
UNITED STATES OF AMERICA
BEFORE THE FEDERAL TRADE COMMISSION
WASHINGTON D.C.

In the Matter of

UNION OIL COMPANY OF CALIFORNIA,
a corporation.

Docket No. 9305

RESPONDENT'S POST-TRIAL PROPOSED FINDINGS OF FACT

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INTRODUCTION

I. FEDERAL TRADE COMMISSION COMPLAINT

The Federal Trade Commission issued its Complaint in this matter on March 4, 2003. The Complaint charges that Respondent, Union Oil Company of California, a corporation, violated Section 5 of the Federal Trade Commission Act, 15 U.S.C. § 45 as amended.

The Complaint charges Unocal with three violations. It alleges that through a “pattern of anticompetitive acts and practices that continues even today, Unocal has illegally monopolized, attempted to monopolize, and otherwise engaged in unfair methods of competition in both the technology market for the production and supply of CARB-compliant “summer-time” RFG and the downstream CARB “summer-time” reformulated gasoline RFG product market.” (Complaint ¶¶ 1, 99-103). To prove exclusionary conduct, the Complaint alleges that Unocal defrauded three separate entities with respect to the status of its intellectual property rights: the California Air Resources Board (“CARB”), the Auto/Oil Air Quality Improvement Research Program (“Auto/Oil”), and the Western States Petroleum Association (“WSPA”). (Complaint ¶¶ 5, 76, 81, & 85).

Specifically, the Complaint alleges that Unocal created the false and misleading impression with CARB, Auto/Oil and WSPA that Unocal had no actual or potential intellectual property claims related to RFG. (*E.g.*, Complaint ¶¶ 3, 58, 79, 82, & 86). Unocal’s “fraud,” according to the Complaint, caused CARB to adopt regulations that overlapped with patent claims, which eventually issued to Unocal on certain RFG compositions. (*E.g.*, Complaint ¶¶ 5 (referring to the patent claims as “Unocal’s concealed patent claims”), 45)). For examples of this “overlap,” the Complaint cites CARB’s inclusion of a specification for a gasoline property known as “T50” in its Phase 2 RFG regulations and its adoption of a “predictive model” that included T50 as one of the parameters.

(Complaint ¶ 45). It is alleged that had Unocal disclosed to CARB or others that it had filed patent application(s) relating to RFG compositions, CARB would have adopted different, alternative regulations so as to avoid Unocal's intellectual property claims. (*E.g.*, Complaint ¶¶ 5, 80). Essentially, the Complaint alleges that by not affirmatively disclosing its pending intellectual property rights, Unocal perpetrated a false and misleading impression that, had the truth been known, would have impacted CARB's analysis of the cost-effectiveness of the Phase 2 RFG regulations. (Complaint ¶¶ 1, 3, 46, 48, 78, & 79).

The Complaint asserts two relevant markets: (1) the worldwide market for technology claimed in patent application No. 07/628,488 (filed on December 13, 1990) and Unocal's issued RFG patents, and any alternative technologies that enable firms to refine, produce, and supply CARB-compliant "summer-time" RFG for sale in California at comparable or lower cost, and comparable or higher effectiveness, without practicing the Unocal technology and (2) the market for CARB-compliant "summer-time" RFG produced and supplied for sale in California. (Complaint ¶¶ 74-75).

II. RESPONDENT'S ANSWER

Unocal filed its Answer on March 21, 2003. In its Answer, Unocal denies all material allegations of the Complaint, including, but not limited to, allegations that it engaged in any wrongful conduct, acts or practices or engaged in bad faith or deceptive conduct. The Answer states that Unocal truthfully described data from its RFG research as "non-proprietary" in order to lift a confidentiality designation that it had previously given to the data; and that this was in response to a specific request from CARB to lift the confidentiality designation. (Answer ¶ 2(a)). The Answer states that "CARB never sought any disclosures, and Unocal never made any representations,

regarding inventions or intellectual property rights pertaining to inventions.” (Answer ¶ 2(a)). CARB officials had previously “testified under oath that Unocal’s representations to CARB were neither deceptive nor misleading.” (Answer ¶ 2(a)). Further, Unocal denies in its Answer that any of Unocal’s statements to CARB staff caused CARB to adopt its Phase 2 regulations. (Answer ¶ 45). To the contrary, Unocal asserts that it opposed the regulations and that “CARB officially acknowledged Unocal’s opposition in its Statement of Reasons.” (Answer ¶ 45).

In addition to denying that Unocal made any misrepresentations to CARB, Unocal’s Answer also denies any wrongful conduct toward or misrepresentations to Auto/Oil or WSPA. Unocal “denies that it ever communicated to ‘other participants’ in CARB’s rulemaking that its research results were in the public domain or that Unocal did not have or would not enforce potential intellectual property rights.” (Answer ¶ 2(a); *see also* Answer ¶¶ 54, 58).

Unocal’s Answer also denies the propriety of Complaint Counsel’s alleged relevant markets. (Answer ¶¶ 74-75). Specifically, with respect to Complaint Counsel’s alleged “summer-time” RFG market, Unocal asserts that it does not even participate in that market. (Answer ¶ 75; *see also* Answer ¶ 1 (“Unocal is legally incapable of monopolizing or adversely affecting competition in a market in which it does not even participate.”)).

Finally, Unocal’s Answer asserts numerous defenses. These include, but are not limited to: that Unocal’s lobbying activity was constitutionally protected under the *Noerr-Pennington* doctrine and First Amendment to the U.S. Constitution; that Complaint Counsel’s action is barred by the five-year statute of limitations specified in 28 U.S.C. § 2462; and that the Commission lacks jurisdiction to decide the substantive questions of patent law that are necessary to find in Complaint Counsel’s favor in this matter. (Answer at Introduction; ¶¶ 1, 65, 68, 95, 96; Additional Defenses).

III. ISSUES PRESENTED

The issues generally presented in this case are:

- (1) Whether Respondent engaged in a pattern of deceptive, exclusionary conduct by committing fraud on CARB, Auto/Oil and WSPA;
- (2) Whether Unocal utilized such conduct to capture, obtain, or dangerously threaten to obtain an unlawful monopoly in the alleged markets;
- (3) Whether Respondent's conduct is immune from antitrust liability based on the *Noerr-Pennington* doctrine;
- (4) Whether Complaint Counsel's Complaint is barred by the statute of limitations; and
- (5) Whether Complaint Counsel may obtain the proposed remedy.

IV. PROCEDURAL BACKGROUND

Upon issuance of the FTC's Complaint, the case was assigned to Administrative Law Judge D. Michael Chappell. On March 28, 2003 (after Unocal filed its Answer), Unocal filed two Motions for Dismissal. *See* Union Oil Company of California's Motion for Dismissal of the Complaint and Memorandum in Support Based Upon Immunity Under *Noerr-Pennington* and Union Oil Company of California's Motion for Dismissal of the Complaint and Memorandum in Support for Failure to Make Sufficient Allegations That Respondent Possesses or Dangerously Threatens to Possess Monopoly Power. On November 25, 2003, Judge Chappell issued an Initial Decision granting in part both of Unocal's motions and dismissing the Complaint in its entirety.

Complaint Counsel appealed. On July 7, 2004, the Commission reversed and vacated the Initial Decision, ordering that this matter be remanded to an Administrative Law Judge for further proceedings as soon as practicable. In so doing, the Commission rejected the position that the

conduct alleged is protected by the *Noerr-Pennington* doctrine on the face of the Complaint. It also rejected the idea that the FTC lacks jurisdiction to decide this matter. The Commission's Opinion instructed the Administrative Law Judge to "conduct appropriate proceedings for resolving disputed facts and substantiating or rejecting the allegations of the Complaint. Unocal, of course, may raise all appropriate defenses, including any renewed arguments concerning *Noerr-Pennington* protections, based on the forthcoming factual record." *Union Oil Co. of Cal.*, No. 9305, slip. op. at 54-55 (FTC July 7, 2004).

Pursuant to the Commission's opinion, an administrative hearing commenced on October 19, 2004, before Administrative Law Judge Chappell. The parties called a total of 42 live witnesses and submitted designated testimony from 40 depositions. The parties rested their respective cases on January 28, 2005, with closing arguments held over until after post-trial briefing is complete.

V. CITATION FORMAT

Citation format, including identification of in camera material, is pursuant to Administrative Law Judge D. Michael Chappell's Order on Post Trial Briefs filed February 3, 2005 as modified by the February 10, 2005 Order on Joint Request Regarding Post Trial Briefs.

- **Documents:** Are cited to by appropriate CX, RX or JX number followed by the computerized page number stamped at the bottom of the page. For example: (CX 8000 at 001-002). (RX 8000 at 236).
- **Designated Depositions:** Are cited by the CX number, followed by the name of the designated deponent and the line numbers. For example: (CX 7080 (Witness, Dep. at 23-24)).

- **Respondent's Findings of Fact:** Are cited as RFF followed by the paragraph of the cited finding. For example: (RFF 1-10).

FINDINGS OF FACT

I. RESPONDENT AND OTHER INTERESTED PARTIES

A. The Respondent Union Oil Company of California

1. Union Oil Company of California is a public corporation organized, existing, and doing business under, and by virtue of, the laws of California. (JX 3A at 022).

2. Its office and principal place of business are located at 2141 Rosecrans Avenue, Suite 4000, El Segundo, California 90245. (JX 3A at 002).

3. Since 1985, Union Oil Company of California has done business under the name Unocal. (JX 3A at 002). Union Oil Company will be referred to in Respondent's Proposed Findings of Fact as Unocal.

4. Prior to 1997, Unocal owned and operated refineries in California as a vertically integrated producer, refiner, and marketer of petroleum products. (JX 3A at 002).

5. By 2000, Unocal had transformed into a global exploration company; its refining and marketing assets (refineries and service stations) had been sold. (Lamb, Tr. 1807-08).

6. Unocal is the owner by assignment of five patents related to reformulated gasoline ("RFG patents") that are the subject of Complaint Counsel's Complaint. These include United States Patent No. 5,288,393, issued on February 22, 1994; No. 5,593,567, issued on January 14, 1997; No. 5,653,866, issued on August 5, 1997; No. 5,837,126, issued on November 17, 1998; and No. 6,030,521, issued on February 29, 2000. (JX 3A at 003).

B. The California Air Resources Board

7. A California statute created the California Air Resources Board and charged it with, among other things, promulgation of regulations relating to clean air. (CX 1665 at 046).

8. CARB is the primary regulatory authority for the control of air pollution in California. (CX 1665 at 046 (CAL. HEALTH & SAFETY CODE § 39500) (“It is the intent of the Legislature that the State Air Resources Board shall have the responsibility, except as otherwise provided in this division, for control of emissions from motor vehicles and shall coordinate, encourage, and review the efforts of all levels of government as they affect air quality.”)

9. The California Clean Air Act was amended to specifically require CARB to take certain actions to reduce harmful emissions from gasoline. (Venturini, Tr. 851-52). According to the requirements imposed by the California Clean Air Act, CARB adopted regulations specifying reformulated gasoline compositions for motor vehicles in two initial rulemakings. (Venturini, Tr. 119). The Phase 1 regulation set limits for a gasoline property known as Reid Vapor Pressure (RVP), mandating that gasolines include detergent additives, and required the elimination of the residual use of lead in gasoline. (Venturini, Tr. 120). Phase 2 regulations, adopted in November of 1991, set forth regulations related to reformulated gasoline and became effective in March 1996. (CX 52; CX 10; Venturini, Tr. 134-35, 138; Boyd, Tr. 6773). It was not until 1994 that CARB modified Phase 2 to include a “predictive model.” (CX 54 at 005). In addition to Phases 1 and 2, CARB also initiated a third phase. Phase 3 regulations went into effect on December 31, 2002, modifying the Phase 2 regulations and banning a gasoline additive known as MTBE. (CX 55; CX 56; Venturini, Tr. 92-94, 851-52).

C. The Refiners

10. At the time of the 1991 rulemaking proceedings at issue in this case (which resulted in the Phase 2 regulations), there were 30 different refineries producing gasoline for sale and/or use in California. (CX 5 at 137).

1. The Auto/Oil Air Quality Improvement Research Program

11. Many of these refiners were members of the Auto/Oil Air Quality Improvement Research Program (“Auto/Oil,” “AQIRP,” or “the Program”) which was formed in 1989. (CX 4001). Auto/Oil was a cooperative, joint research program between three major domestic automobile manufacturers—General Motors, Ford, and Chrysler—and the fourteen largest petroleum companies in the United States, including Unocal. (CX 4001; Klein, Tr. 2537-38; Cunningham, Tr. 4133-34; CX 7076 (Youngblood, Dep. at 12-13)).

12. In accordance with the National Cooperative Research Act of 1984, the automakers and petroleum companies entered into an agreement, executed on October 16, 1989 (“Auto/Oil Agreement”), to coordinate research that would help develop a fuel composition that was both economical and low-emissions. (CX 4001 at 002, 026; CX 7041 (Alley, Dep. at 23)).

13. The objective of the Auto/Oil agreement was to plan and carry out “research and tests designed to measure and evaluate automobile emissions and the potential improvements in air quality achievable through use of reformulated gasolines.” (CX 4001 at 003). The data generated from this research and testing was to be provided to “state regulators in their efforts to reduce total emissions from motor vehicles.” (CX 4001 at 002).

2. The Western States Petroleum Association

14. The major California refiners were also members of the Western States Petroleum Association generally known as WSPA. (*See, e.g.*, Clossey, Tr. 5381-82; Segal, Tr. 5655 (ARCO participation in WSPA); Lieder, Tr. 4674-78 (Shell); Kulakowski, Tr. 4642 (Texaco); Eizember, Tr. 3216 (Exxon); Gyorfı, Tr. 5274-75 (Chevron)). Unocal also participated in WSPA as a member. (Jessup, Tr. 1477; Lamb, Tr. 1927-28; *see also* Kulakowksi, Tr. 4493).

15. WSPA is a trade organization representing oil producers as well as oil refiners and marketers in five western United States. (CX 7059 (Moyer, Dep. at 10)). Its primary mission is to represent the interests of the members “doing business in the Western states in political—or actually regulatory and advocacy affairs.” (CX 7070 (Wang, Dep. at 10-11); CX 7059 (Moyer, Dep. at 10-11)). WSPA provided a common forum for its members to advance common industry positions with CARB, the board itself, the executive and top management of the agency, as well as the staff. (CX 7059 (Moyer, Dep. at 11)).

D. A Description of the Witnesses

1. Witnesses Called Live at Trial

16. **Banducci, Ronald (Shell):** Ronald J. Banducci testified on November 18, 2004. (Banducci, Tr. 3417). Mr. Banducci is a retired employee from Shell Oil Company. (Banducci, Tr. 3418-19). During his career with Shell, Mr. Banducci held various positions, including Refinery Manager of Shell's Martinez California refinery, Vice President and General Manager of Manufacturing Oil, and President and CEO of the Shell Martinez Refining Company. (Banducci, Tr. 3419-23).

17. **Beach, Roger (Unocal):** Roger C. Beach testified on November 2, 2004. (Beach, Tr. 1649). Before retiring on January 1, 2001, Mr. Beach worked for Unocal for 40 years. (Beach, Tr. 1735). During that time, Mr. Beach held various positions, including President of Unocal's Refining and Marketing Division (also known as the 76 Products Division), Chief Operating Officer, Chief Executive Officer, and Chairman. (Beach, Tr. 1650-51, 1738). He created the Fuels Issues Team, to be headed by Dennis Lamb of Unocal, to address fuels-related environmental regulations. (Beach, Tr. 1748). Mr. Beach testified to Unocal's development of a predictive model and CARB's rulemaking process for reformulated gasoline.

18. **Boyd, James (CARB):** James Boyd testified on January 7, 2005. (Boyd, Tr. 6686). Mr. Boyd had several state appointments over the past 40 years. (Boyd, Tr. 6687). He is currently serving as a commissioner with the California Energy Commission. (Boyd, Tr. 6687). As the Executive Director of CARB, Mr. Boyd oversaw the development of Phase 2 reformulated gasoline. (Boyd, Tr. 6688). Between 1996 and the date of his trial testimony, Mr. Boyd met with Complaint Counsel for the Federal Trade Commission five to six times. (Boyd, Tr. 6891). He cooperated with the government in bringing this case against Unocal (Boyd, Tr. 6893-94), appeared and testified without a subpoena (Boyd, Tr. 6893), and understood that it would be bad for the government's case if CARB had no expectation that Unocal would bring a patent application to its attention during the Phase 2 RFG rulemaking proceedings. (Boyd, Tr. 6894-95). He testified to CARB's adoption of the reformulated gasoline standards at issue in this litigation. Mr. Boyd's bias was shown through impeachment with prior testimony that showed in 1996, he did not think that Unocal deceived CARB, misled CARB, or acted unfairly. (Boyd, Tr. 6824-30).

19. **Burns, Vaughn (DaimlerChrysler):** Vaughn R. Burns testified on November 9, 2004. (Burns, Tr. 2407). Mr. Burns is a senior manager of mobile emissions in the environmental regulatory department of DaimlerChrysler, formerly Chrysler. (Burns, Tr. 2407-08). He represented Chrysler in the Auto/Oil program. (Burns, Tr. 2409).

20. **Clossey, Timothy (ARCO):** Timothy John Clossey testified on December 10 and 13, 2004. (Clossey, Tr. 5324, 5539). Mr. Clossey worked for ARCO from 1980 to 2000 in various engineering and supervisory positions. (Clossey, Tr. 5325-26). During that time, he gained experience in the refining business, including blending gasoline, running and designing operating units, and the logistics of transporting fuel. (Clossey, Tr. 5341). During the development of the Phase 2 reformulated gasoline regulations, Mr. Clossey was manager of the Clean Fuels Task Force at ARCO's Engineering and Technology Center. (Clossey, Tr. 5328). The Clean Fuels Task Force was a handpicked group of scientists and engineers tasked with the mission of proving that ARCO's reformulated gasoline was fully competitive with M85 in regards to emissions and cost. (Clossey, Tr. 5332-33, 5338). As manager of the Clean Fuels Task Force, Mr. Clossey learned about the CARB rulemaking process. (Clossey, Tr. 5334). Mr. Clossey was ARCO/BP's corporate designee on subpoena topic 7 and also on topic 10 for the Phase 2 regulatory period:

7. Any decision you made with respect to whether or not you should attempt to avoid the numerical property limitations set forth in the claims of any of Unocal's gasoline patents, including without limitation the dates upon which such decisions were made, the basis for such decisions and any agreements relating to such decisions.
10. Your attempts to influence CARB's actions relating to reformulated gasoline, including without limitation the identity of each person or organization contacted by you as part of that effort.

(RX 451; Clossey, Tr. 5460-61, 5480-82). Mr. Clossey's bias and lack of credibility were demonstrated through his evasive testimony. (*See, e.g.*, Clossey, Tr. 5522-23 (regarding ARCO's efforts to have CARB adopt regulations essentially identical to EC-X), 5560 (regarding ARCO's lobbying efforts)).

21. **Courtis, John (CARB):** John Courtis testified on December 14, 2004. (Courtis, Tr. 5713). Mr. Courtis was the CARB staff air pollution specialist at the time of the Phase 2 rulemaking, promoted after the rulemaking to manager of the fuels section. (Courtis, Tr. 5716-17). He reported to Dean Simeroth who in turn reported to Peter Venturini. (Courtis, Tr. 5717). Mr. Courtis was coauthor of the Staff Report, CX 52, the Technical Support Document, CX 5, and the Final Statement of Reasons, CX 10. (Courtis, Tr. 5719-20). Mr. Courtis' bias and lack of credibility was shown through repeated impeachment on several key issues. His prior testimony shows that he never communicated to Unocal that he felt deceived. (Courtis, Tr. 5784-85). It also shows that by 1996, CARB had continued to analyze the cost of its Phase 2 regulations (Courtis, Tr. 5889-91), but did not evaluate the value of the Unocal patent. (Courtis, Tr. 5891). Mr. Courtis was also impeached when he claimed that he could say which of the factors including the Unocal data and Toyota data were most important in making the T50 recommendation. (Courtis, Tr. 5918-19). In fact, in prior testimony, Mr. Courtis said "I cannot say which one was most important." (Courtis, Tr. 5918-19). Mr. Courtis claimed to have analyzed the Unocal data and that he did so before November of 1991, but his prior testimony was that he did not personally analyze the data and would have to speculate as to whether it had been provided before November of 1991. (Courtis, Tr. 5940-43).

22. **Croudace, Michael (Unocal):** Michael Croudace testified on October 21, 2004. (Croudace, Tr. 420). Dr. Croudace was a scientist at Unocal and is a co-inventor, with Dr. Peter Jessup, of the inventions claimed in the Unocal patents at issue in this matter. (Croudace, Tr. 423, 429). Dr. Croudace was Unocal's representative at WSPA during the evaluation and research of potential regulations. (Croudace, Tr. 603-07). During his time at Unocal, his work also included lobbying CARB on behalf of the company. (Croudace, Tr. 608-12). He currently works for the Petroleum Analyzer Company selling and developing equipment for analyzing gasoline. (Croudace, Tr. 579-80).

23. **Cunningham, Robert (Turner Mason):** Robert E. Cunningham testified on November 29 and 30, 2004. (Cunningham, Tr. 4110, 4266). In the summer of 1995, Mr. Cunningham was retained by the Morgan & Finnegan law firm to work on the Unocal '393 and '126 patents on behalf of major oil refiners engaged in legal proceedings. (Cunningham, Tr. 4267-68). He also worked for the Akin Gump law firm in those legal proceedings. (Cunningham, Tr. 4267-68). Mr. Cunningham has previously said that the '393 patent and '126 patent are invalid. (Cunningham, Tr. 4269-70). He testified that he thought the Unocal inventors, in essence, stole the claims, primarily from CARB, but that Unocal also took its claims on RVP from Toyota, T90 from Auto/Oil, T10 and octane from ASTM, olefins from CARB, and some from his own work on behalf of Auto/Oil. (Cunningham, Tr. 4270-73). Mr. Cunningham is a senior vice president at Turner, Mason & Company. (Cunningham, Tr. 4112). He shares in Turner Mason profits and by August of 2003, Turner Mason had received about \$3½ million for its work with the Unocal patents. (Cunningham, Tr. 4268). He also charged for his time as a testifying witness at the FTC trial. (Cunningham, Tr. 4268). In preparation for his examination in the FTC matter, Mr. Cunningham met with complaint

counsel lawyers and Mr. Bart Verdirame, a partner at Morgan & Finnegan that has been working with him on the Unocal matters on refiners' behalf. (Cunningham, Tr. 4274). Mr. Cunningham's bias and lack of credibility were demonstrated by his attempt testify as a fact witness when refiners paid millions of dollars to his firm to represent them in the underlying patent litigation, that he receives a share of the firm profits, and that he was billing his time in the Federal Trade Commission case. (Cunningham, Tr. 4267-68). Mr. Cunningham was repeatedly impeached regarding numerous important matters. (E.g., Cunningham, Tr. 4269-74 (demonstrating that he held bias against the Unocal patents), 4294-95 (demonstrating that he combined Unocal's information with Chevron's during his cost study), 4304-05 (demonstrating that he never asked individual refiners for cost information), 4315-16 (demonstrating that he in fact knew ARCO licensed its MTBE process patents), 4358-59 (demonstrating that he in fact knew the preamble language of all five Unocal patents)).

24. **Derr, Kenneth (ChevronTexaco):** Kenneth T. Derr testified on December 8, 2004. (Derr, Tr. 5090). Prior to retiring, Mr. Derr was Chairman of the Board and Chief Executive Officer of Chevron Corporation, now ChevronTexaco, for 11 years. (Derr, Tr. 5092). He was involved in the formation of the Auto/Oil group. (Derr, Tr. 5125-26). Mr. Derr testified to his knowledge of the Unocal patents at issue in this litigation. Mr. Derr's bias and lack of credibility were demonstrated after a protracted attempt by Complaint Counsel to introduce an irrelevant personal opinion of Mr. Derr regarding the ethics of Unocal's conduct. (Derr, Tr. 5098-5112, 5514-15). Even though he eventually provided his personal opinion, Mr. Derr later admitted that people should be able to count on agreements such as the Auto/Oil agreement (Derr, Tr. 5138-39), and in giving his opinion, had absolutely no knowledge of any provisions contained in the Auto/Oil agreement. (Derr. 5140). Also

despite his personal opinion of Unocal's conduct, Mr. Derr did not recall if he knew when the Unocal inventors had done their study. (Derr, Tr. 5153-54). Through correspondence with Unocal, Mr. Derr was informed that the inventors' work was wholly independent, but Mr. Derr did not respond to tell Unocal that such a statement was wrong. (CX 374; Derr, Tr. 5167-68). Finally, during his testimony, Mr. Derr admitted that he would like Unocal to lose this case (Derr, Tr. 5137).

25. **Doherty, Helen (Sunoco):** Helen Doherty testified on November 15, 2004. (Doherty, Tr. 2791). Ms. Doherty is the Manager of Products and Environmental at Sunoco. (Doherty, Tr. 2792). She represented Sunoco on Auto/Oil's Research Program Committee and Speciation Committee. (Doherty, Tr. 2793). As a member of the Research Program Committee, Ms. Doherty attended Unocal's September 26, 1991 presentation to Auto/Oil. (Doherty, Tr. 2797). {
[REDACTED]
[REDACTED]}. (Doherty, Tr. 2916-17, *in camera*).

26. **Dowling, Barron (Tesoro):** Barron Dowling testified on November 22, 2004. (Dowling, Tr. 3672). Mr. Dowling is managing attorney for Tesoro Corporation, a petroleum refining and marketing company. (Dowling, Tr. 3673). As such, he is the primary legal representative for Tesoro's acquisitions and divestitures. (Dowling, Tr. 3673). Mr. Dowling also handles the legal affairs for Tesoro's supply and distribution group. (Dowling, Tr. 3673-74). Mr. Dowling testified to Tesoro's expansion into California and license agreement with Unocal regarding the reformulated gasoline patents.

27. **Eizember, Thomas (Exxon/ExxonMobil):** Thomas Richard Eizember testified on November 16-18, 2004. (Eizember, Tr. 3092). Mr. Eizember, an ExxonMobil employee for over

28 years, is currently Senior Business Planner. (Eizember, Tr. 3094-95). He followed the development of the CARB Phase 2 regulations on behalf of Exxon. (Eizember, Tr. 3098-99). Mr. Eizember was also associated with Exxon's CARB Phase 3 project. (Eizember, Tr. 3098-99). He was ExxonMobil's Rule 3.33 designee on several topics, including topics 4, 6, 7, 8 and 10-13:

4. Whether the gasoline refined, produced and/or sold by you falls within the numerical property ranges set forth in the claims of Unocal's gasoline patents.
6. Potential or actual changes to your refineries and/or their operations to make gasoline which complies with CARB regulations but which does not fall within the numerical property ranges set forth in the claims of Unocal's '393, '567, '866, '126 and '521 patents, including without limitation:
 - a. The cost of any changes or potential changes;
 - b. The operating methods which you utilized or would need to utilize in conjunction with any changes or potential changes;
 - c. The capital investment you made or would need to make in conjunction with any changes or potential changes;
 - d. The benefits of any such changes or potential changes;
 - e. Documents reflecting such changes or potential changes.
7. Any decision you made with respect whether or not you should attempt to avoid the numerical property limitations set forth in the claims of any of Unocal's gasoline patents, including without limitation the dates upon which such decisions were made, the basis for such decisions and any agreements relating to such decisions.
8. The date when you first learned of any patent or pending patent application relating to reformulated gasoline.
10. Your attempts to influence CARB's actions relating to reformulated gasoline, including without limitation the identity of each person or organization contacted by you as part of that effort.
11. Any proposals which were made to CARB, or which you considered making to CARB, to change CARB's reformulated gasolines regulations to make it easier for you to avoid the numerical property ranges set forth in the claims of Unocal's gasoline patents.

12. Any communications between you and CARB related to Unocal's gasoline patents.
13. Every disclosure you have ever made to CARB regarding a patent application owned or controlled by you.

(RX 142; Eizember, Tr. 3223, 3247-48, 3251-52, 3273, 3395-96, 3568).

28. **Engibous, William (ChevronTexaco):** William Russell Engibous testified on November 23, 2004. (Engibous, Tr. 3884). Mr. Engibous has been with Chevron for over 25 years and is currently Manager of the Supply Optimization Group for the United States West Coast. (Engibous, Tr. 3884-85). Pursuant to Rule 3.33(c), Mr. Engibous was Chevron's designee for topics 1 through 6 of the deposition notice:

1. Any changes you made in your refineries to meet the CARB specifications for T-50.
2. The alternative technologies that would enable you or others to refine, produce and supply CARB-compliant "summer-time" RFG for sale in California at comparable or lower cost, and comparable or higher effectiveness, without practicing Unocal's patented technology.
3. Whether the gasoline refined, produced and /or sold by you infringes any of Unocal's gasoline patents.
4. Whether the gasoline refined, produced and/or sold by you falls within the numerical property ranges set forth in the claims of Unocal's gasoline patents.
5. Potential or actual changes to your refineries and/or their operations to make gasoline which complies with CARB regulations but which does not infringe the claims of Unocal's '393, '567, '866, '126 and '521 patents, including without limitation:
 - a. The cost of any changes or potential changes;
 - b. The operating methods which you utilized or would need to utilize in conjunction with any changes or potential changes;
 - c. The capital investment you made or would need to make in conjunction with any changes or potential changes;
 - d. The benefits of any such changes or potential changes;

- e. Documents reflecting such changes or potential changes.
6. Potential or actual changes to your refineries and/or their operations to make gasoline which complies with CARB regulations but which does not fall within the numerical property ranges set forth in the claims of Unocal's '393, '567, '866, '126 and '521 patents, including without limitation:
 - a. The cost of any changes or potential changes;
 - b. The operating methods which you utilized or would need to utilize in conjunction with any changes or potential changes;
 - c. The capital investment you made or would need to make in conjunction with any changes or potential changes;
 - d. The benefits of any such changes or potential changes;
 - e. Documents reflecting such changes or potential changes.

(RX 105; Engibous, Tr. 3926-27). Mr. Engibous' bias and lack of credibility was shown through repeated impeachment, including among other things, that { [REDACTED]

[REDACTED] } (Engibous, Tr. 4042-43, 4068-69, *in camera*). He

was also impeached with prior testimony that showed that neither the El Segundo refinery nor the Richmond refinery made any changes solely to meet the T50 specification. (Engibous, Tr. 3929-33).

29. **Fletcher, Robert (CARB):** Robert D. Fletcher testified on December 21, 2004 and January 11, 2005. (Fletcher, Tr. 6437). Mr. Fletcher started at CARB in July 1975 and is currently Chief of the Planning and Technical Support Division. (Fletcher, Tr. 6438, 6440). During the Phase 2 rulemaking process, he was the Manager of the Fuels Section. (Fletcher, Tr. 6439-40). In that role, Mr. Fletcher did the technical analysis for the development of Phase 2 regulations, which meant that he reviewed the staff's work, took part in writing the Staff Report, and also wrote elements of the Technical Support Document. (Fletcher, Tr. 6442). He reported to Dean Simeroth during the process and acted as a conduit between his staff and CARB management (Dean Simeroth, Peter

Venturini, Jim Boyd, Mike Schieble, and Bill Sylte). (Fletcher, Tr. 6443-44). He had no involvement with Phase 1 or Phase 3. (Fletcher, Tr. 6440).

30. **Gyorfi, Lance (Chevron):** Lance Alfred Gyorfi testified on December 8, 2004. (Gyorfi, Tr. 5202). Prior to retiring in 2002, Mr. Gyorfi worked for Chevron for 32 years. (Gyorfi, Tr. 5202-03). Mr. Gyorfi testified as Chevron's corporate representative on several topics of the subpoena to Chevron U.S.A., including topics 7-9:

7. Any decision you made with respect whether or not you should attempt to avoid the numerical property limitations set forth in the claims of any of Unocal's gasoline patents, including without limitation the dates upon which such decisions were made, the basis for such decisions and any agreements relating to such decisions.
8. The date when you first learned of any patent or pending patent application relating to reformulated gasoline.
9. The changes you would have made in your capital investment and refinery reconfiguration decisions to avoid and/or minimize potential infringement of Unocal's patents, had you known of Unocal's pending patent rights before you actually learned of them.

(RX 294 at 003-004; Gyorfi, Tr. 5262, 5258, 5288). Mr. Gyorfi's bias was shown through repeated impeachment that showed Chevron took no action before late 1996 to avoid the numerical claims of the Unocal patents. (Gyorfi, Tr. 5263-64, 5282-83, 5294-95).

31. **Hepper, Jeffrey (Vitol):** Jeffrey K. Hepper testified on November 23, 2004. (Hepper, Tr. 3939). Mr. Hepper is Vice President of Vitol S.A., Inc. and a director of the Vitol group of companies. (Hepper, Tr. 3939-40). Vitol, primarily an oil trading company, sells gasoline in most of the major markets in the world. (Hepper, Tr. 3939-41). Mr. Hepper's primary responsibilities include overseeing the refining business and oil trading in the Americas. (Hepper, Tr. 3940). [REDACTED]

[REDACTED] (Hepper, Tr. 4071-78, *in camera*).

32. **Hoffman, Michael (ARCO/BP):** Michael P. Hoffman testified on December 7, 2004. (Hoffman, Tr. 4866). Mr. Hoffman is the group vice president of BP's refining system. (Hoffman, Tr. 4867). Prior to BP's acquisition of ARCO in 2000, he was employed by ARCO. (Hoffman, Tr. 4867). Mr. Hoffman was refinery manager of ARCO's Carson, California refinery from January 1998 to January 2002. (Hoffman, Tr. 4869). [REDACTED] [REDACTED] (Hoffman, Tr. 5070-71, *in camera*).

33. **Ingham, Michael (Chevron):** Michael C. Ingham testified on November 10, 2004. (Ingham, Tr. 2590). Mr. Ingham is the Manager of State Fuels Regulations for the ChevronTexaco Products Company. (Ingham, Tr. 2591). He holds a bachelor's, a master's and a Ph.D. in Chemical engineering, and first began working at Chevron in 1981. (Ingham, Tr. 2592). As Manager of the Transportation Fuels Performance Unit at Chevron Research and Technology Company from 1990-96, Mr. Ingham managed two research teams at Chevron. (Ingham, Tr. 2593-94). One team provided research to the Chevron USA product engineering department, and the other undertook vehicle emissions test programs to support the Chevron USA strategic planning and business evaluation group. (Ingham, Tr. 2593). This role also required Mr. Ingham to assume Chevron's responsibilities with the Auto/Oil group. (Ingham, Tr. 2594). He began attending Auto/Oil Research Program Committee meetings in 1990, and in the third quarter of that year became Chevron's representative to the committee. (Ingham, Tr. 2594). Mr. Ingham testified as Chevron's corporate

representative on a number of subjects under the subpoena to Chevron U.S.A., including the following:

12. Any communications between you and CARB related to Unocal's gasoline patents.

(Ingham, Tr. 2727-29; RX 105).

34. **Jessup, Peter (Unocal):** Peter Jessup testified on October 28-29 and November 1, 2004. (Jessup, Tr. 1151, 1280, 1467). Dr. Jessup holds a Ph.D. in organic chemistry and works as a scientist at Unocal. (Jessup Tr., 1154). His responsibilities have included the development and implementation of models for use in blending various gasolines—i.e., racing and motor gasolines—as well as lab work involving both hands-on gasoline blending and analytical work, for example with statistical methods in data work. (Jessup, Tr. 1154, 1468-69). He is familiar with Unocal's motor gasoline blending capabilities from the late 1980s to 1997, and also of the blending capabilities of other refiners outside of Unocal. (Jessup, Tr. 1470-72). Dr. Jessup is a named inventor on 35 to 40 patents, and he was the co-inventor, with Dr. Michael Croudace, of the inventions claimed by the Unocal patents at issue in this matter. (Jessup, Tr. 1472; RX 793). He is bound by a Patent and Secrecy Agreement that bars him from disclosing patent applications and other Unocal secrets except under certain specified circumstances. (Jessup, Tr. 1473-74; CX 450). During the time of the Phase 2 rulemaking, Dr. Jessup presented the results of Unocal's independent research into cleaner-burning automotive gasolines to CARB, Auto/Oil, the EPA, and WSPA. (Jessup, Tr. 1480-81). Dr. Jessup also created and provided to CARB and WSPA the diskettes containing some of the raw data from Unocal emissions tests. (Jessup, Tr. 1537-40, 1558-59; CX 1246, 1247).

35. **Kenny, Michael (CARB):** Michael P. Kenny testified on January 6, 2005. (Kenny, Tr. 6495). Mr. Kenny was General Counsel of CARB from January 1990 to August 1996, and Executive Director from August 1996 to January 2003. (Kenny, Tr. 6496). As CARB's General Counsel, Mr. Kenny's day-to-day duties required that he advise and counsel the CARB Board regarding air quality issues. (Kenny, Tr. 6496). He was also obligated to ensure that the CARB Board complied with all federal and state legal obligations. (Kenny, Tr. 6496-97). It was his further obligation to supervise the staff that existed in the General Counsel's office. (Kenny, Tr. 6497). As General Counsel, Mr. Kenny was familiar with the Phase 2 reformulated gasoline rulemaking. (Kenny, Tr. 6497). Mr. Kenny was involved in the rulemaking proceedings as the General Counsel: He reviewed the documents and the proposals that were put forth; and was involved in the board meeting at which the Board approved the Phase 2 regulations. (Kenny, Tr. 6497). Mr. Kenny also reviewed the documents after the board meeting and also prior to their actual adoption by the executive officer. (Kenny, Tr. 6497). As the Executive Officer, Mr. Kenny was the lead staff person, having been appointed by the board to supervise the staff and also to make regulatory proposals to the board. (Kenny, Tr. 6497-98). In that capacity, he was also responsible for management of the staff and budget. (Kenny, Tr. 6498). Mr. Kenny had these duties at the time of the Phase 3 rulemaking. (Kenny, Tr. 6497-98). Mr. Kenny's testimony reflected bias and lack of credibility through evasiveness. (Kenny, Tr. 6643-45 (regarding CARB's rulemaking record)). After asserting deliberative process privilege, but being ordered to answer, Mr. Kenny then asserted an inability to recall the substance of the conversation over which he asserted privilege. (Kenny, Tr. 6679-70).

36. **Kiskis, Ronald (Chevron):** Dr. Ronald C. Kiskis testified on November 23, 2004. (Kiskis, Tr. 2462). Dr. Kiskis currently works for ChevronTexaco as the president of Chevron Oronite Company, a wholly-owned, specialty chemical subsidiary. (Kiskis, Tr. 3815-16). He was Chevron's representative and a co-chair to the Auto/Oil group's Research Program Committee from late July 1989 through mid-1990. (Kiskis, Tr. 3818-19).

37. **Klein, Harvey (Shell):** Dr. Harvey Klein testified on November 9, 2004. (Klein, Tr. 2462). Prior to retiring in 1992, Dr. Klein worked for Shell Development Company for 20 years. (Klein, Tr. 2463). He held numerous positions at Shell, including director of refining and marketing research and development. (Klein, Tr. 2464). As director of refining and marketing, Dr. Klein's duties required that he oversee research and development for oil processes and oil products, including gasoline. (Klein, Tr. 2464). Dr. Klein participated in the Auto/Oil group on behalf of Shell, and was Shell's representative on the Auto/Oil Research Program Committee for approximately 2 years. (Klein, Tr. 2465, 2469). He was present at the September 1991 Auto/Oil meeting at which Unocal made a presentation regarding its reformulated gasoline research. (Klein, Tr. 2476). Dr. Klein testified to his work with the Auto/Oil group and the relationship between the Auto/Oil group and Unocal's reformulated gasoline patents.

38. **Kulakowski, J. Michael (Unocal/Texaco/Shell):** James Michael ("Mike") Kulakowski testified on November 30 and December 1, 2004. (Kulakowski, Tr. 4389, 4465). Mr. Kulakowski has worked for Shell Oil Company since 2000 and was so employed at the time he testified in this FTC proceeding. (Kulakowski, Tr. 4390, 4407, 4566-67). He was an employee of Unocal from 1982 to 1993, an employee of Texaco from 1993 to 1998, and an employee of Equiva (a now-defunct joint venture between Texaco and Shell) from 1998 to 2000. (Kulakowski, Tr. 4390-

91, 4407). From 1991 to 1993, Mr. Kulakowski was in a regulatory group at Unocal in which his duties consisted of influencing gasoline and diesel regulations as they applied to air quality. (Kulakowski, Tr. 4393). His supervisor was Dennis Lamb. (Kulakowski, Tr. 4393). Mr. Kulakowski's work with Mr. Lamb indicated that Mr. Lamb is a very honest and truthful person. (Kulakowski, Tr. 4566). Mr. Kulakowski's responsibilities included representing Unocal's interests before the California Air Resources Board with regard to the Phase 2 regulations and rulemaking. (Kulakowski, Tr. 4394-95). Mr. Kulakowski was impeached on several key points during his testimony. For example, Complaint Counsel completed Mr. Kulakowski's direct examination by eliciting testimony that he thought Mr. Lamb could be "sneaky," but in his prior testimony, Mr. Kulakowski said of Mr. Lamb that "he's a very honest and truthful person." (Kulakowski, Tr. 4563, 4565-66). Another example is that Mr. Kulakowski testified he did not know of Dr. Jessup's efforts to obtain a patent until the latter half of 1991. (Kulakowski, Tr. 4507-08). He was impeached with investigational hearing testimony that he in fact knew of the patent application in late 1990 or early 1991. (Kulakowski, Tr. 4572-73). He was also impeached with prior testimony that demonstrated it was not a Unocal priority to show CARB the importance of T50 at the June 20, 1991 meeting. (Kulakowski, Tr. 4599-4600). Moreover, he was impeached with prior testimony that shows he did not recall providing any royalty information to Turner Mason for its cost study, and prior testimony showing that Texaco did not invest huge sums of money to meet the CARB regulations. (Kulakowski, Tr. 4624-25, 4653-54).

39. **Lamb, Dennis (Unocal):** Dennis W. Lamb testified on November 2-4 and 8-9, 2004. (Lamb, Tr. 1794, 2202). Prior to retiring in 2001, Mr. Lamb worked for Unocal for nearly 35 years. (Lamb, Tr. 2158). Mr. Lamb did not have a technical background, but rather has an educational

background in business administration and political science. (Lamb, Tr. 2161). He spent the first 25 years of his career with Unocal in the marketing department. (Lamb, Tr. 2158). From mid-1989 until mid-1997, Mr. Lamb served as Unocal's primary contact with CARB. (Lamb, Tr. 2164). As Unocal's primary contact with CARB during this time period, Mr. Lamb viewed his role as one of advocating Unocal's interests with CARB. (Lamb, Tr. 2164). Over the years he engaged in a wide variety of formal and informal communications with CARB staff and board members. (Lamb, Tr. 2164-65). In addition to written letters, these communications included oral comments at hearings, participation in public workshops, and one-on-one private consultations with Board members and private communications with CARB staff. (Lamb, Tr. 2164-65).

40. **Lane, Barry (Unocal):** William Barry Lane testified on November 16, 2004. (Lane, Tr. 3021). Mr. Lane has been the Manager of Public Relations at Unocal for the past 24 years. (Lane, Tr. 3022). Since 1995, he has had the responsibility for corporate communications to the public regarding Unocal's reformulated gasoline patents. (Lane, Tr. 3022).

41. **Lieder, Charles (Shell/Equilon):** Charles Lieder testified on December 2, 2004. (Lieder, Tr. 4670). Dr. Lieder holds a bachelor's degree and a Ph.D. in chemistry. (Lieder, Tr. 4670). He joined Shell in 1974 and currently advises and teaches at Shell's refineries in America as a Fuels Blending Technical Adviser for Shell Oil United States. (Lieder, Tr. 4671-72). Dr. Lieder testified as the corporate representative on topic numbers 10-12 and 18 of the subpoena to Shell:

10. Your attempts to influence CARB's actions relating to reformulated gasoline, including without limitation the identity of each person or organization contacted by you as part of that effort.
11. Any proposals which were made to CARB, or which you considered making to CARB, to change CARB's reformulated gasolines regulations to make it

easier for you to avoid the numerical property ranges set forth in the claims of Unocal's gasoline patents.

12. Any communications between you and CARB related to Unocal's gasoline patents.
18. Any agreement, understanding, or rule pursuant to which any data or information presented to WSPA ceased to be owned by its owner upon presentation to WSPA.

(RX 351; Lieder, Tr. 4807-08, *in camera*).

42. **Miller, John Wayne (Unocal):** John Wayne Miller testified on October 29, 2004. (Miller, Tr. 1345). Dr. Miller worked for Unocal from the mid-1970s to 1995, for Sunoco from 1995 to 2000, and then for the University of California at Riverside from 2000 to the present. (Miller, Tr. 1345-46, 3349). Drs. Jessup and Croudace reported to Dr. William Mallett, who in turn reported to Dr. Miller. (Miller, Tr. 1348-49). Dr. Miller supervised Drs. Jessup and Croudace in a personnel sense, but they determined their own technical work and undertook that work. (Miller, Tr. 1351). In June of 2002, Dr. Miller had a number of contracts with the California Air Resource Board, including 3 grants initiated in the stationary source division and grants in CARB's research division and mobile source operating division. (Miller, Tr. 1430-31). Dr. Miller has also contracted with Dean Simeroth and Steve Brisby of CARB. (Miller, Tr. 1431-32). Dr. Miller also received more than \$1 million in grants and contracts from Chevron. (Miller, Tr. 1432).

43. **Pahl, Robert (Phillips/ConocoPhillips):** Robert Harold Pahl testified on November 10, 2004. (Pahl, Tr. 2762). Dr. Pahl is a former employee of both ConocoPhillips and Phillips Petroleum Company. (Pahl, Tr. 2763). He was the Phillips Petroleum representative to Auto/Oil's Research Program Committee, and was chairman of the fuels blending subcommittee. (Pahl, Tr. 2764-65). Dr. Pahl participated in all of the fuels blending subcommittee meetings and almost all

of the Research Program Committee meetings, including one in which Unocal presented its emissions research on September 26, 1991. (Pahl, Tr. 2766, 2768).

44. **Segal, Jack (ARCO/Amoco/BP):** Jack S. Segal testified on December 13, 2004. (Segal, Tr. 5590). Mr. Segal was employed by ARCO (and its predecessor companies) from 1967 until his retirement in 2000. (Segal, Tr. 5591-92). He became an employee of BP when ARCO was merged into BP in April of 2000. (Segal, Tr. 5592). During the adoption of the Phase 2 RFG regulations, Mr. Segal worked in ARCO's fuels department as Director of Industry Liaison (Segal, Tr. 5593), which required that he interface with CARB and other regulatory agencies. (Segal, Tr. 5681-5682). Mr. Segal was ARCO's representative to Auto/Oil on the Research Program Committee. (Segal, Tr. 5596). He reported to Timothy Clossey throughout 1991 and 1992. (Segal, Tr. 5594). Mr. Segal was designated to testify on behalf of BP West Coast Products and its former companies, including AMOCO and ARCO on topic number 8 listed on RX 410. (Segal, Tr. 5661-5664). Topic number 8 specifically includes the date when BP West Coast Products and its predecessor companies first learned of any patent or pending patent application relating to reformulated gasoline. (RX 410 at 004).

45. **Simeroth, Dean (CARB):** Dean Simeroth testified on January 18, 2005. (Simeroth, Tr. 7460). Mr. Simeroth is and has been the Chief of the Criteria Pollutants Branch in the Stationary Source Division of CARB since October of 1987, reporting directly to Peter Venturini. (Simeroth, Tr. 7460-61).

46. **Simonson, Robert (Exxon/Valero):** Robert Simonson testified on December 15, 2004. (Simonson, Tr. 5967). Mr. Simonson is Senior Manager of Products Optimization for the Valero refinery in Benicia, California. (Simonson, Tr. 5967-68). Mr. Simonson was previously

employed by Exxon Corporation and ExxonMobil at the Benicia refinery. (Simonson, Tr. 5969). He remained in Benicia when Exxon sold the refinery to Valero in mid-May of 2000. (Simonson, Tr. 5968-69). Mr. Simonson was also involved in the CARB regulatory processes on Exxon's behalf. (Simonson, Tr. 5989-90). He testified as Valero's corporate representative on topics 1-7 and 9-12 of the subpoena to Valero Energy Corporation:

1. Any changes you made in your refineries to meet the CARB specifications for T-50.
2. The alternative technologies that would enable you or others to refine, produce and supply CARB-compliant "summer-time" RFG for sale in California at comparable or lower cost, and comparable or higher effectiveness, without practicing Unocal's patented technology.
3. Whether the gasoline refined, produced and/or sold by you infringes any of Unocal's gasoline patents.
4. Whether the gasoline refiner, produced and/or sold by you falls within the numerical property ranges set forth in the claims of Unocal's gasoline patents.
5. Potential or actual changes to your refineries and/or their operations to make gasoline which complies with CARB regulations but which does not infringe the claims of Unocal's '393, '567, '866, '126 and '521 patents, including without limitation:
 - a. The cost of any changes or potential changes;
 - b. The operating methods which you utilized or would need to utilize in conjunction with any changes or potential changes;
 - c. The capital investment you made or would need to make in conjunction with any changes or potential changes;
 - d. The benefits of any such changes or potential changes;
 - e. Documents reflecting such changes or potential changes.
6. Potential or actual changes to your refineries and/or their operations to make gasoline which complies with CARB regulations but which does not fall within the numerical property ranges set forth in the claims of Unocal's '393, '567, '866, '126 and '521 patents, including without limitation:
 - a. The cost of any changes or potential changes;

- b. The operating methods which you utilized or would need to utilize in conjunction with any changes or potential changes;
 - c. The capital investment you made or would need to make in conjunction with any changes or potential changes;
 - d. The benefits of any such changes or potential changes;
 - e. Documents reflecting such changes or potential changes.
7. Any decision you made with respect [sic, to] whether or not you should attempt to avoid the numerical property limitations set forth in the claims of any of Unocal's gasoline patents, including without limitation the dates upon which such decisions were made, the basis for such decisions and any agreements relating to such decisions.
9. The changes you would have made in your capital investment and refinery reconfiguration decisions to avoid and/or minimize potential infringement of Unocal's patents, had you known of Unocal's pending patent rights before you actually learned of them.
10. Your attempts to influence CARB's actions relating to reformulated gasoline, including without limitation the identity of each person or organization contacted by you as part of that effort.
11. Any proposals which were made to CARB, or which you considered making to CARB, to change CARB's reformulated gasolines regulations to make it easier for you to avoid the numerical property ranges set forth in the claims of Unocal's gasoline patents.
12. Any communications between you and CARB related to Unocal's gasoline patents.

(RX 275; *see also* Simonson, Tr. 6071-72, *in camera*). Mr. Simonson was impeached with his prior testimony that shows { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]}. (Simonson, Tr. 6056-57, 6060-62, *in camera*).

47. **Strathman, Charles (Unocal):** Charles Strathman testified on November 22, 2004.

(Strathman, Tr. 3602). Prior to retiring, Mr. Strathman spent 24 years with Unocal, eventually rising

to the position of Chief Legal Officer. (Strathman, Tr. 3602-03). Starting in 1995, as Deputy General Counsel, Mr. Strathman worked on Unocal's RFG patent litigation. (Strathman, Tr. 3606-08). He is currently on contract with Unocal primarily to supervise this FTC litigation. (Strathman, Tr. 3602).

48. **Venturini, Peter (CARB):** Peter Venturini testified on October 19, 20 and 26, 2004. (Venturini, Tr. 80, 224, 681). Mr. Venturini was the Stationary Source Division Chief for CARB in 1991, and holds that position to this day. (Venturini, Tr. 81, 84). In that position, he is in charge of developing regulations to reduce the air pollution problem in California. (Venturini, Tr. 83-84). In his position, he was responsible for reviewing and approving the Phase 2 Staff Report (Venturini, Tr. 86-87); the Phase 2 Technical Support document (Venturini, Tr. 90); the Staff Report for amending the Phase 2 regulations to include a predictive model (Venturini, Tr. 94-95); the Phase 3 proposed regulations (Venturini, Tr. 92); and other rulemaking documents. (Venturini, Tr. 93-96). CARB previously designated Mr. Venturini to testify about all facts and documents that evidence or reflect that Unocal committed fraud upon the California Air Resources Board and/or the California Air Resources Board staff before, during or after the adoption of CARB's Phase 2 rulemaking on reformulated gasoline in 1991. (Venturini, Tr. 784-86). Mr. Venturini also testified about the actions that CARB staff and/or CARB would or would not have taken in 1991, 1992, 1993, and 1994 if the acts identified had not occurred. (Venturini, Tr. 785-86). At times during his cross-examination at the FTC hearing, Mr. Venturini was evasive. (Venturini, Tr. 803-05). Mr. Venturini's bias and lack of credibility was shown through repeated impeachment. (*E.g.*, Venturini, Tr. 3332-33, 717-18, 816-18).

49. **Wirzbicki, Gregory (Unocal):** Gregory Francis Wirzbicki testified on October 27 and 28, 2004. (Wirzbicki, Tr. 870, 1075). Mr. Wirzbicki began working at Unocal in 1974, and has served as Unocal's Chief Patent Counsel since 1989. (Wirzbicki, Tr. 871-72). He participated in the prosecution of hundreds of patent applications, and he personally prosecuted the applications for the Unocal patents at issue in this hearing. (Wirzbicki, Tr. 872-73).

2. Witnesses Called by Designated Deposition

50. **Aguila, Jim (CARB):** Jim Aguila's July 24, 2003 deposition designations are at CX 7040. Mr. Aguila is employed at CARB as the manager of the Substance Evaluation Section. (CX 7040 (Aguila, Dep. at 5)). He has a Bachelor of Science in Mechanical Engineering but no special training in accounting. (CX 7040 (Aguila, Dep. at 7-8)). As an Associate Air Resources Engineer in Stationary Source Division during the Phase 2 Regulations, Mr. Aguila's primary goal was to deal with cost. (CX 7040 (Aguila, Dep. at 12-13, 16)).

51. **Alley, Starling Kessler (Unocal):** Starling Kessler Alley's June 24, 2003 deposition designations are at CX 7041. Dr. Alley is a former Unocal employee who held various research and development positions, including Vice President of Petroleum Product and Processes. (CX 7041 (Alley, Dep. at 7-9)). He represented Unocal in the Auto/Oil program. (CX 7041 (Alley, Dep. at 10-11)).

52. **Bea, Don (Chevron):** Donald Bea's September 3, 2003 deposition designations are at CX 7042. Mr. Bea is now retired. (CX 7042 (Bea, Dep. at 10)). Throughout the 1990's, he was a senior staff engineer with Chevron U.S.A.'s Strategic Planning & Business Evaluation Group. (CX 7042 (Bea, Dep. at 16-17)). Mr. Bea was also on the WSPA fuels subcommittee. (CX 7042 (Bea, Dep. at 17)). He was involved with CARB's Phase 2 rulemaking process, and unofficially

himself dubbed “gasoline issues manager.” (CX 7042 (Bea, Dep. at 17-18)). Mr. Bea testified as Chevron’s corporate representative on topic numbers 10 and 18 of the subpoena to Chevron U.S.A. (CX 7042 (Bea, Dep. at 6)):

10. Your attempts to influence CARB’s actions relating to reformulated gasoline, including without limitation the identity of each person or organization contacted by you as part of that effort.
.....
18. Any agreement, understanding, or rule pursuant to to [*sic*] which any data or information presented to WSPA ceased to be owned upon presentation to WSPA.

(RX 105 at 004).

