects.

- **Construction Activity –** The ports have developed key Best Management Practices which are focused on reducing emissions associated with construction activities. Compliance with these practices is required in all project bid specifications.

- **Technology Advancement Program (TAP) –** The ports' Technology Advancement Program is focused on the development and implementation of near-term emission reduction technologies. The ports have made over $9 million available to the TAP since 2007.

- **Emissions Inventory Improvements** - The emissions inventories are the ports' measurement tool for evaluating and reporting on progress toward meeting the San Pedro Bay Standards. The ports continue to identify opportunities to improve the accuracy of key monitoring and tracking elements used in development of the ports' emissions inventories. Several improvements have been made to the methods, data and understanding of the sources types since 2006 and the ports inventories are considered "state-of-art."

- **Zero Emission Container Movement** - Over the past several years, the ports have been evaluating various Zero Emission Container Movement Systems (ZECMS) for potential application at the ports. The short-term goal is to determine if ZECMS are feasible for the ports and if so, demonstrate innovative technologies that can be utilized for more efficient and greener movement of cargo. The ultimate goal is to handle the anticipated cargo throughput growth with pollution-free technologies and strategies.

- **Operational Efficiency Improvement Initiatives** - This initiative identifies projects at the San Pedro Bay ports that improve infrastructure and operational efficiencies, as well as have an air quality benefit. The types of projects that are included in this element of the CAAP are generally initiated primarily as transportation or operational improvements; however, an air quality benefit does result from completing these projects.

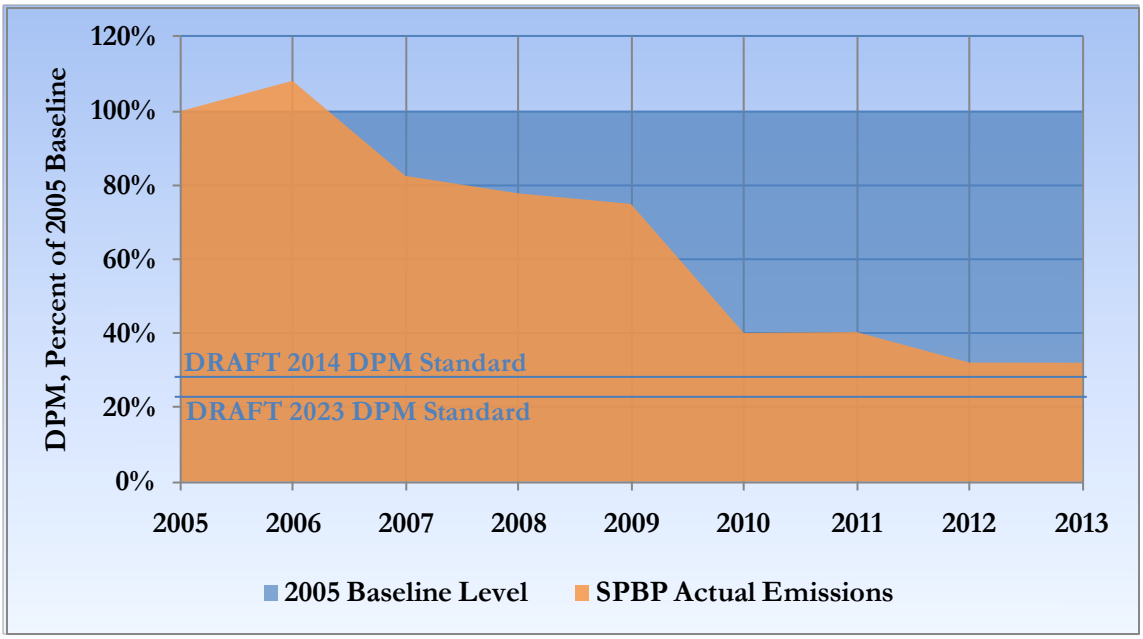
Progress to Date & Future Benefits

Progress to date and future benefits are measured against the San Pedro Bay Emissions and Health Risk Reduction Standards. To be consistent with the methods used in the emissions forecasting for the Standards, the progress to date for this CAAP Update is based on the 2005 inventory methods and assumptions. Accordingly, actual annual activity data for 2006 through 2008 from both ports were modeled using the 2005 methodology and assumptions to develop comparative emissions for these years. In order to determine the projected benefits from the CAAP measures and applicable regulations, emissions are forecasted from 2009 through 2013 based on the 2005 methodology and assumptions and the 2007 San Pedro Bay cargo forecast, consistent with the forecasting that was used in the establishing the San Pedro Bay Standards.