53. **Boone, Mark (Texaco):** Mark Boone’s June 24, 2003 deposition designations are at CX 7043. From 1985-2000, Mr. Boone served as an operations planner at Shell’s Bakersfield refinery, which involved calculating optimal performance. (CX 7043 (Boone, Dep. at 9, 14-15)). In 2000, he became the manager at Shell’s Bakersfield refinery and was the manager at the time that he signed the declaration. (CX 7043 (Boone, Dep. at 9, 18)). These duties included leading a short-term planning group for the Bakersfield and Martinez refineries. (CX 7043 (Boone, Dep. at 18)).

54. **Chan, Nelson (CARB):** Nelson Chan’s August 29, 2003 deposition designations are at CX 7044. Mr. Chan works for the California Air Resource Board as an Air Resources Engineer in the Enforcement Division. (CX 7044 (Chan, Dep. at 4)). Mr. Chan was involved in the development of the proposed Phase 2 regulations with the specific task of determining emission reductions and benefits that would result from the proposed regulations. (CX 7044 (Chan, Dep. at 42)).

55. **Cleary, Kevin (CARB):** Kevin Cleary's August 7, 2003 deposition designations are at CX 7045. Mr. Cleary is an Air Resources Engineer having worked for CARB since June of 1980 with the exception of the year 1991 when he worked for the State Energy Commission. (CX 7045 (Cleary, Dep. at 4-6)). Mr. Cleary has basically done technical work needed to support regulations and suggested control measures. (CX 7045 (Cleary, Dep. at 6)). Mr. Cleary worked at CARB on the development of the predictive model. (CX 7045 (Cleary, Dep. at 97)). Although he was employed at CARB at one time prior to the development of the predictive model, Mr. Cleary had left CARB by the time of the Phase 2 rulemaking, and did not return until late 1991, and was not involved in the development of the original Phase 2 regulations. (CX 7045 (Cleary, Dep. at 95)).

56. **Grey, Gina (formerly Gina Nelhams) (WSPA):** Gina Grey's August 29, 2003 deposition designations are at CX 7046. Ms. Grey works for the Western States Petroleum Association, known as WSPA. (CX 7046 (Grey, Dep. at 5)). She joined WSPA in January 1989. (CX 7046 (Grey, Dep. at 6)). At the time of her deposition, her title was Manager of Fuels in the Southwest Region. (CX 7046 (Grey, Dep. at 5)). She did a lot of work in particular with the Downstream Committee, which supervised and received input from lower-level committees like the Gasoline Issues Group. (CX 7046 (Grey, Dep. at 5-7)). During the time period relevant to this matter, her name was Gina Nelhams. (CX 7046 (Grey, Dep. at 19)). Ms. Grey testified as WSPA's corporate representative on topic number 6 of the subpoena to WSPA, which called for testimony on "Any proposals which were made to CARB, or which you considered making to CARB, to change CARB's reformulated gasoline regulations to make it easier for your members to avoid the numerical property ranges set forth in the claims of Unocal's gasoline patents." (CX 7046 (Grey, Dep. at 55-56); RX 669).

57. **Hancock, Robert (“Steve”) (Shell/Texaco):** Robert Hancock’s June 27, 2003 deposition designations are at CX 7047 and his September 5, 2003 deposition designations are at CX 7048. Mr. Hancock retired from an Equilon joint venture in 2001 as the Manager of Refinery Products Issues (CX 7047 (Hancock, Dep. at 5)). Mr. Hancock worked as an engineer for Texaco/Equilon from 1967 until he retired in 2001. (CX 7047 (Hancock, Dep. at 5-10)). In 1978, he took his first supervisory position as chief process engineer at the Texaco Los Angeles refinery (CX 7047 (Hancock, Dep. at 8)), and from March 1967 until May 1998, Mr Hancock was employed by Texaco as refinery engineer, refinery technical manager, and fuel quality/regulatory compliance manager (RX 200A at 002). In June 1998, Mr. Hancock became the Manager Refinery Products Issues, and his duties included fuel quality, regulatory compliance issues and intellectual property. (CX 7047 (Hancock, Dep. at 22); RX 200A at 002). In this capacity, Mr. Hancock would review blend data from Equilon, Motiva, Texaco, and Shell refineries to determine blend qualities that may or may not have matched the numerical claims of the ’393 patent. (CX 7047 (Hancock, Dep. at 23)). Mr. Hancock was designated to testify as to the Bakersfield and Wilmington/Los Angeles refineries on behalf of Texaco, Shell Oil Product US and Equilon on topic numbers 1 through 9 and 13 through 16 of the subpoenas sent to refiners ChevronTexaco and Shell. (CX 7048 (Hancock, Dep. at 141-146)). These topics relate to refinery reconfigurations, the Unocal patents and policies and practices regarding patent applications. (RX 105).

58. **Hochhauser, Albert (Exxon/ExxonMobil):** Albert M. Hochhauser’s August 28, 2003 deposition designations are at CX 7049. Mr. Hochhauser is a Senior Engineering Advisor for ExxonMobil Research and Engineering Company. (CX 7049 (Hochhauser, Dep. at 5-6)). His primary responsibility throughout most of his career with Exxon and ExxonMobil has been to

conduct research in the area of fuels. (CX 7049 (Hochhauser, Dep. at 6)). Dr. Hochhauser represented Exxon at the Auto/Oil group and participated in Auto/Oil's research. (CX 7049 (Hochhauser, Dep. at 9-10)). He was also a member of the predictive model working group and ExxonMobil's representative to the Cleaner Burning Gasoline ("CBG") Task Force of WSPA. (CX 7049 (Hochhauser, Dep. at 41, 45)). Dr. Hochhauser testified personally and also as the corporate representative for ExxonMobil on the topic number 18 of the subpoena to ExxonMobil, which called for testimony on "Any agreement, understanding or . . . rule pursuant to which any data or information presented to WSPA ceased to be owned by its owner upon presentation to WSPA." (CX 7049 (Hochhauser, Dep. at 54-55)).

59. **Ibergs, Victor (Ultramar/Valero):** Victor Ibergs' August 18, 2003 deposition designations are at CX 7050. Mr. Ibergs is currently Valero's planning manager at its Wilmington, California refinery. (CX 7050 (Ibergs, Dep. at 7)). Before that, he was in project engineering and process control. (CX 7050 (Ibergs, Dep. at 9)). Mr. Ibergs is familiar with the changes that Ultramar and Valero implemented at the Wilmington refinery in order to produce fuels that complied with CARB's Phase 2 and Phase 3 regulations (*see generally* CX 7050 (Ibergs, Dep.)), as well as to avoid the numerical property ranges of the Unocal patent. (*See generally* CX 7050 (Ibergs, Dep.)). He was designated to testify for Valero on topic numbers 1 through 7 and 9 of the subpoena to Valero Energy Corporation:

1. Any changes you made in your refineries to meet the CARB specifications for T-50.
2. The alternative technologies that would enable you or others to refine, produce and supply CARB-compliant "summer-time" RFG for sale in California at comparable or lower cost, and comparable or higher effectiveness, without practicing Unocal's patented technology.

3. Whether the gasoline refined, produced and/or sold by you infringes any of Unocal's gasoline patents.
4. Whether the gasoline refiner, produced and/or sold by you falls within the numerical property ranges set forth in the claims of Unocal's gasoline patents.
5. Potential or actual changes to your refineries and/or their operations to make gasoline which complies with CARB regulations but which does not infringe the claims of Unocal's '393, '567, '866, '126 and '521 patents, including without limitation:
 - a. The cost of any changes or potential changes;
 - b. The operating methods which you utilized or would need to utilize in conjunction with any changes or potential changes;
 - c. The capital investment you made or would need to make in conjunction with any changes or potential changes;
 - d. The benefits of any such changes or potential changes;
 - e. Documents reflecting such changes or potential changes.
6. Potential or actual changes to your refineries and/or their operations to make gasoline which complies with CARB regulations but which does not fall within the numerical property ranges set forth in the claims of Unocal's '393, '567, '866, '126 and '521 patents, including without limitation:
 - a. The cost of any changes or potential changes;
 - b. The operating methods which you utilized or would need to utilize in conjunction with any changes or potential changes;
 - c. The capital investment you made or would need to make in conjunction with any changes or potential changes;
 - d. The benefits of any such changes or potential changes;
 - e. Documents reflecting such changes or potential changes.
7. Any decision you made with respect [sic, to] whether or not you should attempt to avoid the numerical property limitations set forth in the claims of any of Unocal's gasoline patents, including without limitation the dates upon which such decisions were made, the basis for such decisions and any agreements relating to such decisions.

9. The changes you would have made in your capital investment and refinery reconfiguration decisions to avoid and/or minimize potential infringement of Unocal's patents, had you known of Unocal's pending patent rights before you actually learned of them.

(RX 275; CX 7050 (Ibergs, Dep. at 5)).

60. **Irion, Bruce (Shell/Equilon):** Bruce Irion's July 8, 2003 deposition designations are at CX 7051. From 1994 to 2000, Mr. Irion was responsible for ensuring that Shell's—for a period, Equilon's—Martinez refinery would be compliant with CARB and EPA reformulated specifications. (CX 7051 (Irion, Dep. at 5, 10)). He is familiar with the '393 patent specifications (CX 7051 (Irion, Dep. at 19-20); RX 215 at 002), and has personal knowledge of the gasoline production operations at the Martinez refinery (CX 7051 (Irion, Dep. at 17-18)). Mr. Irion is currently a Manager at Shell. (CX 7051 (Irion, Dep. at 5-6)).

61. **Jacober, Dave (Shell/Equilon):** David Jacober's August 20, 2003 deposition designations are at CX 7052. Mr. Jacober is employed by Shell Oil Company as Vice President of Business Management for Shell's Deer Park refinery. (CX 7052 (Jacober, Dep. at 7, 13)). He was designated to testify on behalf of Shell Oil Company and Shell Oil Products US under a subpoena to Shell Oil Company in this action. (CX 7052 (Jacober, Dep. at 6-8)). Mr. Jacober was designated to testify on topic numbers 7, 8 and 13-16, which are: Any decision made by Shell to avoid Unocal's patents; When Shell first learned of Unocal's patent(s); Any disclosures by Shell to CARB regarding any patent application owned or controlled by Shell; Shell's company policies and procedures regarding disclosure of patent applications; Shell's company policies and procedures regarding investigation of the existence of patents; and Shell's consideration of the licensing and enforcement

of patents relating to the production of gasoline for sale in California. (RX 423 at 004; CX 7052 (Jacobson, Dep. at 6-8)).

62. **Lipman, Stephen (Unocal):** Stephen Lipman's June 20, 2003 deposition designations are at CX 7053. In 1992, Mr. Lipman was President of the Science and Technology Division at Unocal. (CX 7053 (Lipman, Dep. at 4)). Mr. Lipman's testimony related to procedures and policies within the Science and Technology Division and Unocal's RFG patents. (*See generally* CX 7053 (Lipman, Dep.)).

63. **Mahdavi, Reza (CARB):** Reza Mahdavi's July 25, 2003 deposition designations are at CX 7054. Dr. Mahdavi works for the California Air Resource Board as a Senior Economist, having joined them in June of 1988. (CX 7054 (Mahdavi, Dep. at 4-5)). Dr. Mahdavi has a Ph.D. in economics and an MBA. (CX 7054 (Mahdavi, Dep. at 5)). Dr. Mahdavi is a resource for those at CARB who need economics help. (CX 7054 (Mahdavi, Dep. at 6)).

64. **Mallett, William (Unocal):** William R. Mallett's June 17, 2003 deposition designations are at CX 7055. Mr. Mallett was a staff consultant at Unocal responsible for fuels from 1990 to 1992. (CX 7055 (Mallett, Dep. at 10-11)). As a staff consultant, Mr. Mallett attended Auto/Oil meetings on behalf of Unocal. (CX 7055 (Mallett, Dep. at 12)). Before he was a staff consultant he worked as a supervisor, and in this role he directly supervised Drs. Jessup and Croudace until 1990. (CX 7055 (Mallett, Dep. at 11)). He retired from Unocal in September 1992, after 26 years with the company. (CX 7055 (Mallett, Dep. at 8-11)).

65. **Martinez, Charles (Exxon/ExxonMobil):** Charles H. Martinez's August 26, 2003 deposition designations are at CX 7056. Mr. Martinez has worked for ExxonMobil for over 25

years. (CX 7056 (Martinez, Dep. at 10)). Mr. Martinez testified as ExxonMobil's designee for topics 14-16 of the deposition notice:

14. Any company policies or procedures you have with respect to the disclosure to your patent applications, including without limitation policies relating to the disclosure of patent applications to research organizations, trade associations, and standard-setting bodies.
15. Any policy or procedures you have with respect to the investigation of the existence of patents.
16. Your consideration of the licensing and enforcement of any patents you have received or have applied for from 1988 to the present relating in any way to the production or potential production of gasoline for sale in California, and any communications with third parties relating to such patents or patent applications.

(RX 511 at 004; CX 7056 (Martinez, Dep. at 8-9)).

66. **McHugh, Gavin (Texaco):** Gavin K. McHugh's June 26, 2003 deposition designations are at CX 7057. Mr. McHugh owns McHugh & Associates, a government affairs consulting firm. (CX 7057 (McHugh, Dep. at 8)). As a registered lobbyist, Mr. McHugh advocated on behalf of Unocal and Shell's interests before the California legislature and regulatory agencies. (CX 7057 (McHugh, Dep. at 8, 10)). He was employed by Texaco from 1991 to 1997 as the Senior Coordinator for Public and Government Affairs. (CX 7057 (McHugh, Dep. at 11)). Mr. McHugh testified to Texaco's efforts to lobby CARB during the Phase 2 RFG rulemaking. (*See generally* CX 7057 (McHugh, Dep.)).

67. **Millar, Robert (Texaco/Equilon/Shell):** Robert F. Millar's June 24, 2003 deposition designations are at CX 7058. Mr. Millar worked at a former Texaco refinery that Shell now owns after a short-lived joint venture. (CX 7058 (Millar, Dep. at 5)). Mr. Millar is the Business Manager at Shell's Los Angeles refinery. (CX 7058 (Millar, Dep. at 5)). At times, the refinery has

been owned by Texaco and known as the Wilmington refinery. (CX 7058 (Millar, Dep. at 15)). Mr. Millar is familiar with the Los Angeles/Wilmington Refinery's ability to blend around the '393 patent. (CX 7058 (Millar, Dep. at 15)).

68. **Moyer, Neal (Texaco):** Neil Moyer's August 22, 2003 deposition designations are at CX 7059 and CX 7060. Mr. Moyer is currently employed by Shell Oil Products U.S. and is contracted to Deer Park Refining Limited Partnership Refinery. (CX 7059 (Moyer, Dep. at 5-6)). He was employed by CARB from 1973 to 1979. (CX 7059 (Moyer, Dep. at 7)). From 1989 to 1999, Mr. Moyer was employed by Texaco in various positions and started at Deer Park as a Texaco employee. (CX 7059 (Moyer, Dep. at 6-7)). He participated in the CARB Phase 2 RFG rulemaking on behalf of Texaco and represented Texaco on a number of WSPA committees. (CX 7059 (Moyer, Dep. at 8-9)). Mr. Moyer was Texaco's designee for Topics 10-12 of the Rule 3.33 subpoena:

10. Your attempts to influence CARB's actions relating to reformulated gasoline, including without limitation the identity of each person or organization contacted by you as part of that effort.
11. Any proposals which were made to CARB, or which you considered making to CARB, to change CARB's reformulated gasolines regulations to make it easier for you to avoid the numerical property ranges set forth in the claims of Unocal's gasoline patents.
12. Any communications between you and CARB related to Unocal's gasoline patents.

(RX 105 at 004; CX 7059 (Moyer, Dep. at 13)).

69. **Riley, Kenneth (ARCO/BP):** Kenneth G. Riley's August 7, 2003 deposition designations are at CX 7061. Prior to retiring, Mr. Riley was ARCO's Vice President of Business Development. (CX 7061 (Riley, Dep. at 4, 6)). He was previously designated to testify on topic number 9 of the subpoena to BP West Coast products:

9. The changes you would have made in your capital investment and refinery reconfiguration decisions to avoid and/or minimize potential infringement of Unocal's patents, had you known of Unocal's pending patent rights before you actually learned of them.

(RX 451 at 004).

70. **Schmale, Neal (Unocal):** Neal E. Schmale's June 27, 2003 deposition designations are at CX 7062. Mr. Schmale currently works for Sempra Energy. (CX 7062 (Schmale, Dep. at 5)). He worked for Unocal until 1997. (CX 7062 (Schmale, Dep. at 5)). Mr. Schmale testified to his recollection of the development and licensing of Unocal's RFG patents.

71. **Sharpless, Jananne (CARB):** Jananne Sharpless's August 6, 2003 deposition designations are at CX 7063. Ms. Sharpless was the Chairwoman of the California Air Resource Board from 1985 through November 1993, and now works as a consultant in the air quality and energy field. (CX 7063 (Sharpless, Dep. at 34, 37)). Ms. Sharpless began work at the California Energy Commission before CARB adopted the predictive model in June of 1994. (CX 7063 (Sharpless, Dep. at 37)). Ms. Sharpless was at the California Energy Commission from January 1994 to April 1999. (CX 7063 (Sharpless, Dep. at 37-39)). Ms. Sharpless now sits on the Board of Advisors for the Institute of Transportation Studies at UC Davis. (CX 7063 (Sharpless, Dep. at 43-44)). On June 20, 1996, Ms. Sharpless gave a deposition regarding the Unocal patent. (CX 7063 (Sharpless, Dep. at 30)). Before her testimony for the FTC trial, she reviewed her prior deposition in the presence of FTC lawyers, who talked with her about questions and answers from that deposition. (CX 7063 (Sharpless, Dep. at 23-24)).

72. **Sinclair, Diane (Ultramar/Valero):** Diane Sinclair's August 19, 2003 deposition designations are at CX 7064. Ms. Sinclair is an attorney with Valero Energy Corporation. (CX 7064

(Sinclair, Dep. at 5-6)). Her title is Environmental Health and Safety counsel for West Coast properties. (CX 7064 (Sinclair, Dep. at 5-6)). Ms. Sinclair was designated to testify for Valero and its predecessor companies (Ultramar and Diamond Shamrock) regarding the companies' policies for disclosing patent applications (CX 7064 (Sinclair, Dep. at 42)), and also regarding (2) any agreement, understanding, or rule pursuant to which any data or information presented to WSPA ceased to be owned by its owner upon presentation to WSPA. (CX 7064 (Sinclair, Dep. at 58)).

73. **Stegemeier, Richard (Unocal):** Richard Stegemeier's June 5, 2003 deposition designations are at CX 7065. Mr. Stegemeier started at Unocal in 1951, and rose to serve as Chairman of the Board and CEO, and in this capacity also headed up the Executive Committee. (CX 7065 (Stegemeier, Dep. at 5)). Before that, he was the head of the Science and Technology Division. (CX 7065 (Stegemeier, Dep. at 6)). Later, in 1994, he became a non-employee Chairman of the Board. (CX 7065 (Stegemeier, Dep. at 5-6)). He also has 7 patents in his name related to methods for oil recovery. (CX 7065 (Stegemeier, Dep. at 7-8)).

74. **Thacher, Michael (Unocal):** Michael W. Thacher's June 10, 2003 deposition designations are at CX 7066. As of the deposition, Mr. Thacher was General Manager of Public Relations and Communications at Unocal. (CX 7066 (Thacher, Dep. at 5)). Barry Lane reported to Mr. Thacher. (CX 7066 (Thacher, Dep. at 6)). Mr. Thacher testified to communications and licensing issues related to Unocal's RFG patents. (*E.g.*, CX 7066 (Thacher, Dep. at 14, 64-65, 69-71)).

75. **Toman, Jeff (ChevronTexaco):** Jeffrey J. Toman's August 21, 2003 deposition designations are at CX 7067. Mr. Toman is employed by ChevronTexaco as the intellectual property manager for the combined Chevron/Oronite Company, ChevronTexaco Global Lubricants/Global

Technology partnership. (CX 7067 (Toman, Dep. at 4)). He was previously designated by Chevron to testify on the company's behalf on topic numbers 14 and 15 of the subpoena to Chevron U.S.A. (CX 7067 (Toman, Dep. at 33)). Those topics relate to (1) policies and practices regarding the disclosure of patents and patent applications; and (2) policies and practices regarding the investigation of patent information. (RX 294; CX 7067 (Toman, Dep. at 7)). In his first job with Oronite, Mr. Toman had responsibility for keeping abreast of the prior art in the area of formulating fuel additives for sale into gasoline and diesel fuels. (CX 7067 (Toman, Dep. at 8)). In a later position, he had responsibility for making sure that competitor patent issues arising within Oronite were addressed. (CX 7067 (Toman, Dep. at 8)). Currently, Mr. Toman administers a patent-administration process which includes obtaining and monitoring ChevronTexaco's patent applications and managing the risk due to third-party patents. (CX 7067 (Toman, Dep. at 15-16)).

76. **Uihlein, Jim (BP/ARCO):** James P. Uihlein's August 27, 2003 deposition designations are at CX 7068 and CX 7069. Mr. Uihlein is Senior Principal Engineer for BP, formerly with ARCO. (CX 7068 (Uihlein, Dep. at 4, 6, 9)). Mr. Uihlein served as BP's representative to WSPA in the early 1990's and also worked with WSPA's Cleaner Burning Gasoline ("CBG") Task Force in the late 1990's. (CX 7068 (Uihlein, Dep. at 7-8, 15)). He was previously designated to testify on behalf of BP and its predecessor ARCO on topic number 10 of the subpoena to BP West Coast Products Company, which relates to BP's and ARCO's attempts to influence CARB's actions relating to reformulated gasoline. (CX 7068 (Uihlein, Dep. at 12-13); RX 410). His testimony as corporate designee was limited to the period after the enactment of the CARB Phase 2 Predictive Model in 1994. (CX 7068 (Uihlein, Dep. at 12-13)).

77. **Wang, Michael (WSPA):** Michael D. Wang's August 28, 2003 deposition designations are at CX 7070. At the time of his deposition, Mr. Wang was manager of the South Coast Region for WSPA, which includes South California and the L.A. Basin. (CX 7070 (Wang, Dep. at 5)). He began working at WSPA in 1987. (CX 7070 (Wang, Dep. at 5)). In 1990 he became responsible for upstream, downstream, and environmental issues, which is both oil and gas, refining and environmental issues. (CX 7070 (Wang, Dep. at 5-6)). He became manager of operations and environmental issues in 1994. (CX 7070 (Wang, Dep. at 6)). Mr. Wang testified by way of deposition as a WSPA Rule 3.33 witness on topics 1 through 5 and 7 of the subpoena to WSPA:

1. Any requests from WSPA to Unocal or anyone else for information regarding royalty rates for inclusion in any study or any analysis relating to reformulated gasoline.
2. Any communications between Unocal and WSPA or WSPA members relating in any way to royalty rates, license fees and/or patents.
3. Any communications between Unocal and WSPA relating in any way to proposed or actual costs involved in the manufacture of reformulated gasoline.
4. Any fiduciary relationship owed by Unocal or any other WSPA member to WSPA or WSPA members.
5. Any procedures and processes of WSPA which were violated by Unocal.
-
7. Any communications from WSPA to its members relating to any antitrust guidelines, policies and/or concerns regarding communications among competitors.

(CX 7070 (Wang, Dep. at 11-12; RX 669).

78. **Welstand, Joseph ("Steve") (Chevron):** Joseph Stephen Welstand's July 17, 2003 deposition designations are at CX 7071. At the time of the deposition and since 1996, Mr. Welstand

was a consulting engineer with Chevron U.S.A., focusing on motor fuels and automotive technology. (CX 7071 (Welstand, Dep. at 5)). From 1974 to 1996, he worked in the Chevron Research and Technology Company. (CX 7071 (Welstand, Dep. at 5-6)). Mr. Welstand testified generally on gasoline properties and patent and invention procedures within the Chevron Research and Technology Company. (E.g., CX 7071 (Welstand, Dep. at 62-63, 66-70, 73-75)).

79. **Williamson, Charles Ross:** Charles Ross Williamson's June 3, 2003 deposition designations are at CX 7072. At the time of the deposition, Mr. Williamson was the Chairman and CEO of Unocal. (CX 7072 (Williamson, Dep. at 5)). From approximately 1990 to September 1992, Mr. Williamson was a Vice President stationed in Thailand. (CX 7072 (Williamson, Dep. at 6)). Mr. Williamson was not involved in or knowledgeable about the development of Unocal's RFG patents, WSPA, Auto/Oil or CARB's RFG rulemaking. (CX 7071 (Williamson, Dep. at 8-9, 59)).

80. **Wise, John (Mobil):** John J. Wise's August 29, 2003 deposition designations are at CX 7073. Mr. Wise was employed by Mobil Oil Company for 44 years. (CX 7073 (Wise, Dep. at 4)). At the time he retired from the company in March of 1997, he was the Vice President of Research. (CX 7073 (Wise, Dep. at 4-5, 7)). In the course of his duties as Vice President of Research, Mr. Wise was involved in the Auto/Oil research program as a member and co-chair of the Research Planning Task Force. (CX 7073 (Wise, Dep. at 8, 10-11)). Mr. Wise was designated to testify on the topic number 17 of the subpoena to ExxonMobil, which called for testimony on "Any agreement, understanding or rule pursuant to which any data or information presented to Auto/Oil became the 'work of the program' (as that term is used in the Auto/Oil agreement) or otherwise ceased to be owned by its owner upon presentation to Auto/Oil." (CX 7073 (Wise, Dep. at 12-13); RX 142).

81. **Witherspoon, Catherine (CARB):** Catherine Witherspoon's August 8, 2003 deposition designations are at CX 7074. Ms. Witherspoon is an Executive Officer at CARB. (CX 7074 (Witherspoon, Dep. at 4)). Ms. Witherspoon testified to the role of cost-effectiveness in CARB's Phase 2 RFG rulemaking. (CX 7074 (Witherspoon, Dep. at 11-14)).

82. **Wood, John (ARCO/BP):** John L. Wood's August 27, 2003 deposition designations are at CX 7075. Mr. Wood is a Senior Attorney for BP America. (CX 7075 (Wood, Dep. at 4, 8)). Mr. Wood was previously designated to testify on behalf of BP West Products Company and its predecessor companies Amoco and ARCO regarding topics 13 through 16 of the subpoena to BP. (CX 7075 (Wood, Dep. at 8)). Those topics relate to: Any disclosures by BP to CARB of pending patent applications; Company policies and procedures regarding disclosure of patent applications; Any policies and procedures for investigation of the existence of patents; and Consideration of licensing and enforcement of patents. (RX 410 at 004).

83. **Youngblood, Douglas (Texaco):** Douglas Youngblood's August 13, 2003 deposition designations are at CX 7076. Mr. Youngblood is a former Texaco employee, having held several positions with Texaco Refining and Marketing from 1989 through 1996. (CX 7076 (Youngblood, Dep. at 6-7)). Mr. Youngblood was Director of Refining in Houston from 1989 through 1990. (CX 7076 (Youngblood, Dep. at 7)). He was Director of Environment, Health and Safety in Houston from 1990 through early 1993. (CX 7076 (Youngblood, Dep. at 7)). From 1993 until his retirement, Mr. Youngblood was General Manager of Environment, Health and Safety in Los Angeles. (CX 7076 (Youngblood, Dep. at 7)). Mr. Youngblood represented Texaco to the Auto/Oil group and co-chaired the Auto/Oil economics committee. (CX 7076 (Youngblood, Dep.

at 11-12, 16)). As co-chairman of the economics committee, Mr. Youngblood interfaced with the Research Program Committee. (CX 7076 (Youngblood, Dep. at 11-12, 16)).

84. **Youngman, Gary (ARCO/BP):** Gary Youngman's June 25, 2003 deposition designations are at CX 7077 and his August 7, 2003 deposition designations are at CX 7078. Mr. Youngman is Lead Engineer at BP's—formerly ARCO's—Carson refinery, which is also known as the Los Angeles refinery. (CX 7077 (Youngman, Dep. at 8-9)). He is familiar with the Carson refinery's operations (CX 7077 (Youngman, Dep. at 18-19); RX 92 at 002), and the claims of the '393 patent (CX 7077 (Youngman, Dep. at 20-24); RX 92 at 002). Mr. Youngman was designated by BP West Coast Products company to testify on behalf of both BP and ARCO on topics 1 through 6 of the subpoena to BP:

1. Any changes you made in your refineries to meet the CARB specifications for T-50.
2. The alternative technologies that would enable you or others to refine, produce and supply CARB-compliant "summer-time" RFG for sale in California at comparable or lower cost, and comparable or higher effectiveness, without practicing Unocal's patented technology.
3. Whether the gasoline refined, produced and/or sold by you infringes any of Unocal's gasoline patents.
4. Whether the gasoline refined, produced and/or sold by you falls within the numerical property ranges set forth in the claims of Unocal's gasoline patents.
5. Potential or actual changes to your refineries and/or their operations to make gasoline which complies with CARB regulations but which does not infringe the claims of Unocal's '393, '567, '866, '126 and '521 patents, including without limitations:
 - a. The cost of any changes or potential changes;
 - b. The operating methods which you utilized or would need to utilize in conjunction with any changes or potential changes;

- c. The capital investment you made or would need to make in conjunction with any changes or potential changes;
 - d. The benefits of any such changes or potential changes;
 - e. Documents reflecting such changes or potential changes.
6. Potential or actual changes to your refineries and/or their operations to make gasoline which complies with CARB regulations but which does not fall within the numerical property ranges set forth in the claims of Unocal's '393, '567, '866, '126 and '521 patents, including without limitation:
- a. The cost of any changes or potential changes;
 - b. The operating methods which you utilized or would need to utilize in conjunction with any changes or potential changes;
 - c. The capital investment you made or would need to make in conjunction with any changes or potential changes;
 - d. The benefits of any such changes or potential changes;
 - e. Documents reflecting such changes or potential changes.

(RX 451; CX 7078 (Youngman, Dep. at 6)).

85. **Zimmerman, Edwin (Auto/Oil):** Edwin Zimmerman's August 13, 2003 deposition designations are at CX 7079. Mr. Edwin Zimmerman is an attorney at Covington & Burling who served as outside antitrust counsel to the "oil side" of the collaborative research effort known as Auto/Oil. (CX 7079 (Zimmerman, Dep. at 5-6)). He was involved in the organization and functioning of Auto/Oil, and specifically helped draft the Auto/Oil agreement, monitored certain committee meetings, and gave general advice. (CX 7079 (Zimmerman, Dep. at 6, 8-9)).

3. Expert Witnesses

a. Expert Witnesses Called by Complaint Counsel

86. **Eskew, Blake (Expert):** Blake Thomas Eskew testified on December 15-16, 2004. (Eskew, Tr. 2807). Mr. Eskew is a chemical engineer. (Eskew, Tr. 2807). He holds a Bachelors of Science in Chemical Engineering from the University of Texas and a Masters in Business Administration from Columbia University. (Eskew, Tr. 2807). Mr. Eskew began working at

Conoco, Inc. in 1982 on capital project analysis, general industry analysis, economic forecasting, budgeting, planning, gas liquids trading and distribution, and even operated a gas plant. (Eskew, Tr. 2808-09). Mr. Eskew then went to work for Purvin & Gertz, a petroleum energy consulting company in Houston, Texas. (Eskew, Tr. 2809). Mr. Eskew testified on behalf of Complaint Counsel as an expert in refining economics and operations. (Eskew, Tr. 2815).

87. **Sarna, Michael (Expert):** Michael Edward Sarna testified on December 20 and 21, 2004. (Sarna, Tr. 6085, 6320). Mr. Sarna has been employed for 14 years by Purvin & Gertz, an engineering consulting firm specializing in oil refining, marketing of petroleum products, and, to a lesser extent, petrochemicals and power generation. (Sarna, Tr. 6092-93). Prior to Purvin & Gertz, Mr. Sarna worked for UOP, a research and development firm specializing in the processing of crude oil into refining products and the production of petrochemicals, for 14 years. (Sarna, Tr. 6093). Mr. Sarna holds a bachelor of science degree in chemical engineering from Michigan Technological University and completed a process engineering course given by UOP. (Sarna, Tr. 6093-94). Complaint Counsel offered Mr. Sarna as an expert in refinery design, construction and operations. (Sarna, Tr. 6125).

88. **Shapiro, Carl (Expert):** Dr. Carl Shapiro testified on January 12 and 13, 2005. (Shapiro, Tr. 7035). Dr. Shapiro is an economist who holds a bachelor's degree in economics and mathematics, a master's degree in mathematics, and a Ph.D. in economics. (Shapiro, Tr. 7036). Dr. Shapiro is currently a professor of business and economics at the University of California at Berkeley. (Shapiro, Tr. 7037). He is also a senior consultant with the Charles River Associates consulting firm. (Shapiro, Tr. 7038). Dr. Shapiro also served as the Deputy Assistant Attorney General for Antitrust in the Department of Justice's Antitrust Division. (Shapiro, Tr. 7038-39). Dr.

Shapiro testified for Complaint Counsel as an expert in economics as it relates to antitrust, innovation and competitive strategy. (Shapiro, Tr. 7040).

b. Expert Witnesses Called by Unocal

89. **Griffin, James M., LECG, LLC (Expert):** Dr. James Griffin testified on January 27 and 28, 2004. (Griffin, Tr. 8322). Dr. Griffin specializes in energy economics, industrial organization as it relates to antitrust and regulatory issues, and the use of econometrics and linear programming modeling. (Griffin, Tr. 8324). Dr. Griffin currently teaches economics and public policy at Texas A&M University. (Griffin, Tr. 8322-23). He is also a director with LECG, a consulting group that provides litigation expertise in economics. (Griffin, Tr. 8329). Dr. Griffin has consulted for Unocal, ExxonMobil, Shell, Chevron and BP/ARCO. (Griffin, Tr. 8329). He holds an undergraduate degree in economics from Southern Methodist University and a Ph.D. from the University of Pennsylvania. (Griffin, Tr. 8324). Dr. Griffin worked for Mobil, Sun Oil Company and Exxon prior to entering academia in 1972. (Griffin, Tr. 8325-26). He held positions at the University of Houston and University of Pennsylvania before starting at Texas A&M University in 1983. (Griffin, Tr. 8326). Dr. Griffin has taught courses in econometrics, microeconomic theory, industrial organization, energy policy, energy modeling, and regulation and antitrust. (Griffin, Tr. 8326). He has authored six books and dozens of articles and edited three additional volumes on various aspects of energy. (Griffin, Tr. 8326-27). Dr. Griffin's work has appeared in leading journals in the energy field, including the Energy Journal and Resources and Energy, as well as general economics journals such as the American Economic Review and the Journal of Political Economy. (Griffin, Tr. 8328). He wrote the leading textbook in the field of energy economics, and has published on topics such as capacity measurement in petroleum refining, measuring energy

consumption in OECD countries, energy input-output modeling, the effect of severance taxes, global warming, electricity deregulation, and monopolization and collusive behavior. (Griffin, Tr. 8327, 8330). Dr. Griffin's work has been cited roughly a thousand times. (Griffin, Tr. 8328). In his capacity as a consultant, Dr. Griffin used his expertise in antitrust policy issues on a variety of antitrust cases. (Griffin, Tr. 8329-30). Dr. Griffin testified in this case as an expert in energy economic, and the use of econometric and linear programming techniques, industrial organizations, and, within that field, regulation and antitrust. (Griffin, Tr. 8331).

90. **Linck, Nancy J. (Expert):** Nancy Linck, Ph.D. testified on January 19, 2005. (Linck, Tr. 7736). Dr. Linck is currently Senior Vice President, Intellectual Property and Regulatory Affairs and Chief Compliance Counsel for Guilford Pharmaceuticals in Baltimore, Maryland. (Linck, Tr. 7736). Dr. Linck is a patent attorney with more than 20 years of patent prosecution and litigation background. (Linck, Tr. 7737-78). She served as the Solicitor for the United States Patent and Trademark Office in Washington, D.C. from August 1994 through October 1998. (Linck, Tr. 7738; RX 1163 at 002). In that position, Dr. Linck was general counsel for the Commissioner of Patents and Trademarks and responsible for litigating suits brought against the government involving patent, trademark, administrative and related issues. (Linck, Tr. 7744-45). She is a member of several patent-related organizations. (Linck, Tr. 7749-50). She testified in this case as an expert on patent prosecution and good patent practices for businesses. (Linck, Tr. 7752-53).

91. **Pedersen, William F. (Expert):** William Francis Pedersen testified on January 25 and 26, 2005. (Pedersen, Tr. 7977). Mr. Pedersen, an attorney for over 30 years, specializes in environmental law, focusing primarily on the Clean Air Act. (Pedersen, Tr. 7978-79). He is a graduate of Harvard College and Harvard Law School. (Pedersen, Tr. 7978). From approximately

1972 to 1985, Mr. Pedersen worked at the Environmental Protection Agency, devoting about half of that time exclusively to the Clean Air Act. (Pedersen, Tr. 7981-82). He was the EPA Associate General Counsel for Air, the government's chief Clean Air Act lawyer, from 1982 to 1985. (Pedersen, Tr. 7982). In that role, Mr. Pedersen worked with the EPA regional office that had an oversight role of California's auto emissions standard. (Pedersen, Tr. 7985). He also gained expertise in the EPA's administration of the Clean Air Act and the Act's impact on states. (Pedersen, Tr. 7986). After leaving the EPA, a significant portion of Mr. Pedersen's private law practice was devoted to the Clean Air Act. (Pedersen, Tr. 7987-88). Congress adopted legislative changes to the Clean Air Act proposed by Mr. Pedersen in the following law review articles: *Formal Records and Informal Rulemaking*, published in the Yale Law Journal in 1985, and *Why the Clean Air Act Works Badly*, published in the University of Pennsylvania Law Review in 1981. (Pedersen, Tr. 7989). Mr. Pedersen's publications have been cited over a hundred times in scholarly literature and approximately 25 times by federal courts in published decisions. (Pedersen, Tr. 7990). Mr. Pedersen testified as an expert on the forces that bear on agencies required to implement the Clean Air Act and how those forces impact decision making. (Pedersen, Tr. 7990).

92. **Stellman, Richard (Expert):** Richard Stellman testified on January 25, 2005. (Stellman, Tr. 7892). Mr. Stellman completed a bachelor's degree in chemical engineering from Penn State University in 1963. (Stellman, Tr. 7893). He then worked for Shell Oil Company in various positions for the next 14 years. (Stellman, Tr. 7894-97). During that time, Mr. Stellman gained experience in refinery process operations and refinery unit expansion. (Stellman, Tr. 7897-98). He was then recruited by Commonwealth Oil Refining Company ("CORCO") to resolve problems plaguing their refinery operations. (Stellman, Tr. 7899). At CORCO, Mr. Stellman honed

his expertise in refinery operations. (Stellman, Tr. 7899). His time at CORCO was also noteworthy for the use of the linear programming model for developing an operating plan for the refinery. (Stellman, Tr. 7899-900). Following CORCO, Mr. Stellman worked for an Australian oil trading company before starting his own oil trading company. (Stellman, Tr. 7900). In 1988, Mr. Stellman joined Pace Consultants, an economic and technical consulting company, as an independent contractor. (Stellman, Tr. 7901). While at Pace, Mr. Stellman consulted for nearly all the major refiners and worked with California's predictive model. (Stellman, Tr. 7901). He served as president of Pace from 1989 until his retirement in 2000. (Stellman, Tr. 7901). He currently consults for refiners and chemical companies. (Stellman, Tr. 7902). Mr. Stellman testified as an expert in refinery operations, process design of refineries, and unit expansion. (Stellman, Tr. 7902).

93. **Teece, David, LECG, LLC (Expert):** David John Teece testified on January 18 and 19, 2005. (Teece, Tr. 7496). Dr. Teece, a professor at the University of California at Berkeley, holds a Ph.D. in economics from the University of Pennsylvania. (Teece, Tr. 7496, 7498). He has been awarded 3 honorary doctorates and prizes for his academic work. (Teece, Tr. 7500). While Dr. Teece specializes in industrial organization, he has taught classes in innovation, technology transfer, licensing and antitrust, and studied a number of industries, including the petroleum industry. (Teece, Tr. 7499). He has published an estimated 150 articles and more than one dozen books on topics such as innovation, public policy and corporate strategy. (Teece, Tr. 7500). Of particular relevance to this litigation, he has published articles in the area of switching costs. (Teece, Tr. 7501). Dr. Teece is currently a consultant for and chairman of LECG, a consulting firm specializing in various fields, including economics. (Teece, Tr. 7503). He has published books on the petroleum industry and consulted for Exxon, Shell, ARCO and Unocal. (Teece, Tr. 7504). Dr. Teece testified as an expert

in the areas of the economics of innovation, industrial organizations, antitrust economics, economics of the petroleum industry, and standard-setting organization economics. (Teece, Tr. 7505).

II. THE AIR POLLUTION PROBLEM IN CALIFORNIA IN THE LATE 1980S

94. By the early 1990s, California had developed an air pollution problem. (CX 52 at 018; Venturini, Tr. 83-84). Los Angeles had the worst air quality in the nation, exceeding air quality standards on two out of every three days. (CX 7063 (Sharpless, Dep. at 76-77)). The nation's most severe ozone problem was in California, which accounted for seventy-five percent of the nation's ozone exposure. (RX 337 at 005). Peak ozone levels measured up to three times the Federal standards and the state's ozone standard was exceeded more than half of the time in 1989. (RX 337 at 005).

95. Motor gasoline, when burned in an automobile engine, produces three pollutants in the tailpipe exhaust: nitrogen oxides (NO_x), carbon monoxide (CO), and hydrocarbons (HC). (See RX 793 at 014). Vehicle emissions were a major source of California's air pollution. (CX 7063 (Sharpless, Dep. at 52)).

96. Due to the severe nature of the air pollution problem, CARB was very interested in pursuing the possibility of switching California to a methanol-based transportation fuel. (Beach, Tr. 1744). M85, a methanol fuel, was considered as an alternative to and replacement for conventional motor gasoline. (Boyd, Tr. 6694, 6700). The California Energy Commission was a strong proponent of M85. (Boyd, Tr. 6698).

97. California Assembly Bill 234, or AB 234, directed the Governor to establish the Advisory Board on Air Quality and Fuels, an advisory panel, which was created to assess methanol and other fuel alternatives. (CX 1021 at 008-009; Venturini, Tr. 196-97; CX 7063 (Sharpless Dep.

at 70-71); Beach, Tr. 1744; Boyd, Tr. 6695). The panel convened to hold panels and workshops and produce a report relating to the proper role of alternative fuels. (Venturini, Tr. 196-97).

98. The AB 234 panel was composed of representatives from the automotive, heavy-duty engine, petroleum, and methanol industries and/or associations; state agencies; non-attainment districts; the business community; and the public-at-large. (Beach, Tr. 1744; CX 1021 at 006). The representatives included Mr. Roger Beach of Unocal and Ms. Jananne Sharpless, the then-Secretary of Environmental Affairs and Chairperson of CARB. (CX 1021 at 003; Boyd, Tr. 6696-98). Mr. James Boyd of CARB served as an alternate to Ms. Sharpless and attended all the meetings. (CX 1021 at 003-004; Boyd, Tr. 6693-94).

99. The AB 234 Advisory Board published its findings on October 2, 1989. (CX 1021 at 001). The Board had six primary findings related to the promise of alternative fuels, especially as related to vehicles powered by methanol, compressed natural gas, propane, ethanol and electricity. (CX 1021 at 019). Among these, the Board found that reformulated gasolines “might be able to qualify as cleaner fuels, but research is only beginning and success is uncertain.” (CX 1021 at 019). The conclusions of the panel reaffirmed that methanol was to be seriously considered as a viable alternative fuel. (Boyd, Tr. 6700-01).

100. Some members of AB 234 expressed concerns about methanol. (Boyd, Tr. 6694-95). Switching to methanol posed several serious problems, including, *inter alia*, distribution and toxicity. (Beach, Tr. 1744-45).

101. The panel also found, however, that “[r]eformulated gasolines might also be able to contribute to improved air quality.” (CX 1021 at 012). Prior to the interest in alternative fuels, the prevailing thought was that reformulating gasoline to remove toxic compounds was not feasible,

primarily due to cost considerations. (Boyd, Tr. 6701-03). This view was debunked during the AB 234 study. (Boyd, Tr. 6701-02). George Babikian, a witness from ARCO, addressed the AB 234 panel and indicated that reformulating gasoline was feasible and could yield gasoline that burned as cleanly as alcohol fuels. (Boyd, Tr. 6702-03). This was one of the “high watermarks of the air quality business.” (Boyd, Tr. 6702).

102. As a result of the AB 234 study panel, which concluded that methanol was a viable alternative fuel, oil companies had an incentive to establish that gasoline could be reformulated to reduce emissions. (Boyd, Tr. 6700-03; Beach, Tr. 1745 (stating that after AB 234, CARB was looking for was a reduction in exhaust emissions by changing the formulation of blended gasoline)).

III. UNOCAL’S RESEARCH AND INVENTION

A. Unocal Scientists Feared that the Auto/Oil Program and Competitors’ Efforts Would Lead to Unfavorable Regulations that Disadvantaged Unocal

103. Dr. Jessup, a Unocal scientist, knew in 1989 that CARB was considering regulating gasoline. (Jessup, Tr. 1195). Indeed, he believed regulation was inevitable, and he thus proposed that Unocal invest in a test program to investigate effects of gasoline composition on emissions. (Jessup, Tr. 1195).

104. On May 24, 1989, Dr. Jessup and his fellow Unocal researcher, Dr. Croudace, sent a memo to Mr. Mallett and Mr. Wessler proposing that Unocal fund an experimental program. (Jessup, Tr. 1582-83; CX 121). The scientists gave several reasons, including referring to ARCO, which was that “their one published work is seriously flawed from the scientific standpoint even though it is beautifully adapted to their political/economic agenda.” (CX 121 at 002).

105. According to Dr. Jessup, the memo “was to show that other companies and in particular ARCO here were doing work on emissions and low-emission gasolines and they were out there publishing their work and pushing it out and showing their version of what they considered a low-emission gasoline that would be in their interest to be the regulations.” (Jessup, Tr. 1584; CX 121 at 002).

106. Dr. Jessup’s “worry at the time was that we wouldn’t be able to produce gasoline if the regulations went a certain way without huge and expensive modifications to the refineries.” (Jessup, Tr. 1584-85; CX 121 at 002).

107. Mr. Mallett then forwarded the memo to Mr. Roger Beach, the then-president of Unocal’s Refining and Marketing Division, and recommended that Unocal commence a program to develop a reformulated gasoline. (CX 7055 (Mallett, Dep. at 73-74); CX 142). He characterized such a program as, “what Unocal should be doing in the 1990’s [sic] in order to remain in the fuels business.” (CX 7055 (Mallett, Dep. at 75); CX 142 at 001).

108. That October, Mr. Mallett sent a memo, titled a “Critique of Auto/Oil Program,” in which he agreed with Drs. Jessup and Croudace’s comments in a memo to him earlier the same day. (CX 142). The Unocal scientists asserted that the Auto/Oil program was dominated by political motives and had little, if any, scientific merit:

[W]e believe that the Auto/Oil program is doomed to failure. Because the test gasolines were selected based on political motives rather than [sic, than] good sound scientific principles, very little information of a scientific nature will come out of the program. And, because we may find no recipe for “clean” gasoline in this program, it could erroneously convince the regulators that the only clean fuel for internal combustion engines is methanol.

Based on these conclusions we believe that Unocal needs to move ahead with a program of our own to determine if, in fact, it is possible to blend a “clean” gasoline from Unocal refinery streams, and, if not, what Unocal should be doing in the 1990s in order to remain in the fuels business.

(CX 7055 (Mallett, Dep. at 77); CX 142 at 001, 003-009).

109. Drs. Jessup and Croudace participated in the Auto/Oil Fuels Task Force, where in 1989 they presented their proposal for a test matrix that would test ten different variables in a 15-fuel matrix, which the group rejected and instead “embarked on a plan that looked at what they called AMOT.” (Croudace, Tr. 622). AMOT means aromatics, MTBE, olefin content, and T90. (Jessup, Tr. 1515).

110. The proposal from Drs. Jessup and Croudace called for a study of the four variables that were to be examined by Auto/Oil—aromatics, MTBE, olefins and T90—as well as numerous other variables including paraffin content, research octane number, motor octane number, T10, T50, and Reid Vapor Pressure (RVP). (CX 142 at 004).

111. Petroleum refineries blend gasolines for use in automobile engines from a number of hydrocarbon streams, or blendstocks, produced at the refinery or purchased elsewhere that have different octane values, composition, and properties. (CX 5 at 010-014). The blendstocks available to a refiner depend upon the crude source available at any given time and also on the refinery’s complexity. (CX 5 at 010-014).

112. The finished motor gasoline products are complex mixtures of hydrocarbons that range in boiling points from 85° to 400° F and have desirable properties for motor vehicle performance under a variety of conditions. (CX 5 at 010). Octane rating, volatility, and distillation

levels are among the properties of gasoline that are critical to automotive performance. (CX 5 at 010, 019).

113. A gasoline's octane rating determines whether the gasoline is sold as "premium" gasoline (91-93 octane), "mid-grade" gasoline (87-93 octane) or unleaded "regular" gasoline (minimum 87 octane). (CX 5 at 013). As a matter of state law in California, to call gasoline "regular unleaded," it must have an octane of at least 87. (Ingham, Tr. 2709-10).

114. Reid vapor pressure ("RVP") is a measure of gasoline volatility which determines how easily and completely a fuel burns when ignited in an engine. (CX 5 at 019).

115. Distillation measures the temperatures at which different percentages of a gasoline distill. The common distillation levels, T10, T50, and T90, refer to the temperatures at which 10 volume percent, 50 volume percent, and 90 volume percent of the gasoline distill. (CX 5 at 019).

116. Driveability Index, or "DI," attempts to quantify the quality of vehicle performance associated with distillation measures, calculated with a formula using the T10, T50 and T90 values:

$$DI = 1.5(T10) + 3(T50) + T90.$$

(Ingham, Tr. 2656-59; RX 248 at 015).

117. Drs. Jessup and Croudace took their proposal back to Unocal, and in the memo they wrote that Mr. Mallett forwarded to Mr. Beach, they argued that their own proposal was superior to what Auto/Oil ultimately adopted, because the Jessup-Croudace test program was,

designed to show directionally how we could change gasoline properties to minimize the impact of automobile emissions on air pollution. Hopefully, this information will allow the Company to continue refining and marketing gasoline into the foreseeable future.

Our program is also intended to show our catalyst and process groups directions for future research that will help our refining system meet the challenge of producing environmentally acceptable fuels.

(CX 142 at 003).

118. They argued to their management that, “It is necessary for Unocal to embark on a program of this nature because the Auto/Oil program, as it is currently set up, will not tell us how to reformulate gasoline to reduce emissions.” (Croudace, Tr. 626-27; CX 142 at 003). They further argued that, “The almost assured failure of the Auto/Oil program will be a severe blow to oil companies and give credence to the methanol lobby.” (CX 142 at 003).

119. Although methanol fuels were under consideration in California, Unocal “would have categorically rejected any use of methanol in our fuel,” according to Mr. Stegemeier. (CX 7065 Stegemeier, Dep. at 55)). “That has always been my premise since I have been with the company. Methanol is a deadly poison and we would not put that in one of our fuels.” (CX 7065 (Stegemeier, Dep. at 55-56)).

120. Echoing their May 1989 memo, Drs. Jessup and Croudace expressed their concern that regulations could force Unocal to spend huge amounts of money in its refineries, but that the regulations would not actually lead to cleaner air, and thus years down the road Unocal and others would have to reconfigure all over again. (Jessup, Tr. 1155).

121. Mr. Mallett also agreed with Drs. Jessup and Croudace that, “In the interest of self preservation, Unocal should be gathering good scientific data independent of political agendas in order to both provide a database for more rational regulating and to provide us with ways of meeting regulations when they are promulgated.” (CX 7055 (Mallett, Dep. at 78); CX 142 at 004).

122. Mr. Ingham from Chevron suggested that other refiners shared similar concerns; when he testified regarding Chevron's goals during the CARB Phase 2 regulations, he stated that Chevron, "certainly as a business, we're interested in staying in business." (Ingham, Tr. 2698-99).

B. Unocal Embarked on an Independent Research Program, Which Led to Patentable Discoveries Regarding Gasoline Composition and Emissions

1. Drs. Jessup and Croudace Performed Their Own In-House, One-Car Study, Much Broader than Auto/Oil's AMOT Study

123. After Auto/Oil rejected their 10-variable proposal, Drs. Jessup and Croudace "decided to see whether we could do it in-house." (Croudace, Tr. 622-23). The October 27, 1989 memo from Drs. Jessup and Croudace to Dr. Mallett, discussed above, shows their "plan for running that same—that—those same fuels in an in-house effort," with one automobile. (Croudace, Tr. 623; CX 142 at 004-027).

124. In their "one-car" study, the fuels used by Drs. Jessup and Croudace were not designed to reduce emissions, but instead to screen for potential effects of multiple variables on specific criteria pollutants (*e.g.* carbon monoxide, or CO). (CX 171 at 023-024, 026; CX 24 at 007).

125. They conducted their testing by measuring and recording the tailpipe emissions from each type of fuel and then used their expertise to analyze and interpret the data. (*See* CX 171 at 024).

126. By March of 1990, Drs. Jessup and Croudace completed their one-car study and analyzed the data they collected to learn the truth about what properties of gasoline they could vary and what compositions could eventually be made in order to adjust the automobile emissions. (Jessup, Tr. 1155, 1158-59; Croudace, Tr. 634-636; CX 186).

127. With the one-car test, Drs. Jessup and Croudace also discovered the ability to simultaneously reduce three tailpipe emissions of motor gasoline: HC, CO, and NO_x. (Jessup, Tr. 1159).

128. Their discoveries included learning that oxygenates like MTBE, advocated by ARCO as an emissions-reducer, did not reduce emissions in modern technology cars. (CX 171 at 005 (“MTBE doesn’t directly affect tailpipe emissions.”); CX 24 at 013-014).

129. To the contrary, Drs. Jessup and Croudace discovered that seven other properties—T50, RVP, research octane number (RON), olefin content, paraffin content, T10, and T90—all effected specific criteria pollutants of exhaust emissions. (CX 186 at 002; CX 24 at 014).

130. By determining what statistical analysis to apply, then analyzing the data for the magnitude and interrelationships of these effects, they developed equations to predict emissions from both new and old compositions of gasoline. (CX 186 at 002).

131. “The emissions data derived from combusting the 15 different fuels were then analyzed by computer program using the SAS system commercially available from SAS Institute, Inc.” (Jessup, Tr. 1526; CX 617 at 016). The computer program, however, did not dictate Dr. Jessup’s analysis, rather he was required to make numerous choices in how to analyze the data: (1) he had to choose the form of the model, and chose a no-intercept model instead of an intercept model; (2) he chose not to center the data for each variable he was studying; (3) he chose which data to include and exclude; and (4) he decided to use a linear equation rather than an exponential equation. (Jessup, Tr. 1526-30).

132. Dr. Jessup was criticized for each of these choices by others in the industry, although he stands by these decisions and would do it the same way again. (Jessup, Tr. 1527-31).

133. Dr. Jessup understood his invention not to require substantial reconfiguration of refineries to implement. (Jessup, Tr. 1433).

2. Unocal Next Authorized and Initiated the “5/14 Project”

134. Mr. Beach sent a memo and arranged a meeting on May 14, 1990, with Drs. Jessup and Croudace, Mr. Kess Alley, Dr. Wayne Miller, and Mr. Tim Wusz, to discuss the results of the one-car study the Unocal scientists completed. (Beach, Tr. 1750-51; CX 172 at 001).

135. At this meeting, the scientists presented the results to Unocal management. Dr. Jessup included a slide showing a “Reformulated Gasoline Industry Scoreboard,” in order “to show the management committee that there were many other companies involved in developing their own reformulated gasolines and publishing them in fact.” (Jessup, Tr. 1496; CX 171 at 003).

136. He also included a slide with a graph titled “Effect of Oxygen content on CO Emissions, W.J. Piel, (ARCO) Energy Progress,” because Dr. Jessup “wanted to contrast my research with other people’s research. This [slide] shows that ARCO had come to a different conclusion to [sic] what I had come to and was publishing in fact.” (Jessup, Tr. 1498-99; CX 171 at 015).

137. Another slide, titled “General Motors data for effects of fuel aromatic content and 90% point,” was included because, “this is published data from General Motors that was out there and that had been published, so it was available, and their conclusions did not totally agree with my conclusions from my own research.” (Jessup, Tr. 1499; CX 171 at 017).

138. When Drs. Jessup and Croudace made their presentation to Unocal management, among other things Dr. Jessup “was showing my management the limited scope of the Auto/Oil

program at the time compared to what I had done” (Jessup, Tr. 1500; CX 171 at 019), a point he also made to CARB in the June 20, 1991 presentation (Jessup, Tr. 1513).

139. Dr. Jessup did not believe Auto/Oil “had gotten much underway by the time we finished our experiment.” And Auto/Oil’s initial test only found a 25 percent change in emissions, while the one-car test found a 300 percent change. (Jessup, Tr. 1156-57).

140. Mr. Lamb attended the May 14, 1990 presentation, which he thought was exciting and meant that Unocal should do more research. (Lamb, Tr. 2178-79).

141. Mr. Beach also became excited about the results of the preliminary test because it appeared that Drs. Jessup and Croudace had discovered the relationship between the composition of gasoline and the amount and quality of the exhaust emissions coming out of the engine. (Beach, Tr. 1751). This discovery made possible the implementation of performance standards, which would impose fewer costs on Unocal. (Beach, Tr. 1751-52).

142. The scientists requested funding for additional work. (Lamb, Tr. 2178-79). According to Mr. Beach, “obviously, they needed to test a lot more cars than that to be sure that their discovery was correct, and so they asked us to sponsor them in terms of another \$750,000 or so to do more testing of their theory.” (Beach, Tr. 1752).

143. Mr. Stegemeier could not recall whether the expenditure for this further research required Executive Committee approval or was within the delegated authority of others to approve. (CX 7065 (Stegemeier, Dep. at 85)).

144. As a result of that meeting, Mr. Beach authorized an expanded study, intending to determine whether the Unocal scientists could confirm the results of the original study. (Beach, Tr. 1752-53). This expanded effort became known as the “5/14 Project.” (Beach, Tr. 1750). It was

known as the 5/14 Project because that was the date on which Mr. Beach met with the Unocal scientists regarding the project. (Beach, Tr. 1750).

145. There was some discussion at the May 1990 presentation about whether Unocal should take the results of its one-car study to CARB, but Unocal decided that there was not enough evidence to convince a regulatory agency. (Lamb, Tr. 2180). Unocal decided to keep the results of its project secret because it did not know what the outcome of the project would be or whether such results would be useful to Unocal. (Lamb, Tr. 2180-81).

146. The additional research that Drs. Jessup and Croudace commenced following the May 14, 1990 meeting included a 10-car study of four older and six newer vehicles. (CX 24 at 015). This study again used test fuels similar to the one-car study (although somewhat different having been separately made at different times from the fuels of the one-car study.) (Jessup, Tr. 1160-61).

147. “When refineries blend gasoline, they blend to get into ranges of properties. They cannot blend to a specific value.” (Jessup, Tr. 1535).

148. Refineries cannot blend to specific value for a given property because, according to Dr. Jessup, “There’s a number of reasons, a lot of reasons. It’s very hard to control the actual amount of each stock going into a blend precisely, so it varies a little bit. You don’t know exactly what you’re putting in there and what’s in there.” In other words, “initially when you create a recipe for gasoline, you cannot exactly predict what the properties of that recipe are, so there’s [sic] some errors in there.” (Jessup, Tr. 1535). In addition, “[w]hen you finally finish a gasoline and do an analysis, there are errors in analysis, so even if you managed to hit something exactly, you wouldn’t necessarily know that because the analytical data may not reflect that.” (Jessup, Tr. 1535).

149. The actual testing for the 5/14 project began in July of 1990 and was conducted by the Southwest Research Institute ("SWRI"). (Jessup, Tr. 1160-61; CX 572; CX 573 at 001).

150. While the results of the 10-car study confirmed some of the discoveries of the one-car test (CX 24 at 015), they also suggested that an additional property, aromatics, should be increased to reduce a certain criteria pollutant. (CX 24 at 022-023). Aromatics is not a variable used in the '393 patent claims. (CX 617 at 021-025; Wirzbicki, Tr. 963-64).

151. After the 10-car test, Drs. Jessup and Croudace also conducted a 13-car test, the purpose of which was to test the fuels made at Unocal's refineries, using the inventions that they already had discovered, and compare those fuels to those of other companies. (Jessup, Tr. 1162).

152. The 13-car study was conducted in part at SWRI, like the 10-car test, but Unocal split up the work and also used the National Institute of Petroleum and Energy Research ("NIPER") to handle some of the work. (Jessup, Tr. at 1221).

153. At the time Mr. Kulakowski worked for Unocal, he thought the work that Dr. Jessup and Dr. Croudace did in the emissions field was good work and sound science, and continues to believe that it is sound science to this day. (Kulakowski, Tr. 4569).

154. Mobil Research and Development Corporation did an analysis of Unocal's 10-car emissions test data dated October 16, 1991. (Jessup, Tr. 1578-79). Dr. Jessup explained that the Mobil analysis was flawed because it included 22 fuels, which means Mobil incorporated the check fuels and control fuel in its analysis. (Jessup, Tr. 1579-80). Unocal's 10-car study was designed to use only the 15 test fuels as part of the experimental design. (Jessup, Tr. 1579). By doing the analysis the way Mobil did, and not following Dr. Jessup's experimental design, "In a case like this you would undoubtedly get a different result." (Jessup, Tr. 1579-80; CX 1693 at 005).

C. Unocal Applied for and Obtained a Patent on Its Independent Discoveries

155. On July 10, 1990, Drs. Jessup and Croudace executed an invention disclosure entitled “A NEW METHOD FOR BLENDING CONVENTIONAL GASOLINE FUEL COMPONENTS INTO LOW EMISSION/ REFORMULATED GASOLINES.” (Croudace, Tr. 509; CX 186 at 002).

156. Thereafter, Unocal’s in-house patent attorney, Mr. Greg Wirzbicki, prepared and filed a patent application claiming aspects of Drs. Jessup and Croudace’s discoveries. (CX 1788 at 013; Wirzbicki, Tr. 1082-83). The application filed with the Patent and Trademark Office on December 13, 1990, No. 07/628,488, originally included 82 claims for certain compositions of cleaner-burning motor gasolines and methods of blending reformulated gasolines. (CX 1788 at 006, 013).

157. Mr. Wirzbicki did not do anything different in the scope of his employment and his job regarding his efforts on the ’393 patent application and related applications and patent than he had done with other patents while employed at Unocal. (Wirzbicki, Tr. 1081-82).

158. Mr. Wirzbicki did not oversee any plan to defraud CARB while he was working on the ’393 patent application, nor did he oversee a plan to cause CARB to adopt regulations that would fall within the scope of any of the ’393 claims. (Wirzbicki, Tr. 1137-38).

159. In a March 1992 amendment, Mr. Wirzbicki submitted an article to the PTO describing the proposed CARB Phase 2 regulations, although CARB’s proposal came after the patent application was filed and was not prior art. (Wirzbicki, Tr. 972-73; CX 1788 at 327-332). But Mr. Wirzbicki could not recall comparing any particular claims of Unocal’s patent application to the proposed CARB regulations in 1991. (Wirzbicki, Tr. 967-68).

160. With respect to any potential overlap between claims in Unocal’s patent applications and the Phase 2 regulations proposed later by CARB, Mr. Wirzbicki explained, “I was claiming for

my inventors an invention, a new gasoline invention. And I was trying to get as much legitimate coverage as I could for that invention. To whatever extent it happened to overlap the CARB regulations was actually meaningless.” (Wirzbicki, Tr. 1081).

161. He cited the 1988 *Kingsdown Medical Consultants* Federal Circuit decision as the basis for his belief that, “if a patent prosecutor is prosecuting a patent application, happens to see that a competitor is doing something, it’s perfectly permissible, legal, and according to their word, not improper, if I recall right, to cover that invention, to cover that competitor’s product. And for that reason—I felt that this was exactly the same situation. And for that reason, I felt that I was on very solid ground in doing the right thing and presenting the claims that I did.” (Wirzbicki, Tr. 1123-24).

162. During the prosecution of the patent application leading to the ’393 patent, Drs. Jessup and Croudace submitted an affidavit stating that they had conceived and reduced to practice embodiments of their invention prior to certain dates. (Jessup, Tr. 1580-81; CX 1788 at 204).

163. By signing the affidavit, however, Dr. Jessup was not representing to the PTO that they had determined what their invention was from simply making the fuels identified in the affidavit. (Jessup, Tr. 1581; CX 1788 at 204).

164. One fuel could never describe all the aspects of their invention, Dr. Jessup explained, because “for one thing, one fuel is a point in space, in blending space, or fuel properties space. It doesn’t convey any information about emissions. It doesn’t convey any information about how you might change the properties of that fuel in some way to change emissions.” (Jessup, Tr. 1581-82).

165. While the patent application was pending, Unocal’s inventors sought approval within Unocal in an August 26, 1991 request (CX 262), received that approval, and then published

information about their research in an SAE paper presented at a conference in February 1992. (Jessup, Tr. 1287-88, 1542-43; CX 477).

166. Unocal's SAE paper contained the same information presented to Auto/Oil in September 1991. (Ingham, Tr. 2652-55; CX 477 at 008, 009, 017; CX 4028 at 014, 015, 032).

167. As of November 14, 1991, Examiner Helane M. Myers in the PTO had rejected all of the pending claims in Unocal's patent application, and Mr. Wirzbicki had no way of knowing whether any of the Unocal patent claims ever would be allowed to issue by the PTO. (Wirzbicki, Tr. 1112; CX 1788 at 215).

168. After several additional disclosures and further amendments, she issued another rejection, this time on June 16, 1992, again rejecting all pending claims. (CX 1788 at 339).

169. On March 24, 1993, Examiner Myers issued a Notice of Allowability, stating that claims 1-3, 5-25, 30-45, 48, 50, 54-58, 81-145, 147-150, 152, 155, 156, 163-181, and 190-202 would be allowed. (CX 1788 at 387). A Supplemental Notice of Allowability issued on June 3, 1993, after Unocal submitted an amendment canceling claims 81 and 82. (CX 1788 at 421).

170. Unocal received notice on January 31, 1994 that application No. 07/628,488 would issue as Patent No. 5,288,393 on February 22, 1994. (CX 1788 at 443).

171. Patents become publicly available upon issuance. 37 CFR § 1.1(a). (Linck, Tr. 7773-74 (“[o]nce a patent issues, one that’s interested in working in the field or a regulatory agency that’s interested in developing standards that don’t cover what are claimed have the document to look at”), 7778 (explaining that until a patent issues, the disclosure is only to the PTO and not to the public)).

172. On December 29, 1994, and again on July 5, 1995, Unocal filed disclaimers, disclaiming certain claims in the '393 patent. (CX 1788 at 460, 477).

173. Forty-one claims remain in the '393 patent; each is a composition claim describing particular ranges of properties for compositions of motor gasoline. (RX 793 at 022-026; CX 1788 at 460-461, 477-478).

174. Table 2 of the '393 patent lists the gasoline properties of the one-car test, and Table 5 lists the properties of the 10-car test. (Jessup, Tr. 1536-37; RX 793 at 017, 019 (referred in testimony to as CX 17)).

175. Unocal's '393 patent is based on the one-car equations, it was not based in any way on the ten-car equations. (Croudace, Tr. 636).

176. Ultimately, Unocal received five RFG patents (RX 793; CX 618; CX 619; CX 620; CX 621) and all five of the patents relate back to the original invention of Drs. Jessup and Croudace. (Wirzbicki, Tr. 880-81, 901-02; CX 186).

177. In March 2001, the Patent and Trademark Office received requests for reexamination of Unocal's '393 patent; about one month later it received a request for reexamination on the '126 patent. (Strathman, Tr. 3661-62). At least one of these requests was made by the defendant refiners. (Strathman, Tr. 3662). In addition to those first requests, additional requests for reexamination have been made as to both patents. (Strathman, Tr. 3663-64). Both patents have received rejections from the Patent and Trademark Office. (Strathman, Tr. 3663-3664).

D. Unocal Announced Its Patent, Was Successful in a Preemptive Lawsuit Filed by Major Refiners, and Now Has a Licensing Plan Available to All Refiners

1. Unocal's Announced the '393 Patent, Which Led to a Preemptive Lawsuit by Six Major Refiners

178. Unocal did not begin to make licensing plans until after the '393 patent issued in February 1994. (Beach, Tr. 1776-77). First, Unocal wanted to evaluate the strength of the patent, as Unocal's Mr. Neal Schmale explained:

we were told that the patent had issued or was about ready to issue, and what we basically said was let's make really, really sure that this is going to be a good patent, because we are going to be really embarrassed, really embarrassed, if we go out and ask for licensing—ask for license revenues on something that doesn't turn out to be a good patent.

(CX 7062 (Schmale, Dep. at 71-72)).

179. For this purpose, Unocal intended to enlist an outside consultant to evaluate the defendability of the patent. (Beach, Tr. 1778). Mr. Beach recalled it required some time to select the appropriate person and then it took that person a while to evaluate the patent. (Beach, Tr. 1778). Unocal sought to use this outside consultant to “scrub this and make sure we had a good patent. Because we didn't want to go out and start saying we were going to charge people for something and then discover that this thing wasn't—wouldn't stand up.” (CX 7062 (Schmale, Dep. at 71-72)).

180. Once Unocal obtained the desired evaluation, it began to consider the licensing potential of the patent, a process that included assembling a group of people to consider the issue and make a recommendation. (Beach, Tr. 1776-78). The group consisted of in-house lawyers, outside counsel, public relations people, individuals from Unocal's refining and marketing departments and individuals from Unocal's government relations department. (Strathman, Tr. 3649).

181. The company charged this group, which began meeting sometime in late 1994 (Strathman, Tr. 3648), with the task of coming up with a recommended license fee, license agreement, and public relations strategy, including a public announcement and rollout program. (Strathman, Tr. 3649; CX 7066 (Thacher, Dep. at 72-73)).

182. Mr. Strathman joined the licensing group in early 1995, by which time the group had retained consultants to look at possible public and governmental reactions to a range of potential announcements and license fees. (Strathman, Tr. 3648). In addition, various people were working on coming up with a recommendation to management on the fee structure and license agreement structure. (Strathman, Tr. 3648).

183. Mr. Thacher was one person who advocated in early 1995 for developing a licensing plan and publicizing it. (CX 7066 (Thacher, Dep. at 64)). He felt that by developing and publicizing a such a plan, Unocal would “make concrete what the patents would mean to other refiners and potentially consumers and other people. And this would forestall enormous amount of mischief that would be potentially stirred up by competitors and advocacy groups who would talk crazy numbers or other things.” (CX 7066 (Thacher, Dep. at 64-65)). Mr. Thacher took the general position that it would be useful to have a licensing program that Unocal could announce in order to bring some certainty and clarity to an announcement of the '393 patent for various audiences from a communications standpoint. (CX 7066 (Thacher, Dep. at 71)).

184. Unocal did not issue the press release announcing its patent until January 31, 1995. (Beach, Tr. 1778; CX 375). In its press release, Unocal indicated it planned to offer the patent for license and anticipated it would have a licensing plan ready by the end of April. (CX 375).

185. Chevron initially learned of the '393 patent in about February 1994. (Ingham, Tr. 2759). Once Unocal issued its press release indicating its willingness to license the patent in January 1995, Chevron and other refiners prepared a lawsuit against Unocal, which they filed in federal court in Los Angeles on April 13, 1995. (Ingham, Tr. 2760).

186. Texaco likewise elected to litigate with Unocal rather than take a license to the '393 patent. (Kulakowski, Tr. 4567-68).

187. Unocal disbanded the licensing group sometime after mid-April 1995, when six major refiners sued Unocal in a declaratory judgment action on the '393 patent, and the group never completed its work. (Beach, Tr. 1777; Strathman, Tr. 3650-51). After Unocal was sued, there was no longer any mandate from management to come up with a licensing plan. (Strathman, Tr. 3651).

188. Consequently, Unocal never put a licensing plan in place in 1995. (Strathman, Tr. 3649-50; Lane, Tr. 3087). The licensing group never developed a proposed agreement structure to submit to management, nor did it ever settle on a proposed licensing rate to submit. The group also never formulated a plan for announcing a licensing strategy. (Strathman, Tr. 3649-50).

2. Article III Courts at Every Level Have Upheld the Validity of the '393 Patent

189. The preamble found in all claims in the '393 patent, requiring “an unleaded fuel suitable for combustion in an automotive engine,” was determined by the Federal Circuit to be a limitation that any fuel must meet before it can fall within a claim. (Wirzbicki, Tr. 1086-87).

190. Although the subsequent Unocal RFG patents have not been litigated and their claims have not been construed by a court, the same preamble also appears in every claim of each of the other Unocal RFG patents. (Wirzbicki, Tr. 1087).

191. Unocal's patent infringement litigation was tried in three phases: liability, damages, and inequitable conduct. (Strathman, Tr. 3655-56). Unocal prevailed on all three phases of trial. (Strathman, Tr. 3656). The jury found infringement of approximately 29 percent during the relevant time period, and awarded Unocal damages consisting of a reasonable royalty of 5.75 cents per gallon on that 29 percent infringement production. (Strathman, Tr. 3656; Wirzbicki, Tr. 1135).

192. In 1998, a judgment was entered in Unocal's favor. (Strathman, Tr. 3658). Although the judgment was stayed pending appeal, after Unocal prevailed at the Federal Circuit and the Supreme Court denied certiorari, Unocal collected this judgment of approximately \$91 million, including interest and attorney's fees. (Strathman, Tr. 3658).

193. Unocal then went back to the district court and requested an accounting for infringement for an additional time period. (Strathman, Tr. 3658). Unocal received batch data from the defendant refiners through some point in 2000 and submitted a request to the court for approximately \$250 million in additional damages. (Strathman, Tr. 3858-59). The court has never ruled on this request. (Strathman, Tr. 3660). The matter is currently "on hold" and no subsequent judgment has been entered. (Strathman, Tr. 3664).

194. The district court has not yet resolved the dispute between Unocal and the defendant refiners as to whether gasolines made with ethanol infringe the '393 patent. (Strathman, Tr. 3660).

195. The only patent at issue in Unocal's patent litigation was the '393 patent. (Strathman, Tr. 3655). During the patent infringement litigation, Unocal had applications for additional patents pending. (Strathman, Tr. 3652). The defendant refiners sought discovery of these pending patent applications. (Strathman, Tr. 3652). Unocal briefed the issue of whether it should provide the refiners with any additional patent applications, and this briefing was part of the public record in the

patent litigation. (Strathman, Tr. 3654-55). Ultimately Unocal disclosed the additional application to the refiners under the terms of a protective order. (Strathman, Tr. 3655).

3. After Winning in Court, Unocal Tried Again to License the Patent

196. With the '393 litigation concluded, Unocal decided it was an opportune time to offer to negotiate licenses. (Strathman, Tr. 3643). To that end, Unocal sent letters in late 1998 to determine if interest existed in licensing from Unocal. (Strathman, Tr. 3643; CX 427). Unocal sent Form Letter A (CX 426) to non-litigating refiners and others; it sent Form Letter B (CX 427) to the six defendants from the patent case. (Strathman, Tr. 3643-44).

197. Unocal had no licensing plan in place when it sent these letters out. (Strathman, Tr. 3643). Unocal received only a few calls from non-defendant refiners in response to these letters, none of which resulted in any licensing negotiations. (Strathman, Tr. 3644). In response to the letters sent to the six refiner defendants, Mr. Strathman recalled getting a call from a lawyer from one of the defendant companies indicating that he was the person to whom Unocal should direct future correspondence. (Strathman, Tr. 3644). Not surprisingly, that communication did not lead to any license negotiations. (Strathman, Tr. 3645).

198. { [REDACTED] } (Strathman, Tr. 3746, *in camera*; CX 2007, *in camera*).

199. { [REDACTED]
[REDACTED] }
(Strathman, Tr. 3746-47, *in camera*).

200. { [REDACTED] }
[REDACTED]
[REDACTED] } (Strathman, Tr. 3747-48, *in camera*).

201. { [REDACTED] }
[REDACTED] } (Strathman, Tr. 3749, *in camera*). { [REDACTED] }
[REDACTED] } (Strathman, Tr. 3749, *in camera*).

202. { [REDACTED] } (Strathman, Tr. 3750-52, *in camera*). { [REDACTED] }
[REDACTED] } (Strathman, Tr. 3750-52, *in camera*).

203. { [REDACTED] }
(Strathman, Tr. 3750-52, *in camera*). { [REDACTED] }
[REDACTED] }
(Strathman, Tr. 3752-54, *in camera*). { [REDACTED] }
[REDACTED] }. (Strathman, Tr. 3752-53, *in camera*). { [REDACTED] }
[REDACTED] } (Strathman, Tr. 3753, *in camera*). { [REDACTED] }
[REDACTED] } (Strathman, Tr. 3753-54, *in camera*). { [REDACTED] }
[REDACTED] } (Strathman, Tr. 3753-54, *in camera*).

204. { [REDACTED]

[REDACTED] } (Strathman, Tr. 3752-3754, *in camera*). { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3750-55, *in camera*). { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3750-55, *in camera*). { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3755, *in camera*). { [REDACTED]

[REDACTED] } (Strathman, Tr. 3755, *in camera*).

205. { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3708, 3711, *in camera*; CX 2018 at 011, *in camera*).

206. { [REDACTED]

[REDACTED] } (Strathman, Tr. 3754, 3759, *in camera*; CX 2017 at 002, *in camera*). { [REDACTED]

[REDACTED]

[REDACTED] }

(Strathman, Tr. 3754, 3759, *in camera*).

207. { [REDACTED] }

(Strathman, Tr. 3754, *in camera*). { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3758, *in camera*). { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3758, *in camera*).

208. { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3760-61, *in camera*).

209. { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3761, *in camera*).

210. { [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3765-66, *in camera*).

211. Unocal would license to the defendant refiners in the '393 patent litigation on the same terms it offered to the rest of the industry, if the refiners would resolve the outstanding patent litigation with Unocal. (Strathman, Tr. 3634-39).

IV. COMPLAINT COUNSEL HAVE FAILED TO PROVE THAT UNOCAL ENGAGED IN EXCLUSIONARY CONDUCT

212. To prove exclusionary conduct, the Complaint alleges that Unocal defrauded three separate entities with respect to the status of its intellectual property rights: the California Air Resources Board, the Auto/Oil Air Quality Improvement Research Program, and the Western States Petroleum Association. (Complaint ¶¶ 5, 76, 81, 85). The evidence failed to prove that Unocal engaged in exclusionary conduct with respect to any of these three entities or their members.

A. Unocal Did Not Defraud CARB

1. CARB Was Responsible for Controlling Air Pollution as Directed by the California Health & Safety Code

213. In 1988, the California Legislature passed a series of amendments to the California Health and Safety Code that are now known as the California Clean Air Act of 1988. (CX 1665 (CAL. HEALTH & SAFETY CODE §§ 40910, *et seq.*)).

214. By law, CARB was charged with controlling air pollution from motor vehicles. (CX 1665 at 184 (CAL. HEALTH & SAFETY CODE § 43000(a)-(b))). According to the 1991 version of the California Health and Safety Code, the control and elimination of air pollutants from motor vehicles—the primary cause of air pollution on California—was of “prime importance.” (CX 1665 at 184 (CAL. HEALTH & SAFETY CODE § 43000(a)-(b))). The California Clean Air Act addressed broad goals related to cleaner air including “the protection and preservation of the public health and well-being, and for the prevention of irritation to the senses, interference with visibility, and damage to vegetation and property.” (CX 1665 at 184 (CAL. HEALTH & SAFETY CODE § 43000(b))).

215. Amendments to section 43013(a) added language expressly authorizing CARB to adopt motor vehicle fuel specifications and in-use performance standards as well as vehicle emission standards. (CX 10 at 195; CX 1665 at 189 (CAL. HEALTH & SAFETY CODE § 43013(a))).

216. Section 43018(a) declared that CARB “shall endeavor to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of the state standards at the earliest practicable date.” (CX 1665 at 190 (CAL. HEALTH & SAFETY CODE § 43018(a)); CX 10 at 195-196).

217. The California Clean Air Act required CARB to “take immediate action to implement both short- and long-range programs of across-the-board reductions in vehicle emissions” (CX 1665 at 184 (CAL. HEALTH & SAFETY CODE § 43000-5(d))). It also required CARB to “take whatever actions are necessary, cost-effective, and technologically feasible in order to achieve, not later than December 31, 2000, a reduction in the actual emissions of reactive organic gases of at least 55 percent [and] a reduction in emissions of oxides of nitrogen of at least 15 percent from motor vehicles.” (CX 1665 at 190 (CAL. HEALTH & SAFETY CODE § 43018(b)); CX 10 at 195-196; Kenny, Tr. 6675-78).

218. CARB was also required, “[n]ot later than January 1, 1992,” to adopt “[s]pecification[s] of vehicular fuel composition.” (CX 1665 at 190-191 (CAL. HEALTH & SAFETY CODE § 43018(b)-(c)); CX 10 at 195-196). CARB was additionally required to hold workshops no later than January 31, 1991, and to hold hearings to consider the adoption of fuel regulations by November 15, 1991. (CX 1665 at 191 ((CAL. HEALTH & SAFETY CODE § 43018(d)); CX 10 at 195).

219. CARB, of course, could not simply disregard these legislative mandates. (Kenny, Tr. 6507-08). As explained by the Final Statement of Reasons published by CARB staff in support of the Phase 2 regulations, “the legislature provided the [C]ARB with the basic charge to adopt fuels standards that are necessary, cost-effective and technologically feasible to meet the specified goals and delegated to the CARB the responsibility to fashion the specific regulatory approach. These basic standards and the Section 43018(d) timetable . . . are the extent of the statutory direction.” (Venturini, Tr. 853; CX 10 at 196).

220. The California Clean Air Act did not mandate what properties to regulate or what limits to place upon those properties. (Venturini, Tr. 855). The Act does not direct CARB

specifically how to set the specifications; it tells CARB what to do, but not how to do it. (Venturini, Tr. 855-56). Therefore, CARB had broad discretion to determine the specific fuel characteristics. (Venturini, Tr. 856; Kenny, Tr. 6652 (agreeing that CARB had broad policy discretion in the context of air quality improvement in California)).

2. A Broad Overview of the CARB Regulatory Process and the Adoption of the Phase 2 RFG Regulations

221. To carry out its charges under the California Clean Air Act amendments, CARB embarked on two rulemaking proceedings, known as Phase 1 and Phase 2, to regulate low emissions reformulated gasoline. (Venturini, Tr. 118-19). “[CARB] did a Phase 1 regulation, which was fairly simple, something that was easily doable that could get some early reductions. And then we committed to embark on a Phase 2 regulation, which was a comprehensive set of regulations for reformulated gasoline.” (Venturini, Tr. 119).

222. Each of the rulemaking proceedings resulted in prescribed limits on specific gasoline properties. (Venturini, Tr. 118-120; CX 10 at 010-011).

a. The Phase 1 Regulations

223. CARB’s Phase 1 process took place in the late 1980s and 1990s, ending with the adoption of regulation on September 28, 1990. (Venturini, Tr. 118-20; CX 785).

224. Under the Phase 1 regulations, CARB limited a gasoline property known as Reid Vapor Pressure (RVP). (Venturini, Tr. 120). Specifically, the Phase 1 regulations limited RVP to 7.8 psi statewide (for specified control periods)). (CX 10 at 010-012 (Phase 2 document referring to “the existing RVP regulation”). CARB also mandated the addition of a deposit control additive (“detergent”) and scheduled the phase-out of leaded gasoline. (Venturini, Tr. 120).

225. As part of its efforts to develop the Phase 1 regulations, CARB solicited and received input and/or research from numerous sources, including refiners, industry groups, and environmental groups. (Venturini, Tr. 118-20; Courtis, Tr. 5732-34).

226. CARB did not, however, ask refiners whether they had patents or pending patents during Phase 1. (Venturini, Tr. 862-83).

b. The Phase 2 Regulatory Process

227. CARB's Phase 2 rulemaking took place in the early 1990s, with the board approving the regulations on November 22, 1991. (CX 817; CX 10 at 007).

228. According to Mr. Robert Fletcher, the manager of CARB's Fuels Section (at the time of the Phase 2 rulemaking), the two goals for Phase 2 were (1) to gain maximum emissions reductions from existing motor vehicles as soon as possible, and (2) to create a fuel that auto manufacturers could use to develop lower-emissions vehicles. (CX 10 at 039; Fletcher, Tr. 6445). Moreover, CARB was interested in obtaining an immediate emissions effect on an existing fleet of cars as soon as it was implemented. (CX 7063 (Sharpless, Dep. at 95-96)).

(1) CARB Met With Interested Parties and Conducted Workshops Before the Phase 2 Rulemaking Began

229. Well before the official rulemaking began, CARB staff conducted numerous private informal ex parte meetings with representatives of companies and organizations that had an interest in the rulemaking. (Venturini, Tr. 370-72; Kenny, Tr. 6652-53). In the period of time leading up to the adoption of the Phase 2 regulations, CARB and its staff met with individual refiners, individual auto companies, refining and auto industry trade groups, ethanol producers, small refiner interest groups, and petroleum marketing groups. (Courtis, Tr. 5733-34, 5893-94).

230. Mr. Robert Fletcher testified that CARB decided on which fuel specifications to regulate by starting from what it had learned during Phase 1. (Fletcher, Tr. 6448-49). He described the process by which CARB developed Phase 2 and obtained information from interested parties:

From there we basically had appeals out to all sectors to provide us as much information and analyses that they had about the impact of changing fuel specifications on emissions for motor vehicles, and so throughout the course of the rulemaking we were bringing this information in, we were analyzing it and making judgments about what appropriate fuels specifications could be to achieve emission reductions.

(Fletcher, Tr. 6448).

231. Before it issued its formal proposal, CARB also conducted public workshops. (Venturini, Tr. 369-71). Public workshops involved a public discussion of the proposed regulations. (Venturini, Tr. 369-70; CX 492 (notice of June 11, 1991 workshop); RX 184 (notice of August 14, 1991 workshop)). CARB conducted two public workshops prior to initiating the rulemaking to discuss various regulatory approaches to regulating gasoline sold in the state of California. (Venturini, Tr. 369-70; CX 7063 (Sharpless, Dep. at 113); CX 492 (notice of June 11, 1991 workshop); RX 184 (notice of August 14, 1991 workshop)). The whole point, according to Mr. Venturini, was to obtain information to begin a formal rulemaking. (Venturini, Tr. 858-59).

232. In preparing to set out the proposed regulations in what CARB staff terms its “Staff Report,” or Initial Statement of Reasons, CARB staff considered many factors including: the need for the regulation, the emission reductions that were possible, the cost to the affected stakeholders of the activity, the cost-effectiveness of that activity, the technical feasibility of producing the fuel in a way that would not interrupt supplies or create disruptions, and the public acceptability. (Fletcher, Tr. 6446-47).

(2) CARB Issued a Rulemaking Notice and Supporting Documents on October 4, 1991

233. The CARB Phase 2 RFG rulemaking proceeding began on October 4, 1991, the day that CARB issued official notice that it was entering a formal rulemaking. (Courtis, Tr. 5779; CX 767 (October 4, 1991 Notice of Public Hearing)). On that day CARB staff also issued proposed regulations in its "Staff Report" along with an accompanying "Technical Support Document." (CX 767 (October 4, 1991 Notice of Public Hearing); Venturini, Tr. 858-59; CX 52 (October 4, 1991 Staff Report); CX 5 (October 4, 1991 Technical Support Document)).

234. Even during the formal rulemaking, CARB staff and Board members continued to have ex parte contacts between agency decision-makers and third parties interested in the outcome of the rulemaking, provided that Board members disclose those ex parte contacts on the rulemaking record. (Venturini, Tr. 370-71; Kenny, Tr. 6652-54, 6655-56; CX 774 at 224-225).

235. The rulemaking culminated in a CARB Board meeting on November 21 and 22, 1991, in which participants had an opportunity to submit oral and written comments on the staff proposal. (CX 10 at 007). The Board passed Resolution 91-54, which officially approves the regulations and describes the Board's actions. (CX 817 at 001-002; CX 10 at 008; CX 7063 (Sharpless, Dep. at 139-40)).

(3) CARB Issued a Final Statement of Reasons in 1992

236. Nearly a year after the November 1991 hearing, CARB published its Final Statement of Reasons for the Phase 2 reformulated gasoline rulemaking. (CX 10; Venturini, Tr. 764). The Final Statement of Reasons is a document compiled to satisfy the requirements of the Office of

Administrative Law. (CX 7063 (Sharpless, Dep. at 139)). The staff does not submit the Final Statement of Reasons to the Board. (CX 7063 (Sharpless, Dep. at 139)).

237. The Final Statement of Reasons for rulemaking is compiled by CARB staff, not the CARB Board. In general, the legal staff takes the lead in compiling the Final Statement of Reasons, supported by CARB technical staff. (Kenny, Tr. 6533; *see also* CX 10). In the case of the Phase 2 regulations, Tom Jennings, an attorney in the CARB General Counsel's office took the lead in compiling CX 10, the Final Statement of Reasons. (Kenny, Tr. 6533; *see also* CX 10). Mr. Boyd, the CARB Executive Officer, approved it. (Kenny, Tr. 6534; *see also* CX 10).

238. In the Final Statement of Reasons for Phase 2, CARB summarized the comments that it had received in oral (at the Phase 2 hearing) and written form, categorized them, and then provided a response to each comment to justify the regulations. (Courtis, Tr. 5755). Then-CARB staff member Mr. John Courtis was one of the coauthors of the Final Statement of Reasons. (Courtis, Tr. 5754-55).

(4) The Refiners and Other Stakeholders Lobbied CARB During the Phase 2 Process

239. CARB met with many different interested parties during the development of the Phase 2 regulations. In its Staff Report, CARB noted that "numerous meetings with representatives from industry" had been held to solicit information and "to discuss their special concerns." (CX 52 at 016). CARB met with representatives of many different entities and groups on a regular basis from at least November 1990 through November 1991, when the Phase 2 RFG regulations were approved. (Venturini, Tr. 110-11 (describing interaction with interested parties in formulating a regulation)).

240. When meeting directly with refiners, CARB understood that the refiners were submitting information helpful to their interests and withholding information that would not advance those interests. (CX 7063 (Sharpless, Dep. at 167-68 (speaking about her awareness that companies who participate in regulated proceedings are, bar none, not forthcoming with all information, and that the oil companies were not going to give her information which they did not want her to have, and would provide her with information that best suited their interests: “[t]hey usually are looking very well after their own self interest . . .”)); (Boyd, Tr. 6801 (testifying that he understood at the time that the various companies and constituents advocated their differing positions about the regulations to CARB from their own perceived best interests))).

(5) Auto/Oil Participated in the Regulatory Process

241. The Auto/Oil program intended to provide the data produced by its own studies to the public and to lawmakers and regulators at the federal and state level. (CX 4001 at 002). “The results of research and testing of the Program will be disclosed to government agencies, the Congress and the public, and otherwise placed in the public domain.” (CX 4001 at 007). In fact, Auto/Oil provided data from its research to both CARB and the United States Environmental Protection Agency. (CX 7073 (Wise, Dep. at 31)).

242. Exxon’s Mr. Jack Wise testified that Auto/Oil’s expectation in giving its data to CARB was that:

they could then take that data set and analyze it in any fashion they chose to see what the effects of the variables were on air pollution, just like the U.S. government did. By allowing the individual agencies to have the data sets they weren’t restricted to our interpretation of the data.

(CX 7073 (Wise, Dep. at 31)). Auto/Oil communicated its research to CARB to assist the RFG rulemaking proceedings. (Burns, Tr. 2465-66).

(6) WSPA Participated in the Regulatory Process

243. WSPA provided a common forum for its members to advance common industry positions with CARB, including the CARB Board, executive and senior management, as well as staff. (CX 7059 (Moyer, Dep. at 10-12)).

244. WSPA members met with CARB a number of times during the Phase 2 regulatory process, WSPA submitted written comments, and also presented oral comments at the CARB November 1991 Board meeting. (Venturini, Tr. 118-20; Curtis, Tr. 5732-34).

245. WSPA also commissioned a cost study of the proposed Phase 2 regulations based on a composite refinery linear programming model which was prepared by Turner Mason. (Cunningham, Tr. 4319-20, 5879-83). It presented the results of this study to CARB and Mr. Cunningham of Turner Mason presented many of the results of this study orally at the CARB November 1991 Board Meeting. (CX 773 at 228; *see* Cunningham, Tr. 4319-20, 5879-83; CX 7063 (Sharpless, Dep. at 105-06)).

246. WSPA hoped that the information it provided to CARB would be utilized by CARB in “crafting their proposed regulations into final proposals” and that those proposals would be “ultimately adopted as regulations.” (CX 7059 (Moyer, Dep. at 12)).

3. Unocal's Advocacy Before CARB Was Driven by Its Operations—Including a Desire for A Predictive Model and an Opposition to Oxygenates—Not by Anything Related to its Patent Application or Uncertain Future Royalties

247. On November 6, 1989, Mr. Roger Beach, then-President of Unocal's Refining and Marketing Division, officially appointed Dennis Lamb to head the newly created Fuels Issues Management Team (also referred to as the Fuels Issues Team). (Beach, Tr. 1748; CX 540; Beach, Tr. 1675). The Fuels Issues Team was a team within Unocal set up to keep track of regulations and proposed regulations faced by Unocal, assess the impact and timing of those regulations, and to make sure Unocal had a good rapport with the regulators to ensure open lines of communication. (Beach, Tr. 1748). Unocal scientists Drs. Jessup and Croudace were not members of the Fuels Issues Team. (Miller, Tr. 1441).

248. Mr. Beach chose Mr. Lamb to head the team because he was very effective in interfacing with regulators and other organizations outside the company. (Beach, Tr. 1748). Mr. Beach wanted Mr. Lamb to lobby the regulators in the direction that would require Unocal to make the least amount of capital investments and to help formulate Unocal's positions regarding future regulations. (Beach, Tr. 1749). As head of the Fuels Issues Team, Mr. Lamb led those who were dealing with CARB. (Beach, Tr. 1675). Thus, with respect to the CARB Phase 2 regulations, Mr. Lamb was involved at the inception of Unocal's advocacy efforts before CARB. (Lamb, Tr. 2169-70).

a. Unocal Officially Adopted a Strategy of Advocating for a Predictive Model

249. Unocal's thinking with respect to its Phase 2 CARB advocacy strategy was motivated by a concern for the operations of its refining business. (See Beach, Tr. 1761-62).

250. In the late 1980s, when Mr. Roger Beach became the President of Refining and Marketing at Unocal, it had three California refineries: San Francisco, Santa Maria, and Los Angeles. (Beach, Tr. 1742). Unocal, however, did not make gasoline at all three refineries—only at San Francisco and Los Angeles. (Beach, Tr. 1742). The San Francisco and Los Angeles refineries were very different from each other. (Beach, Tr. 1742). San Francisco made lube oil while Los Angeles did not. (Beach, Tr. 1743). The San Francisco refinery processed sweet crude while the Los Angeles refinery processed entirely sour crude. (Beach, Tr. 1742). Sweet crude is crude that has very little sulfur in it; sour crude is crude that is heavy on sulfur. (Beach, Tr. 1743). That meant that Los Angeles had a lot more sulfur recovery facilities and it also had a fluid catalytic cracking unit, which San Francisco did not have. (Beach, Tr. 1742-43). Because the San Francisco refinery had neither thermal cracking nor catalytic cracking, it did not have any olefins to speak of in its gasoline. (Beach, Tr. 1743).

251. One of Unocal's concerns with respect to the upcoming regulations was whether CARB would mandate the use of oxygenates. (Lamb, Tr. 2176). Unocal did not have its own manufacturing capacity for oxygenates and was concerned about the expense of either having to develop that capacity itself or having to purchase oxygenates from others. (Lamb, Tr. 2176).

252. ARCO Chemical Company was one of the country's leading manufacturers of the oxygenate MTBE. (Lamb, Tr. 2175-76). ARCO Chemical visited Unocal's Fuels Issues Team to advocate for the use of oxygenates. (CX 154 at 002; Lamb, Tr. 2175-76).

253. In the summer of 1990, Unocal believed that the CARB Phase 2 regulations could take several forms. (Lamb, Tr. 2181). Unocal's frame of reference was the recent reformulated diesel rulemaking proceedings, in which Unocal had observed the development of two compliant

options—(1) a prescribed “formula fuel” and (2) an alternative testing option which allowed a company to make an alternative formulation if testing showed that this formulation had emissions equivalent to that of the formula fuel. (Lamb, Tr. 2181).

254. Under the reformulated diesel regulations, the vehicle testing option was widely utilized. (Lamb, Tr. 2182). Unocal, in fact, developed and certified its own alternative diesel formula. (Lamb, Tr. 2182). Companies kept their alternative diesel formulations secret, and such secrecy conferred a competitive advantage upon them. (Lamb, Tr. 2182-83). By keeping its diesel formulation secret, Unocal was able to preserve what it perceived to be a cost advantage and to prevent others from using Unocal’s own certified formula. (Lamb, Tr. 2182-83).

255. In mid-1990, Unocal believed that CARB would apply the same two-option pattern that it had followed in its diesel rulemaking to its upcoming Phase 2 gasoline rulemaking. (Lamb, Tr. 2181).

256. In this same time frame, some of the individuals within Unocal’s Science and Technology department wanted Unocal to take its research findings to regulatory agencies and advocate that a formula fuel based on the 5/14 research be mandated. (Lamb, Tr. 2187; Beach, Tr. 1755).

257. Mr. Lamb was opposed to this approach. (Lamb, Tr. 2187). He believed that the refining group at Unocal, which would need to spend a lot of money to comply with the CARB Phase 2 regulations, needed flexibility and compliance options. (Lamb, Tr. 2187). Mr. Lamb believed that by advocating a formula based on the 5/14 research, Unocal would be limiting the regulatory options for its refineries. (Lamb, Tr. 2187).

258. Mr. Lamb set forth his position on this issue in an October 2, 1990 memo to Mr. Roger Beach. (Lamb, Tr. 2186-87; Beach, Tr. 1756; CX 194). In this memo, Mr. Lamb discussed why he believed that Unocal should not advocate that regulatory agencies adopt a formula based on the 5/14 project research. (Lamb, Tr. 2187; CX 194). Mr. Lamb wrote: “If Unocal is successful in convincing regulators that 514 is correct it could become the specified formula and Unocal would have just one option and no opportunity for competitive advantage.” (CX 194 at 003).

259. In this memo, Mr. Lamb recommended to Mr. Beach that Unocal continue to advocate for performance standards rather than advocate in favor of any mandated formula—including one based on the 5/14 project research. (Lamb, Tr. 2187-88; Beach, Tr. 1756; CX 194 at 003). Mr. Lamb believed that performance standards provided more flexibility for Unocal. (Lamb, Tr. 2188). In essence, performance standards for a fuel mean simply establishing the level of emissions reductions to be achieved for specific pollutants. (CX 7063 (Sharpless, Dep. at 82)).

260. Mr. Lamb also recommended that Unocal should advocate for “a workable equal emission” provision, that is, a workable vehicle testing option. (CX 194 at 003; Lamb, Tr. 2189).

261. Mr. Lamb’s final recommendation to Mr. Beach in his October 2, 1990 memo was that Unocal should continue to “maintain secrecy regarding 514 findings until air quality benefits and cost-effectiveness are assured and appropriate opportunities for certification or substitution are determined.” (Lamb, Tr. 2189; CX 194 at 003). As Mr. Lamb explained, Unocal did not know what opportunities the 5/14 project research would provide for Unocal to produce its own fuels; Unocal did not know what the costs would be; and, finally, Unocal did not know what CARB would require

with respect to equal emissions provisions or mandated gasoline formulas. (Lamb, Tr. 2189; CX 194).

262. Mr. Lamb's thinking during the period was in line with Unocal management. During this time period, Unocal's Chief Executive Officer, Mr. Richard Stegemeier, supported performance standards. (Miller, Tr. 1434).

263. In response to this memorandum, Mr. Beach conveyed to Mr. Lamb that Unocal should approach CARB to see if they could convince CARB to go the "predictive model route." (Beach, Tr. 1757). Mr. Beach was also a strong supporter of performance standards—a lesson he had learned from the stationary source regulations. (Beach, Tr. 1740-41) ("I think both the industry and the regulators found out that issuing regulations on point specifications as opposed to, you know, performance standards that would have regulated the exhaust coming out of the stack was not the way to go."). Mr. Beach did not authorize Mr. Lamb to persuade CARB to adopt specifications that were based upon a 5/14 formula. (Beach, Tr. 1757).

264. Mr. Beach became aware of the proposals to take Unocal's research findings to regulatory agencies and advocate that a formula fuel be mandated when Mr. Dennis Lamb brought them to his attention. (Beach, Tr. 1755).

265. Mr. Lamb spoke with Mr. Beach about the memo on October 16, 1990. (Lamb, Tr. 2190-92). Mr. Lamb wrote on his copy of the August 2, 1990 memo, "Beach agreed per 10/16 conversation." (Lamb, Tr. 2190-91). In this October conversation, Mr. Beach did not authorize Mr. Lamb to persuade CARB to adopt specifications that were based upon a 5/14 formula. (Beach, Tr. 1757). According to Mr. Beach, he told Mr. Lamb "that was absolutely something we were not going to do." (Beach, Tr. 1755). Mr. Beach testified that Unocal's strategy was that Unocal wanted CARB to adopt a predictive model: "I mean, we wanted them to adopt a predictive model that didn't

have any limits on it, and that would provide us with the most flexibility and therefore the least capital cost. And beyond that we wanted CARB to do their own thing.” (Beach, Tr. 1755).

266. Mr. Lamb understood after his conversation with Mr. Beach that his marching orders were to continue to advocate performance standards and to oppose any formula fuels. (Lamb, Tr. 2193). He also understood his marching orders were to continue to seek a workable equal emissions provision from CARB and to maintain the secrecy of the 5/14 program until Unocal was able to explore the questions Lamb had raised. (Lamb, Tr. 2193).

267. In November 1990, the Unocal scientists presented the results of the expanded study to Mr. Beach and others. (Beach, Tr. 1758). These results confirmed the results of the original, single-car study. (Beach, Tr. 1758).

268. At that meeting, Mr. Beach rejected the suggestion that Unocal attempt to make certain specifications required in the industry. (Beach, Tr. 1759; CX 1182 at 035). According to Mr. Beach, “I told them we’re not going to do that.” (Beach, Tr. 1759). He did so because he was opposed to mandating any particular recipe or set of specifications. (Beach, Tr. 1758-60).

269. Lamb also learned about the results of the 5/14 project during the presentation. (Lamb, Tr. 2194). Mr. Lamb recalled that a “lightbulb” went on as he listened to the presentation, and for the first time, he understood that the 5/14 research could be used to develop a predictive model that could have broad application in the industry. (Lamb, Tr. 2194).

270. After seeing this presentation on the 5/14 project work, Mr. Lamb understood that there could be an opportunity for a third regulatory compliance option. (Lamb, Tr. 2194-95). In addition to the formula fuel and vehicle testing options, Mr. Lamb now saw that there was a potential for a third compliance option, a predictive model. (Lamb, Tr. 2194-95). At that time, it “clicked”

with Mr. Lamb that the equations that Dr. Jessup had used to predict emissions could have a broader utilization as a CARB compliance approach. (Lamb, Tr. 2208).

271. Mr. Lamb also realized that the 5/14 project research results could have implications for Unocal's concern that there would be a regulatory mandate for oxygenates. (Lamb, Tr. 2194-95). In a predictive model, a refinery could use its own strengths and weaknesses to its advantage. (Lamb, Tr. 2195). By playing on those strengths and weaknesses, a company could potentially reduce its oxygenate requirement to near zero. (Lamb, Tr. 2195).

272. In Unocal's particular circumstances, a predictive model could enable Unocal to take advantage of the fact that one of its refineries produced gasoline with very low sulfur and low olefins. (Lamb, Tr. 2195). Because both these properties were useful in reducing emissions, Unocal could use the low olefin/low sulfur qualities to offset the higher emissions from some other parameters of its gasolines. (Lamb, Tr. 2195). A predictive model might enable Unocal to make gasoline with just a minimum amount of oxygen, or with no oxygen at all. (Lamb, Tr. 2195-96).

b. The Unocal Inventors Desired Recognition for Their Work

273. The atmosphere at Unocal in the early 1990s was tense for researchers like Drs. Jessup and Croudace. Dr. Jessup elaborated, "From my perspective, Unocal had gone through very tight monetary times and was starting to restrict the budgets, and in particular the budget for the research center was a target. And there had been a lot of layoffs. There was talk of more layoffs. It was a scary time." (Jessup, Tr. 1588).

274. Dr. Croudace wrote memos attempting to get his management's attention once the 5/14 project was completed: "Well, up and to this point we had done all this research, what I considered to be probably some of the best research that I had seen out there, but we were keeping

it within the walls of Unocal. I was trying to get someone to listen to me and there's a whole series of these documents where we should go out and tell somebody about them. And it was, I have to admit, my ego trying to get my invention or Peter and my invention out there into the field." (Croudace, Tr. 643-44).

275. On November 27, 1990, Dr. Croudace wrote his manager, Wayne Miller, and told him that was inevitable that other studies to be conducted in the immediate future would uncover for CARB two of the key variables to reducing emissions—including T50—and that CARB would then regulate these variables in their Phase 2 regulations. (CX 207 at 001). Dr. Croudace believed CARB was on course to discover the effects of RVP and T50 on emissions in its own study by April 1, 1991, and would then regulate these variables in the Phase 2 gasoline specifications. (Croudace, Tr. 644-45; CX 207). Referencing others' previous or future studies, Croudace told Miller that if Unocal intended to use its results to its advantage in the marketplace and/or to influence CARB that "we have to use our information now." (CX 207 at 001).

276. It is evident from the face of the memorandum that "influencing CARB" did not mean trying to convince CARB to include a T50 specification in its regulations, as Dr. Croudace acknowledged that it was inevitable that this would occur without Unocal's input. (CX 207 at 001). Additionally, Dr. Croudace wanted to get credit for the fact he and Dr. Jessup discovered this first: "I wanted to discover it." (Croudace, Tr. 645).

277. Drs. Croudace and Jessup provided their superiors with various memoranda or presentations in which they raised various justifications for telling others about or otherwise using parts of their discoveries. For example, in a memorandum dated December 11, 1990, the scientists argued for an opportunity to go to Auto/Oil and present an alternative analysis of Unocal data which

would suggest that a mathematical construct of T50, T90 and T10 (known to the industry as a Driveability Index (“DI”)) was a key variable to reduce emissions and not just the T90 parameter Auto/Oil was investigating. (CX 210 at 002). This option, they argued, would “leave the door open” for Unocal to use its research results and license gasoline formulations to other oil companies. (CX 210 at 002). The scientists also argued that allowing publication of research results could allow Unocal to avoid expensive equivalency testing with the EPA or that publishing could make their CEO a hero in the oil industry by showing scientifically that emissions from gasoline could be reduced. (CX 210 at 003-004).

278. The scientists also argued that because their work showed that low olefins reduced emissions, Unocal could benefit from a regulation that recognized this fact since one of its refineries did not produce olefins. (CX 210 at 004).

279. Drs. Jessup and Croudace spoke of \$114 million in royalties per year. (CX 210 at 002, 004). The \$114 million dollars identified in CX 210 was based on one-tenth of one cent as a royalty figure. But that is not the only figure that Drs. Jessup and Croudace utilized. (Croudace, Tr. 595). In other memoranda, they also used one-thousandth of a cent, one-hundredth of a cent, and even a cent. (Croudace, Tr. 595; *see, e.g.*, CX 238 at 018).

280. Dr. Jessup, however, explained that at the time that he wrote came up with the \$114 million dollar number, he had no responsibility for licensing. (Jessup, Tr. 1587). Additionally, he had no prior experience with licensing at Unocal and had not been given any training on what factors to look for, if any, in determining appropriate licensing amounts. (Jessup, Tr. 1587). According to Dr. Croudace, none of the licensing numbers that Drs. Jessup and Croudace came up with (including the \$1 billion per year in CX 493) were based on any sort of licensing analysis that they had done.

(Croudace, Tr. 595-96). When asked how they came up with the numbers, Dr. Croudace explained that they simply “wanted a number big enough that it would interest people in our company” and that he and Dr. Jessup had basically picked the numbers “out of thin air.” (Croudace Tr. 596).

281. Drs. Jessup’s and Croudace’s superior, Dr. Miller, never reported to any of his direct superiors or anyone above them in any memorandum what the value of potential technology was. (Miller, Tr. 1451).

282. Dr. Jessup also believed, and stated in a May 1, 1991 internal Unocal presentation, that the 5/14 project had the potential to save Unocal’s refineries \$40 million per year. (Jessup, Tr. 1221-23; CX 238 at 018).

283. In another attempt to get attention for their research, Dr. Jessup prepared a poster board (CX 2) that was displayed at a spring 1991 meeting that included Unocal senior management (Wirzbicki, Tr. 933) alongside dozens of poster boards others had created describing various projects. The Science and Research Division had more than one poster in order to try and impress management and Mr. Schmale to continue to have funding for science. (Miller, Tr. 1452-53). According to Dr. Miller, Dr. Jessup was the one primarily responsible for the substance of the RFG poster. (Miller, Tr. 1451).

284. The inventors wanted to make the point “that research is valuable to the operating divisions. And that was the point really, was to get their attention and say, ‘[h]ey, we’re paying for ourselves, here’s potential income from research.’” (Jessup, Tr. 1589). This point was echoed by the testimony of Dr. Miller who said the point of the poster was to “[i]mpress Mr. Schmale that research is valuable and important.” (Miller, Tr. 1453). He went on to explain that their rationale was that they “wanted to continue to have funding.” (Miller, Tr. 1453). As Dr. Miller admitted,

“people wanted Mr. Schmale to notice that they were contributing to the company through the various projects that they put on their posters.” (Miller, Tr. 1453).

285. The poster board showed a rainbow and pot of gold, using computer clip art that Dr. Jessup found to be “a nice touch.” (Jessup, Tr. 1242). It also used a royalty figure of one cent per gallon, applied to all of the gallons of gasoline sold in the U.S. in a year, to come up with a figure of one billion dollars, which Dr. Jessup, “pulled out of the air,” as part of their attempt to get attention. (Jessup, Tr. 1589; CX 2). As Dr. Jessup testified, however, no amount of money Unocal could earn from his work would motivate Dr. Jessup to commit fraud. (Jessup, Tr. 1589).

c. Unocal’s Advocacy Strategy Was Not Motivated by Awareness of an Uncertain Patent Application or Royalties

286. After Roger Beach had seen the 5/14 presentation from Drs. Jessup and Croudace, he understood that Unocal was planning on filing a patent application on an invention relating to that work. (Beach, Tr. 1761). Mr. Beach’s knowledge of the patent application was limited. Mr. Beach never looked at the patent application and does not recall discussing the contents of the patent application with anyone. (Beach, Tr. 1761). Furthermore, Mr. Beach did not have any understanding as to what the claims of the patent application covered. (Beach, Tr. 1761). According to Mr. Beach, he was not personally involved in the patent application. (Beach, Tr. 1762).