It should be noted that cargo forecasts vary along with changes in the financial markets. The 2007 San Pedro Bay cargo forecast used to establish the San Pedro Bay Standards was developed and published before the market collapse and ensuing recession and was based on previous year's cargo throughput changes. However, the forecasted cargo volumes for 2007 through 2009 have not occurred at the ports. In fact, all the ports on the U.S. West Coast have experienced significant cargo reductions in the last two years due to the massive reductions in international trade volumes. The 2007 cargo forecast utilized for development of the Standards projected that the ports would continue to experience steady growth and reach cargo capacity (42+ million twenty-foot equivalents (TEUs)) by 2023. However, in actuality, the TEUs at the San Pedro Bay ports were flat in 2007 and declined in 2008 and 2009. Therefore, the forecasted emissions presented in CAAP Update are conservative (i.e. high growth) estimates, and should not be considered definitive as they are subject to change to reflect updated cargo forecasts. These forecasts may be updated with each CAAP Update to reflect new forecast information.

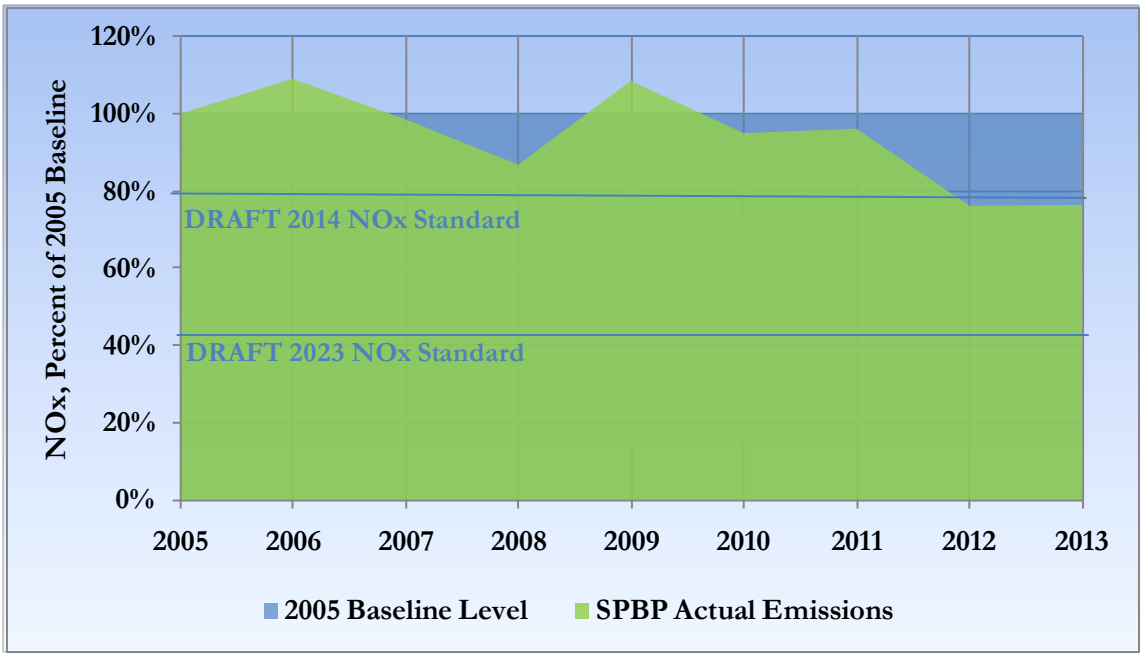
Figures ES.1 through ES.4 present the 2005 baseline and the year-to-year percent change in the magnitude of both ports' emissions, with respect to 2005 and the Emissions Reduction and Health Risk Standards.