287. Although Mr. Beach knew about the patent application, he was skeptical the scientists would obtain a patent on the gasoline formulae contained in the ’393 claims. (Beach, Tr. 1761). He “had a jaundiced view that they’d ever get a patent” on the work that they had done. (Beach, Tr. 1761).

288. Mr. Lamb also learned in late 1990 that Unocal had filed a patent application on some of the results of its 5/14 research project. (Lamb, Tr. 2196). Like Mr. Beach, Mr. Lamb never saw the patent application, and did not know what it covered. (Lamb, Tr. 2196). Mr. Lamb has never read the claims of the patent application. (Lamb, Tr. 2196). When he learned that Unocal had filed for a patent application in December of 1990, that did not change in any way the plan of action that he and Mr. Beach had agreed upon in his October 2, 1990 memo. (Lamb, Tr. 2405-06).

289. Mr. Lamb's subordinate, Mr. Michael Kulakowski, learned of the patent when he had at least one conversation with Dr. Jessup in late 1990 or early 1991. (Kulakowski, Tr. 4572-73). In that conversation, Dr. Jessup told Mr. Kulakowski either that he had filed for a patent or was considering filing for a patent pertaining to the work he had done on low emissions gasoline. (Kulakowski, Tr. 4572-73). Mr. Kulakowski admitted these facts to Complaint Counsel in his Investigational Hearing at which no representative from Unocal was present. (Kulakowski, Tr. 4572-73). Either the same day as his conversation with Dr. Jessup involving the patent application or the next day, Mr. Kulakowski went to Mr. Lamb's office and told Mr. Lamb that Dr. Jessup thought he was going to get a patent for CARB gasoline. (Kulakowski, Tr. 4573). Mr. Kulakowski was skeptical of the idea that Dr. Jessup would obtain a patent. (Kulakowski, Tr. 4511). When he told his boss about it, Mr. Lamb confirmed that Mr. Kulakowski's skepticism was justified: "Mr. Lamb rolled his eyes and waved his hands, kind of shook his head and said, 'Don't worry about that.'" (Kulakowski, Tr. 4511). After Mr. Kulakowski's discussion with Mr. Lamb regarding the patent application, Mr. Kulakowski put the idea out of his mind. (Kulakowski, Tr. 4511-12, 4574).

290. Unocal then-CEO Mr. Richard Stegemeier testified that he simply did not monitor the prosecution of the RFG patents, "Not at all, not close." He explained that, "the company had at

any given time perhaps a thousand active patents. It had 50 to a hundred patent applications under review in the patent office, some of which never materialized, some of which did. And that's the responsibility of the patent counsel to do that, general patent counsel to do that." (CX 7065 (Stegemeier, Dep. at 90)).

291. While Drs. Jessup and Croudace attempted to draw attention to the idea that their invention could bring royalties to Unocal, Mr. Roger Beach testified that there were no plans at Unocal in 1990 or 1991 to charge royalties on the 5/14 research. (Beach, Tr. 1763). While he understood that there could be potential for licensing income from an invention, during this time frame, he did not have any understanding as to what the potential licensing income would be. (Beach, Tr. 1763). Despite the fact that Mr. Beach knew generically about the potential for licensing income from inventions, he made his decisions regarding an advocacy strategy to CARB based on what he thought would best limit the amount of capital costs to be imposed by the regulations. (Beach, Tr. 1761-62). Mr. Beach's focus was as an "operating person." (Beach, Tr. 1762). And, as an operating person, "anything about patents was a big black hole." (Beach, Tr. 1762).

292. Similarly, Mr. Lamb was not aware of any plans at Unocal in 1990 or 1991 to charge royalties on anything related to the 5/14 research. (Lamb, Tr. 2207). He recalls seeing numbers such as the ones discussed in CX 210 in materials that he received from the scientists, but did not believe such numbers had any basis in reality. (Lamb, Tr. 2206-07). He never discussed these numbers with Dr. Miller, nor did these numbers have any effect on Mr. Lamb's decisions about what to say to CARB. (Lamb, Tr. 2207).

4. Unocal Formed Its Equivalency Task Force to Develop a Strategy for Advocacy of Equivalency Provisions at the State and Federal Levels

293. Once Mr. Lamb understood the potential implications of the 5/14 work, he formed a task force within Unocal to ensure that the emerging regulations at both the national level and at the state level would include “equivalency” provisions such as testing and modeling compliance options. (Lamb, Tr. 2208-09; CX 225 at 003-004). This task force included individuals from Unocal’s marketing department, state and federal government relations departments, environmental science department, refining department, and science and technology department. (Lamb, Tr. 2209). In a memo inviting individuals to join this equivalency task force, Mr. Lamb wrote that “the opportunity for pure equivalency still exists.” (Lamb, Tr. 2210; CX 225 at 004). Mr. Lamb was referring in this statement to a regulatory compliance option that had no artificial minimums or maximums but would restrict Unocal’s refineries’ ability to comply with the regulation. (Lamb, Tr. 2210).

294. Unocal’s equivalency assurance task force adopted a five-part strategy. (RX 152). The first strategy was to advocate that CARB adopt “unrestricted pure equivalency provisions.” (RX 152; Lamb, Tr. 2212-13). What Unocal wanted was to have the ability for the parameters to float up or down so that Unocal could have the greatest flexibility for its refineries. (Lamb, Tr. 2213).

295. The second part of Unocal’s strategy was to “focus on keeping oxygen levels unrestricted in the CARB regulations.” (RX 152; Lamb, Tr. 2213). Because oxygen was a very expensive commodity that Unocal did not manufacture, Unocal wanted to be able to both avoid the use of oxygen and to use oxygenate if necessary at its most economical level. (Lamb, Tr. 2213).

296. The third strategy that Unocal's equivalency assurance did was to "maintain the confidentiality of the 5/14 theories in order to retain multiple compliance options until cost-effectiveness can be determined." (RX 152; Lamb, Tr. 2214). Mr. Lamb stated that as of early 1991, Unocal was still attempting to understand what the 5/14 theories meant to Unocal in terms of a regulatory framework and what the costs would be and thus wanted to keep confidentiality in place until they had a good grasp on what potential regulatory options meant to Unocal. (Lamb, Tr. 2214).

297. The fourth strategy Unocal's equivalency assurance task force adopted was to "work with EPA and CARB to craft practical, workable equivalent certification procedures (both modeling and testing)." (RX 152; Lamb, Tr. 2215-16). With respect to CARB, Unocal wanted to make sure that CARB had in place a testing program such as that developed for diesel, and wanted also to ensure that CARB was considering the possibility of a predictive model. (Lamb, Tr. 2215).

298. The fifth strategy was to "implement fall back plans to influence rulemaking through (a) an executive office action or (b) legislative branch action in case regulatory action appears to be failing." (RX 152; Lamb, Tr. 2215). The equivalency assurance task force outlined "backup" plans which included executive office or legislative intervention if the EPA or CARB were not successful in coming up with the regulatory compliance options that Unocal viewed as workable or helpful to Unocal. (RX 152; Lamb, Tr. 2211-12). Unocal anticipated that it might need to go to either the executive office or to the legislature to "nudge" the regulatory agencies in a direction that would be more helpful to Unocal. (Lamb, Tr. 2211-12).

5. To Follow Its Predictive Model Strategy, Unocal Decided to Disclose Its Research to CARB

299. In following this five-part strategy, in the spring of 1991, Unocal proceeded on a couple of fronts. (Lamb, Tr. 2216). At the national level, Unocal was participating in the regulatory negotiation process with respect to two concepts, a “simple model” for EPA Phase I, and a “complex” predictive EPA model. (Lamb, Tr. 2216-17).

300. At the state level, Unocal began looking at opportunities to further the predictive model concept at CARB. (Lamb, Tr. 2216). Unocal decided to take its research to CARB in the hopes that CARB would build a predictive model compliance option into its Phase 2 regulations. (Lamb, Tr. 2217; Beach, Tr. 1764-65).

301. By May 10, 1991, the head of Unocal's regulatory effort, Dennis Lamb (Kulakowski, Tr. 4412), had contacted CARB and requested a meeting in the future between CARB and Unocal, although he had not told CARB the purpose of the meeting. (CX 241 at 001).

302. Mr. Lamb was the person in charge of Unocal's regulatory position and the presentation to CARB to be made at the June 20, 1991 meeting. (Kulakowski, Tr. 4412). Before the meeting, Unocal scientists prepared the main slide presentation for the meeting. (Miller, Tr. 1400-01). Dr. Miller testified that he recalled working primarily with Dr. Jessup to prepare for that meeting and put together slides. (Miller, Tr. 1400-01). Dr. Croudace also recalls that they went through “a number of rounds of what kind of slides we would present there.” (Croudace, Tr. 468).

303. In advance of the Unocal presentation to CARB, Mr. Lamb wrote a memo to Dr. Miller providing his thoughts and suggestions on the presentation. (Lamb, Tr. 2217-18; CX 241). In this memo Mr. Lamb stated that “the purpose of the presentation should be to convince CARB

staff that predictive equations or vehicle testing in particular should not include unnecessary minimums or maximums on fuel parameters (e.g. oxygen).” (CX 241; Lamb, Tr. 2218). Unocal wanted to be able to operate within the full range of gasoline parameters and not have unnecessary minimums and maximums on parameters such as oxygenate. (Lamb, Tr. 2218).

304. As explained by Dr. Peter Jessup, who received a copy of the memorandum, Unocal wanted to convince CARB not to put any fuel property caps or boundaries in the predictive model. (Jessup, Tr. 1502). Specifically, individual refineries should “be allowed to come” to their “own best gasoline blending methods to meet the CARB requirements of emission . . .” (Jessup, Tr. 1502-03). Because every refinery is different, Unocal believed what was optimum in one refinery was not optimum in another. (Jessup, Tr. 1504).

305. One advantage of a predictive model as opposed to a specified formula or range of formulae is one of flexibility and cost. (Beach, Tr. 1765-66). A performance standard would allow Unocal to determine what capital expenditures to make at each refinery, given the unique nature of each of its refineries. (*See* Beach, Tr. 1765-66) (capital requirements would lower with a predictive model because “[t]here would be a lot more flexibility than a specific composition regulation and also limits on the distillation of that gasoline”). One motivation for seeking such flexibility on a refinery-by-refinery basis was Unocal’s desire to obtain a competitive advantage from the fact that its San Francisco refinery featured a very low sulfur gasoline, had high aromatics, and almost no olefins. (Kulakowski, Tr. 4601-03; Beach Tr. 1765-66 (a predictive model would enable Unocal to use low-olefin gasoline to Unocal’s advantage)). As Mr. Kulakowski testified, one of the priorities of the upcoming June 20, 1991 meeting was to look for a way to take advantage of those properties in the CARB proposal. (Kulakowski, Tr. 4603).

306. Unocal's primary goal of working with CARB to avoid set specifications and adopt a predictive model was explained by the testimony of Unocal scientist Dr. Michael Croudace:

The problem that we had, as our refinery set out, is we didn't want to have to meet set specifications, things like MTBE where we were not basic. We did not want to see an oxygenate rule put in. We didn't want to see mandates on exactly how to set your RVP. And we saw that those were going to be probable outcomes of what was happening in Sacramento. So it was the purpose of this meeting to give them enough information to give them an idea that they could do a predictive model, much in the same fashion that the autos have predictive models.

(Croudace, Tr. 655-56). As further explained by Mr. Dennis Lamb, on cross-examination, Unocal wanted CARB to consider putting in its regulations a predictive model—mathematical equations that refiners could use to predict gasoline emissions that would comply with the regulations. (Lamb, Tr. 1997-98). Thus, in the meeting with CARB, Unocal wanted to show CARB the concept of mathematical equations to predict emissions. (Lamb, Tr. 1997-98; Kulakowski, Tr. 4607).

307. As admitted by Mr. Kulakowski, Unocal representatives knew that a single recipe by its very nature could have an effect on competition, and that was one of the reasons that Unocal wanted the June 20, 1991 meeting in the first place. (Kulakowski, Tr. 4607-08). Unocal advocated for a predictive model, not a particular composition of gasoline. (Kulakowski, Tr. 4608).

308. In addition to the primary goal of advocating performance standards, Mr. Lamb also described an additional priority in his May 10, 1991 memorandum:

The second priority is to convince CARB of the importance of T50. (We have been willing to support the relative importance of D.I. over T90 in the past. We will now be saying T50 is relatively more important than D.I.) We will need to be ready to comment on the effect substituting T50 for T90 or D.I. will have on the effect of other parameters. (See the attached effect on A/O slopes when D.I. is substituted for T90.)

(CX 240 at 001). Unocal's research showed that oxygenate was not necessary for a clean gasoline. (Lamb, Tr. 2218). Specifically, it had shown "that oxygenates to deliver oxygen to gasoline were not necessary and had no effect on emissions." (Jessup, Tr. 1505-06). Instead, Unocal had learned that oxygenate acted as a tool to lower T50—and that it was the reduction in T50—not the presence of oxygenate—that reduced emissions. (Lamb, Tr. 2218-19).

309. Unocal wanted to be able to find the most cost-effective level of T50 for Unocal without unnecessary minimums and maximums on oxygenate. (Lamb, Tr. 2219).

310. As explained by Dr. Peter Jessup, it was not Unocal's intent to try and convince CARB to put caps or limits on T50 in the 1991 regulations. (Jessup, Tr. 1504). Before Unocal's meeting with CARB, the Fuels Issues Team made a decision to oppose the setting of caps and specifications. (Croudace, Tr. 656-57). Furthermore, Unocal's CEO at the time, Mr. Roger Beach, stated at trial that he did not authorize Mr. Lamb to persuade CARB to adopt certain specifications. (Beach, Tr. 1757). Mr. Beach never authorized Mr. Lamb to lobby CARB for a T50 specification. (Beach, Tr. 1757).

311. Mr. Beach acknowledged that T50 was an important property for low emissions gasoline (Beach, Tr. 1673-74) but the last thing Unocal wanted was for CARB to adopt T50 as an additional specification in its Phase 2 formula. (Beach, Tr. 1671-72, 1781, 1792 ("so we knew there was a risk when we went up there and exposed our data because it was obvious that T50 was very important, but we sure didn't want to come back with more specifications on the proposed regulation than was already there.")).

312. Before meeting with CARB, Unocal representatives discussed the sort of materials that would be presented to CARB. (Croudace, Tr. 468). As explained by the testimony of Mr. Kulakowski, there was no discussion, however, between the Unocal representatives in advance of the June 20, 1991 meeting with CARB as to whether the '393 patent application should be disclosed. (Kulakowski, Tr. 4600-01).

313. Mr. Lamb did not have any discussions with anyone at Unocal about whether to disclose the existence of Unocal's patent application to CARB, nor did he have any discussions with anyone at Unocal about whether to disclose the actual patent application itself to CARB. (Lamb, Tr. 2242). As explained by a passage of Mr. Lamb's Investigational Hearing Transcript, which was read into the record to clarify previous Investigational Hearing testimony:

Q: Mr. Lamb, do you have an understanding as you sit here today as to the reasons why Unocal did not disclose the patent application to CARB?

A: Well, I was involved in all of that activity. I was the primary point of contact on fuels issues for CARB, from Unocal to CARB, and with EPA for that matter. Now, there are other people in our department, but I can tell you I don't even recall any discussions about it. I mean, there wasn't any debate, so to speak, shall we tell CARB, shall we not tell CARB.

(Lamb, Tr. 2251).

314. Similarly, Dr. Miller does not recall any decisions being made to not disclose the fact that there was a pending patent application to CARB in 1991. (Miller, Tr. 1436). According to Dr. Jessup, before meeting with CARB in June of 1991 no one had instructed him not to tell CARB about pending patent applications. (Jessup, Tr. 1505). Furthermore, such a direction did not ever occur at any time during his employment. (Jessup, Tr. 1505).

315. Unocal's priorities as of June of 1991 with respect to CARB's anticipated Phase 2 rulemaking were to ensure that the regulations were based upon sound science, offer as much flexibility to the refineries as possible, and gain a competitive advantage in terms of lower cost compliance. (Kulakowski, Tr. 4601-02). Neither the '393 patent application nor any potential patent licensing were priorities for Unocal as of the June 20, 1991 meeting with CARB. (Kulakowski, Tr. 4603).

316. From the perspective of former Unocal scientist Dr. Wayne Miller, disclosure of research to CARB was not intended to further Unocal's license or patent strategy. (Miller, Tr. 1450). Mr. Michael Kulakowski, a former Unocal employee who now works for Shell, further admitted that neither the patent application nor licensing was a priority at the time of Unocal's meeting with CARB. (Kulakowski, Tr. 4603).

6. CARB Was Already Interested in the Regulation of T50 Before Unocal Even Met With CARB in June of 1991

317. Before Unocal even met with CARB to discuss the results of its research, several other participants argued that T50 had an effect on emissions. (*See* RFF 320-33). In fact, CARB was already convinced of the importance T50 months before Unocal mentioned T50 to CARB. (*See* RFF 334-38).

318. The distillation of gasoline occurs gradually as the gasoline is manipulated by heat in the refining process. (Ingham, Tr. 2656-59). The term "T50" is a gasoline property that refers to the temperature at which 50 percent of gasoline distills. (Croudace, Tr. 624-25; Ingham, Tr. 2656-59).

319. The distillation of gasoline can be expressed along a “distillation curve,” which displays the boiling range of a fuel from the initial boiling point to the endpoint, and measures the various points along the curve when certain percentages of the fuel are distilled. (Ingham, Tr. 2656-59).

a. Toyota Presented the Importance of T50 to CARB in 1990

320. By October 1990, Toyota had already conducted some research investigating the effects of T50 on emissions. (CX 5 at 030; Jessup, Tr. 1230).

321. In October 1990, Toyota made a presentation to CARB about its research into the effects of T50 on gasoline emissions. (CX 5 at 030; *see also* CX 482 at 004-005, 014 (discussing Toyota’s program)).

322. In an April 1991 meeting between Toyota and CARB, Toyota made another presentation that explained the importance of T50 on reducing emissions. (Venturini, Tr. 346-50 (testifying on RX 19 at 014 and explaining that Toyota discussed the emissions reductions resulting from T50 changes at the April 1991 meeting)).

323. The Toyota presentation and this research information was confidential. (Venturini, Tr. 348-50; *see* RX 19 at 001). CARB’s Mr. Peter Venturini was unable to say when Toyota declassified this research prior to 1996. (Venturini, Tr. 347).

324. Notwithstanding the inability to say when or if Toyota’s research had been declassified as confidential, CARB inserted a chart from Toyota’s October 1990 presentation into the Technical Support Document. (CX 5 at 030; *see also* Venturini; Tr. 347, 350-51, 756). CARB also expressly cited the Toyota information as one of the bases for the T50 specification in the Technical Support Document (CX 5 at 030).

325. Further, in its Final Statement of Reasons for the Phase 2 regulations, CARB used Toyota's study to justify CARB's responses to comments about its imposition of a T50 specification. (CX 10 at 049 (Comment and Response 67)).

326. In addition, another CARB official, Mr. Curtis, confirmed Mr. Venturini's testimony that CARB received information about T50 from Toyota in 1991 or earlier. (Curtis, Tr. 5916-17). Mr. Curtis had reviewed the Toyota information, which showed that T50 was important for exhaust emissions. (Curtis, Tr. 5916-17).

327. Mr. Curtis testified that CARB took many factors into consideration in proposing and adopting the T50 specification, including the Toyota study, the Unocal research, and the ability of the industry to produce gasoline at specified T50 ranges, among others. (Curtis, Tr. 5917-18). Mr. Curtis, in testimony read into the record to impeach a contradictory answer, admitted he could not place Unocal's research on T50 as more or less important or useful to CARB in proposing and adopting a T50 specification as compared to the Toyota research or other factors. (Curtis, Tr. 5918-19).

b. Chevron Presented DI to CARB

328. In addition to Toyota, Chevron also researched the relationship between the distillation temperature of gasoline and emissions. (Ingham, Tr. 2622). Dr. Ingham testified that he was asked to undertake this series of experiments. (Ingham, Tr. 2622).

329. Chevron met privately with CARB approximately 22 times between 1990 and 1994. (CX 7042 (Bea, Dep. at 31-32)). In at least some of those meetings, Chevron discussed its research on Driveability Index with CARB. (CX 7042 (Bea, Dep. at 39-40)).

330. The driveability index formula uses all three common distillation points: ten percent, fifty percent, and ninety percent, or T10, T50, and T90. (Ingham, Tr. 2656-57). The actual formula for driveability index weighs the three individual variables differently, with T50 given the most weight: $DI = 1.5 T_{10} + 3.0 T_{50} + 1.0 T_{90}$. (CX 207). T10 is multiplied by 1.5, T50 is multiplied by 3, and T90 is multiplied by 1, and then the three figures are totaled. (CX 207; Ingham, Tr. 2656-59).

331. On August 30, 1990, Chevron met with CARB to present the results of research that it had done into DI. (Ingham, Tr. 2665, 2668-70; CX 977 at 002). The subject of the meeting was Chevron's reformulated premium unleaded gasoline, and at the meeting Chevron indicated that "a strong relationship had been found between the Driveability Index value of a fuel and exhaust hydrocarbon emissions." (Ingham, Tr. 2667-70; CX 977 at 002).

332. Chevron had alluded to this connection with CARB as early as a year before that. (CX 977 at 002; Ingham, Tr. 2669-70). According to a letter from CARB to Chevron, "This relationship [between DI and HC emissions] had been alluded to in contacts between the ARB staff and Chevron personnel as long as a year ago and has been treated as confidential information by the ARB at Chevron's request." (Ingham, Tr. 2670; CX 977 at 002).

c. Auto Companies Publicly Desired Lower T50

333. The auto companies also lobbied CARB to regulate a reduction in T50, as an August 1990 Exxon memo reported GM's "gratuitous advice for ARB to regulate T50 to address any driveability problems which may result from 7.0 RVP" and described a GM presentation which, "[n]ot incidentally, . . . would relieve some of the pressure for auto emission control system improvements." (RX 518; CX 7056 (Martinez Dep. at 120)).

d. CARB Wanted Information About T50 in January 1991 and Conceived a Study to Develop Information on the Distillation Temperatures of Gasoline

334. As early as January of 1991, CARB was saying that T50 was “critical” to the upcoming Phase 2 regulations. (RX 677). At that time, CARB requested that WSPA provide information regarding the feasibility of reducing T50 by 20°F because it was critical to have lower T50 for the purposes of the regulation. (RX 677; Lieder, Tr. 4754-56).

335. Even after WSPA claimed that a 20°F reduction in T50 would lead to an unbalanced refinery situation, CARB persisted in their request because they believed that it was critical to the regulation to have lower T50. (Lieder, Tr. 4754-56; RX 677).

336. CARB initiated a joint research project with General Motors (GM) and WSPA relating to driveability index. (Lieder, Tr. 4682-83). The study investigated both DI, including T50 as its major component, and RVP. (Courtis, Tr. 5759; Jessup, Tr. 1522).

337. As an internal CARB document from January 1991 shows, CARB intended to use the CARB/WSPA/GM study to develop data on distillation temperature of gasoline, listing the T10, T50, and T90 parameters. (Courtis, Tr. 5759; CX 785 at 003).

338. Further, even though the CARB/WSPA/ GM study results had not been finalized as of October 1991, CARB used some of the results from that study to support its regulations on distillation temperatures in the Technical Support Document. (Courtis Tr. 5756-57; *e.g.*, CX 5 at 021-025, 060-061). Specifically, CARB staff stated that the preliminary results of the CARB/WSPA/GM study “show that controlling the distillation characteristics of the gasoline is important, and that T50 is one of the major parameters to consider.” (Venturini, Tr. 748-49; CX 52 at 033).

7. ARCO Showed Its EC-X Fuel to CARB Before Unocal Presented Its Research

a. Even Before the Phase 2 Process Began, CARB Was Aware of and Sought to Adopt Regulations Reflecting ARCO's Reformulated Fuel

340. During the late 1980s and early 1990s, ARCO was a major retailer of gasoline in the California market and had a significant share of the market. (RX 109; CX 7063 (Sharpless, Dep. at 66-67)). In fact, that ARCO was the largest retailer of gasoline in the state is reflected by CARB's own rulemaking documents. (CX 10 at 090; CX 7063 (Sharpless, Dep. at 68)).

341. On August 15, 1989, CARB issued a press release through Bill Sessa, the press contact at CARB. (RX 108; CX 7063 (Sharpless, Dep. at 58)). In this press release, CARB Chairwoman Jananne Sharpless commended ARCO's efforts to reformulate gasoline and identified those efforts as representing the direction of CARB's future regulation. (RX 108). Specifically, the press release begins by quoting Jananne Sharpless as saying that "[w]e're pleased that ARCO has taken the initiative in developing a new gasoline that is more environmentally acceptable and which reflects the direction of the ARB's future regulation." (CX 7063 (Sharpless, Dep. at 59)).

342. In this press release, Ms. Sharpless also said "this type of creativity, by a company from Southern California and one who will benefit from cleaner air, is encouraging and it reflects the kind of changes that the ARB will be requiring of others in the oil industry as we develop our proposal." (RX 108; CX 7063 (Sharpless, Dep. at 60)).

343. As early as 1989, CARB staff used ARCO's reformulated fuel as an example of low-emissions gasoline that might be suitable for California regulations. (RX 109). This is reflected in a November 1989 letter from Mr. Tom Cackette to Senator Bill Leonard. (RX 109; CX 7063

(Sharpless, Dep. at 61-62)). Mr. Cackette was the Deputy Executive Officer of CARB at that time. (RX 109 at 002). Senator Leonard was an important senator from California and the letter is a response to Mr. Leonard who had sent a letter to Ms. Sharpless. (RX 109; CX 7063 (Sharpless, Dep. at 64)). There was a close relationship between Senator Leonard and the Air Resource Board and the staff. (CX 7063 (Sharpless, Dep. at 64)).

344. The letter notes, in the third paragraph, that ARCO had voluntarily introduced a cleaner gasoline for use in older cars called EC-1. (RX 109; CX 7063 (Sharpless, Dep. at 65)). In the letter, Mr. Cackette then states “[f]urthermore, ARB staff will propose next year that all gasoline, beginning in about 1993, have cleaner properties similar to EC-1.” (RX 109; CX 7063 (Sharpless, Dep. at 65)).

b. ARCO Presented EC-X to CARB on June 7, 1991 and CARB Again Displayed Its Interest in T50

345. ARCO’s EC-X test program was ARCO’s first reformulated gasoline test program that was targeted towards the Phase 2 regulations. (Clossey, Tr. 5360). The program consisted of four test blend fuels, and was the beginning of ARCO’s research to try and define how severely one would have to reformulate a gasoline in order to achieve M85 equivalence. (Clossey, Tr. 5360-61).

346. During the Phase 2 process, ARCO was one of the companies that was foremost in being forward with proposed specifications that they independently came up with. (CX 7040 (Aguila, Dep. at 120)). ARCO offered its EC-X fuels to the staff as examples of a viable fuel that could be considered when determining how to construct the Phase 2 regulations. (CX 7040 (Aguila, Dep. at 119-21)).

347. Toward that end, ARCO presented the specifications of its EC-X blends to CARB staff in a private meeting on June 7, 1991. (RX 180 at 003; Clossey, Tr. 5359-60, 5498-99; Segal Tr. 5688-5690; RX 590). Mr. Robert Fletcher identified RX 180 as presentation slides from a meeting with ARCO on June 7, 1991. (Fletcher, Tr. 6918; Clossey, Tr. 5499 (identifying the first eight pages of RX 180 as the handout ARCO gave to CARB at this presentation)). Members of ARCO's clean fuels task force, including Mr. Jack Segal (Director of Industry Liaison) attended the meeting. (Segal, Tr. 5688-90; RX 589). In addition, the June 7, 1991 meeting was also attended by CARB staff members including Mr. Robert Fletcher. (Fletcher, Tr. 6461; Segal, Tr. 5689-90; RX 589).

348. ARCO's Mr. Timothy Clossey prepared a document that shows several meetings with CARB (RX 589; Clossey, Tr. 5481-82). The first two pages of that document, RX 589, set forth dates of meetings that Mr. Clossey was able to document that ARCO individuals met with CARB. (RX 589; Clossey, Tr. 5485). This list does not reflect all of the meetings ARCO had with CARB. (Clossey, Tr. 5485-86). For example, while he working as part of ARCO's Clean Fuels Task Force, Mr. Clossey had dozens of meetings with CARB, which are not reflected on RX 589. (Clossey, Tr. 5485-86).

349. CARB's interest in T50 was evident at its June 7, 1991 meeting with ARCO. During the meeting, ARCO presented the specifications of its EC-X blends. (RX 180 at 003). ARCO discussed four specific fuel formulas with CARB. (Clossey, Tr. 5499-500). These four fuel formulas are set forth on one of the slides ARCO presented to CARB. (RX 180 at 003; Clossey, Tr. 5499-500). This slide is entitled, "ARCO EC-X Test Program Test Blend Analyses Summary." (RX 180 at 003; Clossey, Tr. 5499-500). ARCO did not, however, initially present the values for

T50. (Clossey, Tr. 5363). Armed with their knowledge of the importance of T50, CARB staff inquired about the T50 specification for EC-X. (Clossey, Tr. 5363-64; Fletcher, Tr. 6463). ARCO looked it up and then told CARB staff what it was. (Clossey, Tr. 5364). On a copy of the presentation provided by ARCO, Mr. Fletcher of CARB handwrote in two T50 values of 190° and 200° Fahrenheit for ARCO's EC-X gasoline. (RX 180 at 003; Fletcher, Tr. 6918-19). Mr. Fletcher admitted that this information was sought at the meeting because CARB was already interested in potentially regulating T50 as of June 7, 1991. (Fletcher, Tr. 6918-19).

8. CARB Held Its First Workshop on June 11, 1991

350. After Unocal had scheduled its meeting with CARB, but before the meeting actually occurred, CARB held its first public workshop related to the Phase 2 regulations on June 11, 1991. (CX 492; CX 1047; CX 793).

351. CARB gave official public notice of the June 11, 1991 workshop on May 23, 1991. (CX 492; Venturini, Tr. 262; Fletcher, Tr. 6958 (identifying duplicate exhibit RX 167 as the notice for the first workshop for the Phase 2 regulatory development)). The purpose of the workshop notice was to encourage people to attend. (Venturini, Tr. 372). According to Mr. Venturini, Unocal had a right to rely on what was said in this notice. (Venturini, Tr. 370).

352. The purpose of the workshop was to discuss the specifications which CARB had been considering for Phase 2 reformulated gasoline. (CX 492 at 001).

353. The workshop notice and its attachment revealed that several parameters were being considered by CARB for regulation including "distillation distribution." (CX 492 at 002, 004). Paragraph A-1 of the attachment also represents that while the "ARB staff is considering regulations which will set specific limits on those fuel parameters which affect criterial and toxic pollutants,"

CARB was also considering an “alternative” approach. (CX 492 at 003). Specifically, CARB represented that “[a]s an alternative to the fuel parameter specifications, the ARB will consider the use of predictive models and/or vehicle testing programs.” (CX 492 at 003). Unocal’s Mr. Dennis Lamb testified that he understood that CARB was discussing the potential of looking at a predictive model in this notice. (Lamb, Tr. 2402-03).

354. The workshop notice also describes how CARB was planning to determine refinery costs for reductions in criteria pollutants. (CX 492 at 005). It planned to do so by hiring an outside consultant, Bechtel Corporation, through the use of a linear program refinery model to simulate refinery operations. (Venturini, Tr. 373; Fletcher, Tr. 6958; CX 492 at 005 (referred to in Fletcher testimony as RX 167)).

355. At the workshop a team from CARB, including CARB staff member Mr. Jim Aguila who was in charge of the cost component of the regulatory development, made a presentation regarding CARB’s efforts to develop the Phase 2 regulations. (CX 7040 (Aguila, Dep. at 91-93); CX 1047 (visual aids for presentation)).

356. Mr. Aguila testified that he recognizes CX 1047 (referred to in testimony as RX 182) as a copy of slides used at a public workshop dated June 11, 1991. (CX 7040 (Aguila, Dep. at 91)). The only slide that discusses cost in CX 1047 (referred to in testimony as RX 182) is entitled “LP Refinery Cost Analysis Methodology” and all three bullet points exclusively relate to linear programming methodology. (CX 7040 (Aguila, Dep. at 91-93); CX 1047 at 016).

357. During the staff presentation, CARB also discussed the possibility of regulating a number of different parameters. (CX 1047 at 004-015, 017-019; CX 252 at 001 (June 13, 1991 Kulakowski Memorandum)).

358. CARB announced its intention to propose formula requirements as opposed to a predictive model, because (in CARB's view) a predictive model would be too difficult to enforce. (CX 793 at 001; RX 519 at 002). Nonetheless, CARB again indicated that it was willing to consider the use of a predictive model. (CX 793 at 001). Despite willingness to consider a predictive model, by June of 1991, an undisclosed determination had been made within CARB that individual fuel specifications would be pursued and that any predictive model would have to comply with whatever caps were in place. (Simeroth, Tr. 7471-72).

359. Additionally, at the June 11, 1991 workshop, CARB again heard about the importance of T50 from at least one source—Toyota. Toyota told CARB that it and other auto manufacturers had generated a lot of data on the effect of T50 in the range of 220°-240°F. (RX 519 at 003; CX 252 at 003).

360. Toyota also advocated for a higher T50 coefficient in the DI formula. (RX 519 at 003; Ingham, Tr. 2719-22; RX 757 at 003). Using a higher coefficient puts more emphasis on that variable in the equation. (CX 7056 (Martinez, Dep. at 131-32)). In fact, at the workshop, CARB was interested in obtaining data to support T50. (CX 252 at 003).

9. Unocal Met with CARB on June 20, 1991 to Advocate for the Importance of a Predictive Model and Against an Oxygenate Mandate

361. Unocal met with members of the CARB staff on June 20, 1991. (Lamb, Tr. 1832). At this meeting, Unocal presented results of its 5/14 project to CARB staff. (Lamb, Tr. 1832).

362. Mr. Dennis Lamb, the head of Unocal's Fuels Issues Team, attended the meeting along with Mr. Michael Kulakowski. (Lamb, Tr. 1832-33; Kulakowski, Tr. 4421-22). Several

Unocal scientists also attended including Dr. Peter Jessup, Dr. Michael Croudace, and Dr. Wayne Miller. (Lamb, Tr. 1832-33; CX 255 at 002; Miller, Tr. 1400).

363. Mr. Peter Venturini, Mr. Dean Simeroth, Mr. Robert Fletcher and Mr. John Courtis attended on behalf of CARB. (Venturini, Tr. 138; Fletcher, Tr. 6465). Mr. Lamb recalled that Mr. Venturini and Mr. Simeroth were there from CARB as well as other individuals whom he could not currently recall. (Lamb, Tr. 2220).

364. Unocal made a slide presentation to CARB staff at this meeting. (CX 24; Jessup, Tr. 1255). CARB staff member Mr. Robert Fletcher testified that he recognized CX 24 to be a copy of the “presentation slides provided to us by Unocal.” (Fletcher, Tr. 6465; *see also* Courtis, Tr. 5922-24). The agenda for this meeting indicates a discussion of Unocal’s test design, followed by the test results, conclusions, and finally a discussion of suggested action steps. (CX 24 at 003).

365. Mr. Lamb prepared the cover sheet for the CARB presentation. (CX 24 at 001; Lamb, Tr. 2219). This page, entitled “Action Steps,” summarized what Unocal was urging CARB to do. (CX 24 at 001). Unocal intended to influence the CARB regulations through the June 20, 1991 presentation. (Kulakowski, Tr. 4418).

366. The first bullet point on this cover sheet states: “Avoid Rule Overlap” (CX 24; Lamb, Tr. 2220-21). At the meeting, Unocal discussed with CARB Unocal’s belief that CARB had the ability to opt out of the Federal Clean Air Act rules and enact its own regulations, a process which would avoid overlap between two competing regulatory schemes. (Lamb, Tr. 2221).

367. The second bullet point: “Adopt Predictive Model” was also discussed at the June 20, 1991 meeting. (CX 24; Lamb, Tr. 2221). Mr. Venturini testified that he does not recall what Unocal meant by “predictive model” during their June 20, 1991 meeting. (Venturini, Tr. 727-29).

Unocal believed a predictive model would be a very viable compliance opportunity. (Lamb, Tr. 2221). Unocal made the argument that a predictive model could be both practical and more cost-effective than the other compliance options that were then under consideration. (Lamb, Tr. 2221-22). Mr. Venturini testified that he does recall any specific words Unocal used to describe what they meant by the words cost-effective in their June 20, 1991 meeting. (Venturini, Tr. 726-27). Unocal also told CARB that a predictive model regulation was enforceable. (Lamb, Tr. 2221-22). According to Mr. Kulakowski, a performance standard would allow flexibility for companies to look at their own refineries and attempt to achieve an emissions standard in whatever way they believed economically best, and that a predictive model could be used to reach a performance standard. (Kulakowski, Tr. 4609).

368. The third bullet point on Unocal's presentation slides: "Avoid RFG O2 Mandate" was also discussed at the June 20, 1991 meeting. (CX 24; Lamb, Tr. 2222). At the national level, Congress had required that the EPA put a minimum oxygen content requirement in the federal RFG regulations. (Lamb, Tr. 2222-23). Unocal wanted California to avoid this mandate and argued to CARB that CARB should let the model work and not put in unnecessary minimums and maximums. (Lamb, Tr. 2222-23). Mr. Venturini testified that he does not recall that Unocal asked CARB to advocate a waiver of a federal mandate to use oxygenates at their June 20, 1991 meeting. (Venturini, Tr. 729).

369. In the slide presentation, Unocal representatives disclosed the results from the one-car (CX 24 at 009-014) and ten-car tests (CX 24 at 015-021) they had conducted. (Croudace, Tr. 657). Unocal did not, however, show CARB raw data. (Jessup, Tr. 1292; Croudace Tr. 657-58). The

Unocal slide presentation explained their studies and how Unocal scientists had studied a much broader range of properties than Auto/Oil. (Jessup, Tr. 1513; CX 24 at 040-041).

370. While Unocal representatives did disclose the properties that they thought affected emissions, they did not give them any fuel compositions. (Jessup, Tr. 1291-92). Through the slides, Dr. Jessup created a very straightforward and clear way to show which parameters had the greatest effect on emissions. (Miller, Tr. 1401).

371. They also disclosed the form of equations without coefficients from the ten-car study. (Jessup, Tr. 1267; Croudace, Tr. 487; CX 24 at 022). Because they did not contain the coefficients, the equations presented to CARB could not be used to predict emissions reductions in grams per mile. (Kulakowski, Tr. 4604). Unocal did not reveal the coefficients to CARB at that time because it considered them to be confidential to Unocal. (Jessup, Tr. 1267-68). Unocal representatives also wanted CARB to come up with their own model. (Jessup, Tr. 1508; Kulakowski, Tr. 4605-07 (agreeing that Unocal withheld the equations because its goal was to convince CARB that a predictive model could be developed)). Finally, as admitted by Mr. Kulakowski, one of the reasons Unocal did not provide the equations was because they did not want CARB to perceive that Unocal was trying to force its equations on CARB. (Kulakowski, Tr. 4606-07).

372. In disclosing the form of equations, Unocal's representatives explained that emissions from various fuels could be predicted by utilizing very simple linear equations—a predictive model. (Jessup, Tr. 1282-83; CX 24 at 022; CX 24 at 038-039). As admitted by Mr. Kulakowski, the goal was to show that a relationship could be developed between fuel parameters and reductions in emissions. (Kulakowski, Tr. 4605). Unocal wanted to show CARB the concept of a predictive model. (Kulakowski, Tr. 4607).

373. At the time of the June 20, 1991 meeting, CARB was operating from the point of view of wanting a single recipe as its standard, a view ARCO was pushing. (Kulakowski, Tr. 4607). Mr. Kulakowski understood at that time that a single recipe by its very nature could have an effect on competition, which was one of the reasons Unocal met with CARB. (Kulakowski, Tr. 4607-08).

374. It was not Unocal's desire to get CARB interested in adopting Unocal's specific model. (Kulakowski, Tr. 4605-07; Jessup, Tr. 1509, 1516). According to Mr. Kulakowski, Unocal "did not take the position at the [June 20, 1991] meeting that CARB should adopt our model." (Kulakowski, Tr. 4606). Instead, according to Dr. Jessup, "[w]e wanted them to take as much data as they could get and develop their own models." (Jessup, Tr. 1509).

375. Furthermore, Unocal did not propose to CARB putting any caps on a predictive model at the June 20, 1991 meeting. (Kulakowski, Tr. 4608).

376. Unocal told CARB that it would help them in any way that it could if CARB was willing to propose a predictive model. (Lamb, Tr. 2223).

377. Mr. Kulakowski was personally a big backer of the predictive model concept because he thought it could reduce capital costs and refining operating costs in Unocal's refineries. (Kulakowski, Tr. 4609-10). He believed that Unocal demonstrated at the June 20, 1991 meeting with CARB that a predictive model could be built. (Kulakowski, Tr. 4609).

378. At that June 20, 1991 meeting, Unocal did not advocate to CARB that CARB adopt a T50 specification and regulation, nor did Unocal advocate to CARB that CARB should adopt any specific set of parameters. (Lamb, Tr. 2223-24; *cf.* Miller, Tr. 1412-13 (explaining that it was not one of Unocal's goals to specifically get T50 into any regulations or complex model); Kulakowski, Tr. 4608, 4599-600 (admitting it was not a priority for Unocal to show CARB the importance of T50

in the June 20, 1991 meeting)). Unocal did not advocate a specific fuel recipe. (Kulakowski, Tr. 4607-08). Unocal representatives were against all caps and specifications. (Croudace, Tr. 656). In fact, at no point in time did Unocal ever advocate that CARB adopt a particular set of parameters as its regulation. (Lamb, Tr. 2223-24).

379. While Unocal did identify T50 as a major factor affecting emissions (Jessup, Tr. 1281), CARB staff member, Mr. Peter Venturini, admitted on cross-examination that Unocal's slide presentation to CARB did not include a single reference anywhere indicating that caps or limits on T50 must be put into the regulations as a result of Unocal's research. (Venturini, Tr. 730-31).

380. Mr. Venturini's notes on Unocal's slides reflect that Unocal was interpreting their study so as not to require substantial modifications to their refinery. (Venturini, Tr. 738; CX 22 at 036). By contrast, the regulations actually adopted by CARB ended up requiring substantial refinery modifications. (Venturini, Tr. 738).

381. Mr. Lamb did not tell CARB that Unocal had filed for a patent application on inventions that related to the 5/14 work. (Lamb, Tr. 2242). It simply never occurred to him to tell CARB about Unocal's patent application. (Lamb, Tr. 2242). Neither the patent application nor licensing was a priority to Unocal at the time of the CARB meeting. (Kulakowski, Tr. 4603).

382. Unocal representatives explained that all the information they provided, including the presentation slides, "was confidential to Unocal." (Miller, Tr. 1403-04; Lamb, Tr. 2402; CX 24 at 001). CARB staff member Mr. Robert Fletcher testified that he was aware that Unocal had asked to keep its information confidential when it presented the information to CARB, and Mr. Fletcher indicated that by marking "CONFIDENTIAL" on his copy. (Fletcher, Tr. 6472; CX 24 at 001). Mr.

Courtis also testified that he understood that Unocal asserted that the slides were confidential. (Courtis, Tr. 5922-24).

383. In an internal Unocal Fuels Issues Team meeting held just after Unocal's June 20, 1991 presentation to CARB, it was clearly expressed that Unocal believed that CARB became optimistic about the applicability of a predictive model and furthermore "[i]f CARB becomes willing to seriously pursue a predictive model, Unocal will need to share all 514 data." (CX 255 at 003; Lamb, Tr. 2226).

384. Unocal knew that if CARB were going to pursue a predictive model it would need to build such a model using what was called a "mega data base" which would include results from a number of research programs such as Unocal's 5/14 project. (Lamb, Tr. 2226). Unocal was aware that before CARB could incorporate Unocal's data base into this mega data base, Unocal would have to lift the confidentiality. (Lamb, Tr. 2226).

385. CARB could not base decisions on information that was not publically available. (Fletcher, Tr. 6480). Mr. Courtis testified that he knew in 1991 that because Unocal's information was designated "confidential," CARB staff could not use the information. (Courtis, Tr. 5929).

386. Just five days after Unocal met with CARB staff to present the results of its research and urge CARB to adopt a predictive model, ARCO again met with CARB to present its EC-X research. (RX 589 at 002 (June 25,1991); RX 590; RX 180 at 009). ARCO this time met with the Chair of the Air Resources Board Jananne Sharpless, CARB Executive Director James Boyd, Deputy Director Tom Cackette, and Mr. Peter Venturini, Chief of the Stationary Source Division. (RX 589 at 002; RX 590). ARCO asked the chair of CARB to participate in a press conference with ARCO to publicly announce the results of their EC-X fuel. (Venturini, Tr. 353-54; RX 180 at 009; *see also*

Clossey, Tr. 5499 (recognizing pages 009 to the end of RX 180 as a presentation given by ARCO to CARB)).

10. CARB Did Not Follow Its Own Internal Procedures to Protect the Confidentiality of Unocal's Presentation Slides

387. A memorandum from Mr. Dean Simeroth, dated February 13, 1991, sets forth the procedure by which CARB staff were supposed to handle confidential information. (RX 266; Curtis, Tr. 5921). Mr. Curtis was a member of the CARB Criteria Pollutants Branch staff at the time of the memo. (Curtis, Tr. 5921). During that period, several companies had given CARB confidential material, prompting CARB to adopt a specific procedure for handling such confidential information. (Curtis, Tr. 5930-32). The memo states that: "The following is to serve as an interim procedure for the handling of confidential material until a more comprehensive procedure is developed. Any material received for which confidentiality is requested is to be handled in the following manner." (RX 266; Curtis, Tr. 5921-22).

388. In particular, each page of the specified material is on is to be stamped "confidential." (Curtis, Tr. 5922; RX 266). Confidential material was "to be placed in the branch's project file (separate from nonconfidential project file). The hanging folder, in addition to the file ID in the lefthand corner, will be further identified by a red tab placed on the righthand corner." (RX 266; Curtis, Tr. 5925). Confidential material was to be kept segregated in a separate locked room. (Curtis, Tr. 5926).

389. The CARB procedure set forth in RX 266 required that each page of confidential information be stamped confidential. (RX 266). Mr. Curtis knew the entirety of Unocal's June 20, 1991 presentation slides was confidential. (Curtis, Tr. 5922-25). The word "confidential" was

handwritten on two pages, but not stamped or written on any of the remaining pages. (CX 24; Courtis, Tr. 5922-24).

390. In an attempt to explain why only two pages contained the word “confidential,” Mr. Courtis came up with the explanation that the document did not need to be stamped “[b]ecause the confidentiality has been released.” (Courtis, Tr. 5924). When then asked whether CARB went back to get a new copy without the words confidential, Mr. Courtis replied, “ I don't remember exactly if there was a new copy or the ‘confidential’ was erased of the copy.” (Courtis, Tr. 5924-25). Mr. Courtis then insisted that he stamped the pages of his copy of the presentation and that CX 24 was not his copy. (Courtis, Tr. 5924-25).

391. Mr. Courtis’s explanation was not credible. There was no evidence showing that a stamped copy of CX 24 or the Unocal slide presentation from June 20, 1991 was ever produced by CARB: Mr. Courtis could not direct the Court to such a copy (Courtis, Tr. 5926-28), nor did Mr. Courtis know of anyone from CARB staff who stamped CX 24 or any copy of the June, 1991 Unocal presentation “confidential.” (Courtis, Tr. 5928-29).

11. Unocal Provided Its Equations to CARB on July 1, 1991

392. At some point in time, CARB requested additional information from Unocal. (Lamb, Tr. 2224). One of the slides Unocal gave to CARB at the June 20, 1991 meeting contained a representation of the equations that Unocal scientists had used. (Lamb, Tr. 2224; CX 24 at 022). CARB followed up with Unocal and requested that Unocal provide the actual numbers used in the equations. (Lamb, Tr. 2224).

393. On July 1, 1991, Unocal provided CARB with actual 5/14 emissions equations developed from the ten-car study. (CX 25; Kulakowski, Tr. 4612; Croudace, Tr. 497; Venturini, Tr. 336-37).

394. The equations were attached to a cover letter signed by Mr. Michael Kulakowski of Unocal on behalf of Mr. Dennis Lamb. (CX 25; Kulakowski, Tr. 4612; Lamb, Tr. 2226-27). The letter was addressed to Mr. Peter Venturini of CARB (CX 25; Kulakowski, Tr. 4612; Lamb, Tr. 1836, 2226-27), and was approved by Mr. Lamb before it was sent. (Lamb, Tr. 1836-37, 2227).

395. In the cover letter, Unocal requested that CARB hold the equations confidential, “as we feel that they may represent a competitive advantage in the production of reformulated gasoline.” (CX 25; Lamb Tr. 2227). Mr. Kulakowski testified that the purpose in requesting that the equations be held confidential was to make it clear to CARB that Unocal was claiming this as business confidential information, which received different treatment under the California Public Records Act. (Kulakowski, Tr. 4425). The “competitive advantage” to which Unocal was referring in this letter was the potential for the 5/14 equations to provide Unocal the opportunity to certify its own formulas that could be used under a vehicle testing compliance option. (Lamb, Tr. 2228). Mr. Kulakowski echoed this view—by “competitive advantage” Mr. Kulakowski meant that the equations might be a basis for Unocal to certify gasolines. (Kulakowski, Tr. 4613). Mr. Lamb believed formulas might provide Unocal’s refineries with an advantage such as lower costs and that such an advantage would be lost if Unocal’s competitors got a hold of the equations. (Lamb, Tr. 2228).

396. The letter indicated, however, that if CARB would pursue “a meaningful dialogue on a predictive model approach to Phase 2 gasoline, Unocal will consider making the equations and

underlying data public as required to assist in the development of a predictive model.” (CX 25; Lamb, Tr. 2228). Mr. Lamb testified that when he used the phrase “underlying data” in this sentence he meant the “data base” of “the vehicles, fuels, and emissions results.” (Lamb, Tr. 2228).

397. Mr. Lamb and Mr. Kulakowski used the words equations and data distinctly in the text of CX 25. (CX 25). Mr. Venturini admitted this fact in his deposition in this matter, which was read into the record during this administrative hearing. (Venturini, Tr. 337-39).

398. Mr. Lamb and Mr. Kulakowski did not indicate that Unocal would release the confidentiality of the data or equations for use in the Phase 2 regulations. (CX 25). Instead, they specifically said Unocal would consider release for use in a predictive model. (CX 25). Additionally, nowhere in the July 1, 1991 letter did they indicate that CARB had requested or that Unocal should consider releasing confidentiality on its June 20, 1991 presentation slides. (CX 25).

399. Furthermore, Mr. Venturini admitted that there is nothing in Unocal’s July 1, 1991 letter, including the equations, indicating that Unocal’s emissions study must be interpreted to require a T50 cap or limit. (Venturini, Tr. 741). Mr. Venturini does not recall whether he discussed CX 25, the July 1, 1991 letter from Mr. Kulakowski to Mr. Venturini, with staff. (Venturini, Tr. 334-36).

12. Unocal Did Not Provide Its Data to CARB Until on or After July 25, 1991

400. By June of 1991, a determination had been made within CARB that individual fuel specifications would be pursued and that any predictive model would have to comply with whatever caps were in place. (Simeroth, Tr. 7471-72). There was no evidence introduced at trial, however, that Unocal was ever informed prior to July of 1991 that a decision had been made that any

predictive model would have to comply with whatever caps were in place. At some point in time, however, CARB followed up with Unocal and asked for the underlying data base represented in the June 20, 1991 presentation. (Lamb, Tr. 2224).

401. Thus on or subsequent to July 25, 1991, Dr. Peter Jessup of Unocal provided a data disk to CARB containing Unocal's raw emissions data base from its ten-car tests. (Jessup, Tr. 1537-38; CX 1247). Dr. Jessup recognized CX 1247 as the data disk that he sent to CARB. (Jessup, Tr. 1537).

402. The disk contains a README.DOC file, which in turn contains a general description of what is in the data file on the disk. (CX 1247 at 004; Jessup, Tr. 1539). It provides a description of the form of the data, provides an example of the same, and describes how to access it. (CX 1247 at 004). The README.DOC file also contains a description of Unocal's test fuels A through P, the fuel Q, as well as the check fuels R through X. (CX 1247 at 004-005; Jessup, Tr. 1539-40). The actual data sent to CARB was analytical and emissions data based on the ten-car test. (CX 1247; Jessup, Tr. 1540-41). Essentially, this data base contains information on the vehicles used in Unocal's research—which was important because it showed the types of emissions controls on the vehicles. (Lamb, Tr. 2224-25). The data base also has information about the fuels used in the tests, and what the various parameters of those fuels were. (Lamb, Tr. 2224-25). And finally, the data base contains emissions results from the federal test procedures Unocal had performed. (Lamb, Tr. 2224-25).

403. When printed out, the data consisted of over 50 pages of columns of numbers, of which a sample is shown below:

		CAR146.DAT							
		B2	0.08	4.07	0.03	511.1	17.95	17.80	
		B3	0.18	2.14	0.35	413.7	22.25	21.85	
		FTP	0.20	3.62	0.25	475.9	19.27	18.70	
146-ES	8/23/90	E	B1	0.49	4.96	0.55	494.3	18.45	21.10
			B2	0.05	2.82	0.03	514.4	17.90	19.92
			B3	0.19	2.97	0.30	427.5	21.47	20.55
			FTP	0.18	3.31	0.21	486.4	18.88	20.24
146-F	7/30/90	F	B1	0.38	3.62	0.86	457.7	17.39	17.39
			B2	0.08	3.31	0.12	483.7	16.51	17.89
			B3	0.14	1.35	0.80	398.3	20.15	20.83
			FTP	0.16	2.83	0.46	454.9	17.57	18.43
146-FS	8/24/90	F	B1	0.40	4.47	0.96	466.7	17.00	24.14
			B2	0.07	2.85	0.09	475.7	16.81	14.84
			B3	0.16	1.52	0.70	396.8	20.21	17.67
			FTP	0.17	2.82	0.44	452.2	17.67	16.91
146-G	8/01/90	G	B1	0.38	2.94	0.65	476.8	17.79	17.69
			B2	0.04	2.71	0.01	493.6	17.24	17.54
			B3	0.10	1.10	0.44	404.1	21.14	21.63
			FTP	0.13	2.31	0.26	465.5	18.28	18.42
146-GS	8/27/90	G	B1	0.45	4.48	0.59	482.2	17.50	.
			B2	0.05	3.00	0.03	493.1	17.24	.
			B3	0.18	1.32	0.83	406.2	21.00	.
			FTP	0.17	2.84	0.36	467.1	18.18	.
146-GS	9/26/90	G	B1	0.44	2.85	0.62	473.4	17.91	17.57
			B2	0.02	1.91	0.03	492.2	17.33	17.31
			B3	0.17	0.98	0.39	408.1	20.93	21.34
			FTP	0.15	1.85	0.25	465.3	18.32	18.20
146-H	8/02/90	H	B1	0.47	2.34	0.50	460.0	17.64	17.39
			B2	0.08	3.27	0.12	482.1	16.83	16.84
			B3	0.12	1.49	0.52	408.1	19.97	20.44
			FTP	0.17	2.59	0.31	457.4	17.76	17.68
146-HS	8/28/90	H	B1	0.39	3.50	0.75	467.6	17.30	15.63
			B2	0.06	2.68	0.09	480.2	16.93	17.70
			B3	0.12	0.87	0.53	398.1	20.52	21.64
			FTP	0.15	2.36	0.35	455.2	17.86	18.20

(CX 1247 at 012).

404. The data base does not contain any equations, nor does it contain any of Unocal's presentation slides. (Jessup, Tr. 1541). Furthermore, there is nothing in CX 1247 that says the Unocal study must be interpreted to require a T50 cap or limit in the regulations. (Venturini, Tr. 742-43).

405. Dr. Jessup's superior, Dr. Wayne Miller testified he understood CARB wanted raw data results to build its own data base such that the data was going to be analyzed by CARB or consultants for developing a predictive model. (Miller, Tr. 1439-40). CARB staff likewise understood that Unocal had sent the data because CARB needed it to develop a predictive model. (Venturini, Tr. 718 (explaining in his deposition, which was read into the record during his testimony, that Unocal "had to somehow transmit the data to us because we needed this for the predictive model"))).

406. The disk and its contents were understood to be treated as confidential. (Jessup, Tr. 1539). Because of this, Dr. Jessup did not feel he needed to stamp the disk as confidential. (Jessup, Tr. 1538-39). CARB understood that before the emissions data on this disk was to be treated as confidential. (Venturini, Tr. 719-20 (testifying that the disk was confidential before Mr. Dennis Lamb sent his August 27, 1991 letter)).

407. Unocal did not ever send data from its one-car test to CARB. (Jessup, Tr. 1541).

13. CARB Proposed a Preliminary Draft Regulation Substantially Similar to ARCO's EC-X and Without the Use of the Unocal Data

408. By July 21, 1991, CARB, in an internal draft of its proposed regulations specified a T50 value of 190° Fahrenheit. (RX 198 at 012 (§ 2262.6(b) (Distillation Temperatures)); Venturini, Tr. 359-61). On that same day, an internal draft proposed that "[s]tarting January 1, 1996, no person shall sell, offer for sale, dispense, supply, offer for supply, or transport California gasoline which has a 50 percent distillation temperature which exceeds 200 degrees Fahrenheit." (RX 184 at 028). The two proposed T50 values represented values identical to two values for T50 that Fletcher wrote down during the ARCO EC-X fuel presentation. (RX 180 at 003; Fletcher, Tr. 6918-19).

409. Then on August 1, 1991, CARB issued a Notice of Public Consultation Meeting to discuss Phase 2 Reformulated Gasoline Specifications. (RX 184). RX 184 is a copy of draft regulations that were sent out to the public on or about August 1, 1991. (Fletcher, Tr. 6921; Curtis, Tr. 5788-89). CARB attached a copy of its preliminary draft Phase 2 regulation to that Notice. (RX 184 at 012-051). Even though the document is dated August 1, 1991, a proposed T50 specification of 200° appears on a page dated July 21, 1991. (Fletcher, Tr. 6921; RX 184 at 028 (§ 2262.6(b) (Standards for Distillation Temperatures)); Venturini, Tr. 361-62). Additionally, RX 184 contains a driveability index of 1100. (Fletcher, Tr. 6921-22; RX 184 at 028).

410. Texaco viewed the proposed specifications as a “kissing cousin” to ARCO’s EC-X composition. (RX 438 at 005). A chart attached to an internal Texaco memorandum shows a side-by-side comparison of the two fuels. (RX 438 at 006; *see also* RX 439 at 001) (“The proposal very closely matches the specifications for ARCO’s EC-X gasoline;” RX 441 at 004 (comparing the proposed specifications to both ARCO EC-X and a GM proposal)).

411. The draft regulation could not have been developed with the use of Unocal’s test data because Unocal did not provide its data to CARB until at least July 25, 1991. (RX 327 at 001, 003; CX 1247). CARB, however, did not load any of Unocal’s data onto its data base until at least August 2, 1991. (RX 122 at 005; CX 7045 (Cleary, Dep. at 78-79); *see also* RX 121A at 002 (letter from CARB attorney Tom Jennings indicating the earliest load date onto the data base at the Teale Data Center was August 2, 1991); *see also* RFF 614-17, *infra*).

412. Mr. Venturini could not point to a single document that shows CARB staff actually analyzed Unocal’s ten-car test data before November 21, 1991 or that anyone from the staff even accessed a computer to look at the data. (Venturini, Tr. 706).

413. Additionally, as of both July 21, 1991 and August 1, 1991, Unocal had not waived confidentiality on any of the information, including the data, that it provided to CARB. (Venturini, Tr. 720).

414. Days after the proposed regulations had been sent out to the public and before CARB's public workshop, staff prepared an internal briefing paper specifically evidencing the direct relationship between the proposed regulations and the specifications of ARCO's EC-X gasoline. (Fletcher, Tr. 6922; CX 803). CARB Chairwoman Jananne Sharpless testified that she was presented with briefing papers on the status of proposals and that CX 803 appeared to be such a briefing paper. (CX 7063 (Sharpless, Dep. at 120); CX 803 (referred to in testimony as RX 268)).

415. CX 803 is a briefing paper on the status of Phase 2 reformulated gasoline as of August 8, 1991. (Fletcher, Tr. 6922; CX 803; CX 7063; Sharpless, Dep. at 120) (referred to in testimony as RX 268)). It has an attachment listing four columns. (Fletcher, Tr. 6924; CX 803 at 002). Two of the columns represent government gasoline specifications, including the specifications for EPA reformulated gasoline and CARB Phase 1. (Fletcher, Tr. 6924; Venturini, Tr. 366-67; CX 803 at 002). The third column contains the draft CARB Phase 2 regulations. (Fletcher, Tr. 6924; Venturini, Tr. 366-67; CX 803 at 002). The last column contains the specifications for ARCO's EC-X reformulated gasoline. (Fletcher, Tr. 6924; Venturini, Tr. 366-67; CX 803 at 002). This is the same ARCO EC-X fuel that was shown to Mr. Fletcher on June 7, 1991 as Fuel 2 from the June 7 slide presentation. (Fletcher, Tr. 6925-26; CX 803 at 002; RX 180 at 003). It lists EC-X as having a driveability index of 1109 and a T50 of 201° (Fletcher, Tr. 6924-25; CX 803 at 002), while it lists the draft CARB Phase 2 regulations as having a driveability index of 1100 and a T50 of 200°. (CX 803 at 002; Venturini Tr. 368). As explained by Mr. Venturini, staff used ARCO

EC-X as a comparison fuel because of the work that staff was doing in trying to identify and come up with appropriate specifications for the Phase 2 gasoline proposal. (Venturini, Tr. 367-68; CX 803).

416. ARCO EC-X is the only gasoline that was compared to EPA gasoline, to Phase 1 gasoline, and to Phase 2 draft reformulated gasoline in the CARB briefing paper. (Venturini, Tr. 366-67; CX 803 at 002). There is no mention of Unocal or its disclosures (neither data nor equations), in this contemporaneous document. (CX 803 at 002; Venturini, Tr. 368).

417. According to Ms. Sharpless, she could not answer any question as to interpretation of CX 803 due to the fact that “it would be an interpretation now and not how I might have been interpreting it then because I was in a different place, I had knowledge that I’ve now forgotten, and so I’m not going to attempt to answer it. I could hit it wrong.” (CX 7063 (Sharpless, Dep. at 121-122)). Ms. Sharpless then admitted that this could be true of any of the events that occurred back in 1991. (CX 7063 (Sharpless, Dep. at 122)).

418. However, when asked whether it was a coincidence that ARCO’s T50 was 201° with the recommendation of T50 being 200°, Ms. Sharpless testified that staff was compiling a set of information upon which they would ultimately make a recommendation to the Board. (CX 7063 (Sharpless, Dep. at 130)).

419. A month after this briefing paper comparing ARCO’s EC-X to the CARB proposal, Ms. Sharpless sent a letter to the Honorable George Bailey, a supervisor with the San Diego County Board of Supervisors (Fletcher, Tr. 6928), in which she would publicly represent the similarity between the ARCO’s EC-X and the upcoming CARB Phase 2 proposal: “ARCO recently announced test results on a reformulated gasoline which has specifications similar to what we are proposing for

Phase 2 reformulated gasoline.” (RX 111 at 001; Fletcher, Tr. 6930; CX 7063 (Sharpless, Dep. at 136)). Ms. Sharpless admitted that, when she wrote this letter, she was aware that ARCO had announced test results with specifications similar to what was being proposed for Phase 2. (CX 7063 (Sharpless, Dep. at 137)).

14. CARB Held Its Second Workshop on August 14, 1991

420. CARB held its second Phase 2 workshop on August 14, 1991. (RX 184 at 001). CARB gave notice of this meeting on July 17, 1991, and provided supporting documents in a supplemental notice dated August 1, 1991. (RX 184 at 001).

421. As previously discussed, the notice provided that a number of specifications were being considered for the Phase 2 regulations including distillation temperatures. (RX 184 at 001-002, 028). It also informed the public that CARB would be discussing the status of its refinery linear programming modeling efforts at the workshop. (RX 184 at 002).

422. Finally, the notice incorporated into its draft regulation a placeholder for the predictive model:

2265. Certified Gasoline Formulations Resulting in Equivalent Emission Reductions Based on a Predictive Model.

[EXPLANATORY NOTE: The ARB intends to develop predictive models based on past and current vehicle emissions testing programs. The ARB is interested in obtaining any information or data that should be considered in developing the models.]

(RX 184 at 035-036).

423. Thus, on approximately August 1, 1991, Unocal’s Mr. Dennis Lamb learned that CARB intended to develop a predictive model. (RX 184 at 035-036; Lamb, Tr. 2229-30). He attended CARB’s public consultation on August 14, 1991. (Lamb, Tr. 2229).

15. Unocal's Fuels Issues Team Discussed CARB's Predictive Model Proposal and Its Minutes Memorialize Unocal's Intent to Send a Letter Waiving Its Rights to the Confidentiality the 5/14 Emissions Data

424. Unocal's Fuels Issues Team discussed CARB's proposal to develop a predictive model in a meeting held on August 22, 1991. (Lamb, Tr. 2230; CX 266). CX 266, which is the meeting minutes, reflect discussions that occurred at an August 22, 1991 meeting of the fuels issue team. (Miller, Tr. 1443-44). The minutes, written by Mr. Mario Aguila, state that: "Unocal wants to make sure that CARB understands that the proposed form of the predictive model does not truly give the industry "flexibility" in the certification process." (CX 266 at 004; Lamb, Tr. 2231; Miller, Tr. 1442, 1444). Mr. Lamb recalled that it was already apparent that CARB had some preconceived concepts about a predictive model—such as including minimums, maximums and caps—and that Unocal had some concerns about these preconceived concepts. (Lamb, Tr. 2231).

425. The minutes of this August 22, 1991 Fuels Issues Team meeting also state that: "In order to ensure that the predictive model is as well-founded as possible, Unocal will send CARB a waiver to release the 514 Project emissions data." (CX 266 at 004; Lamb, Tr. 2231-33; Miller, Tr. 1445). Dr. Miller testified that he understood this to mean the underlying, raw data. (Miller, Tr. 1446). At this meeting, Unocal discussed sending such a waiver to CARB. (Lamb, Tr. 2231-32).

426. The August 22, 1991 Fuels Issues Team meeting minutes also note that one Unocal-specific example of why Unocal wanted a full term predictive model was so that Unocal's San Francisco refinery could take advantage of its ability to produce at lower sulfur and olefin levels than the competition. (CX 266 at 004, Lamb, Tr. 2232; Miller, Tr. 1448). Unocal's San Francisco refinery was a good example of why Unocal believed it was so advantageous to have a predictive model. (Lamb, Tr. 2232-33). Unocal's San Francisco refinery—which was not ordinarily thought

of as a good gasoline producer—did have low sulfur and low olefin levels. (Lamb, Tr. 2232-33). A predictive model, which was not artificially hamstrung with minimums to maximums, would enable Unocal to take advantage of the lower emissions properties of the sulfur and olefin levels in its San Francisco gasoline by offsetting these with higher properties in other parameters. (Lamb, Tr. 2232-33). This would mean that it might be less costly for Unocal to bring its San Francisco refinery into compliance. (Lamb, Tr. 2232-33).

427. The minutes also reflect that Unocal was recommending that WSPA experts develop a draft predictive model. (CX 266 at 004; Kulakowski, Tr. 4531-32).

428. Unocal's discussion of the predictive model in its August 22, 1991 Fuels Issues Team meeting minutes concluded with the statement that: "Unocal will notify CARB that it will waive its rights to the confidentiality of the 5/14 project data." (CX 266 at 004; Lamb, Tr. 2233).

16. On August 27, 1991, Unocal Sent a Letter to CARB Lifting the Confidentiality of Its 5/14 Data

429. Shortly after the August 22, 1991 Fuels Issues Team meeting, Unocal gave notice to CARB waiving its rights to the confidentiality of the 5/14 project data. (CX 29). Unocal gave such notification to CARB by letter dated August 27, 1991 from Mr. Lamb to Mr. James Boyd who was then the executive officer of CARB. (CX 29; Lamb, Tr. 2233). The subject of the letter was "PUBLIC AVAILABILITY OF UNOCAL RESEARCH DATA." (CX 29).

430. The entire text of the letter states:

On June 20, 1991, certain Unocal representatives met with Peter Venturini and other members of his staff. During that meeting, we presented the results of three phases in Unocal's Vehicle/Fuels testing program. We subsequently made the data base available to the staff and agreed to make the data public if necessary in the development

of a predictive model for use in the certification of reformulated gasoline.

The staff has now proposed to develop such a predictive model and requested that we make the data public.

Please be advised that Unocal now considers this data to be non-proprietary and available to CARB, environmental interest groups, other members of the petroleum industry, and the general public upon request.

(CX 29).

431. The first sentence of Mr. Lamb's August 27, 1991 letter, which describes a meeting between certain Unocal representatives and CARB staff is a true statement. (CX 29; Lamb, Tr. 2233). The next sentence of Mr. Lamb's letter, which describes Unocal's presentation of the results of three phases in Unocal's vehicle/fuels testing program was also a true statement. (CX 29; Lamb, Tr. 2234).

432. Next, the August 27, 1991 letter states: "We subsequently made the data base available to the staff and agreed to make the data public if necessary in the development of a predictive model for use in the certification of reformulated gasoline." (CX 29; Lamb, Tr. 2234). The words "data base" in that sentence refer to the underlying data base of the 5/14 project. (Lamb, Tr. 2234). That data base was the vehicle data, fuels data, and emissions results for Unocal's 5/14 project. (Lamb, Tr. 2235). When Mr. Lamb stated in this sentence that he "agreed to make the data public," the data to which he was referring was the previously described data base. (Lamb, Tr. 2235). This third sentence of Mr. Lamb's letter, like the two that preceded it, was also a true statement. (Lamb, Tr. 2234).

433. In the second paragraph of the letter, Mr. Lamb states: “The staff has now proposed to develop such a predictive model and requested that we make the data public.” (Lamb, Tr. 2235-36). When Mr. Lamb referred to “data” in that sentence, he was referring to the same previously referenced data base. (Lamb, Tr. 2236). This paragraph was a true statement. (Lamb, Tr. 2235-36).

434. In the last paragraph of Mr. Lamb’s letter, he states: “Please be advised that Unocal now considers this data to be non-proprietary and available to CARB, environmental interest groups, other members of the petroleum industry, and the general public upon request.” (CX 29; Lamb, Tr. 2236). When he used the phrase “this data” in this third paragraph, Mr. Lamb was referring to the same data base referenced earlier in the letter. (Lamb, Tr. 2236). Like the other statements in the letter, the last sentence of the letter was a true statement. (Lamb, Tr. 2236).

435. Unocal’s August 27, 1991 waiver of confidentiality on its data occurred five weeks after CARB prepared the July 21, 1991 internal preliminary draft regulations and nearly four weeks after CARB published them in its August 1, 1991 notice. (CX 29; RX 198; RX 184).

a. Unocal Lifted Confidentiality on Its Data Alone

436. There is a difference between data, equations, and patentable inventions. In Mr. Venturini’s June 2003 deposition, which was read into the record at the hearing, he explained how data were distinct from equations:

“question: You say that technically you do not consider equations to be the same thing as data. What do you mean, technically no? Your answer: Well, it’s kind of a—data are the actual results from testing, and so forth, and equations may be the relationships that you derive from analysis of the data.”

(Venturini, Tr. 332 (stipulated to as answer at 334); *see also* Croudace, Tr. 636 (stating that equations are not data, “[t]hose are the interpretations of the data”)). Mr. Venturini agreed that this

is one interpretation of data. (Venturini, Tr. 331). Inventions may be derived from data and from equations but are not the same as data or equations. (RX 1163 at 004). Furthermore, neither data nor equations can be patented. (RX 1163 at 004; Linck, Tr. 7752).

437. For example, Appendix 11 of the CARB's Technical Support Document, which contains the Unocal regression equations, uses the word data to refer to the actual emissions data collected—the raw data. (CX 5 at 297-298; Venturini, Tr. 329-30).

438. Another example is from the testimony of Mr. John Wise, who discussed data in the context of Auto/Oil. Mr. Wise used the terms “data” and “data set.” (CX 7073 (Wise, Dep. at 029-31)). He testified, “When we were developing the Auto/Oil program the first thing we did was develop the data set by measuring the emissions from vehicles for different fuels. That data set was put on disks and sent to all interested parties.” (CX 7073 (Wise, Dep. at 030)). He testified that a “data set” was a completed set of experiments and that the “data” was represented “[w]ith numbers. Numbers on a disk.” (CX 7073 (Wise, Dep. at 030-31)).

439. Specifically as related to Unocal, inventor Dr. Michael Croudace explained, when he used the term “data,” that meant “[t]he data is the fuels and the response from the engine that we got out, simple raw data.” (Croudace, Tr. 636). This includes “[m]easurements.” (Croudace, Tr. 636).

440. Unocal's letter contains the words “data base” and “data.” (CX 29). Unocal's August 27, 1991 letter lifted confidentiality on its data base alone. (Lamb, Tr. 2236). In the last paragraph of Mr. Lamb's letter, when he stated that he now considered “this data to be non-proprietary and available to CARB” what Mr. Lamb meant by “data” and intended to convey to CARB was that CARB could now use Unocal's data base. (Lamb, Tr. 2236, 2238).

441. As admitted by Mr. Courtis:

- Q. Now, nowhere in this letter are the slides mentioned, are they?
- A. The word "slides," yes, is not mentioned.
- Q. Nowhere in this letter are the equations mentioned; correct?
- A. No, they're not mentioned.
- Q. The only thing that's mentioned is "this data"; correct?
- A. That's what the letter says.

(Courtis, Tr. 5937-38; *see also* CX 29; Venturini, Tr. 339).

442. Despite the fact that the letter refers to only to "data," Mr. Courtis did not call Mr. Lamb after receipt of the letter, CX 29, and ask him what he meant by the word "data", and is not aware of anyone else from CARB staff doing so. (Courtis, Tr. 5937-38). This was substantiated by the testimony of Mr. Peter Venturini. To Mr. Venturini's knowledge, no one from CARB contacted Unocal and asked Unocal to clarify what they meant in the August 27, 1991 letter by data. (Venturini, Tr. 339-40).

443. Mr. Courtis testified under oath that the only reason he did not do so was based on his understanding "that that made reference to the whole information we received from Unocal." (Courtis, Tr. 5938). While Mr. Courtis has now claimed this was his understanding, the only contemporaneous writings that either side has produced, including the text of the August 27, 1991 letter itself, support the fact that Unocal was releasing confidentiality on the 5/14 project data.

444. Two other contemporaneous internal Unocal communications prepared shortly before and after the August 27, 1991 letter confirm what Unocal thought it was releasing confidentiality on. The first, is the August 22, 1991 minutes of the Fuels Issues Team, which have already been discussed. (CX 266). The minutes highlight that Unocal's release was focused on the 5/14 data: "Unocal will notify CARB that it will waive its rights to confidentiality of the 514 Project data." (CX 266 at 004).

445. The second communication is a memorandum written by Mr. Lamb the day after he sent the August 27, 1991 letter to CARB. (CX 1755). On August 28, 1991, Mr. Lamb wrote a memo updating Mr. Beach on the status of Unocal's equivalency assurance efforts. (Lamb, Tr. 2262; CX 1755). Mr. Lamb informed Mr. Beach that CARB had advanced from agreeing to consider a predictive model to proposing that a model be included as a certification alternative along with a recipe fuel and vehicle testing. (Beach, Tr. 1767-68; CX 1755 (referred to in testimony as CX 263)). Mr. Lamb then told Mr. Beach: "We have agreed to make our 5/14 data public." (CX 1755; Lamb, Tr. 2263). This was a direct reference to the August 27, 1991 letter lifting the confidentiality of Unocal's data base. (Lamb, Tr. 2262-63).

446. Additionally, Mr. Venturini explained in testimony read into the record from his 1996 deposition that he could not "infer from reading the letter" that CARB could use Unocal's information to promulgate regulations that included a T50 specification. (Venturini, Tr. 822-23).

447. Mr. Courtis, who in 1996 testified that he wrote Mr. Lamb a letter, now professed at the hearing that he had an oral conversation with Mr. Lamb in which he asserts that he asked Mr. Lamb to release the "proprietary and confidential" of "the data." (Courtis, Tr. 5742; 5936-37). While it is hard to believe that Mr. Courtis recalls the exact words of one telephone conversation that occurred over thirteen years ago, the only contemporaneous evidence of what was requested—the August 27, 1991 letter—speaks only of "data base" and "the data."

448. The fact that the Unocal August 27, 1991 letter lifted confidentiality on the data alone was corroborated by CARB attorney W. Thomas Jennings. (See RX 327 at 002). In a letter from Mr. Jennings to Unocal outside counsel Mr. David W. Beehler, Mr. Jennings stated that "[i]t appears to ARB staff that the diskette we were able to copy, and a copy of which is enclosed, is the original

diskette containing the data base referred to in Dennis Lamb's August 27, 1991 letter." (RX 327 at 002). In fact, the data base produced in discovery by CARB contained raw emissions data. (CX 1247).

b. By Using the Word "Non-Proprietary," Unocal Did Not Intend to Mislead or Deceive CARB

449. When Mr. Lamb wrote the August 27, 1991 letter to CARB, he had no intent to mislead anyone at CARB. (Lamb, Tr. 2262).

450. In the last paragraph of Mr. Lamb's letter, when he stated that he now considered "this data to be non-proprietary and available to CARB" what Mr. Lamb meant by "non-proprietary" and intended to convey to CARB was Unocal was lifting the confidentiality and that CARB could now use Unocal's data base. (Lamb, Tr. 2238).

451. Again, the only contemporaneous documents produced by either side support Mr. Lamb's testimony that the August 27, 1991 letter was intended to lift confidentiality and make the data base available for use. (Lamb, Tr. 2238). The first is the August 22, 1991 minutes of the Fuels Issues Team, which have already been discussed. (CX 266). These minutes underscore that the purpose of the waiver solely to lift confidentiality restrictions: "Unocal will notify CARB that it will waive its rights to confidentiality of the 514 project data." (CX 266 at 004).

452. The second is the memorandum written by Mr. Lamb the day after he sent the August 27, 1991 letter to CARB. (CX 1755). Here, Mr. Lamb told Mr. Beach: "We have agreed to make our 5/14 data public." (CX 1755; Lamb, Tr. 2263). This was a direct reference to the August 27, 1991 letter lifting the confidentiality of Unocal's data base. (Lamb, Tr. 2262-63).

453. Complaint Counsel failed to produce a single witness to testify or a document that shows any intent by Unocal to mislead CARB in the August 27, 1991 letter as to the ownership or lack of patent rights stemming from Unocal's 5/14 research.

c. By Using the Word "Non-Proprietary," Unocal Did Not Intend to Give Up Its Patent Rights or Make a Royalty-Free Offer

454. When Mr. Lamb wrote the August 27, 1991 letter to CARB he did not intend to give up any future rights Unocal might have if a patent were to issue some day. (Lamb, Tr. 2254). He did not intend in that letter to offer CARB or the public a royalty-free license to any Unocal patent that might issue based upon inventions arising from the 5/14 work. (Lamb, Tr. 2254-55).

455. Mr. Lamb had no authority to make any such offer on behalf of Unocal. (Lamb, Tr. 2255). Dr. Miller testified that he understood that Mr. Lamb did not have any authority to give up Unocal's potential intellectual property rights in communicating with the public. (Miller, Tr. 1451-52). No member of the Fuels Issues Team had any authority to give up Unocal's potential intellectual property rights when communicating with CARB. (Miller, Tr. 1452).

456. Mr. Roger Beach never authorized Mr. Lamb to give up Unocal's patent rights or to offer anyone a royalty-free license on any patent that might issue to Unocal. (Beach, Tr. 1768). In fact, Mr. Beach stated that he did not even have the authority to authorize Mr. Lamb to make such offers or to make such offers himself. (Beach, Tr. 1768).

457. Complaint Counsel failed to produce a single witness to testify or a document that shows any intent by Unocal in its August 27, 1991 letter to give away its potential patent rights stemming from Unocal's 5/14 research.

d. Unocal's Designation of Its "Data" as "Non-Proprietary" Was Not Misleading

458. Complaint Counsel have not shown that the letter written to CARB was misleading. As Mr. Lamb testified he intended to lift the confidentiality of Unocal's data. (RFF 440, 445, *supra*).

459. Mr. Venturini admitted that a CARB document which he approved, CX 5 at internal page 149, uses the word "proprietary" in such a fashion that it would not be unreasonable for someone to have thought that staff meant confidential in using the term proprietary. (Venturini, Tr. 341-43; CX 5 at 152).

460. This understanding was consistent with the practice of California refiners, in their dealings with CARB, to use the term "proprietary" as a synonym for "confidential. "Various refiners have used "proprietary" to mean confidential in the ordinary course of business and in submitting materials to CARB. For example, Exxon's official policy states that "Exxon Proprietary" applies to all documents that contain "operational or financial information (such as earnings statements, business investments and assessments of the Company's competitive position)." (RX 513 at 028). Exxon routinely marked submissions to CARB that contained confidential information as "Proprietary." (*See, e.g.*, RX 568; RX 883; RX 552).

461. In his deposition in this case, Texaco's Mr. Douglas Youngblood testified that "proprietary means patented." (CX 7076 (Youngblood, Dep. at 60)). However, in his deposition in May 1996, Mr. Youngblood defined the term "proprietary" as "that's something that your particular company considers confidential." (CX 7076 (Youngblood, Dep. at 63)). He continued, "proprietary . . . could refer to owns. It doesn't always have to." (CX 7076 (Youngblood, Dep. at 63)).

462. Even if “non-proprietary” is interpreted as “not patented” or “not owned,” the sentence “Please be advised that Unocal now considers this data to be nonproprietary and available to CARB, environmental interest groups, other members of the petroleum industry, and the general public upon request” was a true statement and was not misleading. (CX 29; Lamb, Tr. 2236). CARB did use Unocal’s data base. (Lamb, Tr. 2238). Unocal never charged CARB for the use of this data base nor did Unocal ever charge any members of the general public for the use of the data base. (Lamb, Tr. 2239).

463. Furthermore, CARB testimony does not indicate that CARB thought the letter had anything to do with patent rights. Before Mr. Lamb sent his letter of August 27, 1991 all of the information that Unocal had provided to CARB was understood to be confidential. (Venturini, Tr. 720). CARB, however, could not use confidential information in rulemakings. (Venturini, Tr. 233). In order to use Unocal’s information in its rulemaking, including publishing it in its rulemaking documents, CARB needed the information to be made public. (Fletcher, Tr. 6469).

464. Mr. Venturini understood this to be the purpose of Mr. Lamb’s August 27, 1991 letter—he did not think it had anything to do releasing patent rights. (Venturini, Tr. 821-22). Specifically, Mr. Venturini testified that at the time CARB received the letter, “[t]he thought did not occur” to him that it had anything to do with patent rights. (Venturini, Tr. 821-22). In fact, Mr. Venturini thought that Unocal had a right to protect its patent when he learned of it. (Venturini, Tr. 823).

465. Mr. Boyd, the CARB staff member to whom the letter was addressed, testified that he was familiar with the subject matter of Mr. Lamb’s letter. (Boyd, Tr. 6710-11). Mr. Boyd testified that CARB had learned that Unocal had undertaken an extensive scientific study and was

interested in acquiring the data from this study. (Boyd, Tr. 6711-12). Mr. Boyd recalled that Unocal originally had deemed its data to be confidential, but that he learned at some point, “that Unocal intended to make that data available, that a letter and the data were coming to the agency. And ultimately I was informed that the letter had arrived.” (Boyd, Tr. 6710-11). Mr. Boyd admitted at trial that it “does happen” that the word “proprietary” can be used as a synonym for “confidential.” (Boyd, Tr. 6839).

466. Ms. Jananne Sharpless, the only CARB Board member to testify in this action, did not even recall reviewing the August 27, 1991 letter to Mr. Boyd prior to the Board adopting its regulations. (CX 7063 (Sharpless, Dep. at 25)). Furthermore, Ms. Sharpless does not recall whether anyone discussed with her the fact that the letter had been sent. (CX 7063 (Sharpless, Dep. at 26)). Ms. Sharpless could not recall any detail as to whether she had discussions with staff about what the term non-proprietary meant. (CX 7063 (Sharpless, Dep. at 169)).

467. Finally, even if Unocal had used the words “not confidential” in its August 27, 1991 letter instead of “non proprietary,” CARB staff would have used the information, the equations, the data, and the presentation of the slides as they actually did. (Venturini, Tr. 345-46).

e. CARB Did Not Follow Its Own Procedures as Required by the California Code of Regulations

468. Section 91011, Title 17, California Code of Regulations governed Mr. Courtis’s conduct as a CARB staff member. (Courtis, Tr. 5795-96; RX 1183 at 007). Section 91011, Title 17, California Code of Regulation (RX 1183) sets forth requirements for disclosure of public records, which Mr. Courtis admitted he was required to follow as a CARB staff member. (Courtis, Tr. 5796-98, 5920; RX 1183 at 007-008). Mr. Courtis had personally read this rule prior to 1990 and

was familiar with it when he performed his work for CARB. (Courtis, Tr. 5796; RX 1183 at 007-008).

469. In particular, RX 1183 contains “Article 3. Inspection of Public Records,” which addresses the treatment of confidential information that is submitted to CARB. (RX 1183 at 008; Courtis, Tr. 5920).

470. Section 91022, entitled Disclosure of Confidential Data, states in subsection (b):

Upon receipt of a request from a member of the public that the state board disclose data claimed to be confidential or if the state board itself seeks to disclose such data, the state board shall inform the individual designated pursuant to Section 91011 by telephone and by mail that disclosure of the data is sought.

(RX 1183 at 008 (§ 91022(b)). Mr. Courtis knew that under circumstances where the Air Resources Board itself wanted to disclose confidential data, it had to inform an individual by telephone and by mail. (Courtis, Tr. 5921; RX 1183 at 008).

471. In sworn deposition testimony in 1996, taken in the underlying litigation commenced by the refiners against Unocal, Mr. Courtis testified under oath that he sent a letter to Unocal when he sought to declassify the Unocal material from “confidential” to “non-confidential.” (Courtis, Tr. 5932-33). Mr. Courtis knew such a letter was required by law to declassify the material designated confidential. (Courtis, Tr. 5932-33).

472. In his sworn testimony in this proceeding, Mr. Courtis admitted the opposite was true—that in fact he did not send Unocal a letter as required by law to declassify the asserted confidential material (Courtis, Tr. 5933-34).

473. Neither CARB nor Mr. Courtis gave Unocal notice by mail of its desire that Unocal release the confidentiality of any material or information presented at or subsequent to the June 1991

meeting between Unocal and CARB as required by California Code of Regulations Section 91022. (Courtis, Tr. 5933-34; RX 1183 at 008). Additionally, neither Mr. Courtis nor CARB sent any letter to Mr. Lamb stating the purpose for which CARB wanted the confidentiality released. (Courtis, Tr. 5939; RX 1183 at 008). Nor did Mr. Courtis send Unocal a letter requesting that Unocal release confidentiality of information presented at the June 20, 1991 meeting between Unocal and CARB. (Courtis, Tr. 5769-70). Mr. Peter Venturini is also unaware of any documentation to show that a mailing ever occurred to Unocal for a release of confidential information during 1991. (Venturini, Tr. 413-14).

474. Mr. Courtis admitted that had he sent the required letter setting forth what information CARB wanted to use, the letter would have shown exactly what words were actually used in requesting the release of confidentiality, rather than Mr. Courtis having to depend upon his memory 13 years after the events took place. (Courtis, Tr. 5939).

17. Independent of Anything Unocal Had Disclosed, CARB Decided to Go with ARCO's Twofold Recommendation

475. CARB staff not only communicated to ARCO representatives that it had decided to propose a set of RFG regulations that adopted specific ARCO recommendations, but a CARB staff member also made it clear to ARCO representatives at the time that such a communication should not be revealed. (RX 73).

476. On September 16, 1991, 19 days before CARB publicly issued its proposed regulations, Mr. Robert Fletcher of CARB spoke with Mr. Tim Clossey of ARCO on the phone. (RX 73; CX 52 (Staff Report dated October 4, 1991)).

477. On that same date, Mr. Clossey wrote an email to his supervisor, Mr. Bill Dickinson, summarizing the communication with CARB, and putting forth some of the conclusions that Mr. Clossey had reached based on the communication. (Clossey, Tr. 5504). As Mr. Clossey put it, CARB's Mr. Fletcher provided "insights" to ARCO about the Staff Report recommendations that would be forthcoming from CARB. (RX 73).

478. According to Mr. Clossey, Mr. Fletcher cautioned that CARB did not want this communication and other inside information regarding these proposed recommendations publicly revealed. (RX 73). Mr. Clossey reported that Mr. Fletcher was very concerned about giving the data out at that time, and that Mr. Fletcher requested that ARCO treat the information with special attention and not pass the information along to others. (RX 73 at 002).

479. In his email, Mr. Clossey explained that ARCO had made a recommendation to CARB that it should raise the specification for T50 to 210°F. (Clossey, Tr. 5505; RX 73). And Mr. Clossey understood that CARB decided to "go with" that recommendation. (RX 73).

480. In addition, Mr. Clossey explained that ARCO had recommended that CARB not include a driveability index specification in its regulations. (Clossey, Tr. 5505; RX 73). Again, Mr. Clossey understood that CARB decided to "go with" ARCO's DI recommendation. (RX 73).

481. Mr. Clossey concluded that CARB decided to propose regulations that closely conformed with ARCO's recommendations: "they have opted to take the bulk of our recommendations and go with them as is." (Clossey, Tr. 5506; RX 73).

482. At the administrative hearing in this matter, Mr. Clossey testified that his email fairly and accurately characterized the conclusions that he drew from his conversation with Mr. Fletcher. (Clossey, Tr. 5506).

483. Although he did not know it at the time, Mr. Boyd, CARB's Executive Officer at the time, is now aware that Mr. Fletcher discussed the staff's upcoming proposal with Mr. Clossey before that proposal was available to the rest of the public. (Boyd, Tr. 6792-93).

484. Mr. Boyd testified that it would not have been appropriate for staff to pass along information to ARCO before making it public and that such communications would not be fair to anyone. (Boyd, Tr. 6792-93). Further, Mr. Boyd stated that this notice was wrong if it was advance private notice. (Boyd, Tr. 6792-93).

18. CARB Published Its Proposed Regulations on October 4, 1991

485. On October 4, 1991, CARB released its Staff Report, containing the proposed regulations for California Phase 2 reformulated gasoline that it intended to present to the Board at the upcoming Board meeting. (CX 52). Issued on the same day, the Technical Support Document provides technical and scientific support for the regulations that CARB proposed. (Venturini, Tr. 88; CX 5).

486. For the Phase 2 regulations, CARB staff officially proposed an RFG formula, with specific limits on a number of gasoline properties. (CX 52 at 010). Properties subject to the proposed regulation included sulfur, benzene, oflefins, oxygen, T90, T50, aromatics, and RVP. (CX 52 at 010 (Table I-2)).

Table I-2
Proposed Specifications for California
Phase 2 Reformulated Gasoline

Fuel Parameter	Typical California Gasoline	Flat Limit For Producers	Standard for Producers Using Averaging	"Cap" For All Gasoline a/
Sulfur, ppmw	150	40	30	80
Benzene, vol %	2.0	1.80	0.80	1.20
Olefins, vol %	9.9	5.0	---	10.0
Oxygen, wt %	0	1.8-2.2	---	2.7 (max) 1.8 (min) b/
T90 (°F)	330	300	---	330
T50 (°F)	220	210	---	220
Aromatic HC, vol %	32	25	20	30
RVP, psi c/	8.5	7.0	---	7.0

a/ Applies to all gasoline throughout the distribution system, including fuels qualified under modeling or testing options.
b/ Applies to the wintertime control periods only.
c/ Applies to the summertime control periods only.
--- Averaging is not proposed for these parameters.

487. As ARCO recommended (e.g., Clossey, Tr. 5505), the proposal included a 210°F flat limit on T50. (CX 52 at 010, 107 (§ 2262.6(b))).

488. With regard to a predictive model, CARB merely provided a placeholder for the future development of a predictive model, as one had not yet been developed. (Lamb, Tr. 2294; CX 52 at 046). The proposal indicated that CARB staff had not yet completed its analysis of the data sufficient to propose a predictive model. (CX 52 at 046).

489. On the same day, CARB staff issued a "Technical Support Document" to provide a more detailed explanation and analysis of CARB staff's proposal. (CX 5; Venturini, Tr. 88).

490. Both the Staff Report and the Technical Support Document included staff's estimates of the costs of compliance with the Proposed Regulations and a corresponding cost-effectiveness analysis. (CX 52 at 071-072, 076-079; CX 5 at 137, 141).

491. The primary Unocal representative throughout the Phase 2 rulemaking, Mr. Dennis Lamb, received the Technical Support Document, and, at that time, Mr. Lamb asked a number of people within Unocal to look the proposal over and provide him with comments. (Lamb, Tr. 2269).

492. The Technical Support Document contains two slides from Unocal's June 20, 1991, presentation to CARB. (Lamb, Tr. 2269-70; CX 5 at 031-032). Unocal had never given CARB permission to use the slides, but Mr. Lamb did not protest to CARB when he saw that CARB had used materials from this presentation, since by that date Unocal's slides had already been sent out to hundreds of people. (Lamb, Tr. 2270). Likewise, Mr. Lamb had not given CARB specific permission to use Unocal's equations, but did not object to CARB's publication of the equations when the Technical Support Document came out. (Lamb, Tr. 2273).

493. Unocal did not want CARB to pass the Phase 2 specifications that CARB's staff was proposing in October, 1991. (Lamb, Tr. 2274). At the November 1991 CARB Board meeting, Unocal intended to take the position that the proposals were unnecessary and did not have to be so restricted. (Lamb, Tr. 2274).

19. Refiners Continued to Meet With and Advocate to CARB Leading Up to the November Hearing on the Phase 2 Proposal

a. CARB Held Its Third Workshop in October of 1991

494. The staff conducted an informal public workshop on October 14, 1991, to discuss the Phase 2 RFG regulatory proposal. (CX 10 at 023 n.5; Lamb, Tr. 2052; CX 295).

495. Participants were advised that comments made at the workshop would not be considered part of the rulemaking record, and to assure formal consideration the participants should submit written comments or provide oral testimony at the November 21-22 public hearing. (CX 10

at 023 n.5). Thus, although the October workshop was informal, participants continued to advocate their positions to CARB.

496. For example, at this informal workshop, Mr. Douglas Youngblood made a presentation on behalf of Texaco. (RX 436 at 001, 011-015). In his presentation, he challenged the staff's methodology in determining the cost-effectiveness of the proposed regulations and stated that the proposed regulations were not cost-effective when cost-effectiveness was properly calculated. (RX 436 at 001, 014). Mr. Youngblood specifically told staff that cost-effectiveness for all pollutants should be calculated on an incremental property basis, not on an aggregate property basis. (RX 436 at 002). In a memorandum regarding the workshop, Mr. Youngblood reported that Rick Rykowski from the EPA had attended the workshop and had stated that EPA would be using incremental cost analysis where feasible. (RX 436 at 001).

497. Mr. Youngblood also reported that participants at the workshop discussed CARB's lack of emissions data on their proposed fuel other than data from ARCO's EC-X fuel: "Their previous work involved running 1½ drums of ARCO EC-X on several vehicles." (RX 436 at 004).

b. Unocal Again Met With CARB to Discuss Its Concerns Regarding the Staff Proposal

498. On October 21, 1991, Unocal's Fuels Issues Team met internally to discuss some of the major concerns Unocal had with the staff proposal. (Lamb, Tr. 2281; CX 288). These included concerns with CARB's proposals on T90, T50, and RVP. (Lamb, Tr. 2282-84).

499. Before the November Board meeting, Unocal arranged to sit down in private with CARB staff and discuss certain major areas of concern that Unocal had with the proposal. (Lamb, Tr. 2280-81). In anticipation of this meeting, Mr. Lamb asked Mr. Felderman, Unocal's Vice

President for Refining, for his input on the two or three major concerns that he had with CARB's proposal. (Lamb, Tr. 2280; CX 295).

500. Unocal met with CARB on October 29, 1991. (Lamb, Tr. 2287-88). Mr. Lamb presented Unocal's concerns to CARB staff. (Lamb, Tr. 2284).

501. At the October 29 meeting with CARB, Unocal explicitly continued its support for the predictive model. (Lamb, Tr. 2068; CX 449 at 002).

502. Unocal was looking to find common ground for support of CARB's proposals. (Lamb, Tr. 2285). Unocal was able to come to some agreement with CARB on some of the CARB proposals, such as CARB's agreement to propose a predictive model, certain policy issues relating to how the regulations were to be enforced, and dates when the regulations would become effective. (Lamb, Tr. 2286).

503. But there was also a number of areas in which Unocal was unable to find any common ground with CARB. (Lamb, Tr. 2287). For example, Unocal could not agree with CARB with respect to the vehicle testing compliance option which turned out to be unworkable in Unocal's view. (Lamb, Tr. 2287; CX 10 at 224 ("Unocal opposes the vehicle testing option unless it is changed to reduce the number of vehicle tests required for a reasonable probability of passing.")).

504. Unocal was also unable to find any common ground with respect to the specifications themselves. (Lamb, Tr. 2287). Unocal specifically requested that CARB provide more flexibility in its proposed regulations, asking for an adjustment in the property ranges of the proposed specifications. (Lamb, Tr. 2066; Venturini, Tr. 275-77, 691-92, 849-51; CX 449; CX 32). Each of the comments made by Mr. Lamb reflects a proposed relaxation of the regulations being proposed. (CX 32; Venturini, Tr. 848-51).

505. Initially, the proposed regulations contained a distribution-wide cap of 220°F for T50 and a flat limit of 210°F for T50. (Venturini, Tr. 684-85).

506. After CARB distributed the initial proposal, many refiners in the industry advocated for “averaging,” or a regulation that would allow refiners to occasionally exceed the flat limits as long as those refiners also made an equivalent amount of gasoline that met the averaging limit, which would be set lower than the flat limit or the distribution-wide cap. (Venturini, Tr. 686-87).

507. In response to the industry’s concerns, CARB supported a “DAL,” or Designated Alternative Limit of 200°F. (Venturini, Tr. 688). The DAL is the technical term for the averaging limit. (Venturini, Tr. 686). Under this proposal, refiners could occasionally produce gasoline that exceeded the flat limit of 220°F so long as that refiner also produced an equivalent amount of gasoline with a T50 that was below the DAL of 200°F. (Venturini, Tr. 686-87).

508. Mr. Venturini remembered that on or about October 29, 1991, Unocal asked that CARB set the T50 averaging limit (DAL) at 205°F. (Venturini, Tr. 682). Peter Venturini agreed that Mr. Lamb wanted CARB to move the averaging limit up from 200°F to 205°F to gain more flexibility. (Venturini, Tr. 682). A 205°F limit would allow the refiner more flexibility in terms of averaging every batch of gasoline than 200°F. (Venturini, Tr. 687).

509. Mr. Venturini clarified on cross examination that no one should interpret his testimony to mean that Unocal or Mr. Lamb advocated that CARB lower the flat limit or the distribution-wide cap from 210°F or 220°F (respectively) to 205°F. (Venturini, Tr. 692).

c. Other Refiners Including ARCO Continued to Advocate to Influence the Outcome of the Regulations

510. Many refiners were attempting to influence the final outcome of the regulations, including many through WSPA. (Kulakowski, Tr. 4637-38). ARCO, however, advocated for

positions that the rest of the industry participants opposed. (Kulakowski, Tr. 4638 (observing that by pushing its RFG recipe, ARCO was “splitting the herd” and giving CARB the ability to play one part of the industry against another)).

511. For instance, ARCO advocated for an oxygenate requirement, whereas Unocal and others opposed such a requirement. (Courtis, Tr. 5903-05). The primary reason that Unocal opposed an oxygenate requirement was because they did not produce, or were not basic in, oxygenate. (Lamb, 2175-76; Croudace, Tr. 614-15).

512. In addition, whereas WSPA advocated to CARB for the relaxation of olefins, T50, T90, and aromatics (Clossey, Tr. 5567), ARCO was opposed to CARB relaxing the specifications for these properties. (Clossey, Tr. 5567).

513. In response to this opposition, ARCO advocated to CARB that olefins, T50, T90 and aromatics were all absolutely critical to emissions performance. (Clossey, Tr. 5568-69, RX 187 at 002).

514. WSPA advocated to CARB that by relaxing the specifications, it could achieve 80 percent of the benefits of its proposed regulation while only incurring 50% of the costs. (Clossey, Tr. 5509-10; RX 77 at 001).

515. Mr. Clossey wrote another email in early November 1991 relating to discussions WSPA had with CARB in which WSPA advocated this approach. (RX 77). Mr. Clossey told CARB at the meeting with WSPA that ARCO’s “attendance at the meeting should not be viewed as ARCO agreeing in any way with WSPA’s position.” (Clossey, Tr. 5510-12, RX 77). ARCO ultimately opposed WSPA’s position that CARB could achieve 80 percent of the benefits for 50 percent of the cost. (Clossey, Tr. 5512).

516. Further, three weeks before the November Board meeting, ARCO's Mr. Trunek wrote a letter to CARB Chairwoman, Jananne Sharpless (Clossey, Tr. 5565-66; RX 187), copying Mr. Courtis of CARB as well (RX 187 at 001; Courtis, Tr. 5805-07). In this letter, Mr. Trunek expressed ARCO's support for the Phase 2 regulations and acknowledged that the industry was divided in its advocacy before CARB: "We are aware that ARB staff is being lobbied heavily in two areas," one of which was to relax olefins, T50, T90, and aromatics. (Clossey, Tr. 5566-67, RX 187 at 002). Mr. Trunek concluded "We urge that these not be changed." (RX 187 at 002; Courtis, Tr. 5909).

517. Chairwoman Sharpless testified that Mr. Trunek's advocacy letter was part of the information that CARB used to adopt its specifications. (CX 7063 (Sharpless, Dep. at 144-45)).

518. CARB attributed this comment to ARCO in its Final Statement of Reasons: "Considerable pressure is being exerted to relax the specifications on T90. We urge that this not be changed." (CX 10 at 045). In response, CARB stated that it had not relaxed the specifications as much as many refiners had urged. (CX 10 at 045).

519. Finally, ARCO also criticized the positions advocated by General Motors during the Phase 2 rulemaking process. (Clossey 5506-08; RX 75).

520. In the fall of 1991, ARCO and CARB staff had a meeting in which they discussed General Motors' suggestion that CARB "razor out di- and tri- substituted aromatics." (Clossey 5507; RX 75 at 001). In a memo, dated October 24, 1991, and summarizing this meeting, Mr. Clossey concluded that the meeting "went perfect." (Clossey, Tr. 5506-07, RX 75).

521. Mr. Clossey explained that Mr. Dean Simeroth of CARB had asked ARCO to help it respond to General Motors. (Clossey, Tr. 5507-08, RX 75 at 001). In response to CARB's staff

request for help in defeating General Motors' request, ARCO provided a letter to CARB analyzing and critiquing the economics and practicality of General Motors' request. (Clossey, Tr. 5508).

522. Ultimately, as ARCO advocated, CARB rejected the request from General Motors. (Clossey, Tr. 5509).

20. The CARB Board Met on November 21 and 22, 1991 to Approve the Phase 2 Regulations, and Unocal Opposed Them

523. On November 21 and 22, 1991, CARB held a meeting to consider the subject of the proposed Phase 2 regulations. (CX 773 (November 21 Transcript); CX 774 (November 22 Transcript)). The two-day meeting was held in Los Angeles, California. (CX 767 at 003; CX 773; CX 774).

524. As of November 21 and 22, 1991, there were nine members the California Air Resources Board. (CX 7063 (Sharpless, Dep. at 40)). Of those nine members, Mr. Bilbray, Dr. Boston, Mrs. Ichikawa, Mr. Lagarias, Supervisor Riordan, Dr. Wortman, and Chairwoman Sharpless identified themselves as present at the meeting on November 21, 1991. (CX 773 at 003-004). Initially, Board members Hughan and Weider were not present. (CX 773 at 003-004). Mayor Hughan, however, took her seat after the meeting began. (CX 773 at 028). On November 22, 1991, Mr. Bilbray, Dr. Boston, Mayor Hughan, Mrs. Ichikawa, Mr. Lagarias, Dr. Wortman and Chairwoman Sharpless identified themselves as present; Board members Riordan and Weider were not present. (CX 774 at 002). Only one of these Board members was called to testify by Complaint Counsel—Ms. Jananne Sharpless, who testified by designated deposition. (CX 7063 (Sharpless, Dep.)).

525. The Board received a substantial number of written and oral comments, both in connection with the November 21-22, 1991 Board meeting and during the three subsequent 15-day

public comment periods. (CX 10 at 023; CX 838 at 1553-2325 (written comments), 2326-3620 (15-day comments)).

a. CARB Staff Changed Its Proposed Regulations and Put a Modified Proposal Before the Board

526. CARB staff members Mr. Robert Fletcher, then Manager of the Fuels Section of the Stationary Source Division, and Mr. Dan Donohoue, then Manager of the Technical Analysis Section, presented the Phase 2 staff proposal at the meeting. (Fletcher, Tr. 7018-20; CX 773 at 008).

527. They did not present the original October 4, 1991 proposal; instead, they presented an alternative proposal. (Fletcher, Tr. 6947-48; CX 870 (comparing the October 4 proposal to the modified proposal and what was actually adopted); RX 528 at 001). The revised proposal was represented by staff as providing “substantial emission benefits in a much less costly manner” as well as “more flexibility for refiners.” (RX 528 at 001). It contained a modified set of specifications. (Lamb, Tr. 2318; Cunningham, Tr. 2224; CX 1192). It also allowed for averaging a number of the specifications, known as DAL (designated alternative limits), to provide more flexibility to the refiners. (CX 10 at 013-014; Venturini, Tr. 687-88).

b. ARCO and Others Supported More Stringent Specifications

528. Numerous individuals presented comments on behalf of various parties, including large refiners, small refiners, auto manufacturers, California government entities, and public interest groups. (CX 773; CX 774).

529. A number of commenters generally supported adoption of Phase 2 RFG gasoline regulations. These commenters included the Motor Vehicle Manufacturers Association (MVMA), Ford, GM, Chrysler, Toyota, and ARCO Products Company. (CX 10 at 023).

530. In addition, a number of commenters specifically supported the more stringent original regulatory proposal made available with the October 4, 1991 Staff Report rather than the less stringent modifications suggested by the staff at the November 21-22, 1991 hearing, including MVMA, Ford, GM, Chrysler, Toyota, ARCO Products, as well as environmentalists, environmental regulatory authorities, and other businesses. (CX 10 at 023-024).

531. The oil companies, with the exception of ARCO, opposed the regulations at the November meeting including, but not limited to, WSPA, Chevron, Unocal, and Texaco. (RX 437 at 001; RX 434 at 007). ARCO was the only oil company that supported the proposed regulations. (CX 7076 (Youngblood, Dep. at 40)).

532. ARCO advocated that CARB adopt the most stringent set of regulations before it: a fuel formula that replicated ARCO's EC-X fuel. (Lamb, Tr. 2173). In fact, Mr. Babikian of ARCO, who was the first person to present comments, declared at the November hearing that the "specifications that CARB was looking at on October 4 are very, very similar to the specifications of EC-X. They're almost identical." (CX 773 at 146).

533. In fact, ARCO issued a press release on November 21, 1991, the first day of the CARB Board meeting. (Clossey, Tr. 5513, CX 1591). This press release quotes ARCO Products Company president, Mr. George Babikian, as stating that ARCO favored more stringent air quality standards than those being considered by the Board. (CX 1591 at 001).

534. The ARCO press release also quotes Mr. Babikian as saying that CARB should adopt a stricter proposal that was originally made by CARB staff on October 4, rather than a second, more lenient proposal made on November 18. (Clossey, Tr. 5514, CX 1591 at 001). ARCO argued in the

press release that if the strict gasoline specifications were not adopted, then the state would need to find another way to clean up the air. (Clossey, Tr. 5515).

535. In the press release, Mr. Babikian refutes the argument that the higher cost for stricter requirements would create more economic hardship in California by stating, “If clean air standards aren’t met by reformulated gasoline, then the financial burden would be borne by stationary sources, including many small business that would have to submit to stricter regulations. This ultimately would be much more detrimental to the state’s economy.” (Clossey, Tr. 5514, CX 1591 at 002). The clean air standards to which Mr. Babikian was referring included both federal and state laws. (Clossey, Tr. 5514-15).

536. According to Chevron’s records of the meeting, ARCO “strongly urged the Board to reject staff’s revised proposal and instead adopt the original formula;” WSPA “attempted to cast doubt on the cost-effectiveness of the proposal and to point out the probable economic impacts,” and “[i]ndividual companies (Chevron, Unocal, Texaco) testified in support of the WSPA arguments and placed focus on items of particular concern.” (RX 528 at 001-002).

c. At the Board Meeting, Unocal Made Oral Comments Against the Proposed Regulations, and Advocated for a Predictive Model

537. At the Board meeting, Mr. Dennis Lamb presented Unocal’s views on the Phase 2 regulations to the CARB Board. (Lamb, Tr. 2292). Mr. Lamb expressed Unocal’s desire that CARB adopt a predictive model. (CX 774 at 020-021; CX 34 at 005 (submission accompanying oral comments)). In Unocal’s view, a predictive model was needed by the industry for compliance flexibility in order to deliver the same benefits while minimizing capital investment costs. (RX 774 at 020-022). Unocal expressed disappointment that the predictive model had not been completed by the time of the November 1991 Board meeting and asked that the compliance date for Phase 2

gasoline regulations be linked to the adoption of a predictive model. (CX 774 at 021-022; Lamb, Tr. 2299-300; Venturini, Tr. 809). Mr. Lamb urged CARB to develop it as soon as practicable and to delay implementation of the regulations until at least four years from the date on which a predictive model was adopted. (RX 774 at 020-022 (Mr. Lamb testifying on behalf of Unocal)).

538. In his oral comments, Mr. Lamb also addressed certain of the proposed parameter specifications. (CX 774 at 023; Lamb, Tr. 2300-07). He told CARB that Unocal supported the WSPA analysis identifying the most cost-effective levels of control for each fuel parameter. (CX 774 at 023; Lamb, Tr. 2301-02). This was a reference to the presentation made the previous day by Mr. Cunningham on behalf of WSPA. (Lamb, Tr. 2302). The previous day, Mr. Cunningham had recommended that CARB eliminate T50 from its regulation. (Lamb, Tr. 2303-04; CX 773 at 228).