Figure ES.1: DPM Progress To Date & Forecasted Benefits



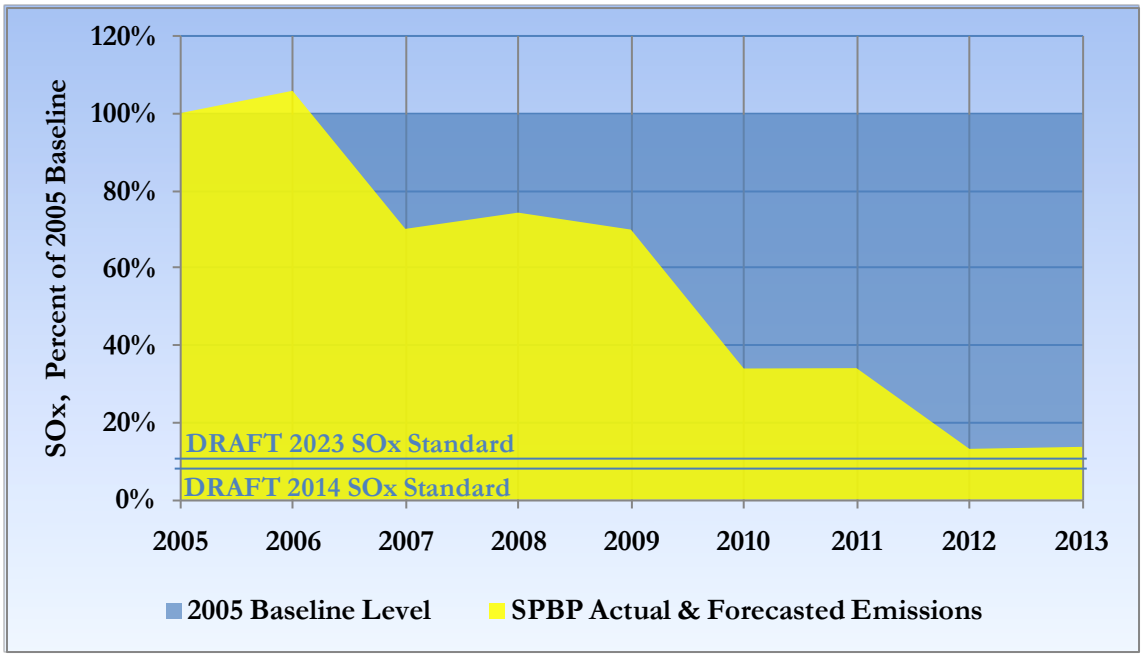
As presented above, with the additional CAAP measures coming on line, including the Clean Trucks Program, and CARB's OGV fuel switch regulation implemented in mid-2009, it is anticipated that the reduction trend experienced through 2008 will continue and sharpen slightly. By 2013, the ports are anticipated to be close to achieving their 2014 DPM Emissions Reduction Standard. Though significant progress has been made, significant challenges remain with actually reaching the goals.

Figure ES.2: NOx Progress To Date & Forecasted Benefits



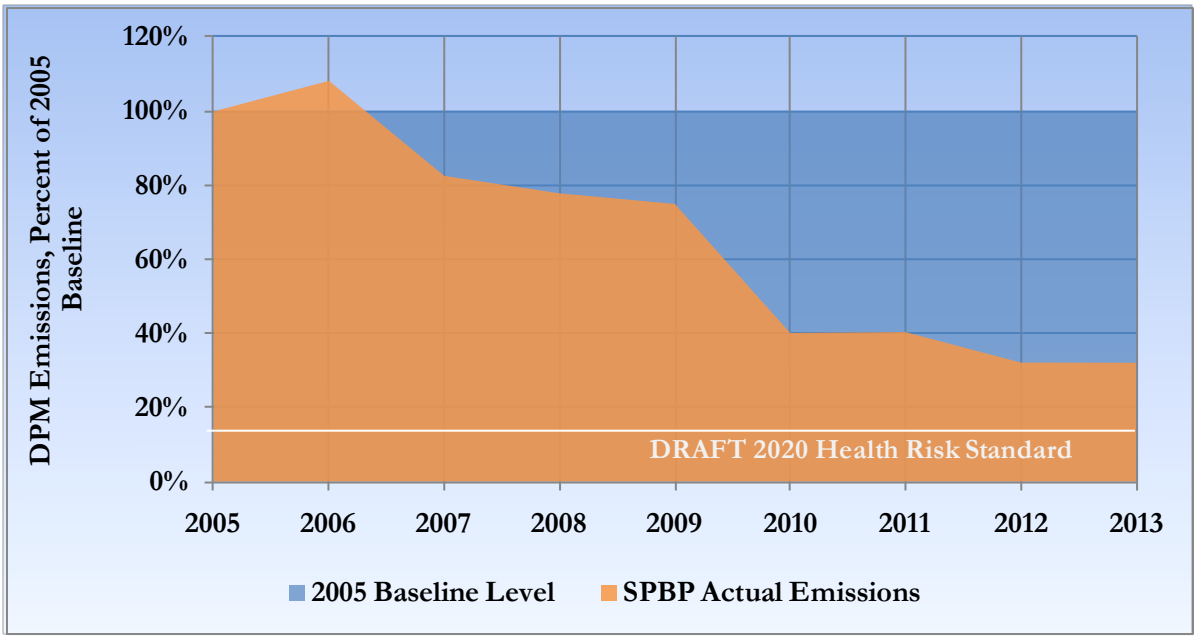
As presented above, it is anticipated that with implementation of the CAAP measures, including the vessel speed reduction (VSR) program, shore-power, and the Clean Trucks Program, the ports are on target with meeting the 2014 NOx Standard. Increased participation in VSR out to 40 nm, increased use of shore power (or equivalent technologies) at berth and introduction of new control technologies on existing and new build OGVs will significantly help in meeting the 2023 NOx Emissions Reduction Standard. Additionally, continued fleet turnover in other source categories will contribute to future NOx reductions. The increase in emission levels in 2009 is a manifestation of the cargo forecast compared to the actual cargo throughputs in the preceding years. The decrease in NOx emissions in 2009 is less than 2007 and 2008 because uncontrolled emissions for that year are based on the higher estimated growth from the 2007 cargo forecast, whereas controlled emissions in 2007 and 2008 reflect the actual decline in growth that occurred during those years.