539. During Mr. Lamb's statements, Chairwoman Sharpless asked him about T50, to which he replied, "I don't disagree with what was said here. There's very limited things you can do to change T50 . . . [w]e don't see the spec for T50 as necessary." (CX 774 at 045; Venturini, Tr. 809-10). Mr. Lamb told the CARB Board that Unocal agreed with Mr. Cunningham's recommendation that T50 be eliminated: (Lamb, Tr. 2304-06; CX 774 at 045).

540. Chairwoman Sharpless also asked Mr. Lamb whether Unocal would tell CARB what Unocal anticipated its costs for CARB gasoline would be. (Lamb, Tr. 2307; Venturini, Tr. 810-11; CX 774 at 047-048). Unocal was also asked if it knew what it would have to charge for reformulated gasoline. (Lamb; Tr. 2307, CX 774 at 048). Unocal did not give CARB a number for either what its anticipated costs were or for the potential prices it thought it would charge for CARB 2 gasoline. (Lamb, Tr. 2307; Venturini, Tr. 811). Mr. Lamb believed that the question about what Unocal might

have to charge was a highly inappropriate question because the room was full of Unocal's competitors, and did not provide a response other than to say he was not going to provide anything. (Lamb, Tr. 2307-08; Venturini, Tr. 808, 812; *cf.* CX 7076 (Youngblood, Dep. at 39-40) (numerous oil companies present)).

d. Unocal Also Submitted Written Comments in Opposition to the Regulation

541. Unocal also provided written comments to the CARB Board for the Phase 2 rulemaking in a letter sent to Ms. Jananne Sharpless from Mr. Roger Beach. (Lamb, Tr. 2292; CX 7063 (Sharpless, Dep. at 92); CX 33). Mr. Beach drafted the letter with assistance from Mr. Lamb. (Beach, Tr. 1681, 1772). The first two pages summarize Unocal's positions on the CARB regulations; the remaining pages contain more specific and detailed comments. (Lamb, Tr. 2292; CX 33).

542. Unocal had a significant number of comments with respect to the proposed Phase 2 regulations. (CX 33). With respect to the proposed vehicle testing option, Unocal told CARB that it was opposed to the regulation as currently proposed because it provided only an illusion of flexibility and that the program as proposed was not workable. (CX 33 at 001; Lamb, Tr. 2293; CX 10 at 224). Unocal was never able to convince CARB to adopt a more workable vehicle test program. (Lamb, Tr. 2293). During the time Mr. Lamb was with Unocal, neither Unocal nor any other refiner (to Mr. Lamb's knowledge) ever utilized CARB's vehicle test program alternative. (Lamb, Tr. 2293).

543. With respect to the predictive model, Unocal told CARB that it strongly supported the development of a predictive model for gasoline certification. (Lamb, Tr. 2294-95; Beach, Tr. 1682, 1773; CX 33 at 002 ("Unocal strongly supports the development of a predictive model for

gasoline certification.”)). Unocal, however, noted a number of concerns that it had with respect to CARB’s predictive model development. (CX 33 at 002; Lamb, Tr. 2294-97).

544. One such concern Unocal raised with respect to a proposed predictive model was that CARB staff was proposing limiting the model by proposed caps. (CX 33 at 006; Lamb, Tr. 2295-96; Beach, Tr. 1774-75). In Mr. Beach’s letter to Chairwoman Sharpless, Unocal told CARB that using caps to limit the predictive model “could eliminate the model as a viable alternative.” (CX 33 at 006; Lamb, Tr. 2295-96; Beach, Tr. 1775). In fact, Unocal wanted a pure predictive model without caps because it that would provide the most flexibility. (Beach, Tr. 1773-75). Unocal did not want caps on the parameters within the model because such caps could limit Unocal’s use of the model to take advantage of its strengths and offset its weaknesses. (Lamb, Tr. 2296). This was an issue that Mr. Lamb had discussed with CARB staff as well. (Lamb, Tr. 2296).

545. Unocal also told CARB that the predictive model should not include certain parameters, such as oxygen, which were not suggested by an impartial analysis of the data. (CX 33 at 007). Inclusion of such parameters would, in Unocal’s words, “significantly reduce the flexibility that the model is meant to provide.” (CX 33 at 007). Unocal believed that science should determine what was included in the predictive model, and Unocal wanted to be able to use the model to the full range that was scientifically supported, and did not want that range artificially limited by caps. (Lamb, Tr. 2296-97).

546. In addition, Unocal told CARB that it was concerned regarding the staff’s proposed delay in adopting a predictive model, and requested that for every month in delaying the development of the model, the compliance date for the Phase 2 regulations should be deferred by one month. (CX 33 at 002; CX 33 at 006; Lamb, Tr. 2294; Beach, Tr. 1774). Chairwoman Sharpless

understood that Unocal was expressing the view that she shouldn't even wait until mid-1992 to adopt a predictive model. (CX 7063 (Sharpless, Dep. at 93)).

547. With respect to the specific parameter limitations proposed by CARB, Unocal provided comments to CARB opposing or critiquing CARB's fuel specifications for RVP (CX 33 at 007-009), T90 (CX 33 at 009), sulfur (CX 33 at 009-010), oxygen (CX 33 at 010-011), olefin (CX 33 at 011-012), aromatics (CX 33 at 012-013), benzene (CX 33 at 014) and, T50 (CX 33 at 016).

548. Regarding the proposed olefin specifications, Unocal argued to CARB that neither the Staff Report nor the Technical Support Document supported the necessity of controlling or reducing olefins. (CX 33 at 011-012). With respect to CARB's T50 specification, Unocal critiqued the staff's proposed process options for reducing T50 and argued that CARB's oxygen limit reduced the only workable proposal for controlling T50. (CX 33 at 016; Lamb, Tr. 2298).

549. With respect to the proposed gasoline specifications, Unocal also told CARB that the proposed specifications were not cost-effective. (CX 33 at 002; CX 7063 (Sharpless, Dep. at 93, 99)). Mr. Beach, referring to the proposed Phase 2 regulations, expressed his view that Unocal was strongly opposed to the imposition of measures that are not cost-effective. (Beach, Tr. 1682; CX 33 at 001).

550. Unocal criticized also CARB staff for failing to recognize other cost-effective control measures such as a vehicle buy-back program. (CX 33 at 019-020; Lamb, Tr. 2308-09). The cars that are in California, or its "fleet," tend to be older than in other states. (CX 7063 (Sharpless, Dep. at 95)). Ms. Sharpless understood that Unocal argued that low-emission vehicles and technology improvements in the vehicle would, over time, achieve significant emissions reductions, and that it

would be more cost-effective than the Phase 2 regulations to scrap older, higher-polluting cars. (CX 7063 (Sharpless, Dep. at 95, 100-01)). Part of what CARB achieved with its regulations was an immediate reduction in emissions from California's current fleet, which was one of CARB's goals in 1991. (CX 7063 (Sharpless, Dep. at 95-96)). One of CARB's concerns with the vehicle scrapping program was the social equity issues that could affect people of lesser economic means more profoundly than others. (CX 7063 (Sharpless, Dep. at 101-02)).

551. In its written comments, Unocal also told CARB that the proposed specifications were not necessary to achieve the reductions required by the California Clean Air Act. (Lamb, Tr. 2309-10; CX 33 at 005). Unocal took the position that the proposed regulations were unnecessary and did not have to be so restrictive. (Lamb, Tr. 2274; CX 7065 (Stegemeier, Dep. at 136-37)). Even CARB's Executive Officer James Boyd remembers that Unocal repeatedly argued to CARB that the regulations were not needed in California to achieve air quality standards. (Boyd, Tr. 6786). Unocal told Ms. Sharpless that CARB did not have to take any action to achieve the emissions reductions required by December 31, 2000, but Ms. Sharpless also disagreed with that statement. (CX 42; CX 7063 (Sharpless, Dep. at 94-95)).

552. Unocal continued to complain about caps in the predictive model even after the November 1991 meeting. (RFF 800-03, *infra*).

e. CARB Did Not Credit the Industry's Comments

553. At the CARB meeting, Mr. Robert Cunningham of Turner Mason presented his cost analysis on behalf of the Western States Petroleum Association and additionally claimed that the T50 specification should be written out of the regulation. (CX 7063 (Sharpless, Dep. at 105-06)). According to Ms. Sharpless, however, it has been her experience in regulatory proceedings that when

it comes to cost-effectiveness, industry estimates tend to be on the high side. (CX 7063 (Sharpless, Dep. at 118-119)). Thus, Mr. Fletcher testified that although the stakeholders submitted comments criticizing the cost of the regulations, the comments did not materially change the regulation. (Fletcher, Tr. 6485).

554. According to Texaco's representative, Mr. Doug Youngblood, the arguments regarding cost-effectiveness "fell on deaf ears" and were offset by the efforts of ARCO, environmentalists, individual air quality management districts, and the auto industry, who pushed for more stringent requirements than the original CARB staff proposal. (RX 437 at 001).

555. CARB staff did not believe at the time of the rulemaking that it would ever cost as much to make CARB-compliant gasoline as the oil industry said it would. (Boyd, Tr. 6817).

21. CARB Rejected the Staff Modifications and Approved Regulations that Used Prescriptive Limits, Promising a Predictive Model by Spring 1992

556. The Board rejected much of the staff's modified proposal and instead adopted a more "stringent" version of the Phase 2 regulations. (Venturini, Tr. 110-11 ("[I]n fact there was one board member—his name is Jack Lagarias—made a proposal to the board to basically change the specifications to make them more stringent than the modified proposal that the staff had made. And that was in light of the testimony that had been given and the dialogue with the staff. He presented that, and the staff did not object, we didn't have a problem with that, and the board said okay, we will do this.")).

557. As approved in 1991, the CARB Phase 2 regulations set specific limits on eight different gasoline properties:

The following chart sets forth the standards as modified:

<u>Property</u>	<u>"Cap"</u>	<u>Flat Limit for Producer</u>	<u>Standard for Producer Under DAL Option</u>
RVP	7.0 psi [*]	NA	NA
Sulfur	80 ppm	40 ppm	30 ppm
Benzene	1.20% vol	1.00% vol	0.80% vol
Aromatic Hydrocarbons	30% vol	25% vol	22% vol
Olefins	10.0% vol	6.0% vol	4.0% vol
Distillation Temp.			
T90	330° F	300° F	290° F ^{***}
T50	220° F ^{***}	210° F	200° F
Oxygen (min)	1.8% wt ^{***}	1.8% wt	NA
(max)	2.7% wt	2.2% wt	NA

* Applicable during summertime control periods only.

** No DAL can exceed 310° F.

*** Applicable during wintertime control periods only.

(CX 10 at 014).

558. The regulations CARB adopted were stringent specifications that the Board determined were the most effective in carrying out the purpose for which the regulatory action was proposed. (CX 10 at 009). The staff wrote that the Phase 2 regulations were designed to achieve maximum reductions in the emissions of volatile organic compounds ("VOCs"), oxides of nitrogen ("NOx"), carbon monoxide, sulfur dioxide and toxic air pollutants from gasoline-fueled vehicles. (CX 10 at 010).

559. At the meeting, the Board also approved DAL (designated alternative limits) options. (Venturini, Tr. 688). Under the DAL, a refiner was allowed to make gasoline that could go past the CARB-mandated limits, but that refiner would have to make just as much gasoline that offset that excess. (Venturini, Tr. 687-88). The DAL was designed to give refiners more flexibility. (Venturini, Tr. 688).

560. The regulations as adopted, included a T50 flat limit specification of 210°F, which was a small downward adjustment from the historical industry average of 212°F. (Eizember, Tr. 3232; RX 210 at 003). This small downward adjustment accounted for the effects of adding MTBE. (RX 210 at 003).

561. The regulations included both cap and flat limits and as well as limits for producers utilizing the Designated Alternative Limit option. (CX 10 at 014). The cap standard applied throughout the distribution system while the flat limits applied to gasoline when it was first supplied by producers and importers. (CX 10 at 010).

562. The cap standards served two important purposes. The first was to ensure that emissions did not increase to unacceptably high levels when gasoline producers were utilizing the averaging provisions. (CX 10 at 026). While CARB staff acknowledged that these caps limited flexibility to gasoline producers, they said it “[i]s necessary to have cap limits for each of the individual gasoline properties for each method of compliance in order to ensure that high emissions gasoline is not produced and used during the times of the year when it would have the greatest adverse effects on air quality.” (CX 10 at 028).

563. The second purpose for the cap standards was to ensure that the regulations could be enforced downstream of the refinery including all points in the distribution system. (CX 10 at 026, 028).

564. The final regulation did not include a predictive model. However, acknowledging the industry’s desire to have a predictive model, CARB claimed a predictive model would be ready by the spring of 1992. (CX 774 at 021 (Sharpless); CX 773 at 027-028 (Fletcher); CX 817 at 008-009 (Resolution 91-54, adopted at the hearing, directs the executive officer to develop the predictive

model and schedule a hearing for its adoption in the spring of 1992)). Mr. Dennis Lamb specifically spoke about the predictive model during his oral comments on November 22, 1991, to which Chairwoman Sharpless replied, “[w]e’re talking about the spring of ’92.” (CX 774 at 021).

22. ARCO and Others Recognized the Phase 2 Regulations as a Victory for ARCO

565. Even before the hearing, during the development of the Phase 2 regulations, Chairwoman Sharpless became aware of criticism that the Board was modeling its regulations after ARCO’s gasoline. (CX 7063 (Sharpless, Dep. at 56-57)). Texaco had viewed CARB’s Phase 2 proposal as a “kissing cousin” to ARCO’s EC-X composition. (RX 438 at 005).

566. Both the staff proposal and the specifications ultimately adopted by the Board, were similar to ARCO’s EC-X. The staff proposed 28 percent aromatics, EC-X had 21.6 percent aromatics, and the Board required aromatics at 25 percent. (Fletcher, Tr. 6948-52). The staff proposed a 7 percent olefin content, EC-X had 5.5 percent olefins, and the Board’s regulation called for olefins limited to 6 percent. (Fletcher, Tr. 6948-52). For T90, the staff proposed 310°F, EC-X had 293°F, and the Board’s regulation called for 300°F. (Fletcher, Tr. 6948-52).

567. Based on the regulations as adopted, ARCO took credit for revolutionizing the refining industry. Shortly after the conclusion of the CARB Phase 2 hearing, Mr. Clossey sent an email to all the employees at ARCO’s Anaheim technical center. (Clossey, Tr. 5562-63, RX 80). In this email, Mr. Clossey wrote, “Several years of fuels development work came to fruition today at the CARB hearing on Phase 2 gasoline specifications. The work done by the nine members of the Fuels Development Group here at AET had a major and controlling influence in the outcome of the hearing.” (RX 80 at 001). Mr. Clossey also reported that “[o]ur work became the standard, and the resulting reformulated gasoline specifications will effect everyone in California in the years to

come—indeed it will likely spread beyond California into other states as well. This small group of nine revolutionized the refining industry for years to come.” (RX 80 at 001).

568. On November 26, 1991, ARCO’s Mr. Robert Trunek reported to his boss, Mr. George Babikian, then president of ARCO Products Company that “[t]he major success this month has been the successful orchestration of ARCO’s viewpoints in the CARB Phase 2 Reformulated Gasoline hearings.” (Clossey Tr. 5571-72; RX 81 at 002). Additionally, Mr. Trunek reports that although ARCO had been different from everyone in the industry, ARCO representatives had “prevailed and the new CARB gasoline specification is extremely close to the EC-X formulation which was presented earlier this year.” (Clossey Tr. 5571-72; RX 81 at 002).

569. Mr. Clossey later nominated his team for ARCO’s Outstanding Technical Achievement Award, which ARCO did bestow upon the team. (RX 83 at 002; Clossey, Tr. 5407-10). The nomination is dated April 10, 1992. (RX 83). Mr. Jack Segal was one of the people nominated for the award. (Segal, Tr. 5696). In the nomination, Mr. Clossey told his management that CARB’s Phase 2 gasoline specifications were “essentially identical” to EC-X (RX 83 at 002); that the new gasoline standard “sprang from the EC-X work” (RX 83 at 002); that ARCO had been challenged to convince regulators to adopt standards that would “mirror the EC-X formula” (RX 83 at 005); that the final specifications adopted by CARB were “equivalent to the EC-X formula” and “essentially identical in every aspect to [ARCO’s] proposal” (RX 83 at 006); and that California’s reformulated gasoline was “patterned after EC-X” (RX 83 at 006). The “EC-X” to which Mr. Clossey was referring to in this memo was a new gasoline formula that ARCO had dubbed EC-X. (Clossey, Tr. 5519; RX 83 at 002).

570. In the nomination, Mr. Clossey discussed at some length ARCO's lobbying efforts in conjunction with the Phase 2 regulations. (RX 83). Mr. Clossey notes at the beginning of the memo that ARCO's "successful lobbying efforts" led to CARB's adoption of specifications essentially identical to EC-X. (RX 83 at 002). Mr. Clossey wrote that if ARCO had not developed EC-X, "it is likely that regulators would have continued their drive to regulate gasoline out of existence." (RX 83 at 002). He further stated that the regulators were blocked in their efforts to regulate gasoline out of existence because ARCO had been able to show that EC-X had equal emissions benefits to M85 and other alternatives, that it provided equal energy security, that it could be implemented more readily than alternatives and it was "far and away" the most cost-effective option. (RX 83 at 002).

571. While noting that the technical challenge in developing EC-X was substantial, Mr. Clossey wrote that "equally challenging was the task of packaging the new developments in a way that ARCO could successfully convince regulators and legislators that reformulated gasoline was the best answer in the face of the strong tide of sentiment to mandate that California convert to M85 fuel." (RX 83 at 004).

572. Once his team had developed the EC-X formula, Mr. Clossey wrote that the challenge then was "to package and present the detailed and complex scientific data in a way which would result in the ultimate adoption of reformulated gasoline standards that would mirror the EC-X formula." (RX 83 at 005).

573. In his memo, Mr. Clossey further stated that many "did not want to hear our message, were unwilling to objectively evaluate the data, and were very quick to attempt political maneuvers to discredit the information." (RX 83 at 005). Mr. Clossey testified at trial that the above sentence

described some of the challenges his team faced in trying to convince CARB to adopt specifications that mirrored ARCO's EC-X formula. (Clossey, Tr. 5529).

574. In his memo, Mr. Clossey also noted that members of the petroleum industry "fought the ARCO invention at almost every step." (RX 83 at 005-006). Unocal was one of the petroleum industry members that fought ARCO's invention. (Clossey, Tr. 5530).

575. Mr. Clossey stated that the challenge of "selling" the new invention was particularly challenging for his group, since they were not lobbyists or politicians: "To operate effectively in this political and regulatory environment was quite new to the team members, but was critical to the success of the project." (RX 83 at 006). Mr. Clossey testified that EC-X was the new invention referred to in his memo. (Clossey, Tr. 5532).

576. In their efforts to "sell" the ARCO invention, Mr. Clossey wrote, "[m]embers of the team made numerous public presentations at seminars, CARB public hearings and fuels conferences. They also met with governmental agencies, CARB staff and AQMD staff, even political leaders and members of the Governor's cabinet." (RX 83 at 006). These meetings with government agencies, political leaders and members of the governor's cabinet were a critical component of ARCO's project. (Clossey, Tr. 5551). Ultimately, Mr. Clossey wrote, "the ARCO team controlled the flow of the deliberations and dominated the CARB hearing at which the fuel specs were considered." (RX 83 at 006).

577. ARCO thought it had succeeded in having its proposal adopted as the final regulation: "The team's successes in the public/regulatory arena were particularly satisfying. Many within Products Company feel that this is likely the first time that ARCO has been able to influence the

regulatory process such that the final regulation adopted is essentially identical in every aspect to our proposal.” (RX 83 at 006).

578. Despite the clear words of RX 83 describing ARCO’s successful lobbying efforts, in his testimony at trial Mr. Clossey was very reluctant to admit that ARCO’s lobbying efforts had been successful. (Clossey, Tr. 5560-61). He was further reluctant to admit that his use of the words “lobbying efforts” meant ARCO’s attempts to influence the formulation of CARB’s Phase 2 specifications. (Clossey, Tr. 5559-60).

579. In his testimony at trial, Mr. Clossey could not give a yes or no answer to the question as to whether the “successful lobbying efforts” referred to in RX 83 were the efforts he and others at ARCO had engaged in to persuade CARB to adopt specifications that were essentially identical to EC-X. (Clossey, Tr. 5523).

580. And, despite the fact that Mr. Clossey stated in RX 83 that the challenge for his team was to package and present data in such a way as would “result in the ultimate adoption of reformulated gasoline standards that would mirror the EC-X formula” (RX 83 at 005), Mr. Clossey claimed at trial that it was “misleading” to say that he wanted CARB to ultimately adopt reformulated gasoline standards that would mirror ARCO’s EC-X formula. (Clossey, Tr. 5528-29).

581. Also, despite the many, many references in his memo to the EC-X formula and its similarities to the CARB Phase 2 regulations, Mr. Clossey’s testimony on this topic at trial consisted of numerous equivocations and denials. (Clossey, Tr. 5524, 5551-52, 5556-57). For example, despite the fact that he wrote “California’s reformulated gasoline (patterned after EC-X)” (RX 83 at 006), in his testimony at trial Mr. Clossey denied that it was his understanding that California’s Phase 2 specifications were “patterned after EC-X.” (Clossey, Tr. 5556-57). And, despite the fact

that in his memo Mr. Clossey stated that “CARB adopted reformulated gasoline specifications for all gasoline sold in California after March 1, 1996 that are equivalent to the EC-X formula” (RX 83 at 006), Mr. Clossey testified at trial that he could not answer yes or no to the question of whether he would agree that CARB’s Phase 2 specifications are equivalent to ARCO’s EC-X formula. (Clossey, Tr. 5551-52).

582. The nomination was successful; Mr. Jack Segal and the other members of the team received the ARCO Outstanding Technical Achievement Award. (Segal, Tr. 5696). At the time Mr. Segal accepted this award, he did not believe that his nomination was based on any untrue statements. (Segal, Tr. 5697-98). Despite the fact that Mr. Segal was an award nominee who was a carbon-copy recipient of RX 83, and despite the fact that the technical achievement award was an important award at ARCO, Mr. Segal testified that he was not aware of what RX 83—the document nominating him for his award—contained, nor did he even care. (Segal, Tr. 5699-700).

583. Publicly, ARCO described a “partnership” with governmental regulators, and extolled EC-X: “With the EC-X formula as a reference, the Air Resources Board defined its strict specifications for clean fuels of the future.” (RX 82). ARCO’s Mr. Babikian and Mr. Cooke—two senior-level executives at ARCO—took credit for the promulgation of the Phase 2 regulations. (Boyd, Tr. 6790). ARCO published splashy, full-page advertisements in prominent newspapers in California, taking credit for the CARB regulations. (Boyd, Tr. 6792). ARCO showed proofs of the advertisements to CARB before they published them. (Boyd, Tr. 6791-92).

584. In addition to ARCO’s public announcement, there were other sources reporting that CARB’s specifications were based on EC-X, but John Courtis claimed he had never heard of, or seen

the sources of those statements. (RX 504¹ at 001 (“CARB Staff Embraces ARCO Specifications for ‘EC-X’ Reformulated Gasoline at Workshop”), 002 (stating that “the basis for many of the revised specifications appears to be ARCO’s recently announced ‘EC-X’ gasoline”), 007 (noting “CARB’s wholesale adoption of EC-X specifications”); *see also* RX 329 (internal CARB circulation from July of 1991 with news clippings about ARCO’s efforts to promote its EC-X fuel to CARB); Courtis, Tr. 5914-15).

585. After flatly denying under oath that he was aware of criticism of CARB staff for simply adopting ARCO’s EC-X formulation, a portion of Mr. Courtis’s 2003 deposition testimony was read into the record in which he volunteered that such criticism had been made. (Courtis, Tr. 5912). CARB admitted that the specifications adopted by the Board were similar to the ARCO specifications for EC-X gasoline, but in its Final Statement of Reasons claimed that it did not believe that ARCO had received special treatment. (CX 10 at 178).

23. CARB Justified Its Regulation of T50 Using Many Sources Including Unocal, But There Is No Evidence That CARB Ever Analyzed the Unocal Data Before the 1991 Board Meeting

a. CARB Considered Many Factors When It Regulated T50, Including the Emissions Benefits, Enforceability, Its Impact on Other Properties, and Submitted Comments

586. CARB published its proposed T50 regulation on October 4, 1991 in the Staff Report and Technical Support Document, and also *supported* the regulation in the Final Statement of Reasons. (CX 52 at 032; CX 5 at 028; CX 10 at 046-050). The Staff Report purports to set forth

¹ RX 504, an exhibit entitled “CVS News,” was not admitted for the truth of the matter asserted, but rather for the non-hearsay purpose of demonstrating the effect on the listener. (Tr., 5912-14). CARB was certainly aware of the criticism that it had endorsed ARCO EC-X, and such criticism is reflected in the CVS News document. (Courtis, Tr. 5911-12, RX 504).

the staff's reasons for regulating distillation temperatures. (Venturini, Tr. 743,752; CX 52 at 032-033). In addition, the Technical Support Document has a section on the impact of the T50 distillation temperature on emissions. (CX 5 at 028). Almost one year after those documents, CARB published its justification for T50 in the Final Statement of Reasons. (CX 10 at 046-050).

587. CARB staff proposed a regulation for T50 with a flat limit of 210°F (CX 5 at 033; CX 52 at 040). In the first six months of 1991, the production-weighted average of T50 for California gasoline was 212°F. (CX 52 at 031). Therefore, CARB took an assumed Phase 1 baseline gasoline with a 212°F T50 level, and compared it to a test gasoline that had Phase 2-compliant properties with varying T50 measurements. (CX 5 at 028, 033 (Table II-11)). Based on that analysis, the staff determined that a T50 of 210°F would result in small decreases of pollutants. (CX 5 at 028).

588. Although the comparison of Phase 2-compliant gasoline showed that even greater emissions reductions could be achieved by lowering the flat limit for T50 below 210°F, the staff declined set a lower flat limit for two reasons. (CX 5 at 028-032; Fletcher Tr. 6483-84; Venturini, Tr. 761). Staff expected that to meet a 210°F flat limit, refiners would have to produce gasoline at about 200°F (because of test method reproducibility concerns), thereby providing the emissions benefits associated with a 200°F T50 without a regulated limit at that level. (CX 5 at 033; Fletcher, Tr. 6483). Staff was also concerned that to meet a lower T50 limit, refiners would have to produce at a correspondingly lower level (*e.g.*, for a flat limit of 200°F, refiners would produce at 190°F), which could increase front-end volatility and would be more expensive to produce. (CX 5 at 033; CX 10 at 050; Fletcher Tr. 6483-84; Venturini, Tr. 761).

589. In setting that limit on T50, exhaust emissions were not the only type of emissions that CARB wanted to control, because it also sought to minimize evaporative emissions. (CX 52 at 033; Venturini, Tr. 748).

590. Nor did CARB's determination of the T50 limits end with benefits to exhaust and evaporative emissions; aside from the emissions benefits associated with the flat limit, CARB also set a cap limit on T50 because of enforcement reasons. (CX 10 at 049-050; Venturini, Tr. 783-84). CARB wanted to ensure that the regulation would be enforceable at all points in the distribution system. (CX 10 at 028). With a cap limit, CARB could enforce the regulations downstream of the refinery. (CX 10 at 026).

591. Yet another consideration was the interaction between T50 and the other regulated parameters, including RVP. (Venturini, Tr. 781-83; CX 10 at 049-050).

592. The Final Statement of Reasons reflects comments from auto manufacturers and ARCO arguing that CARB should regulate T50 and set a more stringent level than the proposed regulation called for. (Venturini, Tr. 778-83; CX 10 at 049-050; CX 774 at 184-185 (Toyota supported all of the flat limit specifications except for T50, and asked that the flat limit be set at 200°F); RFF 528-36, *supra*). On the other hand, many refiners did not want the T50 regulation at all or wanted the limits to be raised. (CX 10 at 047-050).

b. CARB Cited to Unocal Among Many Other Parties to Support Its T50 Regulation

593. CARB cited many studies to support its T50 regulation when it published its Staff Report and Technical Support Document, and later in the Final Statement of Reasons. (CX 5 at 028-033; CX 10 at 046-050; CX 52 at 032-033). Mr. Courtis could not say which of those studies was most important to the decision to regulate T50. (Courtis, Tr. 5917-19).

594. Specifically, in the Staff Report discussion of distillation temperatures for the proposed regulations, staff cited to studies from Toyota, Unocal, and GM/WSPA/ARB to support its regulation of T50. (CX 5 at 028). The Staff Report says that the Toyota and Unocal studies show that reducing T50 results in a decrease in VOC and CO emissions and has no significant effect on NOx emissions (oxides of nitrogen). (CX 52 at 033; Venturini, Tr. 744). But CARB staff cited the GM/WSPA/ARB volatility study as showing “that T50 is one of the major parameters to consider.” (CX 52 at 033).

595. In the Technical Support Document, staff led off its discussion of T50 with Toyota’s study. (CX 5 at 028). The staff included a chart from Toyota and two from Unocal showing directionally that lowered T50 reduced emissions. (CX 5 at 030-032). But Mr. Venturini admitted that CARB already had enough information to know directionally where T50 would go even without the Unocal study. (Venturini, Tr. 381-82, 763-64).

596. In a separate section of the Technical Support Document, CARB does include a table that the CARB staff created, titled Sensitivity Analysis of T50 Changes on Exhaust Emissions using Unocal Regression. (Venturini, Tr. 758; CX 5 at 033). That analysis did not enter into CARB’s evaluation of the emissions benefits; it merely demonstrated the effect of T50 on emissions:

The staff used different models in the technical discussion of the effects of fuel properties on emissions. However, this approach did not enter into the evaluation of emission benefits. Therefore there is not need to address the comparative accuracy of the models.

(CX 10 at 075; *accord* Fletcher, Tr. 6468 (testifying that CARB used Unocal’s data to show what happened to emissions when you reduce T50)).

597. In the Final Statement of Reasons, CARB cited to multiple studies, including Toyota, Unocal, GM/WSPA/ARB, and Auto/Oil's work as supportive of the T50 part of the regulation. (CX 10 at 047-051; Venturini, Tr. 775).

598. In response to a comment that the support for T50 was weak, CARB cited the GM/WSPA/CARB study. (CX 10 at 047). CARB claimed that the GM/WSPA/CARB study was an appropriate basis to study the effects of T50, despite the fact that it did not control for MTBE, because the effects of T50 and MTBE were interrelated. (CX 10 at 047; Venturini, Tr. 769).

599. CARB stated that while the Unocal work provided a superior estimate of the effect of T50 on emissions, Auto/Oil had provided support for its choice of where to set the T50 specification. (CX 10 at 047; Venturini, Tr. 767). The data from Auto/Oil indicated that the point of diminishing returns for emissions reductions was from 210°F to 220°F, which supported the choice of a limit within that range. (CX 10 at 047; Venturini, Tr. 767).

600. Unocal's research, equations, and data did not show any requirement that CARB had to put limits or caps on T50. (Venturini, Tr. 730-31,741-42; CX 24; CX 25; CX 29; CX 1247). Nor is there a statement in CARB's Staff Report or Technical Support document that says the Unocal study must be interpreted to require a T50 cap or limit in the regulation. (Venturini, Tr. 751, 753-54; CX 52; CX 5).

c. CARB Did Not Cite to Unocal for Its Other Specifications

601. Staff discussed its support for T90, oxygenate, sulfur, aromatics, and olefins, citing almost exclusively to ARCO, Auto/Oil, and Chevron studies. (CX 5 at 042-054; *see, e.g.*, CX 10 at 071 (for aromatics, CARB noted, "[w]hile the Unocal results showed that fuel aromatic hydrocarbons content does not affect vehicle exhaust emissions, other studies, including Auto/Oil,

vehicle emission aromatic hydrocarbons do affect vehicle exhaust emissions. However, due to the fact that the Unocal data are neutral, it did not play a role in the calculation of the reductions of emissions due to changes in fuel aromatic hydrocarbon content”).

d. CARB Did Not Use Unocal’s Regression Equations to Calculate the Emissions Benefits of the Phase 2 Regulations

602. As part of the Phase 2 rulemaking, CARB had to determine the benefits of the proposed regulations so that those calculations could be used as part of the cost-effectiveness analysis. (CX 5; CX 7044 (Chan, Dep. at 38-41)). It did so in the Technical Support Document. (CX 5 at 019 (Impact of Gasoline Properties on Emissions), 058 (Calculating Reductions in Exhaust Emissions)).

603. CARB used two methods to calculate the exhaust emissions benefits of the Phase 2 regulations. (Fletcher, Tr. 6937-38; CX 5 at 058-065 (referred in testimony as RX 5 at 063-070)). The first method utilized the Auto/Oil regression equations. (CX 10 at 052; Fletcher, Tr. 6938; CX 7044 (Chan, Dep. at 44) (testifying that he used the Auto/Oil regression equations)). The second method used the ARCO EC-X test fuel run in vehicle tests. (CX 10 at 052; Fletcher, Tr. 6939-46).

(1) CARB Used Auto/Oil’s Regression Equations Which Did Not Isolate T50, and Did Not Use Unocal’s Equations or Information to Calculate the T50 Emissions Benefits

604. CARB used the Auto/Oil regression equations, not Unocal’s. (CX 10 at 052; Fletcher, Tr. 6938; CX 7044 (Chan, Dep. at 44) (testifying that he used the Auto/Oil regression equations)).

605. While CARB claimed that the Unocal study supported its estimated emissions reductions, the actual figures that CARB staff cited come from staff’s own independent analysis in the Technical Support Document. (CX 10 at 048; Venturini, Tr. 775-76).

606. CARB staff itself conducted the calculation of emissions benefits of the regulations, and it did not use the Unocal equations. (Venturini, Tr. 759; Fletcher, Tr. 6936-37; CX 5 at 058 (Calculating Reductions in Exhaust Emissions) (cited in the testimony as RX 5 at 063)). In fact, there is no indication that CARB used the Unocal program for the purposes of emissions benefits calculation. (CX 7044 (Chan, Dep. at 44)).

607. Moreover, the Auto/Oil equations do not include T50. (Fletcher, Tr. 6938; CX 7044 (Chan, Dep. at 44); CX 5 at 058-059).

(2) CARB's Emissions Study Looked at Fuel as a System, and Did Not Isolate T50

608. The second method used to determine the benefits of its regulation was to analyze the results of vehicle tests conducted with fuels that had properties similar to those of Phase 2 reformulated gasoline. (CX 10 at 052). To confirm the results of other emissions test programs, CARB staff conducted its own emissions test program. (CX 10 at 025).

609. CARB sought to consider gasoline as a system in which all important fuel parameters are controlled in order to optimize the emissions reductions of the total fuel. (CX 10 at 029). Therefore, the staff in calculating emission benefits did not look at individual parameters. (CX 10 at 070). Each parameter was evaluated as a part of the overall change to gasoline. (CX 10 at 070). Changes in the olefin content combined with changes in the aromatics content, T50, T90, sulfur content, oxygen content, benzene content, and RVP resulted in the emission benefits that were discussed in Chapter II of the Technical Support Document. (CX 10 at 070).

610. This method used the ARCO EC-X results from tests conducted by ARCO for the then-current technology vehicles and the ARCO EC-X results from the ARB/GM confirmation study on vehicles representing a range of vehicle ages and technologies. (CX 10 at 052; Fletcher, Tr. 6941;

CX 7044 (Chan, Dep. at 38-41, 44)). CARB considered it important to use data from the ARCO study and the GM/ARB confirmation tests because these studies were conducted with fuels that have properties similar to those of Phase 2 reformulated gasoline. (CX 10 at 058). The staff substituted the ARCO data for the confirmation test data for the 1986-1995 vehicle class because the ARCO tests included more cars in this vehicle class than the GM/ARB confirmation tests. (CX 10 at 058).

611. Both the ARCO program and the GM/CARB confirmation study program used ARCO's EC-X fuel—the same fuel that ARCO presented to CARB on June 7—to determine the extent of emissions reductions. (Fletcher, Tr. 6941-42, 6946; CX 7044 (Chan, Dep. at 51-52)).

612. On the basis of its own emissions test program, CARB concluded that the effect of fuel properties on emissions was well enough established to support its regulations. (CX 10 at 025).

613. The staff estimated the emissions reductions as the average of the emission reductions calculated with the Auto/Oil regression equations and those based on the ARCO and ARB/GM confirmation test results. (CX 10 at 052; Fletcher, Tr. 6938-40). Neither of these studies included T50 as a separate variable. (RFF 607, 609).

e. CARB Never Analyzed the Unocal Data Before November of 1991

(1) CARB Received Unocal's Data on or After July 25, 1991

614. Unocal served a subpoena on CARB for the data that Unocal had provided, in the form that Unocal had sent it to CARB in 1991. (RX 121A). But CARB could not find it, as is exhibited by a letter sent from Mr. Thomas Jennings, CARB's senior staff counsel (RX 121A). "After a diligent search, CARB staff has not identified any preexisting diskette containing the data referenced in the August 27, 1991 letter, nor has it identified such data on a CARB server or CARB personal computer." (RX 121A).

615. Mr. Jennings was, however, able to provide some documentation of a file created at California's Teale Data Center on August 2, 1991, entitled "ARNCHAN.UNOCAL.CARS.DATA," which he said "appears likely . . . contains some or all of the data referred to in Unocal's August 27, 1991 letter." (RX 121A at 002). He therefore sent the data from the Teale Directory on a disk created on July 22, 2003. (RX 121A at 002).

616. On August 22, 2003, Mr. Jennings sent another disk that CARB staff had identified the day before. (RX 327). That disk, originally dated July 21, 1991, appeared to CARB staff to be "the original diskette containing the data base referred to in Dennis Lamb's August 27, 1991 letter." (RX 327 at 001-003; CX 1247). Apparently, CARB staff was not aware of the disk until August 21, 2003. (RX 327 at 002). The discovery cutoff was scheduled for August 31, 2003.

617. CARB obtained the disk of data from Unocal on or after July 25, 1991 (CX 1247; RX 327; RFF 401, *supra*), and saved it to a computer on August 2, 1991. (RX 121A).

(2) The Person Who Analyzed the Data Did So for the Predictive Model, Not Phase 2, and No One Else Analyzed the Data or Accessed It Before the Hearing

618. Only Mr. Cleary analyzed the Unocal Data. (Courtis, Tr. 5940-43). Although Mr. Courtis of CARB claimed that he must have analyzed the data before the Board meeting to validate Unocal's equations, he was impeached on that point twice. (Courtis, Tr. 5778-79 (claiming to have analyzed the data), 5940-43 (impeachment demonstrating that Mr. Courtis did not himself analyze the data, but Kevin Cleary did, and that Mr. Courtis would have to speculate as to whether CARB received the data before the November 1991 hearing)).

619. Mr. Cleary, the person who would have analyzed the Unocal data, was not involved in the development of the original Phase 2 regulations at all. (Courtis, Tr. 5940-43; CX 7045

(Cleary, Dep. at 95)). Mr. Cleary has no understanding of any analysis of the Unocal data that was done by anyone at CARB before he began his work on the predictive model. (CX 7045 (Cleary, Dep. at 32, 62-63, 96-97)). Mr. Cleary does not remember having any discussions with Unocal prior to beginning his work on the predictive model. (CX 7045 (Cleary, Dep. at 97)).

620. Moreover, CARB's electronic files do not demonstrate that CARB analyzed the data before the hearing. To develop a predictive model, Mr. Cleary worked on a master data set that had been assembled (but not analyzed) by a consultant, Ms. Peggy Miller, that CARB had hired to build the data base. (CX 7044 (Chan, Dep. at 21-22); RFF 785, *infra*). Mr. Cleary accessed an account at Teale Data Center named ARNCHAN in order to retrieve all the electronic data necessary to perform a statistical analysis and do model runs in developing the Phase 2 predictive model. (CX 7045 (Cleary, Dep. at 76-77)).

621. Access to that file required Mr. Chan's password. (CX 7044 (Chan, Dep. at 20)). Mr. Chan does not remember if he gave Ms. Miller access to that file before or after November 1991. (CX 7044 (Chan, Dep. at 19-22)). To Mr. Chan's knowledge, no one besides Ms. Miller and Mr. Cleary had access to that file. (CX 7044 (Chan, Dep. at 22)).

622. Neither Mr. Chan nor CARB, through its attorney Mr. Matthew Goldman, were able to provide any documentation that anyone accessed the August 2, 1991 file (ARNCHAN.UNOCAL.CARS.DATA) from August through October of 1991. (RX 122 at 005; CX 7044 (Chan, Dep. at 26)).

(3) Even After the Hearing, CARB Did Not Claim to Have Analyzed the Data Before November 1991

623. When CARB published its Final Statement of Reasons, it included comments criticizing it for not publicly showing Unocal's data as its basis for setting the T50 regulation.

(Venturini, Tr. 703). Specifically, WSPA commented that no actual test data were shown with respect to the Unocal predictive model as CARB relied on it in the Technical Support Document. (CX 10 at 046 (cmt. 61); Venturini, Tr. 704). CARB did not directly address this comment in its answer. (CX 10 at 047).

624. Later in the Final Statement of Reasons, CARB describes the Toyota and Unocal studies, but CARB does not indicate whether it had reviewed the underlying data. (Venturini, Tr. 744-747; CX 5 at 028-032; CX 10 at 049). When asked about this at trial, Mr. Venturini, the chief of the stationary source division at CARB, admitted that he does not know if CARB staff actually analyzed the Unocal data. (Venturini, Tr. 705-06; 736-38, 747). Mr. Venturini also admitted that he could not point to a single document that shows CARB's staff actually analyzed the Unocal ten-car test data before November 21, 1991, nor could he identify a single document showing that anyone from [CARB] staff accessed a computer to look at the data. (Venturini, Tr. 706).

625. Moreover, at trial, Complaint Counsel asked Mr. Fletcher to describe what Unocal information CARB used to develop its Phase 2 regulations. (Fletcher, Tr. 6468). Upon question by Complaint Counsel, Mr. Fletcher did not testify that CARB used Unocal's data or analyzed it in any way:

- Q. And we'll get to that in a minute.
Can you talk about what information from Unocal was used in the development of the regulations, so what you received from them that was used?
- A. We used some of the charts specifically out of this presentation in the staff report. We used the equations that—the regression equations as basically an indication of what happens when you change T50 and what benefits you get from that, so that was used in the staff report.

And generally we then used the other information ultimately in the development of the predictive model, but . . .

(Fletcher, Tr. 6468 (ellipsis in original)).

f. CARB Drafted the T50 Regulation Before It Could Use Unocal's Information

627. As discussed above, CARB could not use information that was confidential in setting a regulation, and could not make decisions based on information that was not publicly available. (RFF 385, *supra*). At the time of the June 20, 1991 presentation, the Unocal information was confidential. (Miller, Tr. 1403-04). Despite the parties' arguments about the August 27 letter from Mr. Lamb to CARB, there is no dispute that the date of the letter is August 27 of 1991. (Venturini, Tr. 413; CX 29). The draft regulations with a T50 specification were already prepared by July 21, 1991. (RX 198 at 012; RX 184 at 028; RFF 408-11, *supra*).

628. Even if CARB had used Unocal's information before it had permission to do so, the draft regulations existed before CARB obtained the disk of data from Unocal on or after July 25, 1991. (RFF 400-06, *supra*; *see also* CX 1247; RX 327; RX 198; RX 184).

g. The Unocal Data Was Not Substantial Evidence Upon Which CARB Based the Phase 2 Regulation

630. On October 4, 1991, CARB issued the public notice of the CARB Board hearing scheduled to commence November 21, 1991. (CX 767 at 003; Kenny, Tr. 6610-12). The public notice, CX 767, constitutes the formal beginning of the rulemaking record for the CARB Phase 2 regulations. (CX 767 at 003; Kenny, Tr. 6610-12). The notice states on the front page that it has been deposited in the United States mail at least 45 days before the hearing. (CX 767 at 003; Kenny, Tr. 6610-12). The 45-day period is significant because the California Administrative Procedures Act

requires that before any regulatory action, a 45-day notice must be provided to the public. (CX 767 at 003; Kenny, Tr. 6610-12).

631. The October 4, 1991 public notice, at page 010, provides that “[t]he public hearing will be conducted in accordance with the California Administrative Procedure Act, Title II, Division 3, Part 1, Chapter 3.5 (commencing with section 11340) of the Government Code,” which is a quasi-legislative section of the code. (CX 767 at 010; Kenny, Tr. 6612, 6613).

632. The California Administrative Procedures Act requires agencies to maintain a file of their rulemaking records. (Kenny, Tr. 6631-32; CX 7029 at 068 (section 11347.3)). CARB maintained a rulemaking record for the Phase 2 regulations. (Kenny, Tr. 6614-17).

633. CARB’s legal office was responsible for maintaining the integrity of the official rulemaking record. (Venturini, Tr. 700-01). At the time of the 1991 rulemaking, Mr. Kenny, CARB’s chief counsel, was the head of the legal department. (Venturini, Tr. 701). Mr. Venturini testified that he did not have any knowledge of what their processes were. (Venturini, Tr. 701-03).

634. The California Code sections which encompass the California Administrative Procedures Act are contained in CX 7029. (Kenny, Tr. 6631-32; CX 7029). Under the California Administrative Procedures Act, as reflected on page 68 of CX 7029, the rulemaking file must include anything that was substantial evidence such that the agency relied upon it for the rulemaking. (Kenny, Tr. 6632; CX 7029 at 068). Page 68 of CX 7029 applied to the Phase 2 rulemaking packet Mr. Kenny sent to the Office of Administrative Law for approval of the regulation, CX 838. (Kenny, Tr. 6631-32; CX 7029).

635. Specifically, section 11347.3 defines the rulemaking file, “Every agency shall maintain a file of each rulemaking which shall be deemed to be the record for that rulemaking

proceeding.” (CX 7029 at 068). In Mr. Kenny’s words, this section identifies what is required to be sent over for a regulation to be approved. (Kenny, Tr. 6631-32). The section enumerates what should be included in the rulemaking file. (Kenny, Tr. 6631-32; CX 7029).

636. According to the statute, the rulemaking file has to include everything that was “substantial evidence” such that it was relied upon for the rulemaking. (CX 7029 at 068-069).

Included among the requirements is Part (7):

(7) All data and other factual information, technical, theoretical, and empirical studies or reports, if any, on which the agency is relying in the adoption, amendment, or repeal of a regulation, including any cost impact estimates as required by Section 11346.53.

(Kenny, Tr. 6631-32; CX 7029 at 068).

637. For example, in its October 4, 1991 notice of the Phase 2 hearing, CARB included a section on “AVAILABILITY OF DOCUMENTS AND CONTACT PERSON.” (CX 767 at 008). Some of the documents available included the Staff Reports, the Technical Support Document, and the full text of the proposed regulatory language. (CX 767 at 008). CARB claimed, in addition to those items, that the staff had “completed a record which includes all information upon which the proposal is based.” (CX 767 at 008). The material was available for inspection upon request. (CX 767 at 008). All of the documents listed in “AVAILABILITY OF DOCUMENTS” end up a part of the official rulemaking record, according to CARB’s general counsel at the time. (Kenny, Tr. 6614-15).

638. At the time the Phase 2 rulemaking record closed, CARB was required to submit the official rulemaking record to the Office of Administrative Law. (Kenny, Tr. 6616). Mr. Kenny, as General Counsel, was the individual who signed off on the official rulemaking record for the Phase

2 regulations. (Kenny, Tr. 6616). As General Counsel, Mr. Kenny personally reviewed every package that went to the Office of Administrative Law. (Kenny, Tr. 6616).

639. In November 1992, Mr. Tom Jennings, CARB's senior staff counsel, sent a letter, CX 1815, to Mr. Craig Tarpenning of the California Office of Administrative Law (OAL), which encloses a supplement to the Final Statement of Reasons and contains a "table of contents" for Phase 2's rulemaking record. (Fletcher, Tr. 6934; Kenny, Tr. 6615-16; CX 1815 at 016-017). The table of contents from CX 1815 appears as the first two pages of CX 838, a 4,000-page exhibit that contains the documents listed in the table of contents. (Kenny, Tr. 6618-31; CX 1815 at 016-017; CX 838 at 001-002).

640. Mr. Kenny testified that the Table of Contents, CX 1815 at 016-017, is a list of the official rulemaking record. (Kenny, Tr. 6615-16). He was able to confirm that he had questions only regarding the contents of items 15, documents incorporated by reference, and 17, the references. (Kenny, Tr. 6617).

641. Mr. Kenny could not remember the specific documents incorporated by reference or the reference as 13 years had passed. (Kenny, Tr. 6627). Mr. Kenny confirmed that the official rulemaking record, CX 838, sets forth documents under tab 15 which corresponded to item 15 of the table of contents—documents incorporated by reference (CX 1815 at 016; Kenny, Tr. 6627; CX 838 at 3763-811).

642. Mr. Kenny confirmed that the references (referred to as item 17) that are part of the official rulemaking record are set forth in the Technical Support Document, CX 5. (Kenny, Tr. 6628-29). For the rulemaking record, "references" means the references that are identified in either the Staff Report or the Technical Support Document. (Kenny, Tr. 6627-29). The table of contents

in CX 1815 at 016-017 and the official rulemaking record, CX 838, are therefore the best evidence of the official rulemaking record for the Phase 2 regulations.

643. The complete rulemaking record from the Phase 2 proceeding includes all of the contents of CX 838, plus the documents incorporated by reference (at tab 15 of CX 838), plus the references in the Staff Report and the Technical Support Document, plus a letter supplementing the record. (Kenny, Tr. 6628-31; CX 838 (table of contents on 001-002)); CX 1815 (letter accompanying supplement to the rulemaking record)). Mr. Kenny could not remember anything else that would be part of the rulemaking record. (Kenny, Tr. 6630-31).

644. In order to be a part of the official rulemaking record, a document must therefore be in CX 838 (as further described by the corresponding table of contents in CX 1815 at 016-017), CX 1815 itself, or CX 5 (also RX 5) as a reference, identified at page range 700 to 705 in CX 838 (or CX 5 at 166-171). (Kenny, Tr. 6616-17, 6627-29).

645. CARB issued the Official Notice that started the formal rulemaking on October 4, 1991. (CX 767). Unocal gave CARB its presentation in June of 1991, and provided its equations on July 1, 1991. (CX 24; CX 25). Unocal provided its data base on or after July 25, 1991, and the file was created at California's Teale Data Center on August 2, 1991. (RX 121A at 002; CX 1247). Unocal lifted confidentiality on its data base on August 27, 1991. (CX 29). Therefore, CARB had four key pieces of Unocal information (the presentation, the equations, the data base, and the confidentiality waiver) by the time the formal rulemaking began on October 4.

646. It is undisputed the some of Unocal's slides were published by CARB staff in Phase 2 rulemaking documents (CX 5 at 031-032) and Unocal's slides were cited in the Phase 2 Technical

Support Document list of references. (CX 5 at 171). Unocal's equations were also published by CARB. (CX 5 at 297-298). These were part of the rulemaking record of CARB.

647. The letter from Mr. Kulakowski on behalf of Mr. Lamb to Mr. Venturini, CX 25 (also identified in the record as CX 386), dated July 1, 1991, is neither a part of nor identified in CX 838, CX 1815, or CX 5 and therefore is not a part of the official rulemaking record for the Phase 2 regulations. In order to be relied upon as substantial evidence in the Phase 2 rulemaking, Mr. Kulakowski's letter of July 1, 1991, CX 25, necessarily had to be part of the rulemaking record. (RFF 636). CX 25 was not part of the rulemaking record for Phase 2 and was not and could not have been relied upon by CARB in the Phase 2 rulemaking. (CX 838, CX 1815; CX 5 at 166-171; RFF 636).

648. The letter from Mr. Lamb to Mr. Boyd, CX 29, dated August 27, 1991, is neither a part of nor identified in CX 838, CX 1815, or CX 5 and is therefore not a part of the official rulemaking record for the Phase 2 regulations. In order to be relied upon as substantial evidence in the Phase 2 rulemaking, Mr. Lamb's letter of August 27, 1991, CX 29, necessarily had to be part of the rulemaking record. (RFF 636). CX 29 was not part of the rulemaking record for Phase 2 and was not and could not have been relied upon by CARB in the Phase 2 rulemaking. (CX 838, CX 1815; CX 5 at 166-171; RFF 636).

649. The data base referred to by Mr. Lamb in his letter of August 27 to Mr. Boyd, CX 29, as described in RX 121A (RX 121A (letter from Jennings), and as found at CX 1247 is not part of and not identified in CX 838, CX 1815, or CX 5 and therefore is not a part of the official rulemaking record for the Phase 2 regulations. In order to be relied upon as substantial evidence in the Phase 2 rulemaking, the data in the data base, RX 1247, referred to in Mr. Lamb's letter of August 27,

1991, CX 29, necessarily had to be part of the rulemaking record. (RFF 636). The data base was not part of the rulemaking record for Phase 2 and was not and could not have been relied upon by CARB in the Phase 2 rulemaking. (CX 838, CX 1815; CX 5 at 166-171; RFF 636).

650. The fact that the disk was not contained in the rulemaking record is evidenced by CARB's failure to produce the disk in discovery in either 1996 or until August 22, 2003, just days before the August 31, 2003 discovery cut-off in this matter. (RX 327). In an email authored by Mr. Kenny on April 16, 1996, well after the rulemaking record for the Phase 2 regulation was completed, Mr. Kenny states:

Dean: I've received a request from the majors for two pieces of information related to a Unocal meeting with Staff in 1991. The meeting was one in which Unocal presented to the staff its analysis of RFG with particular emphasis on the T50 spec. The request is for any notes that might have been created by ARB staff who attended the meeting and for a disc (which contained Unocal data) that was possibly provided by Unocal.

(RX 196; Kenny, Tr. 6633-34).

651. RX 196 was prompted by a request by the refiners for the data in the data base referred to in Mr. Lamb's letter to Mr. Boyd of August 27, 1991. (RX 196). The refiners specifically requested the disk with the data referred to in Mr. Lamb's letter. (RX 196; Kenny, Tr. 6634-35). Mr. Kenny directed his email, RX 196, to Mr. Jennings, Mr. Fletcher, Mr. Cleary, Mr. Simeroth and Mr. Curtis, all members of CARB staff. (Kenny, Tr. 6634). Among other things, Mr. Kenny was asking these CARB individuals if they knew of or could find the disk containing the data referred to in Mr. Lamb's letter. (RX 196; Kenny, Tr. 6635).

652. Mr. Kenny professed to never have even looked in the official rulemaking record for the data disk, and further professed to not know if the disk and the data were a part of the official

rulemaking record for the Phase 2 regulation. (Kenny, Tr. 6636-39). As indicated, the disk was not produced until August 22, 2003. (RX 327). When he testified in this proceeding, Mr. Kenny admitted that he could not point to anywhere in the rulemaking record for the Phase 2 regulation that the disk containing the data or its contents were included or otherwise set forth. (Kenny, Tr. 6639-41; *cf.* Venturini, Tr. 699 (Mr. Venturini does not know whether the content of CX 1247 or any diskette containing the exhibit's content was in the official rulemaking file)).

653. After a protracted line of cross examination during which Mr. Kenny was persistently evasive, Mr. Kenny also admitted that if the data on that disk was relied upon by the agency in the adoption of the CARB Phase 2 regulations, it was required to be part of the rulemaking record under section 11347.3 and required to be in the Staff Report, which was a part of the official rulemaking record for the Phase 2 regulation. (Kenny, Tr. 6644-46).

24. Unocal's Nondisclosure of Pending Patent Rights Did Not Violate Any Duty and Did Not Materially Affect CARB's Cost-Effectiveness Analysis

654. As part of its rulemaking process, CARB conducted a "cost-effectiveness analysis" of the Phase 2 regulations pursuant to a September 1990 document entitled, "California Clean Air Act Cost-Effectiveness Guidance." (CX 10 at 104 (citing Guidance document); CX 5 at 169 (listing as reference #57); RX 195). The cover of RX 195 bears the banner of the California Air Resources Board. (Courtis, Tr. 5833-34; RX 195).

655. The Cost-Effectiveness Guidance document was adopted by a resolution of the California Air Resources Board on September 13, 1990. (CX 817). One of the purposes of the Cost-Effectiveness Guidance Document was to establish uniformity in doing cost-effectiveness analyses. (CX 7054 (Mahdavi, Dep. at 25-26)).

656. RX 195, the Cost-Effectiveness Guidance document, lists CARB staff member Mr. Reza Mahdavi as a contributor because he was asked to review and comment on the document at Ms. Catherine Witherspoon's request. (CX 7054 (Mahdavi, Dep. at 7-8)). Mr. Mahdavi recognized that the Guidance document discusses provisions applicable to the California pollution control districts as well as to regulations developed by the California Air Resources Board. (CX 7054 (Mahdavi, Dep. at 13-14)).

657. The Cost-Effectiveness Guidance document contains a section called "Available Methods for Determining Cost-Effectiveness." (Fletcher, Tr. 6957; RX 195 at 009). Mr. Fletcher understood that the method used by CARB in conducting its cost-effectiveness analysis is depicted in this document as the annualized method. (Fletcher, Tr. 6957).

658. CARB Chairwoman Sharpless is sure that she was aware of the Cost-Effectiveness Guidance document in September 1990. (CX 7063 (Sharpless, Dep. at 203)). While Mr. Venturini testified he did not personally make any use of the Guidance document, it was used by the staff to assist them in doing their cost-effectiveness calculations. (Venturini, Tr. 384; *see also* RFF 687, *infra*).

a. Cost-Effectiveness Has a Specific Definition

659. According to the Cost-Effectiveness Guidance document, "[t]he California Clean Air Act makes cost-effectiveness a necessary component of air quality planning and rulemaking. Under the Act, certain control measures must be deemed cost-effective prior to adoption." (RX 195 at 004). Under the heading "II. LEGAL REQUIREMENTS RELATED TO COST-EFFECTIVENESS, the document explains that cost-effectiveness under that California Clean Air Act applies to CARB:

“Five provisions in the California Clean Air Act address cost-effectiveness” among which are cited sections 43013 and 43018:

Section 43013 authorizes the Air Resources Board (Board) to adopt standards, regulations and specifications for a host of vehicular and mobile sources, provided those measures are necessary, technologically feasible, and cost-effective.

Section 43018 directs the Board to exercise its regulatory authority in accordance with specified schedules and objectives. Subdivision (b) requires the ARB to take whatever actions are necessary, cost-effective and technologically feasible to achieve a 55% reduction in emissions of reactive organic gases, and a 15% reduction in emissions of nitrogen oxides, from motor vehicles by the year 2000. Subdivision (c) directs the ARB to adopt standards and regulations that will result in the most cost-effective combination of control measures on all classes of motor vehicles and motor vehicle fuel.

(RX 195 at 005-006; Curtis, Tr. 5962-65).

660. Cost-effectiveness has a particular meaning to those who regulate air quality. (CX 7054 (Mahdavi, Dep. at 22)). According to the Cost-Effectiveness Guidance document, the term “cost-effectiveness” is defined not in terms of its plain English meaning, but in a much more limited fashion—that is, dollars per ton of pollutants reduced. (RX 195 at 006).

661. In measuring the cost-effectiveness of alternative control measures, CARB was to express it as a rate: “the dollars per ton of pollutants reduced, or the dollars per unit of air quality improvement.” (RX 195 at 006; CX 7042 (Bea, Dep. at 20-22); Curtis, Tr. 5833-35, 5837-39). CARB staff performed calculations to determine the amount of pollutant removed and the cost per ton of those pollutants removed as a result of the Phase 2 regulations. (Curtis, Tr. 5833-35).

662. The Cost-Effectiveness Guidance document further explains that “[c]ost-effectiveness is a relative concept. . . . A measure is deemed cost-effective if it reduces emissions at a cost comparable to other measures, again, on a per ton basis.” (RX 195 at 006).

663. Additionally, to be cost-effective, the measure must be below the upper cost bound for previously adopted or proposed regulations. (RX 195 at 006-007). The concept was explained in designated deposition testimony by Chevron's Don Bea:

what you're trying to do is you're trying to ensure that anything they adopt is in reasonable range of things that they adopted in the past, not something that's way out of line. An example might be that I have \$10,000 per ton for reduction of hydrocarbon, for example. If they were trying to adopt something that was \$200,000 per ton, we would be objecting to that and saying, you know, this is way out of line with anything you've adopted in the past and what's your rationale for this, and try to get them -- bring them back into something that's in the realm of things that they have adopted historically. So that's what I mean by "cost-effective."

(CX 7042 (Bea, Dep. at 21-22)).

664. Cost-effectiveness is not the same thing as cost-benefit analysis. (CX 7054 (Mahdavi, Dep. at 22-24)). A cost-effectiveness evaluation is much more limited in scope. (RX 195 at 008; CX 7054 (Mahdavi, Dep. at 23); *see also* CX 7040 (Aguila, Dep. at 189-90) (stating that Mr. Aguila understood that the term "cost-effective" has a particular meaning and is not the same as cost-benefit analysis)).

665. "A cost-benefit analysis attempts to quantify all the costs and benefits of a control measure, including social and environmental effects. . . . Because costs and benefits are weighed directly one against the other, both must be quantified in dollar terms." (RX 195 at 008).

666. By contrast, a "cost-effectiveness evaluation usually addresses just the direct costs (or savings) of a measure." And "benefits are described only in terms of emission reductions or air quality improvement." (RX 195 at 008). Accordingly, as CARB has noted, "[a] cost-effectiveness evaluation is much more limited in scope than a cost-benefit analysis." (RX 195 at 008).

667. For its Phase 2 regulations, CARB performed a cost-effectiveness evaluation, as opposed to a cost-benefit analysis. (Fletcher, Tr. 6954). Staff did not have the tools available within the Air Resources Board to conduct such a full cost-benefit analysis. (Fletcher, Tr. 6954). According to deposition testimony of Mr. Robert Fletcher, which was read into the record at trial, it was the CARB Board who made a decision not to do a full cost-benefit analysis. (Fletcher, Tr. 6954-55).

668. A cost-effectiveness evaluation also should not be confused with a socio-economic impact analysis. (RX 195 at 008). A socio-economic impact analysis is again much broader than a cost-effectiveness analysis, because it examines, among other things, the effect of a measure on natural gas availability, the ethnicity of displaced workers, changes in fuel oil sales and resulting income and employment effects to fuel oil producers. (RX 195 at 008-009; CX 7054 (Mahdavi, Dep. at 23); Fletcher, Tr. 6956)).

669. A socio-economic analysis could look for the potential for monopolistic pressures in the market. (Fletcher, Tr. 6956).

670. Staff, by their own choice, did not perform a full-blown socio-economic analysis for Phase 2. (Fletcher, Tr. 6957). And correspondingly, Mr. Aguila, who was responsible for the cost analysis, was not told to do a socio-economic analysis as described in the California Clean Air Act Cost-Effectiveness Guidance. (CX 7040 (Aguila, Dep. at 194-96)).

b. Cost-Effectiveness Is One of Several Criteria That Was Considered by CARB

671. While “cost-effectiveness is given great emphasis in the California Clean Air Act, it is neither the sole nor the dominant criterion for decisionmaking. The primary mandate is to achieve the state air quality standards by the earliest practicable date.” (RX 195 at 004; CX 7040

(Aguila, Dep. at 189) (CARB staff member Mr. James Aguila understood that cost-effectiveness is an important parameter that policy-makers look at but that it is not the sole or dominant parameter); Curtis, Tr. 5837).

672. At the time of the Phase 2 rulemaking, CARB was required “to achieve a 55% reduction in emissions of reactive organic gases, and a 15% reduction in emissions of nitrogen oxides, from motor vehicles by the year 2000.” (RX 195 at 006).

673. CARB articulated these considerations in connection with its adoption of the Phase 2 regulations: “Even if the regulations may not be necessary to meet the specific emission reductions identified in section 43018(b), the regulations would still be necessary to meet the requirement in section 43018(a) that the Board endeavor to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish attainment of the state ambient air quality standards at the earliest practicable date.” (CX 10 at 053-054). CARB economist Dr. Mahdavi recognized that the Final Statement of Reasons sets out Section 43018(a) and Section 43018(b) as separate mandates in comment 78. (CX 7054 (Mahdavi, Dep. at 19-21); CX 10 at 053). A CARB Board member vocalized concern over the Section 43018(a) mandate at CARB’s October workshop: According to a Texaco memorandum, one Board member stated at the workshop that CARB “needed to do whatever was necessary to reduce emissions regardless of cost.” (RX 436 at 004). Texaco’s corporate designee testified that CARB staff and Board were very concerned about the total amount of emission reductions that would be achieved through their measure. (CX 7059 (Moyer, Dep. at 76)).

674. Another factor CARB focused on was expediency. CARB interpreted its statutory mandate to place “priority on expediency” by stating that “[t]he earliest practicable attainment date must be considered in developing adoption and implementation schedules.” (RX 195 at 015).

675. CARB also wrote that the “Phase 2 RFG [was] necessary to help us in our efforts to achieve ambient air quality standards and to satisfy the mandate of Health and Safety Code section 43018, which directs the Board to endeavor to reduce emissions from vehicular sources to attain the state ambient air quality standards by the earliest practicable date.” (CX 10 at 092).

676. Thus, CARB’s statements make clear that CARB understood the term “cost-effectiveness” in light of its primary mandate of early emissions reduction. (CX 10 at 092).

677. In addition to expediency, another factor competing with cost-effectiveness was CARB’s commitment to achieve the “maximum degree of emission reduction.” (CX 10 at 091-093). CARB’s view was that it was appropriate to “adopt measures that [were] less cost-effective on a dollars per ton basis, if the potential emission reductions [were] greater.” (RX 195 at 015).

678. Emphasizing its commitment to achieving the maximum degree of emission reduction, CARB explained, “[a]lthough the Phase 2 RFG regulations will undoubtedly be costly, the emissions reductions associated with it are quite large. . . . In the early years of implementation, the Phase 2 RFG regulations will reduce motor vehicle emissions more than any measure recently adopted by the ARB.” (CX 10 at 092).

679. Public acceptability was another important consideration that drove CARB’s rulemaking decisions. CARB recognized that “[s]ome measures that would be highly cost-effective may be unacceptable to the public” and, accordingly, that it was appropriate “to move ahead on more acceptable measures.” (RX 195 at 015). CARB offered “[n]o-drive days or highrise developments

to limit trips” as “two cogent examples” of publicly unacceptable strategies to reduce pollution. (RX 195 at 015).

680. Technical feasibility was yet another factor competing with cost-effectiveness. For example, CARB was mindful of considering whether districts would “want to take advantage of the best available control technology, even if it [was] not the cheapest alternative on a per ton basis.” (RX 195 at 015).

681. Further emphasizing the malleability of the cost-effectiveness criterion, CARB, when enacting the Phase 2 expeditions and regulations, stated: “There is no requirement that control measures should be adopted in the precise order of their respective cost-effectivenesses [sic].” (CX 10 at 110; *see also* RX 195 at 016). CARB reasoned that there is no obligation “to adopt or implement control measures in rank order of cost-effectiveness” because “the California Clean Air Act mandates consideration of several different factors and places an emphasis on expeditious attainment.” (RX 195 at 016).

682. The testimony of CARB Chairwoman Sharpless confirms there were factors other than cost that the Board considered in 1991 when adopting regulations, including technical feasibility, emission reduction levels, and other information on how to weigh those factors. (CX 7063 (Sharpless, Dep. at 54)).

c. CARB’s Determined Cost-Effectiveness for Phase 2 Regulations by Relying on a Preliminary Analysis of Limited Cost Information Voluntarily Provided by Few Refiners Only After Announcing That It Intended to Rely on LP Models

683. The Complaint alleges that Unocal management and employees “understood that information and data relating to the potential costs of complying with, or relating to the cost-effectiveness of, the Phase 2 regulations were material to CARB's RFG rulemaking

proceedings.” (Complaint ¶ 26). CARB represented, at least through the issuance of its Staff Report, that it intended to rely on a linear programming analysis to determine its cost numbers for cost-effectiveness. (RFF 688-709). CARB only made one “informal,” undetailed request to refiners to voluntarily provide cost information. (RFF 699-702). Only six refiners responded. (RFF 703). Unocal was never directly asked for cost information until the CARB Phase 2 meeting at which Mr. Lamb submitted oral comments. (RFF 747). Furthermore, Unocal employees were not aware of any duty or regulation that required them to provide information about costs or revenues. (RFF 748).

(1) CARB Did Not Put an Experienced Staff Person in Charge of Directing the Cost-Effectiveness Study

684. CARB assigned the task of conducting the cost-effectiveness analysis to a junior engineer, Mr. James Aguila. (CX 7040 (Aguila, Dep. at 15); Venturini, Tr. 327-28). Mr. Aguila did not know how he was selected to do the cost-effectiveness analysis for Phase 2 but he worked with Mr. John Courtis and reported directly to Mr. Robert Fletcher. (CX 7040 (Aguila, Dep. at 15)). Mr. Courtis testified he was familiar with cost-effectiveness in doing his work leading up to the Phase 2 regulations. (Courtis, Tr. 5833-34).

685. Mr. Aguila, who was formally trained in mechanical engineering, had no formal training in accounting. (CX 7040 (Aguila, Dep. at 7-8).

686. Nor did Mr. Aguila have experience in performing complicated cost analysis. (CX 7040 (Aguila, Dep. at 14-16). With the exception of working on three previous rulemakings that did not contain significant cost components, Mr. Aguila had never performed a complicated a cost-effectiveness analysis before his Phase 2 analysis. (CX 7040 (Aguila, Dep. at 14-16) (“I was responsible for [looking at costs] for that rulemaking, [concerning motor vehicle specifications for alternative fuels] for example, but there wasn’t much substance to it” because “there really weren’t

any cost impacts;” “I was also responsible for two other rulemakings on the deposit control additive regulation and again neither one of those had big cost implications”). Mr. Aguila was only involved in Phase 1 Reformulated Gasoline Regulations as a junior staff member conducting research regarding the status of technology for deposit control additive regulation. (CX 7040 (Aguila, Dep. at 8)). Mr. Aguila did not conduct a cost-effectiveness analysis for Phase 1. (CX 7040 (Aguila, Dep. at 9)).

687. Notwithstanding Mr. Aguila’s lack of experience, he received only minimal guidance from his superior at CARB, Mr. Robert Fletcher. Mr. Fletcher provided Mr. Aguila with only one explanatory guidance document—the September 1990 “Cost-Effectiveness Guidance” document. (CX 7040 (Aguila, Dep. at 16-18, 21); RX 195). It was the only instructional document given to Mr. Aguila when he was given the assignment that he would be the point person for cost. (CX 7040 (Aguila, Dep. at 16-18, 21-22)). Otherwise, Mr. Fletcher instructed Mr. Aguila to “inform [him]self and to—and to educate [him]self on the proper techniques.” (CX 7040 (Aguila, Dep. at 20)). Mr. Fletcher also instructed Mr. Aguila “to conduct, you know, [his] own assessment of how a cost-effectiveness analysis should be performed.” (CX 7040 (Aguila, Dep. at 21-22)).

(2) CARB Intended to Perform the Cost-Effectiveness Analysis Using a Linear Programming Model, but Shifted Course at the Last Minute

688. During the Phase 2 process, CARB had planned and announced that its cost-effectiveness analysis would consist of determining the cost impact of the Phase 2 regulations based on linear programming models. (CX 5 at 148-149). The models, which were to be developed by Bechtel Corporation, would simulate actual refinery operations and thereby determine the overall

cost impact based on individual cost information. (CX 492 at 005 (referred to in testimony as RX 167); CX 7040 (Aguila, Dep. at 30-31, 87-89)).

689. Thus as of May 23, 1991, the date of the notice for the first Phase 2 workshop, CARB staff intended to determine the overall cost impact for criteria pollutants reduction using the linear programming model from Bechtel. (CX 7040 (Aguila, Dep. at 85); CX 492 at 005).

690. As early as June 11, 1991, CARB represented to the public, at its first Phase 2 workshop, that overall cost impact would be determined through a linear programming model. (CX 1047 at 016 (referred to in testimony as RX 182); CX 7040 (Aguila, Dep. at 91-93)). The only slide that discusses cost in CX 1047 (referred to as RX 182 in testimony) is entitled “LP Refinery Cost Analysis Methodology” and all three bullet points exclusively relate to linear programming methodology. (CX 7040 (Aguila, Dep. at 91); CX 1047 at 016). Specifically, the slide advised the refining industry that CARB planned to evaluate costs of Phase 2 gasoline by developing five refinery models to accurately represent the California refining industry. (CX 1047 at 016; Courtis, Tr. 5790-91). The slide also advised attendees of the June 11, 1991 workshop that CARB would refine the models to represent 1995 operations and include investment costs and would use the linear program models to evaluate cost impacts to various segments of the refining industry. (CX 1047 at 016; Courtis, Tr. 5790-91). Mr. Aguila recalled telling the audience that this was the proposed approach for calculating cost. (CX 7040 (Aguila, Dep. at 93)).

691. Through this linear programming, Mr. Aguila was trying to model four or five different refineries to determine what the cost impacts would be given the differences in economy of scale. (CX 7040 (Aguila, Dep. at 31)).

692. CARB went to certain refiners and asked them to provide cost information for use in developing the five refinery models. (Courtis, Tr. 5792-94). CARB requested, by way of a survey, that these refineries provide specific information to accomplish the LP modeling. (CX 7040 (Aguila, Dep. at 35-36, 48). Mr. Courtis was involved in that effort. (Courtis, Tr. 5792-93).

693. As part of this survey, Mr. Dean Simeroth of CARB wrote a letter to Mr. Manning of Tosco Refining advising that CARB considered Tosco's refinery to be representative of a deep conversion refinery and sought Tosco's cooperation in providing information that could be used to develop and validate a model for that type of refinery. (RX 169; Courtis, Tr. 5792-94). The letter attached a survey of information which CARB sought from Tosco and advised Tosco that any information provided would be held confidential in accordance with Section 91011, Title 17, California Code of Regulations. (Courtis, Tr. 5795-96; RX 169).

694. The refineries that Mr. Aguila attempted to model were Kern Oil, Fletcher, Texaco Bakersfield, and Tosco Martinez, and information was asked directly of these refineries. (CX 7040 (Aguila, Dep. at 34-35)). Not all of these companies responded. (CX 7040 (Aguila, Dep. at 37)).

695. { [REDACTED]
[REDACTED]
[REDACTED] } (Courtis, Tr. 5866-67, *in camera*; RX 173, *in camera*). { [REDACTED]
[REDACTED]
[REDACTED] } (RX 173, *in camera*;
Courtis, Tr. 5867).

696. By August 8, 1991, CARB staff had not completed an estimate of the cost component of the cost-effectiveness analysis. In a briefing paper of that date, CARB staff explained that “the cost has not yet been considered as we are currently completing and calibrating our linear refinery programming model.” (CX 803 at 001 (referred to in testimony as RX 268); Curtis, Tr. 5807-08).

697. Despite the fact that CARB staff was calibrating the model, CARB’s ability to rely on the linear programming model before the October proposal came into doubt. (CX 7040 (Aguila, Dep. at 51-52)). Mr. Aguila had hoped to complete the linear programming model by the time of the Board meeting but it became apparent that it was going to require a lot more time to refine the models to a sufficient point where they could actually conduct a technical evaluation. (CX 7040 (Aguila, Dep. at 51-52)). Similarly, by August of 1991, Mr. Curtis was pessimistic about CARB’s ability to carry out the refinery modeling and believed that CARB did not have the resources or capability to carry it out. (Curtis, Tr. 5803-04).

(3) CARB Issued an Informal and General Request for the Voluntary Provision of Cost Information

698. Despite Mr. Curtis’s pessimism, CARB announced and discussed the refinery linear programming models with industry at the CARB workshop held August 14, 1991. (Curtis, Tr. 5805-06; RX 184). Both Mr. Curtis and Mr. Aguila recognized RX 184 as the August 1, 1991 notice for an August 14, 1991 workshop. (Curtis, Tr. 5789; CX 7040 (Aguila, Dep. at 114-15)). The notice states that “we will be discussing the information contained in the Attachments. We will also be discussing the status of our refinery linear programming modeling efforts and the status of the ongoing vehicle emission test programs.” (RX 184 at 002; Curtis, Tr. 5789). This notice says nothing about the need to provide cost information due to the fact the linear programming model is not going to work. (CX 7040 (Aguila, Dep. at 115); RX 184 at 001-002). At the August 14 meeting,

no one from CARB staff told industry representatives that it was doubtful that CARB was going to get the refinery LP model working. (Courtis, Tr. 5805-06; RX 184).

699. CARB staff, likely at this meeting, requested refiners to voluntarily provide their actual costs for meeting the Phase 2 regulations. (Fletcher, Tr. 6959; CX 7040 (Aguila, Dep. at 51-52, 54, 89-91)). Mr. Aguila does not recall the exact words that were used to make this request. (CX 7040 (Aguila, Dep. at 54)). Mr. Venturini is also unaware of who put out a request for cost information, what words were used in making such a request, and whether any documentation exists as to what was requested. (Venturini, Tr. 377-78).

700. Unlike in its effort to construct a linear programming model, CARB did not send out any specific questionnaire to the refiners directing them as to what cost information to provide. Rather, as described by Mr. Aguila it was more of an “informal survey.” (CX 7040 (Aguila, Dep. at 51-52)). Nor did Mr. Aguila personally send the California Clean Air Act Cost-Effectiveness Guidance to any of the refiners. Moreover, he is unaware as to whether it was sent out. (CX 7040 (Aguila, Dep. at 193-94)).

701. Mr. Aguila does not recall any time other than the late summer of 1991 when a request was made for such cost information. (CX 7040 (Aguila, Dep. at 91)).

702. Although CARB now acknowledges that the informal survey at the late summer workshop was a “midcourse correction” (CX 7040 (Aguila, Dep. at 51)), CARB continued to represent to refiners at the time—through its October 1991 Staff Report and Technical Support Document—that it still intended to complete the linear programming models. (CX 7040 (Aguila, Dep. at 51-52, 144-46); CX 52 at 078; CX 5 at 153).

(4) CARB Based Its Cost-Effectiveness Analysis on Information Provided from Six Refiners and the Actual Information about Capital and Operating Costs of Only Two Refiners

703. The response to CARB's late summer request for information was minimal. Out of thirty refineries in the state of California, only six refiners responded to CARB's request to voluntarily provide any cost-related information to CARB. (CX 7040 (Aguila, Dep. at 54-55); Fletcher, Tr. 6958-59; Venturini, Tr. 376-77). It was up to each individual company whether it was going to provide staff with full cost information, some cost information, or no cost information at all. (Fletcher, Tr. 6961).

704. Mr. Aguila recalls for certain the names of only two refineries who responded to this request. (CX 7040 (Aguila, Dep. at 55-56)). The names of the refiners who responded to the request would have been located in Mr. Aguila's working papers, but he was unable to personally verify their names because he had not seen those papers for more than ten years. (CX 7040 (Aguila, Dep. at 55-56)). As pointed out in the CARB staff's Final Statement of Reasons, Unocal was not one of the refiners to have provided information. (CX 10 at 125 (Comment 226); Courtis, Tr. 5830-32; Venturini, Tr. 376-77 (recalling that Unocal was not one of the six refiners)).

705. The Staff Report, dated October 4, 1991, contains a section entitled "Economic Impacts of the Proposed Regulations," most of which Mr. Aguila authored. (CX 7040 (Aguila, Dep. at 140)). Mr. John Courtis was coauthor of the Technical Support document. (CX 5 at 005). Both the Staff Report and the corresponding Technical Support Document contain a detailed description of the cost information CARB relied upon in conducting its cost-effectiveness analysis. (CX 52 at 071-073; CX 5 at 137-138).

706. Ultimately, CARB used the cost figures from the six refiners who voluntarily provided information, labeled A through F on internal page 66 of its Staff Report, as the basis for its cost-effectiveness analysis. (Fletcher, Tr. 6961; CX 52 at 071). Mr. Aguila's working papers would have identified who the refiners A-F were and would have also included the cost information that was provided to Mr. Aguila. (CX 7040 (Aguila, Dep. at 57)). Mr. Aguila believes he put his working files in an archive. He was asked to produce the documents, but does not have them. (CX 7040 (Aguila, Dep. at 57-60)).

707. Additionally, Mr. Aguila was unable to describe the level of detail of the refiners' cost information—whether they provided a detailed breakdown or simply gave figures. (CX 7040 (Aguila, Dep. at 154-156)).

708. As late as October 1991, in the Staff Report and Technical Support Document, CARB continued to lead refiners to believe that it would complete and rely on the linear programming models. In its Technical Support Document, CARB staff told the public that “Bechtel validated all the LP models under ARB guidance” and that “the LP models depicted real refining material balance sufficiently accurate for the cost determinations of this study.” (CX 5 at 151; Fletcher, Tr. 6962). Despite Mr. Curtis's pessimism about CARB's ability to develop the refinery LP models, the Technical Support Document describes each of the five models and states:

Staff intends to complete the LP analysis prior to the November Board hearing. To this end, additional refinements to most of the models needs to be accomplished. In addition, update of capital cost of investment units and further changes to various properties still needs to be done. It is staff's goal to finalize the development and

validation of the models in order to accomplish a detailed study of costs for the entire refinery industry in time for the November Board hearing.

(CX 5 at 153 (referred to in testimony as RX 5 at 163²); Courtis, Tr. 5812-13).

709. Likewise, in the Staff Report:

Staff intends to evaluate further the impacts of the fiscal impacts associated with Phase 2 regulations on the refining industry using linear programming (LP) refinery models. This approach will provide specific economic data for specific refineries operating within California. Results from modeled refineries will provide valuable information when evaluating the rest of the refineries with similar operating characteristics. At the present time, our LP models are not yet sufficiently developed to produce an accurate assessment of costs. Therefore, staff utilized data submitted from refiners, in addition to other sources of data, to estimate the fiscal impact on the refining industry. These results are considered to be preliminary.

(CX 52 at 078 (referred to as RX 52 at 079 in the testimony); Courtis, Tr. 5814-15).

710. Because CARB had not sufficiently developed the LP models as of the publication of the Staff Report and the Technical Support Document it had to use something else to assess costs. (Courtis, Tr. 5818). Specifically, CARB used cost data provided by six refiners. (CX 52 at 071). As included below, Table VI-4 of the Technical Support Document shows the capital and operating costs as provided by these six refiners. (CX 5 at 137A). The refiners were not identified by name or producer so as to maintain the confidentiality of the information. (Courtis, Tr. 5823; CX 5 at 137A). The Final Statement of Reasons said that the refiners' cost information was confidential and, therefore, not placed in the record or relied on to support the final action. (CX 10 at 096).

² Respondent used document RX 5 because CX 5 was not complete at the time of trial. Complaint Counsel agreed to supplement CX 5 to make it complete. Therefore, Respondent will cite to CX 5 to comply with Administrative Judge Chappell's Order On Post Trial Briefs regarding duplicate exhibits. Respondent will also provide a description of the discrepancy between the cite and the trial transcript where helpful.

711. The capital costs include investment costs for the specific process units which would be necessary for Phase 2 gasoline, in addition to off-site costs. (Courtis, Tr. 5821-22; CX 5 at 137). Mr. Fletcher understood that the definition of capital cost used in the Cost-Effectiveness Guidance document is the same as the definition used during the Phase 2 regulation cost-effectiveness analysis. (Fletcher, Tr. 6957-58; RX 195 at 010).

Table VI-4
Capital and Operating Cost for Six California Refineries
to Comply With Phase 2 Regulations

<u>Refinery</u>	<u>Capital Investment Cost (M\$)</u>	<u>Operating Costs (M \$/year)</u>
A	100	N/A
B	178	65
C	1,000	275
D	53	26 ^{a/}
E _{b/}	N/A	N/A
F _{c/}	147	50

N/A - Not Available

a/ The staff assumed 50 percent of capital cost to be operating expenses.

b/ This refinery is included because they submitted data on cost per gallon.

c/ This refinery submitted the cost for meeting the olefin and sulfur limits only.

(CX 5 at 137A).

712. Three of the refiners who submitted cost data were large, complex refineries. (Courtis, Tr. 5821). Of the six refiners providing any information, only two gave actual information about capital investment and operating costs (refiners B and C). (CX 7040 (Aguila, Dep. at 54-55; 165); Fletcher, Tr. 6958-59; CX 52 at 071). One of the two refiners submitted that its capital costs were 25% of its operating costs and the other refiner submitted that its capital costs were 40% of its operating costs. (CX 7040 (Aguila, Dep. at 167, 203-06)).

713. For at least one of the refiners who did not provide operating costs (refiner D), Mr. Aguila assumed operating costs for that refinery to complete his cost analysis. (CX 7040 (Aguila, Dep. at 162-63, 166-67, 203-06)). To do so, he used a “conservative” estimate of 50% based on the other estimates of 25% and 40%. (CX 7040 (Aguila, Dep. at 166-67, 203-06); Courtis, Tr. 5821-22; CX 5 at 137A). Mr. Aguila assumed 50% because “[n]ot having other information particular to refiners at the time, what we had to go on was the limited information that was provided by the few.” (CX 7040 (Aguila, Dep. at 203-06)). By the use of the term “conservative,” Mr. Aguila meant that he used a higher figure than what was actually shown by the figures given. (CX 7040 (Aguila, Dep. at 206); Courtis, Tr. 5821-22). Mr. Courtis termed this conservative assumption a “worst case” scenario. (Courtis, Tr. 5828-29).

714. Refiner A provided only capital investment costs. (CX 7040 (Aguila, Dep. at 149-52)). Mr. Aguila did not assume 50% operating costs for refiner A, however, and cannot explain the reason why he did not do so. (CX 7040 (Aguila, Dep. at 149-52)). Mr. Aguila cannot give an accurate answer for why such an assumption was not used for all refineries without referring to his working papers—which he does not know the location of. (CX 7040 (Aguila, Dep. at 149-52)). Nor can Mr. Aguila explain or recall how he computed that refiner A’s cost of compliance would be 12 cents per gallon without having information relating to operating costs. (CX 7040 (Aguila, Dep. at 151-54)).

715. Another of the refiners did not provide information about either investment or operating costs, but did provide its own estimate of its cost of compliance in cents per gallon. (CX 5 at 137A (refiner E)). For this refiner, CARB staff could not even assume investment or operating

costs, and therefore, did not use this refiner's cost information in computing the cost portion of its cost-effectiveness analysis. (CX 7040 (Aguila, Dep. at 160-62)).

716. Refiner F provided operating costs for meeting only the olefin and sulfur specifications and for none of the remainder of the specifications that CARB staff had proposed. (CX 137A). As a result, Mr. Aguila did not consider refiner F's information in his cost-effectiveness analysis. (CX 7040 (Aguila, Dep. at 163-64; 176)).

717. As demonstrated above and as reflected in Table VI-4, Mr. Aguila's cost-effectiveness analysis is based on the investment and operating costs from only two refiners. (CX 5 at 137A). Mr. Aguila assumed operating costs for a third refiner and received operating costs from a fourth refiner only with respect to the proposed olefin and sulfur specifications. (CX 7040 (Aguila, Dep. at 203-06, 176-77)). When Mr. Aguila determined the annualized capital cost for his cost analysis, he used information from three refiners, refineries B, C and D—refiners which Mr. Aguila cannot identify. (CX 7040 (Aguila, Dep. at 176, 179)). The information used by Mr. Aguila was intended to be only for a preliminary analysis and was incomplete. (Courtis, Tr. 5823-27; CX 7040 (Aguila, Dep. at 225-26)). Furthermore, Mr. Aguila fully recognized that any costs staff received from individual refiners would have been their best guess, yet somewhat preliminary in nature. (CX 7040 (Aguila, Dep. at 225-26)).

718. Using this data, CARB estimated that the increased production cost per gallon of CARB Phase 2 gasoline would be 12 to 16 cents per gallon for a ten-year capital recovery period. (CX 5 at 137B). CARB then computed cost-effectiveness to the consumer, considering the fuel economy penalty of two to four cents per gallon. (CX 5 at 144-145). Using both sets of numbers

and separately computed emissions reductions, CARB then computed cost-effectiveness. (CX 5 at 141-148).

719. As further discussed in RFF 602-13, *supra*, emissions benefits were computed by Mr. Nelson Chan, whose role was not to determine cost, but rather was to try and estimate what the emissions benefits would be if the proposed regulations were adopted. (CX 7044 (Chan, Dep. at 43-44)). Mr. Chan understood that the emissions numbers he calculated were to be used in the cost-effectiveness analysis. (CX 7044 (Chan, Dep. at 43)).

720. Table VI-2 of the Staff Report shows the cents per gallon calculations CARB used to derive the dollars per ton of pollutant removed under the Phase 2 regulations. (CX 52 at 074 (referred to in testimony as RX 52 at 075)). It also shows the cost-effectiveness results:

Table VI-2
Cost-Effectiveness for California Phase 2 Reformulated Gasoline
for Criteria Pollutants ^{a/}

	<u>Cost-Effectiveness (\$/Ton)</u>	
	<u>1996</u> <u>Emissions Benefits</u>	<u>Emissions Benefits</u> <u>Averaged 1996-2005</u>
<u>Costs of Compliance</u>		
<u>Production Costs</u>		
12 cents/gal	5,100	6,800
16 cents/gal	6,800	9,100
<u>Cost to the Consumer</u>		
14 cents/gal	5,900	8,000
20 cents/gal	8,400	12,000

^{a/} Based on 50% of costs attributed for VOC, NO_x, 1/7CO, & SO₂ reductions and 50% of costs for reductions in toxic air contaminants.

721. In addition, Table VI-2 reports the cost-effectiveness of Phase 2 RFG for criteria pollutants utilizing both the 12 and 16 cents per gallon estimates for production costs and the 14 to

20 cents per gallon cost to consumers. (CX 52 at 074). The latter figure corresponds to a cost-effectiveness amount of \$8,000 to \$12,000 per ton of pollutant removed. (CX 52 at 074).

722. As required in the Cost-Effectiveness Guidance document, Mr. Curtis then prepared a table that compares the cost-effectiveness of Phase 2 RFG to measures recently adopted or scheduled for action. (RX 195 at 006; Curtis, Tr. 5839, 5842; CX 52 at 077 (referred to in testimony as RX 52 at 078)). The \$8,000 to \$12,000 per ton figures noted above were used for purposes of cost-effectiveness comparison in Table VI-5 of the Staff Report, included below. (CX 52 at 074, 077; Curtis, Tr. 5847-49).

Table VI-5
Comparison of Cost-Effectiveness of the Proposed Phase 2 Reformulated Gasoline Specifications with Cost-Effectiveness of Other Control Measures for Criteria Pollutants

<u>Source</u>	<u>Pollutant(s)</u>	<u>Capital Costs (million \$)</u>	<u>Cost-Effectiveness (\$/Ton of Pollutant Reduced)</u>
Aromatics Content of Diesel Fuels	PM10, NOx	720	14,000
Low Emission Vehicles/Clean Fuels	NOx, VOC, CO	N/A	10,000-32,000
Light Duty Diesel Exhaust Standards	PM10	N/A	5,400-21,400
Light-Duty Gasoline Vehicle Standards	NOx	N/A	1,300
Heavy Duty Diesel Exhaust Standards	PM10	N/A	6,400
SCAQMD Rule 1135 Power Plants	NOx	532	7,000-24,000
SCAQMD Rule 1146 Industrial Boilers & Heaters	NOx	N/A	20,000
Phase 2 Gasoline	VOC, NOx CO, SOx	4,000-7,000	8,000-12,000

(CX 52 at 077).

723. The Cost-Effectiveness Guidance document provides that a measure is deemed cost-effective if it reduces emissions at a cost comparable to other measures, again, on a per-ton basis. (RX 195 at 006; Courtis, Tr. 5839). The Cost-Effectiveness Guidance document also provides that over time a going rate for pollutant reductions has been established, which is the upper cost bound for measures recently adopted or proposed for adoption. (RX 195 at 007; Courtis, Tr. 5841-42). Table VI-5 shows number of measures that cost more in terms of dollars per ton of pollutant removed than CARB Phase 2 gasoline. (CX 52 at 077 (referred to in testimony as RX 52 at 078)). These measures included industrial heaters and boilers, power plants, emissions for light duty diesel vehicles, low emission vehicles, and diesel aromatics. (CX 52 at 077). Mr. Courtis admitted that Table VI-5 shows that CARB Phase 2 gasoline was cost-effective compared to these other measures. (CX 52 at 077; Courtis, Tr. 5845-46).

724. CARB described these estimates as “preliminary,” since it said that it intended complete its refinery LP models. (CX 52 at 078; Courtis, Tr. 5820-21). Yet CARB did not ultimately rely on the intended Bechtel LP modeling. (CX 7040 (Aguila, Dep. at 82-83)). Nor did CARB use the linear program modeling as a justification for its Phase 2 cost-effectiveness analysis. (Venturini, Tr. 374). According to Mr. Peter Venturini, CARB staff did not complete its refinery models in time for the regulation. (Venturini, Tr. 374). According to Mr. John Courtis, CARB never completed the refinery LP models. (Courtis, Tr. 5813).

725. Although Mr. Aguila was the most hands-on person at CARB in terms of working on the refining modeling approach, he did not make the determination that the modeling should not be used and cannot identify the rationale for deciding not to use the modeling. (CX 7040 (Aguila,

Dep. at 106-07)). According to Mr. Aguila, Mr. Robert Fletcher made the determination that Bechtel modeling would not be used. (CX 7040 (Aguila, Dep. at 104, 106-07)). Mr. Aguila had run enough scenarios under the Bechtel modeling to generate cost information, but does not recall what the details of those results were. (CX 7040 (Aguila, Dep. at 104-05)). Mr. Aguila was previously in possession of an electronic version of the Bechtel LP model in floppy disk form, but sent that disk to archiving. (CX 7040 (Aguila, Dep. at 60-62)). Mr. Fletcher does not know where any output is from Bechtel's LP modeling. (Fletcher, Tr. 6962).

726. Mr. Venturini does not know whether CARB or its staff ever told Unocal prior to the November 1991 meeting that the Bechtel linear programming model would not be the basis of its cost-effectiveness analysis. (Venturini, Tr. 376). Mr. Aguila testified that he believes refiners were told at the November 1991 Board meeting that the cost estimates were being based on actual refinery information and not the LP information but does not know if the refiners were ever told before the meeting that this would be the case. (CX 7040 (Aguila, Dep. at 145-46)).

(5) CARB Also Used the Cost Information Provided By Refiners to Compute a Capital Investment Cost

727. Separate from its cost-effectiveness analysis, CARB staff also computed a total capital investment cost for refiners. An explanation of this analysis is set forth in the Technical Support Document. (CX 5 at 137). Using the cost information provided by refiners (set forth in Table VI-4 of the Technical Support Document) "and the refinery's gasoline production rates, staff estimated that the capital investment cost ranges from \$13 to \$21 per barrel-day of gasoline produced." (CX 5 at 137). "This capital investment cost was then applied to about 900,000 barrels per day of gasoline produced in California to estimate a total capital investment cost from four to seven billion dollars for the California refining industry." (CX 5 at 137; Venturini, Tr. 388-89).

**(6) CARB Did Not Even Utilize the Numbers Prepared in its
October 4, 1991 Cost-Effectiveness Analysis**

728. As discussed above in RFF 526-27, the staff did not present its original proposal to the Board at the November 21-22, 1991 hearing. Instead it presented a modified proposal to the Board. (RFF 526-27, *supra*). Mr. Aguila recalled that although there was a modification to the original October 1991 proposal, he did not perform a separate independent cost-effectiveness analysis for purposes of that staff proposal. (CX 7040 (Aguila, Dep. at 208-09)).

729. The CARB Board did not adopt the original staff proposal as submitted on October 4, 1991 or the modified proposal. (RFF 556, *supra*). Instead the Board adopted a proposal offered by Board Member John Lagarias. (RFF 556, *supra*). Board Member Lagarias's proposal was somewhere between the stringency of what staff had originally proposed and their modification. (CX 7040 (Aguila, Dep. at 209); CX 10 at 091; RFF 557-58, *supra*).

730. The proposal as adopted was said to provide "95 percent of the emissions benefits at 85 percent of the cost" in comparison to the staff's original proposal. (CX 10 at 083, 091). "The expected costs resulting from the regulations represent an increase of about 12 to 17 cents per gallon. We project that the cost-effectiveness of the regulations as adopted is about \$7,000 to \$11,000 per ton." (CX 10 at 091; *see also* RX 189 at 006 (Board Resolution)). Although CARB presented these numbers in the Board Resolution and the Final Statement of Reasons, Mr. Aguila, who was responsible for the cost-effectiveness analysis, testified that he did not do any separate cost-effectiveness analysis for Board Member Lagarias's proposal. (CX 7040 (Aguila, Dep. at 209)). Furthermore, there has been no testimony or documentation presented as to how this cost-effectiveness analysis was completed.

731. Additionally, the expected capital investment costs were modified from \$4 to \$7 billion to \$3 to \$6 billion. (RX 189 at 006). Mr. Aguila testified that he was not aware of how the capital investments figure was changed. (CX 7040 (Aguila, Dep. at 218-21)). There has been no testimony or documentation presented as to how this number was calculated.

(7) CARB Did Not Ask Refiners to Provide Revenue Information or Information About Other Refiners' Costs Nor Did Unocal Expect It Should Disclose Such Information

732. Although CARB asked that refiners provide information regarding their own costs during the Phase 2 process, CARB merely requested this information—it was not required. (Fletcher, Tr. 6959). CARB Chairwoman Sharpless recognized that giving information to CARB was voluntary and not mandatory because they were not requiring people to give CARB information. (CX 7063 (Sharpless, Dep. at 166-67)).

733. Essentially CARB requested that refiners “tell us what they felt they were going to spend to meet the regulations.” (CX 7040 (Aguila, Dep. at 131)). Although Mr. Aguila cannot recall who actually made the request or the words that were used, to the best of his recollection, companies were asked for their actual costs. (CX 7040 (Aguila, Dep. at 130-34)).

734. CARB did not require or even request information about patents from refiners. (CX 7040 (Aguila, Dep. at 130)). Even though Mr. Aguila understood that patent costs and royalty costs are part and parcel of doing business within the refining industry, no one at CARB instructed Mr. Aguila to ask about patents as part of his cost-effectiveness analysis. (CX 7040 (Aguila, Dep. at 129)). Nor did Mr. Aguila actually ask refiners whether they had patents. (CX 7040 (Aguila, Dep. at 130)).

735. CARB understood that a refiner's possession of a patent does not impose costs on the refiner itself, but, at most, may be a source of revenue to the patent holder. (CX 7040 (Aguila, Dep. at 134)). Yet, CARB did not ask the refiners to provide any information for its cost-effectiveness analysis that related to revenues or potential revenues related to the proposed RFG regulations. (CX 7040 (Aguila, Dep. at 135)). The cost-effectiveness guidelines do not discuss revenue. (Venturini, Tr. 818). As admitted by Mr. Venturini under oath in his 2003 deposition, which was read into the record, "when we do cost-effectiveness calculations, we look at the cost of the regulation." (Venturini, Tr. 818).

736. At the time Mr. Michael Kulakowski was involved in the CARB Phase 2 rulemaking, it did not occur to him that potential royalties from a Unocal patent application would be information that would have been pertinent to CARB's efforts to gather cost information. (Kulakowski, Tr. 4586-88).

737. Unocal's Mr. Dennis Lamb was aware of no CARB rule, regulation, or policy that required Unocal to disclose to CARB any revenues it expected to receive with respect to reformulated gasoline. (Lamb, Tr. 2261).

738. Furthermore, Mr. Aguila, in his analysis, was not attempting to determine price but incremental production cost. (CX 7040 (Aguila, Dep. at 241)).

(8) Refiners Did Not Provide All Information Including Information About Competitive Advantage

739. Refiners understood that to avoid potential antitrust violations, they were not to publicly share competitive information with CARB, which in turn was also aware of these antitrust constraints. (Eizember, Tr. 3272; Banducci, Tr. 3547; CX 7056 (Martinez, Dep. at 85); Venturini, Tr. 810-12; Simeroth, Tr. 7465-67; RX 212 at 002 ("Due to potential antitrust issues, [Exxon] can

not comment directly on the value proposed by ARB as the industry average production cost estimate.); RX 166).

740. Chevron, for example, would not volunteer any information that it believed gave it a competitive advantage. Internally, Chevron identified a number of competitive advantages posed for Chevron by the Proposed Phase 2 regulations. (RX 526 at 010; CX 7042 (Bea, Dep. at 103-06)). Chevron, however, did not provide information to CARB about potential competitive advantages from the regulations (CX 7042 (Bea, Dep. at 106-08)). Chevron did not disclose refinery-specific data to CARB. (CX 7042 (Bea, Dep. at 106-07) (testifying that Chevron refused to give refinery-specific data to CARB because it wanted to keep knowledge of its facilities confidential)). Nor did Chevron disclose its business strategies to CARB. (CX 7042 (Bea, Dep. at 84-85) (testifying that Chevron wanted to keep “confidential” its internal strategies of how it planned to “work the issues and what the impacts are in the company”)).

741. Refiners were acutely aware of the need to be vigilant about not sharing competitive information. (CX 7042 (Bea, Dep. at 108) (“Generally you do not give that kind of information, because it tends—once it gets into CARB it tends to get out into the industry, and so your—whatever your capabilities are get—get spread around, which you don’t particularly want to have done. So you would not comment on that particular issue from a competitive standpoint.”)).

742. In fact, Mr. Bea from Chevron testified that CARB staff repeatedly asked refiners for company- and refiner-specific data to evaluate the cost-effectiveness of the proposed Phase 2 regulations. (CX 7042 (Bea, Dep. at 70-71)). Chevron, and other companies, “refused to give it to them.” (CX 7042 (Bea, Dep. at 70-71); *see also* RX 524 at 001 (explaining that Chevron was not interested in giving CARB information to model a specific refinery); *cf.* Eizember, Tr. 3272; RX 212

at 002 (stating in 1995 that “[d]ue to potential antitrust issues,” Exxon would not comment directly on CARB’s estimate for the average industry production of CARB Phase 2 gasoline)).

743. Chevron also testified that the reason companies declined to volunteer information that CARB might deem relevant to cost-effectiveness was that “we were afraid that [the cost information] would get out into the public domain and—and give some competitiveness away to other parties. We were not unique in that; other companies also refused to provide that information to CARB. But [CARB] kept trying.” (CX 7042 (Bea, Dep. at 70-71)).

744. CARB was also aware that refiners could not publicly provide competitive information such as cost information or provide such information through the Western States Petroleum Association due to antitrust concerns. (RX 166; *see also* CX 7063 (Sharpless, Dep. at 159-61)). WSPA communicated its antitrust policies to CARB over the years. (CX 7070 (Wang, Dep. at 27-28)). Mr. Simeroth was copied on a March 7, 1990 letter to Mr. Peter Venturini from a lawyer representing WSPA. (RX 166; Simeroth, Tr. 7464). The letter contains WSPA’s comments regarding antitrust constraints on the refining industry as related to CARB’s upcoming public meeting. (RX 166). Discussions about antitrust issues occurred within Mr. Simeroth’s office, with Mr. Venturini and Mr. Tom Jennings present, relating specifically to what not to discuss with oil companies present. (Simeroth, Tr. 7465-68). The antitrust issues that these gentlemen discussed generally included market sector, market share, supply, cost, or strategies of individual companies to comply with the regulation. (Simeroth, Tr. 7466-67). CARB staff was advised to avoid questions about competitiveness between companies, such as their anticipated prices and what mechanisms they would use to set prices. (Simeroth, Tr. 7487-88).

745. Although after the Phase 2 cost-effectiveness analysis, WSPA pointed out its “long-standing policy” regarding WSPA’s avoidance of what could be construed as anticompetitive behavior in a June 20, 1995 letter to CARB. (CX 7070 (Wang, Dep. at 34-35); RX 671 at 003). Mr. Wang of WSPA agreed this document accurately described WSPA’s policy, and that the policy was “religiously adhered to by WSPA.” (CX 7070 (Wang, Dep. at 34-35); RX 671 at 002-003).

746. CARB Chairwoman Sharpless testified that she understands why there is sensitivity about costs between companies when they compete in the marketplace. (CX 7063 (Sharpless, Dep. at 166)). Based on Ms. Sharpless’ experience it is true that, “those companies who go through regulated proceedings are not always forthcoming with all information, bar none.” (CX 7063 (Sharpless, Dep. at 167)). In fact, as Ms. Sharpless explained, oil companies were not going to give her information which they did not want her to have because they were “looking very well after their own self interest.” (CX 7063 (Sharpless, Dep. at 167)).

(9) Unocal Was Not Directly Asked to Provide Its Own Cost Information Until the Phase 2 Board Meeting

747. At the November Board meeting Mr. Lamb was asked whether Unocal would tell CARB what Unocal anticipated its costs for CARB gasoline would be. (Lamb, Tr. 2307; CX 774 at 047-048). Unocal was also asked if it knew what it would have to charge for reformulated gasoline. (Lamb, Tr. 2307; CX 774 at 048). Unocal did not give CARB a number for either what its anticipated costs were or for the potential prices it thought it would charge for CARB 2 gasoline. (Lamb, Tr. 2307). Mr. Lamb believed that the question about what Unocal might have to charge was a highly inappropriate question because the room was full of Unocal’s competitors. (Lamb, Tr. 2307-08).

748. Mr. Lamb was not aware of any CARB rule, regulation or policy that required Unocal to disclose to CARB its expected costs of compliance to make CARB 2 gasoline. (Lamb, Tr. 2261). Although CARB asked Unocal for such information, Unocal did not provide any such information to CARB. (Lamb, Tr. 2261). Likewise, Mr. Lamb was aware of no rule, regulation, or policy of CARB that required Unocal to disclose to CARB any revenues it expected to receive with respect to reformulated gasoline. (Lamb, Tr. 2261-62, 2338-39). Although CARB asked Unocal for such information at the Phase 2 hearing, Unocal did not disclose that information to CARB. (Lamb, Tr. 2261-62). And finally, Mr. Lamb was not aware of any rule, regulation or policy of CARB that required Unocal to disclose to CARB any prices that Unocal intended to charge. (Lamb, Tr. 2262). Although CARB once asked Unocal for that information, Unocal did not provide it to CARB. (Lamb, Tr. 2262).

d. CARB Refused to Conduct Incremental Analyses of Individual Parameters of Its Regulatory Scheme

749. Although urged by refiners to do so, CARB did not conduct an incremental cost-effectiveness analysis to determine which specifications were the most cost-effective. (Eizember, Tr. 3227 (Exxon); CX 7059 (Moyer, Dep. at 84-85) (Texaco); RX 436 at 002 (Texaco) Cunningham, Tr. 4319-20 (WSPA); Fletcher, Tr. 6933-35, 6960-61, 6978-82; Venturini, Tr. 770; Curtis, Tr. 5882; CX 10 at 104). CARB “steadfastly refuse[d] to calculate or consider incremental cost-effectiveness,” in favor of an average cost-effectiveness analysis. (Eizember, Tr. 3226-27, 3231-32; RX 210 at 003). Thus, a specific cost for T50 was never determined as part of the regulations. (Venturini, Tr. 770; Curtis, Tr. 5883)).

750. Although Mr. Fletcher testified on direct examination that it was important to consider the impacts on the refinery in terms of cost to produce different levels of T50, and that he

knew such an analysis had been done, he could not point out any section in the Technical Support document where CARB staff laid out a separate cost analysis for T50 at different levels. (Fletcher, Tr. 6959-60).

751. As explained in the Phase 2 Final Statement of Reasons: “[t]he staff d[id] not agree that incremental analysis on a property-by-property basis is appropriate. . . . Since individual properties affect emissions differently, and because all properties are interrelated, all properties needed to be considered together in order to optimize the overall emissions performance of the fuel.” (CX 10 at 104).

752. As CARB noted, “the staff in calculating emission benefits did not look at individual parameters.” (CX 10 at 070). With respect to calculation of costs, instead of conducting an incremental cost analysis, CARB’s approach was also to look at the fuel as a whole as opposed to determining the costs of the individual parameters. As CARB’s Mr. Fletcher stated at the November 1991 Board meeting, CARB “look[s] at the fuel as a system.” (CX 773 at 052). And likewise, CARB’s chairwoman, Ms. Sharpless, stated “we’re looking at the fuel properties as an integrated system.” (CX 773 at 264).

753. CARB also explained its rationale in the Phase 2 Final Statement of Reasons: “Because of the emissions and cost interrelationships discussed above, staff believes that an incremental (limit-by-limit) analysis is not appropriate. Gasoline needs to be viewed as a system where emissions performance and costs can be optimized. Moreover, incremental analysis has typically not been considered in past rulemakings.” (CX 10 at 104). Additionally, CARB explained that “it is inappropriate to compare incremental cost-effectiveness with the cost-effectiveness of an entire regulation. The Board has not used incremental analyses to determine cost-effectiveness, but

instead looks at the costs and emission reductions associated with an entire regulation relative to the existing situation.” (CX 10 at 182).

754. WSPA supported the use of an incremental cost analysis, and, in fact, Turner Mason conducted an analysis on its behalf which looked at the cost-effectiveness of certain parameters. (Cunningham, Tr. 4319-20, Courtis, Tr. 5879-83; CX 7059 (Moyer, Dep. at 84-86)). Turner Mason used refinery linear programming using a hypothetical representation of an average refinery to predict costs. (Courtis, Tr. 5877-78). Turner Mason then used the hypothetical representation of an average refinery to estimate costs as a result of the Phase 2 regulation. (Courtis, Tr. 5877-78). Mr. Fletcher and Mr. Courtis admitted that one of CARB staff’s criticisms of the cost analysis conducted by Turner Mason on behalf of WSPA was that the analysis looked at the benefits and costs on a property-by-property basis. (Fletcher, Tr. 6960-61; Courtis, Tr. 5879-81).

755. Incremental, as opposed to average total cost analysis, revealed that some of the parameters that CARB was considering adopting were drastically more expensive than others, yet modifications to correct this situation were rejected by CARB. For example, CARB rejected WSPA’s suggestion that moving the T90 average from 300° to 310°F, which would have saved nearly \$200 million per year. (CX 10 at 105). CARB also rejected WSPA’s suggestion that moving olefins from an average of 5% to an average of 7% would achieve a \$200 million annual cost saving because the proposal reflected an incremental cost analysis. (CX 10 at 105). Specifically, CARB stated, “we do not feel it is appropriate to consider the incremental cost-effectiveness of individual properties such as T90.” (CX 10 at 105).

756. CARB staff economist Dr. Reza Mahdavi did not recall any one ever asking him for his input or opinion on whether CARB staff should do an incremental cost-effectiveness analysis during the 1991 rulemaking or rule-development stage. (CX 7054 (Mahdavi, Dep. at 40)).

e. CARB Did Not Consider Even Known Patents in its Cost Analysis

757. Before the November 21, 1991 CARB Board meeting, a number of CARB staff members, including Mr. John Courtis, Mr. Robert Fletcher, and Mr. Dean Simeroth, were aware of a patent issued to a Mr. Talbert for low emissions gasoline. (Simeroth, Tr. 7468-69; Courtis, Tr. 5884-86). Mr. Courtis denied ever doing an analysis of the Talbert patent as it might relate to the Phase 2 regulations, and was unaware of any CARB staff member who conducted an analysis of the Talbert patent in connection with Phase 2 gasoline regulation. (Courtis, Tr. 5885-86). Mr. Aguila did not recall John Courtis ever telling him about a Talbert patent. (CX 7040 (Aguila, Dep. at 135-36)).