Figure ES.3: SOx Progress To Date & Forecasted Benefits



As presented above, with the implementation of additional CAAP measures and CARB's OGV fuel regulation implemented in mid-2009, it is anticipated that the high rate of SO_x reductions will continue in the coming years. The slight erosion of SO_x reductions from 2007 and 2008 was due to the injunction of the previous CARB OGV fuel rule in 2008. The plateau in 2009 is a manifestation of the cargo forecast. The ports are anticipated to be close to achieving their 2014 and 2023 SO_x Emissions Reduction Standards by 2012. Significant challenges, however, remain with closing the final gap and sustaining these reductions.

Figure ES.4: Health Risk Progress To Date and Forecasted Benefits



DPM emission reductions closely track with DPM-related health risk reduction. Therefore, evaluating the DPM emission reduction trend is a good surrogate for estimating the health risk reduction trend. As presented above, with additional CAAP measures coming on line, CARB's OGV fuel switch regulation implemented in mid-2009, and the Clean Trucks Program, it is anticipated that the reduction trend seen since 2006 will continue. The slight bump in 2009 is a manifestation of the cargo forecast. Although it appears that the ports will be close to meeting the Health Risk Reduction Standard by 2013, closing the remaining gap to meet the Standard will be a significant challenge as the remaining sources from which to gain reductions are anticipated to be the hardest to control.

Looking Ahead

The CAAP is a planning tool to assist the ports, the port operators, and the air quality regulatory agencies to move forward with strategies that will achieve the ports' commitment to reduce emissions associated with port activities. The CAAP was designed to provide direction for developing and implementing strategies and programs necessary to progressively achieve real and measurable air quality and public health improvements, while allowing port development to continue. This remains the primary goal of the CAAP Update and, as shown above, real and measurable benefits are being achieved and are forecasted. The most significant addition to the CAAP Update is the development of the San Pedro Bay Standards which establish long-term goals for emissions and health risk reductions for the overall two port complex. Achievement of the Standards will require diligent implementation of all of the known CAAP measures and aggressive action to seek out further emissions and health risk reductions from port-related sources from strategies that will emerge over time. In looking ahead over the next five years, the preeminent goal of the ports is to demonstrate

progress in achievement of the Standards and to annually report performance and effectiveness in meeting this challenge with consistently improved, accurate and state-of-the-art emission inventories.

An impressive array of enhanced measures is contained in the CAAP Update and the key areas of focus over next five years are highlighted below:

- Continue to implement the Clean Trucks Programs at each port, with full implementation of trucks meeting the 2007 USEPA on-road standard by January 2012
- Achieve 90% or greater VSR participation to 40nm
- Continue implementation of shore-power infrastructure to meet the ports' lease schedules and to support CARB's requirement of 50% compliant calls for regulated vessels by 2014
- Implement use of marine fuel for OGVs with reduced sulfur content of 0.1% in 2012 through CARB's regulation
- Support implementation of a North America and Canada Emission Control Area
- Encourage demonstration and deployment of OGV control technologies for existing vessels calling at the San Pedro Bay ports
- Encourage vessels meeting the cleanest new engine standards to preferentially call at the ports of Long Beach and Los Angeles
- Continue aggressive implementation of the Technology Advancement Program to demonstrate, verify and commercialize new, cleaner engine technologies
- Evaluate progress toward achieving the San Pedro Bay Standards in 2012, and update as needed.

Lastly, in looking ahead, the ports will continue the collaborative and cooperative partnership with our agency partners and industry stakeholders to implement these strategies and to develop new technologies and control strategies to further accelerate progress toward meeting the ports' goals. Federal, state and local air quality agencies will play an essential role by identifying and pursuing future regulatory measures targeting specific source categories to further reduce emissions to order to achieve the San Pedro Bay Standards. As stated in CARB's 2006 Emission Reduction Plan for Ports and Goods Movement in California - "Successful implementation of the CARB emission reduction plan will depend upon actions at all levels of government and partnership with the private sector. No single entity can solve this problem in isolation."[1] This is also true for the CAAP.

[1] *Emission Reduction Plan for Ports and Goods Movement in California*, Executive Summary, ES-1, CARB, 2006