758. Even though Mr. Courtis was aware of the Talbert patent, it was not referenced in the Technical Support Document which contains a list of references for the Phase 2 rulemaking, and of which Mr. Courtis was a co-author. (Courtis, Tr. 5885-86). Mr. Courtis was unaware of any cost analysis of the Talbert patent conducted or performed by any CARB staff member prior to the November 21, 1991 CARB Board meeting. (Courtis, Tr. 5885-86). This is despite the fact that Mr. Simeroth directed him to investigate the Talbert patent. (Simeroth, Tr. 7470-71).

759. Mr. Courtis was unaware of any effort by any member of CARB staff to deliberately carve around any claims of the Talbert patent in their October 4 proposal to the Board. (Courtis, Tr. 5886-87). He was similarly unaware of any Board effort to avoid overlap between its regulations and the Talbert patent when it made its decisions at the November 1991 Board meeting. (Courtis,

Tr. 5886-87). Mr. Courtis never himself attempted to evaluate a pending patent application or an issued patent for any reason prior to the adoption of the CARB Phase 2 regulations. (Courtis, Tr. 5886).

760. As of 1996, after CARB staff had been aware of the '393 patent for a year, CARB staff had still neglected to conduct any analysis of any potential costs associated with the '393 patent. (Courtis, Tr. 5890-91). Similarly Mr. Courtis performed no analysis of whether the '393 patent was increasing the cost of CARB Phase 2 gasoline during the year after CARB learned of the '393 patent. (Courtis, Tr. 5890-91).

f. CARB Rejected Other Highly Cost-Effective Regulatory Options

761. Significantly, the Phase 2 RFG that CARB ultimately adopted was not the most cost-effective option available. More cost-effective options included enhanced inspection and maintenance ("I & M") programs, a vehicle scrap program, and future research on low-emission vehicles. (CX 10 at 110-111, 123-124).

762. One alternative approach to the Los Angeles pollution problem that Unocal's Mr. Richard Stegemeier strongly endorsed was the "scrap program." (CX 7065 (Stegemeier, Dep. at 124-26)). Unocal conducted a trial program with CARB, spending five million dollars of its own money, which demonstrated that, by spending half as much money to take older, high-polluting cars off the streets by simply buying them, a scrap program could remove six times as much pollution on an annual basis when compared to the anticipated CARB RFG regulations. (CX 7065 (Stegemeier, Dep. at 124-26)). The vehicle scrap program received an environmental award from former President Bush, and the EPA considered it one of the most innovative and cost-effective programs of the year. (CX 7065 (Stegemeier, Dep. at 139)).

763. In defending its decision not to adopt a more cost-effective measure, such as the vehicle scrap program, CARB emphasized that, as long as the cost-effectiveness of a measure fits within a range relative to recently adopted measures, the requirement for cost-effectiveness is met. (CX 10 at 110-111).

764. For example, CARB specifically rejected the argument that emphasized Phase 2 RFG were not cost-effective because they were more costly than enhanced I & M programs and vehicle scrapping. (CX 10 at 110-111).

765. Rather, CARB emphasized that cost-effectiveness is relative only to the range established by recently adopted measures: “We do not agree with this statement [that reformulated gasoline beyond federal requirements is not cost-effective]. The Staff Report indicates that Phase 2 RFG is cost-effective compared to recently adopted measures.” (CX 10 at 123).

g. CARB Still Would Have Concluded the Phase 2 Regulations Were More Cost-Effective than Any Alternatives, Even One That Included the Unocal Royalty

766. The “upper bound” listed in the Technical Support Document was \$32,000 per ton. (CX 7063 (Sharpless, Dep. at 205-06); CX 52 at 077 (referred to in testimony as RX 52)). In fact, the upper bound cited by CARB at its November 21, 1991 Board meeting was \$50,000 per ton. (CX 773 at 312).

767. In response to Unocal’s objection that the Phase 2 regulation would be more costly than projected by CARB, CARB stated that it believed that Unocal’s objection was based on an estimate that the regulation would impose costs of 23 cents per gallon, in contrast to CARB’s estimate of 12 to 17 cents per gallon. (CX 10 at 184). CARB asserted that “even if the cost-

effectiveness of Phase 2 RFG is changed by 25 percent as suggested by Unocal, the Phase 2 RFG cost-effectiveness would still be comparable to recently adopted regulations.” (CX 10 at 184).

768. In fact, the 23 cents per gallon figure is 35 percent higher than the high end of CARB’s estimate and 92 percent higher than the low end of that estimate. Nonetheless, CARB concluded that even if the estimated costs were increased by that amount, the Phase 2 regulations would “still be comparable to recently adopted regulations.” (CX 10 at 184).

769. { [REDACTED]
[REDACTED]
[REDACTED] } (CX 2018 at 013, *in camera*). That royalty represents a cost increase of 9.4 percent to 13.3 percent over the 12 to 17 cents per gallon estimate made by CARB in its Phase 2 Final Statement of Reasons. This is significantly less than 25 percent the cost increase that CARB stated would have maintained the comparable nature of the Phase 2 regulations. (CX 10 at 184).

770. Even if the 1.6 cents per gallon royalty would have been put into the cost-effectiveness estimate, it would have raised the estimate to 13.6 to 18 cents per gallon, or less than the 23 cents per gallon estimate that CARB deemed acceptable. (CX 10 at 184).

771. CARB did not deem a change in the cost-effectiveness of the Phase 2 regulations from a range of \$8,000 to \$12,000 per ton to a range of \$9,000 to \$13,000 per ton to be significant. (CX 773 at 052). Thus, CARB did not deem an increase of \$1,000 per ton in cost-effectiveness as significant. (Griffin, Tr. 8392-95).

772. The value of a 1.6 cents per gallon royalty is about \$1,000 per ton. (Griffin, Tr. 8392).

773. For refiners who would not have full royalty-bearing production, the cost increase of the Unocal royalty spread over their entire production of CARB Phase 2 RFG is even lower. (Griffin, Tr. 8392-95 (making conservative assumption of full overlap)).

774. By CARB's own conclusions, to the extent that CARB was acting to maximize cost-effectiveness, the next best alternative regulation (or the alternative of no regulation) would have been preferable to the Phase 2 regulations only if the cost of taking the license fees into account would have increased the estimated cost of the Phase 2 regulations by more than 35 percent above the high end of CARB's estimated range. (CX 10 at 184). Thus, even if the Unocal royalty had been in effect and CARB had included that amount in its analysis, the Phase 2 regulations would still have been "cost-effective." (Griffin, Tr. 8392-95).

775. The effect of adding approximately two cents to CARB's cost numbers was also explained by Mr. John Courtis. Specifically, Table VI-2 (shown earlier in RFF 722) of the Staff Report shows the cents per gallon calculations CARB used to derive the dollars per ton of pollutant removed under the Phase 2 regulations. (CX 52 at 074 (referred to in testimony as RX 52 at 075)). The calculations of Table VI-2 are CARB's estimate that the increased cost per gallon to the California consumer of gasoline produced under Phase 2 is in the range of 14 to 20 cents per gallon, which translates to \$8,000 to 12,000 per ton of pollutant reduced. (CX 52 at 074). These \$8,000 to \$12,000 per ton figures were used for purposes of cost-effectiveness comparison in the Staff Report (Table VI-5). (CX 52 at 074, 077; Courtis, Tr. 5847-50).

776. That same table in the Staff Report also sets forth the anticipated production cost increase of Phase 2 gasoline, at a range of 12 to 16 cents per gallon, translating into \$6,800 to \$9,100 per ton of pollutant reduced. (CX 52 at 074). Mr. Courtis explained that from Table VI-5, one can

calculate the effect of 2 cents per gallon on the dollars-per-ton of pollutants reduced: An additional 2 cents per gallon would add \$1,200 per ton of pollutant removed. (Courtis, Tr. 5847-51; CX 52 at 074). Therefore, if you added 2 cents per gallon to the estimated dollars per ton, it would total \$9,200 to \$13,200 per ton of pollutant removed. (Courtis, Tr. 5847-51; CX 52 at 074).

777. \$9,200 to \$13,200 per ton of pollutant removed would be within the range or lower than other measures identified in Table VI-2 of the Staff Report. (Courtis, Tr. 5851-53; CX 52 at 074).

778. Finally, while CARB staff estimated cost-effectiveness measured as dollars per ton of pollutant reduced to be \$8,000 to \$12,000 a ton, by 1996 there was a revision of that estimate to \$8,000 a ton. (Venturini, Tr. 816-17).

25. Unocal Continued to Advocate Against the Need for the Phase 2 Rules Even After CARB Adopted Those Rules

779. Even after the Phase 2 regulations were approved, Unocal continued to advocate against the need for any regulations. As previously indicated, during the Phase 2 process, Unocal maintained that the Phase 2 regulations were unnecessary. (CX 10 at 053 (“Although the California Clean Air Act requires ARB to take actions that are necessary, cost-effective, and technologically feasible to reduce emissions of volatile organic compounds by 55 percent and oxides of nitrogen by 15 percent . . . no further action is necessary to achieve those reductions by December 31, 2000.”)).

780. Even as late as three years after the adoption of the CARB Phase 2 regulations, Unocal continued to advocate to CARB that the regulations were not needed and that the low-emission vehicle program alone was sufficient. (Boyd, Tr. 6786-87; RX 200). In a January 5, 1994 meeting with CARB’s chairperson, after the ’393 patent had been allowed, Unocal specifically argued that “RFG2 is not needed in [California] to achieve air quality standards.” (RX 200

(summary of points raised by Unocal at January 5, 1994 RFG2 meeting with Chairwoman)). Unocal also told CARB that the federal RFG program was adequate for California. (Boyd, Tr. 6787; RX 200). It urged CARB to reevaluate the T90, aromatics and olefins limits. (RX 200).

26. CARB Finally Adopted a Predictive Model in 1994

781. The Complaint alleges that “Unocal's misrepresentations and materially false and misleading statements caused CARB to adopt Phase 2 RFG regulations that substantially overlapped with Unocal's concealed patent claims. Specifically, for example, CARB included a specification for T50 in its Phase 2 RFG regulations and eventually adopted a ‘predictive model’ that included T50 as one of the parameters.” (Complaint ¶ 45). Unocal, however, opposed the form of the predictive model adopted by CARB, advocated for a predictive model without caps and alternatively argued for a model like the EPA model. (RFF 800-03, 810). CARB developed a model that does not use Unocal's equations and does not adopt Unocal's suggestions about its structure. (RFF 807-812). Moreover, Unocal gave the EPA the same information that it provided to CARB. (RFF 808-09). The EPA used the Unocal information, and unlike CARB, the EPA did not place a cap on T50 and assigned a flatter T50 response curve to its own predictive model. (RFF 809, 811).

a. Predictive Model Overview

782. Despite CARB's assurances at the 1991 Board meeting that it would develop a predictive model by the spring of 1992 (CX 773 at 027-028; CX 774 at 021; *see also* CX 817 at 008-009), it did not ultimately adopt a the Phase 2 predictive model until June 1994. (CX 53 (Proposed Amendments to the California Phase 2 Reformulated Gasoline Regulations, Including Amendments Providing for the use of a Predictive Model, dated April 22, 1994); CX 54 at 005-006 (April 1995 Final Statement of Reasons for the predictive model, dated April 1995 and describing the June 9,

1994 meeting adopting the predictive model)). The CARB model was adopted in 1994 and was later updated in 1999. (CX 7045 (Cleary, Dep. at 104)).

783. At the June 9, 1994 meeting, CARB adopted resolution 94-38, approving the proposed amendments with various modifications. (CX 54 at 005). Mr. Jennings (CARB's lawyer), Mr. Brisby, and Mr. Cleary were all principal authors of the staff proposal for the Phase 2 predictive model marked as CX 53. (CX 53; CX 7045 (Cleary, Dep. at 162-63)).

784. Under the 1994 predictive model, gasoline producers were allowed to compare, via computer model, the performance of Phase 2 RFG with the performance of an alternative gasoline formulation that has different specifications. (CX 54 at 007). An alternative formulation was acceptable if the predicted emissions resulting from its use were equal to or better than the predicted emissions resulting from the use of Phase 2 RFG. (CX 54 at 007). The process by which CARB developed the predictive model is described below.

b. CARB Developed the Predictive Model After the Phase 2 Regulations by Assembling a Mega-Data Base

785. To develop its predictive model, CARB used one of its own staff, Mr. Kevin Cleary, and two consultants, Ms. Peggy Miller and Dr. David Rocke. (CX 7045 (Cleary, Dep. at 45-46, 132-33); Venturini, Tr. 406-07; CX 53 at 002). Ms. Miller assembled the master data set for the Predictive Model. (CX 7044 (Chan, Dep. at 18-22); CX 7045 (Cleary, Dep. at 46)). Dr. Rocke, a professor from the University of California Davis, supervised the development of the Phase 2 predictive model as the lead statistician. (Venturini, Tr. 406-07; CX 10 at 022).

786. The data assembled by Ms. Miller for the predictive model consisted of approximately 7,724 data points. (CX 53 at 030-031, 150-151, CX 7045 (Cleary, Dep. at 167)). The data was taken from twenty different studies, including studies from Auto/Oil, GM/WSPA/CARB,

API, NIPER, and the EPA. (CX 53 at 150-151). The data set included data from studies other than from Unocal that had examined T50's effect on emissions. (See CX 7045 (Cleary, Dep. at 169)).

787. The data from Unocal's emissions tests accounted for 744 of the 7,724 total data points, or just less than 10 percent (9.63 percent) of the total data. (CX 7045 (Cleary, Dep. at 167); CX 53 at 150-151). The Unocal data contained in the data set was from its 10-car and 13-car studies. (Venturini, Tr. 818-19; CX 7045 (Cleary, Dep. at 32)). Unocal never sent data from its 1-car test to CARB. (Jessup, Tr. 1541; CX 7045 (Cleary, Dep. at 33-35)). Although Mr. Cleary read about Unocal's 1-car test in a published Society of Automotive Engineers (SAE) paper, he never put that data into CARB's data base. (CX 7045 (Cleary, Dep. at 35-36, 41)).

788. Because of the extraordinary size of the data base and the complexity of the statistical analysis, the "supercomputer" at UCLA was used to run the data. (CX 10 at 022). Dr. Rocke and CARB staff used the data base to develop complicated mathematical equations based upon sophisticated regression techniques. (Venturini, Tr. 819). It is those sophisticated equations that were put into software that is now called the predictive model. (Venturini, Tr. 819).

789. The 1994 predictive model was composed of three equations. CX 7045 (Cleary, Dep. at 165-66; CX 54 at 007)). In each equation, the vehicular emissions that resulted from the use of an alternative gasoline formulation were compared to emissions resulting from the use of Phase 2 RFG. (CX 54 at 007). One equation determined the percent change in exhaust emissions of hydrocarbons; the second determined the percent changed in exhaust emissions of oxides of nitrogen; and the third determines the percent change in the combined exhaust emissions of four toxic air contaminants. (CX 54 at 007). Although the predictive model can be described as a series of three equations, there are sub-equations and sub-models. (CX 7045 (Cleary, Dep. at 165-66)).

c. Throughout the Development of the Predictive Model Unocal Continued to Advocate for a Delay in the Implementation of the Phase 2 Regulations Which Would Be Tied Directly to the Predictive Model and for No Caps on the Model

790. Unocal advocated for a predictive model both before and after the November 1991 Phase 2 Board meeting. (Lamb, Tr. 2311-14; CX 38 at 003; CX 39 at 004-005; CX 42 at 001 (September 4, 1992 letter from Unocal to CARB, stating “the predictive model, is of utmost importance to us and requires the Board's immediate attention” (emphasis in original)), 003-006).

791. Unocal continued to reiterate the need for delay in the implementation of the Phase 2 regulations until a predictive model was adopted. (Boyd, Tr. 6774, 6787-89). At the time of the Phase 2 hearing, Unocal requested a link between the effective date of the predictive model and the implementation date of the regulations. (CX 575 at 003). CARB rejected that request on the basis that it would continue to work to develop a predictive model, which CARB assured would be ready by spring of 1992. (CX 575 at 003; CX 39 at 004-005; CX 773 at 027-028; CX 774 at 021-022; CX 1192; CX 817 at 008-009 (resolution requiring a hearing to be scheduled for the spring of 1992)).

792. Unocal’s comment appears in the Final Statement of Reasons, in which it explains that the effective date of March, 1996 for Phase 2 RFG was based on the assumption that the predictive model would be promulgated in April, 1992, and thus refineries would have four years to use the predictive model as a capital planning tool. (CX 10 at 224). According to Unocal it appeared at the time of the Phase 2 rulemaking that the predictive model would not be available until 1993. (CX 10 at 224). Unocal asked for linkage between the effective date of the regulations and the promulgation of the predictive model urging CARB to delay implementation of the regulations,

with an extension of one month for each additional month that CARB took to adopt a predictive model. (CX 10 at 224).

793. CARB rejected Unocal's comment:

Refiners are not required to use the predictive model. Use of the predictive may allow refiners to meet Phase 2 RFG requirements at a lower cost, but it would be unreasonable to delay implementation of Phase 2 RFG merely because refiners will not have a full four years to use the predictive model. It is also appears that application of a predictive model will have a greater impact on operational parameters than on capital planning and capital expenditures. Therefore the lead time for installing or modifying equipment does not need to be delayed until promulgation of the predictive model.

(CX 10 at 224; *see also* CX 10 at 171).

794. On March 20, 1992, Unocal submitted comments regarding CARB's wintertime oxygenate program. (CX 38). In those comments, Unocal again expressed concern over the delay in CARB's development of the predictive model, and asked CARB to act as expeditiously as possible. (CX 38 at 003-004).

795. On June 19, 1992, Unocal again requested that CARB delay implementation of the regulations to correspond to the delay in the predictive model, with an extension of one month for each additional month that CARB took to adopt a predictive model. (CX 39 at 004-005).

796. On August 14, 1992, Mr. Michael Kulakowski, employed by Unocal at the time, provided a statement to CARB. (CX 575). He stated that despite the Board's assurance that the predictive model would be complete by the spring of 1992, no model had been promulgated. (CX 575 at 003). Therefore, he again reiterated Unocal's request for linkage between the effective date of the predictive model and the effective date of the regulations. (Kulakowski, Tr. 4544; CX 575 at 003-004).

797. A WSPA memo dated August 31, 1992, set forth the general industry belief that CARB's "[d]elay or deferral of the Predictive Model will further limit planning for flexibility offered by the Model and will eventually deny the accompanying cost-effectiveness from use of the Predictive Model. (CX 315 at 002). WSPA and Unocal shared this view. (CX 315 at 002; Kulakowski, Tr. 4545).

798. On September 4, 1992, Unocal again requested an implementation delay:

Unocal continues to believe that there must be linkage between the final adoption of the predictive model and the effective date for compliance. Four years was the period of time that all interested and impacted parties (including CARB's representative) did agree to as reasonable for linkage in the federal Complex model. Therefore, CARB should allow four years from the adoption of the predictive model; otherwise, the adoption of the model will not accomplish CARB's (and Unocal's) stated goal.

The failure to provide the predictive-model option on a timely basis should have been followed by a staff proposal to delay and link the effective date. The Board can correct that by adopting an effective date linked to the final adoption of the model by a 48-month lead time.

(CX 42 at 006; CX 7063 (Sharpless, Dep. at 88) (acknowledging that Chairwoman Sharpless received the letter)).

799. CARB understood during that time frame that Unocal believed that the predictive model would provide cost savings and flexibility for gasoline production under the CARB Phase 2 regulations. (Boyd, Tr. 6774).

800. Additionally, Unocal had been and continued to be concerned about the inclusion of caps in a predictive model. (Lamb, Tr. 2311-13; CX 42 at 006). Unocal continued to express its viewpoint to CARB. In 1992, Unocal specifically told CARB that it did not want cap limits in the predictive model. (CX 42 at 005 ("Staff discusses use of a statistical approach for the predictive

model on page 41 of the SR [1991 Statement of Reasons]. The model will also be limited by the proposed ‘caps.’ Either of these considerations could eliminate the model as a viable alternative.”) (cited in deposition transcript as RX 42); CX 7063 (Sharpless, Dep. at 89-90)).

801. Unocal also continued to argue for an unbounded, pure predictive model, even after the '393 patent had already issued. (RX 159). Dr. Jessup made a presentation to WSPA in May of 1994 in which he argued that “no caps on fuel properties are necessary.” (RX 159 at 037). Dr. Jessup argued that CARB’s version of a predictive model with caps on fuel properties too severely limited the blend space available to refiners to reduce emissions to an acceptable level. (Jessup, Tr. 1485-93 (explaining that it was possible to blend a gasoline where a specific property went beyond CARB's caps, but still reduce emissions to CARB-acceptable levels by adjusting that gasoline’s other properties); RX 1184 (demonstrative); RX 1185 (demonstrative); RX 159 at 017-018).

802. For example, in his aromatics chart at RX 159 at 017, Dr. Jessup showed “that the area of accepted emissions in the dark outlined area had been severely curtailed by the limits that CARB had placed on those variables” and that “they made a very small acceptable area to blend.” (Jessup, Tr. 1492). On the other hand, Dr. Jessup’s model would have allowed for blending gasolines that have acceptable emissions even when the aromatics level would be unacceptable under CARB regulations. (Jessup, Tr. 1493-94). Unocal’s “no caps” position included no caps on T50. (Kulakowski, Tr. 4645).

803. But after Dr. Jessup’s presentation, the WSPA predictive model policy group decided to support CARB’s proposal with the caps in place. (Kulakowski, Tr. 4646-47). Even Mr. Kulakowski, a Texaco employee and chair of the WSPA policy committee for the predictive model who knew that the '393 patent had issued, voted to support CARB’s version of a predictive model.

(Kulakowski, Tr. 4580-81, 4646-47). He and Texaco, along with other refiners, advocated to CARB in favor of adoption of the CARB predictive model and told CARB that it would save Texaco 2-3 cents per gallon in production costs. (Kulakowski, Tr. 4651-52; RX 161 at 001; *see also* CX 7046 (Grey Dep. at 53-55)). The CARB model that was adopted included a requirement that all gasoline still had to meet Phase 2 cap limitations. (Boyd, Tr. 6775; CX 54 at 009).

804. CARB and others in the refining industry ultimately shared Unocal's view that a predictive model would be cost-effective and flexible. (CX 54 at 007, 022 (CARB analysis stating that the purpose of the regulatory amendments incorporating the predictive model was "to provide additional flexibility to gasoline producers and concluding that "the California Predictive Model will reduce production costs and minimize the potential for supply disruptions.")). Indeed, CARB claimed, "The proposed predictive model is expected to lower producers' and gasoline suppliers' costs to comply with the Phase 2 RFG regulations." (CX 53 at 053).

805. CARB described most parties as generally supporting the predictive model, including Texaco, Mobil, and ARCO. (CX 54 at 013). CARB did not list Unocal among the parties supporting the predictive model. (CX 54 at 013).

d. Even Though Unocal's Data Is Included in CARB's Mega-Data Base, It Did Not Skew the Resulting Predictive Model

806. The predictive model developed by CARB is not skewed as a result of the inclusion of the Unocal data. During the FTC's investigation of this matter and at the FTC's request, CARB's Mr. Kevin Cleary performed an analysis of the effect of the Unocal data by removing it from the data base. (CX 7045 (Cleary, Dep. at 8-9)). The result of Mr. Cleary's analysis was a computer-run output of 5 to 10 pages. (CX 7045 (Cleary, Dep. at 8, 11-12)). Although Unocal's attorney immediately requested that Complaint Counsel or CARB produce that computer run (CX 7045

(Cleary, Dep. at 13-14)), it was never produced to Unocal, and it was never presented at trial. Mr. Cleary did remember, however, that the computer run showed that the exclusion of Unocal's data did not have a large effect on the models responses. (CX 7045 (Cleary, Dep. at 11); Venturini, Tr. 407-08 (testifying that he did not know if Unocal's data had an effect on the predictive model)).

e. Neither Unocal Nor Its Data Caused the Predictive Model to Take the Form It Took; Rather It Was the Result of Scientific and Policy Choices Made by CARB

807. CARB's predictive model is not based on Unocal's equations, nor does it use Unocal's equations. (Kulakowski, Tr. at 4650). There are many differences between the CARB model and Unocal's equations. The Unocal equations are linear. (Jessup, Tr. 1178, 1282, 1530; Venturini, Tr. 406; CX 24 at 039; CX 171 at 004). CARB's model, adopted in 1994, is nonlinear. (Jessup, Tr. 1531; Eskew, Tr. 2996-3001). Unocal used non-centered data to complete its regression analysis. (Jessup, Tr. 1529). CARB used centered data. (Jessup, Tr. 1531). Unocal used a no-intercept model. (Jessup, Tr. 1527). The CARB predictive model is based on an intercept analysis. (Jessup, Tr. 1531).

808. Further evidence of the fact that Unocal's research or data did not require the inclusion of caps or the form of the predictive model adopted by CARB may be found in the EPA complex model. The United States Environmental Protection Agency (EPA) worked on developing a predictive model in the fall of 1991. (Lamb, Tr. 2267). Unocal sent the EPA a disk containing the same data base of vehicle information, fuel information, and test results that Unocal had previously provided to CARB. (Lamb, Tr. 2266-67). Unocal followed that submission by going to Ann Arbor, Michigan, in the winter of 1991 to make a presentation to the EPA in person. (Lamb, Tr. 1990-91). Unocal's EPA presentation and slides were similar to the presentation and slides it

had given to CARB. (Jessup, Tr. 1566-67; Miller, Tr. 1454; Lamb, Tr. 1990-91). In January of 1992, Dr. Jessup also sent the EPA a copy of his SAE paper. (Jessup, Tr. 1566-67).

809. The EPA used Unocal's data in the development of the complex model. (Lamb, Tr. 2267). Unocal data is in both the CARB model and also in the EPA data base, but with only 462 data points because the EPA data base was only interested in modeling 1990 model year vintage automobiles. (CX 7045 (Cleary, Dep. at 167-69)).

810. The EPA's model was adopted in 1993, and dubbed the "complex model." (Jessup, Tr. 1569-70; CX 7045 (Cleary, Dep. at 104)). Although the two regulations were based on similar data sets, the structure and the form of the models are quite different. (Lamb, Tr. 2267-68). The "EPA's was much more of a performance standard model designed to measure a reduction from a base in the past, while CARB's was an equivalency to a set formula." (Lamb, Tr. 2268). Specifically, the federal model did not have a cap on T50. (Kulakowski, Tr. 4642). Unocal argued unsuccessfully to WSPA in favor of the EPA model. (Kulakowski, Tr. 4642). CARB in fact rejected the EPA model, a hybrid CARB-EPA model, and a model offered by WSPA, because CARB felt its approach was more appropriate. (CX 7045 (Cleary, Dep. at 181-182)).

811. There are multiple reasons for the differences in the EPA model versus the CARB predictive model. The Phase 2 model had more fuels and a broader range of vehicle types than the EPA complex model. (CX 7045 (Cleary, Dep. at 105-07)). CARB and EPA treated the data differently for purposes of grouping and analyzing the data. (RX 65 at 005-006). The EPA complex model used different modeling software and analysis than the CARB model. (CX 7045 (Cleary, Dep. at 110)). A statistical analysis known as PROC MIXED was used for the development of the CARB Phase 2 predictive model. (CX 7045 (Cleary, Dep. at 23, 109)). But the U.S. EPA Complex

Model did not use PROC MIXED. (CX 7045 (Cleary, Dep. at 109-10)). Both the CARB predictive model and the EPA complex model use a “T50 response curve”—which depicts the incremental difference in emissions for every degree increase in T50. (Eizember, Tr. 3280-81). The EPA complex model’s T50 response curve is flatter than CARB’s T50 response curve: {



[REDACTED]

[REDACTED]; Eizember, Tr. 3280-81).

812. CARB staff made the decision to use the statistical approach they used based on the recommendation of consultant Dr. David Rocke. (CX 7045 (Cleary, Dep. at 132)).

f. Refiners Are Using the Predictive Model to Certify Their Gasoline

813. The refiners are almost universally using the predictive model to certify their gasoline. (Simeroth, Tr. 7479-80; RX 190 at 019 (stating that the predictive model is “[u]sed for virtually all gasoline produced”); *see also* CX 7045 (Cleary Dep. at 192-93)).

814. For just a few examples, {

[REDACTED]

[REDACTED]}. Chevron also used the CARB Phase 2 predictive model in the summer of 2002. (Engibous, Tr. 4055).

27. CARB's Response to Unocal's Patent

815. When CARB staff first learned about the patent, they had a variety of responses. For example, Mr. Venturini admitted that what came to his mind when he first found out about Unocal's patent was that if in fact it was a patent, Unocal had a right to protect it. (Venturini, Tr. 823).

816. Mr. Boyd testified about first learning that Unocal had received the '393 Patent. (Boyd, Tr. 6730). His first reaction was "humor." (Boyd, Tr. 6730). Mr. Boyd said in 1996—under oath—that "dismayed" would be too strong a word to describe the reaction of CARB staff members by his observation. (Boyd, Tr. at 6821). He was being truthful in 1996. (Boyd, Tr. 6826-27). Speaking for himself as well as CARB staff, Mr. Boyd said in his deposition in this case in 2003 that "misled" is too strong a word to use in connection with a question of whether Unocal's silence had the effect of misleading staff. (Boyd, Tr. 6826-27). At both his depositions in 1996 and 2003, Mr. Boyd refused to even characterize Unocal not disclosing its patent as unfair. (Boyd, Tr. 6828).

817. At trial, Mr. Boyd attempted to change his previous testimony and contend that CARB was misled and that Unocal's conduct was unfair, in direct contradiction to his previous testimony and with no credible explanation for attempting to change his testimony. (Boyd, Tr. 6827-28; 6885-91).

818. Additionally, after Unocal's patent announcement in the spring of 1995, then-Chairman of CARB, Mr. John Dunlap, discussed the patent issue directly with a Unocal representative at a reception in Dunlap's honor. (RX 840). Mr. Dunlap did not assert that Unocal had acted unfairly or misled CARB, but instead told the Unocal employee that he was impressed that Unocal had taken time to brief him on the patent issues and spoke of the hard work that Unocal had done to maintain a good regulatory relationship with CARB. (RX 840). He personally requested that Unocal should brief him personally first—rather than CARB staff—when significant events occur. (RX 840).

819. In response to Unocal's patent announcement, CARB staff requested a meeting with Unocal. (CX 47). Mr. Lamb, Mr. Beach, and Mr. Larry Higby, president of Unocal's 76 Products Company, participated in that meeting with CARB staff regarding the patent. (Lamb, Tr. 2321-22). Mr. Lamb recalls that Unocal told CARB that it would not interrupt the rollout of CARB Phase 2 gasoline. (Lamb, Tr. 2322; Beach, Tr. 1779).

820. No one from CARB raised any issue of rolling back the Phase 2 regulations. (Kenny, Tr. 6439-40). Nor did anyone at the CARB-Unocal meeting that spring express that they felt deceived by Unocal, that they believed that Unocal had dedicated its patent to the public, or that they believed that Unocal had already granted a royalty-free license on its patents. (Beach, Tr. 1779-80).

In fact, no one at CARB ever told Mr. Lamb that Unocal had lied or misled CARB into believing that Unocal had no patent rights. (Lamb, Tr. 2323-34).

821. To the contrary, far from accusing Unocal or Mr. Dennis Lamb of misleading CARB, a former CARB Board member Jack Lagarias called Mr. Lamb at a later date and asked him to do a consulting project for him. (Lamb, Tr. 2340). Mr. Lamb turned the project down since he was still employed by Unocal at that time. (Lamb, Tr. 2341).

a. Unocal Attended a Meeting with the Governor of California

822. After the issuance of the press release regarding Unocal's patent, Mr. Roger Beach of Unocal also attended a meeting with California Governor Pete Wilson. (Beach, Tr. 1719-20, 1782). Mr. Lamb participated in that meeting as well. (Lamb, Tr. 2339-40).

823. At this meeting, Unocal assured the governor that it would not do anything to interrupt the rollout of CARB gasoline. (Lamb, Tr. 2339-40; Beach, Tr. 1782-83). Unocal did not ask the Governor to stay out of or to get involved in the matter. (Beach, Tr. 1721-22).

824. The Governor then complimented the patent system, wished Unocal luck with its licensing rollout, and took pictures with the Unocal representatives before they left. (Beach, Tr. 1782-83; Lamb, Tr. 2340).

825. The actual rollout of the Phase 2 program went very well and was smooth. (Venturini, Tr. 814-15).

b. CARB's Subsequent Behavior Is Consistent with the Fact that CARB Did Not Think that Unocal Had Already Given Up Its Patent Rights

826. In the spring of 1995, CARB's Mr. Jim Ryden drafted a memorandum describing the background leading up to Unocal's patent announcement and discussing the issues this

announcement presented for CARB. (CX 812). The memorandum does not state that Unocal ever did anything to mislead CARB. (CX 812).

827. Mr. Ryden's 1995 memorandum also describes options to resolve what CARB perceived as issues surrounding the patent. (CX 812). It suggested that one option was to have Unocal place its patented formulations in the public domain. (CX 812). The memorandum does not state or imply that Unocal had already done so by sending its August 27, 1991 letter to CARB. (CX 812).

828. Even in conducting its own testing, CARB requested that Unocal allow it to produce a test fuel within the patent: Mr. Boyd wrote to Mr. Larry Higby, the President of Unocal's 76 Products Company, asking for Mr. Higby's assurance that Unocal would not assert a patent infringement claim against fuel that was being blended for a CARB test program for Phase 2 reformulated gasoline. (Boyd, Tr. 6738, 6817-18; Lamb, Tr. 2257-60; CX 50; CX 49).

829. CARB did not suggest that Unocal could not enforce its patent rights. (CX 50). Nor did CARB suggest that Unocal had already given CARB permission to infringe. (CX 50). Nor did the letter indicate that CARB felt that it had been defrauded, that CARB thought it had a license, or that there were "no strings attached." (Boyd, Tr. 6818; CX 50). The letter also did not indicate that Unocal had any obligation to disclose a pending patent application during the pendency of the rulemaking. (Boyd, Tr. 6818; CX 50).

830. In fact, Mr. Boyd testified that he was "pleased that the test program was going to be able to proceed without any negative consequences" when he learned that Unocal would allow CARB produce the test fuel. (Boyd, Tr. 6739-40; CX 49).

c. The Governor of California Elected Not to Allow CARB to Intervene in the *Unocal v. ARCO* '393 Litigation

831. Prior to filing suit against Unocal, the refiners approached CARB and informed it of their intent to file suit, and asked for CARB's cooperation and assistance in their efforts. (Kenny, Tr. 6584-85; Boyd Tr. 6759-6760; CX 812). The refiners that were involved in the litigation included ARCO, Chevron, Exxon, Mobil, Shell, and Texaco. (Boyd, Tr. 6760).

832. In February of 1995 Texaco met with CARB about the '393 Patent. (CX 7059 (Moyer, Dep. at 110)). It is apparent from Texaco's internal memo that it contemplated telling CARB and in fact may have told CARB that Unocal could have other potential patents. (CX 7059 (Moyer, Dep. at 111-12)). Texaco's attorneys told CARB that they believed the validity of the patent to be "weak or negligible" and indicated that it "could be subject to challenge." (CX 7059 (Moyer, Dep. at 113)).

833. In March, Mr. Kenny requested permission from the governor for CARB to intervene in the patent litigation. (Kenny, Tr. 6584-86; CX 812).

834. Governor Wilson elected not allow CARB to intervene. (Kenny, Tr. 6592-93). Mr. Kenny refused to state why the intervention did not proceed, claiming that such questions called for information protected by the deliberative process exception under California law, and acknowledged that such information was never provided to Unocal. (Kenny, Tr. 6592-93).

835. CARB advised the Governor that Unocal was permitted under federal patent laws to not disclose the application, subsequent amendments and issuance of the patent. (CX 895A at 002; Kenny, Tr. 6599).

28. The Oil Companies Lobbied CARB to Provide More Blending Flexibility Under its Regulations

a. WSPA Formed the Cleaner-Burning Gasoline Task Force at CARB's Request

836. By the late 1990s, MTBE had been discovered in California's water supplies. (Venturini, Tr. 126-27). Responding to pressures over MTBE, CARB approached WSPA companies in 1998 to begin discussions regarding flexibility issues. (Lieder, Tr. 4747; RX 89; Lieder, Tr. 4824-25, *in camera*). Discussions followed in which WSPA proposed several changes to the CARB Phase 2 regulations. (Lieder, Tr. 4747; RX 89).

837. WSPA's formed a clean burning gasoline (CBG) Task Force in 1997 to explore avenues for increasing refiners' flexibility in producing CARB Phase 2 gasoline. (Eizember, Tr. 3278-79; Lieder, Tr. 4823-24), *in camera*). (CX 7068 (Uihlein, Dep. at 14-15)). The major drivers at the time in terms of trying to increase refiners' flexibility were the phaseout of MTBE, supply and costs, and the Unocal patents. (Eizember, Tr. 3278-79; Lieder, Tr. 4823-24), *in camera*). (CX 7068 (Uihlein, Dep. at 16)). CARB indicated, however, that any changes could not degrade the benefits of its existing regulations. (RX 551).

838. In March of 1998, the WSPA CBG Task Force met with CARB and other "major stakeholders" with a specific proposal to provide flexibility by, *inter alia*, increasing certain caps on the Phase 2 regulations, including the caps on RVP, T50 and olefins. (CX 7049 (Hochhauser, Dep. at 88-89); CX 7068 (Uihlein, Dep. at 64-65); RX 703 at 001).

839. On March 31 and April 1, 1998, WSPA and CARB discussed WSPA proposals to raise the olefin cap to 12% and to raise the T90 and T50 caps. (RX 553 at 001-002). CARB

explained that the auto manufacturers had “voiced serious concerns about raising the T50 caps.” (RX 553 at 002; CX 7068 (Uihlein, Dep. at 64-65)).

840. At a WSPA meeting that CARB attended, WSPA also made a T50 proposal. (Eizember, Tr. 3284-85). WSPA proposed recommending the flat limits for RVP be increased by a tenth of a pound per square inch and increasing T50 from 213° to 214° and T90 by 5°F. (CX 7045 (Cleary, Dep. at 195); *see also* RX 64 at 038).

841. WSPA also asked CARB to consider using E200 and E300 in the predictive model instead of T50 and T90. (CX 7049 (Hochhauser, Dep. at 91)). E200 is the percent of gasoline evaporated at 200° Fahrenheit and E300 is the percent of gasoline evaporated at 300 Fahrenheit. (CX 7049 (Hochhauser, Dep. at 91)). Dr. Hochhauser supported the proposal to use E200 and E300 because (1) those are the same parameters used in the EPA complex model and (2) it might be easier for the refineries to control and certify gasoline to those targets as opposed to T50 and T90. (CX 7049 (Hochhauser, Dep. at 92)).

b. During the Late 1990s, Refiners Also Met Individually with CARB

842. At a 1997 meeting with CARB, Chevron discussed its commitment to cease blending gasoline with MTBE, and wanted to talk with CARB “about flexibilities that [they] believed would be required in order to accomplish that end.” (Ingham, Tr. 2712-14; RX 755). The presentation shows on a preliminary page titled “What We Think We Need” that Chevron saw the impact of the Unocal patent as something to consider when thinking of a way to remove oxygenates from CARB gasoline. (RX 755 at 001, 003).

843. Exxon and Mobil both approached CARB to specifically talk about gaining flexibility to blend around the Unocal patents. (RX 544 (entry dated November 20, 1997); Eizember, Tr. 3256,

[REDACTED], *in camera*; RX 576 at 012). But CARB rejected the EPA approach. ([REDACTED]
[REDACTED], *in camera*).

849. [REDACTED]
[REDACTED], *in camera*;
RX 576 at 012, 015, 016, *in camera*). [REDACTED]
[REDACTED], *in camera*). [REDACTED]
[REDACTED]
[REDACTED], *in camera*).

c. Refiners Recognized Their Requested Changes Were Subject to Political Constraints from Auto Makers and Environmentalists

850. The refiners' proposals for relaxation of the CARB specifications and predictive model revisions raised issues of "[p]olitical acceptance of emissions increases." (CX 1749 at 010).

851. The auto companies were "particularly concerned with WSPA's proposals to raise T50 caps above 220 degrees Fahrenheit" because of driveability issues. (CX 7049 (Hochhauser, Dep. at 88-90); RX 703 at 001).

852. In addition, the Sierra Club weighed in, wanting CARB to improve the emissions performance of its cleaner-burning gasoline, not just maintain it. (RX 703). Indeed, the "ground rules" for WSPA members was "a general recognition that emissions couldn't go up. We had to maintain the benefits of the program, and that but within that, we would try to explore ways to increase the flexibility." (CX 7068 (Uihlein, Dep. at 28)).

853. Exxon reported that CARB was "under pressure to move quickly, finalize by year end" and that there were "many stakeholders, difficult, often conflicting positions; high political exposure." (RX 707 at 005).

854. In April 1998, Shell's Mr. Bruce Irion described his view of the positions of the different parties, including CARB, auto companies, Unocal, environmentalists, oxygenate lobbies and others. (RX 89). With regard to CARB, Mr. Irion stated that CARB needed to maintain California RFG emissions benefits; wanted to avoid an MTBE crisis; and "wants to get away from California RFG being viewed as their program. (Lieder, Tr. 4748; RX 89 at 002). He mused that, "somewhere along the way this changed from a "CARB issue" to a "WSPA request." (RX 89).

855. When WSPA asked for the T50 cap to be raised, CARB responded that, because of the resistance by auto manufacturers, it wanted to avoid doing so. (Eizember, Tr. 3285; RFF 889-91 (outcome of Phase 3)). CARB eventually rejected the proposal that it increase the T90 cap as well. (Eizember, Tr. 3284; (RFF 890)).

856. Throughout Dr. Hochhauser's work on the flexibility task force, CARB was firm that it wanted to maintain or increase emissions benefits even if it changed cleaner burning gasoline regulations. (CX 7049 (Hochhauser, Dep. at 96)). After a meeting with CARB staff in June of 1998, Dr. Hochhauser advised his colleagues at ExxonMobil, "[I]t appears that they [CARB staff] are holding firm to the idea of maintaining emissions equivalency to real world fuels." (CX 7049 (Hochhauser, Dep. at 101); RX 706). This meant that "any changes in the CARB regulations would result in equivalent emissions based on actual fuels that were made and sold as opposed to the specifications." (CX 7049 (Hochhauser, Dep. at 102)). Dr. Hochhauser testified that CARB wanted more than to simply maintain the current emissions benefits. (CX 7049 (Hochhauser, Dep. at 104-05)).

857. Therefore, WSPA assured CARB that its proposal would result in environmental benefits equivalent to those achieved by RFG2. (RX 656 at 001, 004).

d. Refiners Were Disappointed Because They Perceived that CARB Did Not Care About the Unocal Patent as Much as They Would Have Liked

858. As far as Mobil was concerned, it thought that, “[t]he Unocal patent [did] not appear to be a significant issue with CARB.” (RX 559 at 001;³ Eizember, Tr. 3290-91). On October 6, 1998, after WSPA representatives met with CARB to discuss potential changes to the predictive model, Mobil’s Mr. Morgan reported, “The Unocal patent does not appear to be a significant issue with CARB.” (RX 559 at 001).

859. With regard to the Unocal patents, Mr. Uihlein stated, “I think the Unocal patents were varied in their importance [to CARB] relative to different items that they were looking at.” (CX 7068 (Uihlein, Dep. at 45)).

860. There was a general feeling with the CBG task force that CARB was in fact increasing its requirements for emissions performance rather than simply maintaining equivalency. (CX 7068 (Uihlein, Dep. at 70-71)).

861. In an internal Mobil memorandum from 1998, written by Mr. Chuck Morgan, reported that CARB staff was “more concerned about changes to provide for oxygenate flexibility than addressing relief for the patent coverage.” (RX 520 at 001). Mr. Morgan further reported:

Although CARB realizes the loss of flexibility arising from the patents, they are currently more concerned about regulatory flexibility for oxygenates. They are not convinced that supply shortages will arise from the patents and believe any license fee impact will be within the noise of normal price fluctuations.

(RX 520 at 002).

³ RX 559 was not admitted for the truth of CARB’s beliefs, but to demonstrate what Mobil gathered about CARB’s position. (Eizember, Tr. 3290-91).

29. CARB Staff Continued to Meet with Refiners Who Urged CARB to Change the Regulations or Assist in Modifying State Laws in Various Ways to Provide Flexibility in Blending Around the Unocal Patents

a. Exxon Asked CARB and the CEC for Additional Flexibility to Blend Around the Unocal Patents

862. In March of 1999, Exxon met with CARB. (Eizember, Tr. 3281-82; RX 560; RX 561). This meeting was set up at CARB's request to discuss Exxon's position on MTBE, Unocal's patent activity, and CARB's Phase 3 gasoline. (RX 560 at 001; RX 561 at 002).

863. At that meeting, Exxon told CARB that Unocal's patents restrict blending flexibility and could significantly increase gasoline production costs. (RX 287 at 006). Exxon advised CARB that the '393 patent had been upheld by the U.S. District Court and appealed to the Federal Circuit. (RX 287 at 006). In describing the results of that decision, Exxon noted "royalty payments substantial at 5.75 cpg." (RX 287 at 006).

864. Exxon told CARB that it was "continuing to evaluate the[] impact [of the patents]" but that the last three patents were "extremely difficult to avoid." (RX 560 at 001 (memo describing the events of the meeting); RX 287 at 006). Exxon said that this was the case "even with investment, unless CARB implements specification changes to provide significant additional flexibility" and targeted the T50, T90 and aromatics caps as the most important. (RX 287 at 006, 008). According to an Exxon recap of the meeting, "[w]e emphasized the importance of CARB granting additional blending flexibility to help control costs and supply if the Unocal patents are enforced." (RX 560 at 001). In the meeting, Exxon learned that the environmental groups were "continu[ing] to push hard on emissions reduction and the preservation of real-world benefits." (RX 560 at 002).

b. Chevron Attempted to Reduce Octane Levels

865. One method of gaining space to blend around the numerical claims of the Unocal patents would be to reduce the required octane for regular unleaded gasoline. ({ [REDACTED] }, *in camera*; Hoffman, Tr. 4974-77 (testifying that reducing octane from 92 to 91 helps to avoid the numerical property ranges of the '393 patent); Gyorfi, Tr. 5268 (reducing octane to below 87 helps avoid the numerical property ranges of the '126 patent)).

866. But the required octane levels are a matter of state law in California; CARB does not set the octane requirements. (Ingham, Tr. 2709-10 (testifying that octane is a matter of state law); Gyorfi, Tr. 5270-71 (CARB does not regulate octane in California)). Chevron's strategy was to find enough support to get that law changed. (Gyorfi, Tr. 5268-74; Ingham, Tr. 2709-10; Hoffman, Tr. 4974-77; RX 225; RX 454 (BP presentation regarding reducing octane from 92 to 91)).

867. Therefore, Chevron planned to seek CARB's assistance in attempting to change the state law on the octane requirement. (Gyorfi, Tr. 5270-71). As part of this strategy Chevron also approached auto companies and other members of WSPA to get their support for an octane reduction to something below 87. (Gyorfi, Tr. 5274-75; RX 225).

868. Chevron's attempt to find support failed because Chevron could not agree on the plan with members of WSPA, nor could it agree on the strategy with the auto manufacturers (except for Honda, whose owners' manuals said the cars could run on 86 octane). (Gyorfi, Tr. 5275; Ingham, Tr. 2709-10; *see generally* CX 7069 (Uihlein, Dep. at 7-10, 13) (The idea died out "because the autos did not respond particularly favorably.")). Chevron abandoned the effort to reduce octane to 86. (Ingham, Tr. 2709-11).

869. Chevron returned to CARB to update it on Chevron's efforts, and reported the news of its failure to find support during an October 10, 2001 meeting with CARB. (Ingham, Tr. 2708-09).

30. CARB Adopted Its Phase 3 Regulations to Remove MTBE

a. The Legislature and Governor of California Ordered CARB to Address the MTBE Problem

870. As described above, MTBE was found in the California water supply in the late 1990s. (RFF 836). During the same time frame, refiners continued to meet with CARB about the flexibility issue. (RFF 836-57, *supra*).

871. By 1999, the California Governor and Legislature each took action in response to the MTBE problem. (Venturini, Tr. 127-28; CX 55 at 012 (“Why Do We Have Concerns with the Use of MTBE?”)). Both issued directives to CARB to remove MTBE from gasoline and maintain the emissions benefits associated with Phase 2. (Venturini, Tr. 127-28; CX 55 at 012 (“Why Do We Have Concerns with the Use of MTBE?”)). The Legislative Bill, or SB 989, was known as the “Sher Bill.” (RX 656). The Governor's directive was Executive Order D-5-99, and was issued after the University of California at Davis conducted a study on the effects of MTBE at the Governor's direction. (CX 7054 (Mahdavi, Dep. at 47); CX 55 at 012).

872. When the Governor's executive order issued in 1999 ordering a phaseout of MTBE, “it was clear we needed a full rulemaking at that point that would include changes in specs. [CARB] wanted to tighten the specification for sulfur and also tighten the specification for benzene in addition to implementing the MTBE phaseout, which was the main goal of the—the Phase 3 rulemaking.” (CX 7068 (Uihlein, Dep. at 24-25)).

873. Up until CARB received these mandates, it had done nothing to relax the regulations in order to make it easier for refiners to produce Phase 2 gasoline without infringing the patents, even after Unocal won the underlying patent infringement verdict against the other refiners. (Kenny, Tr. 6304-05; *see also* RFF 836-57 (refiners requesting flexibility); RFF 862-64 (Exxon meeting with CARB); RFF 865-69 (Chevron requesting octane reduction)).

874. As Mr. Kenny admitted, the Sher Bill went through the California legislature after Unocal won the infringement trial against the other refiners. (Kenny, Tr. 6601, 6605-07). If it had desired to, CARB could have brought the Unocal patents to the attention of the California legislature for consideration in adopting the Sher Bill. (Kenny, Tr. 6605-07). Neither did Mr. Kenny, who by that time was the Executive Director of CARB, nor did anyone on his staff. (Kenny, Tr. 6605-07).

875. To fulfill its mandates regarding MTBE, CARB staff proposed the Phase 3 regulations in the fall of 1999 and the Board approved them in December of that year. (Venturini, Tr. 129; CX 7045 (Cleary, Dep. at 104); CX 55 (Staff Report for Phase 3); RX 64 (Final Statement of Reasons for Phase 3)).

b. CARB Staff's Goal for Phase 3 Was to Maintain and Even Further Reduce Emissions from Phase 2 Levels

876. As explained above, CARB's legislative and executive mandate to phase out MTBE included a duty to preserve or improve the emissions benefits that Phase 2 gained, which became known as the "no backsliding" requirement. (Kenny, Tr. 6576-77, 6605; Venturini, Tr. 128, 310; CX 7045 (Cleary, Dep. at 195-196); CX 554 at 015 ("Identify additional opportunities for further emission reductions that are cost-effective"); CX 7044 (Chan, Dep. at 73 (preserving benefits), 75 (testifying that it is always CARB's goal to achieve further emissions reductions))).

877. CARB therefore rejected proposals to modify the regulations if it believed that the proposal would not maintain the emissions benefits that CARB had gained from Phase 2. (CX 7045 (Cleary, Dep. at 195-96 (testifying that CARB rejected WSPA's proposal to increase the distillation temperature limits of the regulations because staff did not believe that it could maintain equivalent or lesser emissions))).

878. CARB's "no backsliding" policy was well-known to refiners throughout the rulemaking, which they understood to mean that any regulation could not degrade air quality in California. ({ [REDACTED] }, *in camera*; RX 576 at 007, *in camera*; Eizember, Tr. 3296 (testifying that Exxon "may have in this general time frame for some period held a belief similar to" CARB's no backsliding requirement)).

879. An internal Exxon report from May of 1991 stated that it was clear from the regulations that CARB was then considering to propose that "values were chosen not to maintain but to reduce emissions relative to today's gasoline specifications." (CX 7049 (Hochhauser, Dep. at 117-18); RX 563 at 001). Exxon believed in June of 1991 that CARB appeared to be heading towards more stringent specifications for Phase 3 cleaner burning gasoline. (RX 711; CX 7049 (Hochhauser, Dep. at 122)). When WSPA asked CARB to explain its rationale for the proposals,

Peter Venturini said that they wanted to obtain some additional benefits as part of this exercise, not just preserve current benefits. He also said that non-technical issues were driving them to make the specifications more stringent, especially for sulphur and benzene.

(RX 711 at 001; CX 7049 (Hochhauser, Dep. at 120)).

880. Out of concern for the stringency of the Phase 3 regulations, at least one refiner criticized CARB because it believed that its suggested regulations went well beyond simply

preserving the emissions benefits of Phase 2 . ({ [REDACTED] }, *in camera*; RX 578 at 010, 013, *in camera*).

c. Auto Companies Argued Contrary to the Refiners' Requests

881. As described above, refiners met with CARB throughout the late 1990s to ask for flexibility in the regulations, specifically noting that the Unocal patent was one of the reasons they desired such flexibility. (RFF 836-57, 862-69, *supra*). But when CARB opened the Phase 3 process to the public, the auto companies strongly resisted the refiners' requests for changes in the regulations. (Lieder, Tr. 4748; RX 89). As one Exxon employee acknowledged during trial, Exxon and the auto companies generally disagreed over the CARB Phase 3 regulations in the 1999 time period. (Simonson, Tr. 5994-95).

882. Specifically, the auto industry lobbied CARB for lower gasoline property caps, the opposite of refiners' requests that CARB raise those caps. (CX 7051 (Irion, Dep. at 75-76)). If there is a more restrictive range of fuels, auto manufacturers can more cost-effectively design and modify their cars and engines to improve emissions. (CX 7051 (Irion, Dep. at 75-76)).

883. Because of these conflicting positions, CARB wanted to know if auto manufacturers would agree to an increase in T50 before CARB would consider raising it. (Ingham, Tr. 2717-18). But auto companies were not on board with a T50 increase. (Ingham, Tr. at 2722-23).

884. The auto industry also argued for a lower sulfur specification, and the addition of driveability index as a specification, which Exxon opposed. (Simonson, Tr. 6000-01; RX 287 at 011-012).

885. Exxon specifically challenged the auto companies' technical arguments regarding the sulfur specification and driveability index, as well as the underlying policies for regulating

driveability index. (Simonson, Tr. 6001-02; RX 287 at 011-012). Exxon told CARB that it considered T50, T90, and aromatics the most important factors to provide flexibility. (Simonson, Tr. 5999-6000, RX 287 at 008).

d. The CARB Staff Issued Its Official Phase 3 Staff Report on October 22, 1999

886. The Phase 3 Staff Report, also referred to as the Phase 3 Initial Statement of Reasons, came out on October 22, 1999. (CX 55).

887. CARB's formal proposal included many modifications to the California Phase 2 regulations. (CX 55 at 016-017). For example, the Phase 3 Staff Report included a ban on MTBE (pursuant to the Sher Bill and Executive Directive), reduced sulfur and benzene limits, slightly increased distillation temperature limits for the T50 and T90 caps, updated the predictive model, and added a driveability index. (CX 55 at 017-020; Simeroth, Tr. 7474-75).

888. CARB included a driveability index was included because automobile manufacturers expressed concern that increasing the T50 and T90 caps—in accordance with refiners' wishes—would increase driveability index too high. (Simeroth, Tr. 7474-75; CX 55 at 020 (staff proposed DI “to preserve vehicle driveability and to ensure that compliance with LEV II standards are not hampered by increases in cap levels proposed for the distillation temperatures”)).

e. The Advocacy Compromise: Auto Companies Agreed Not to Argue for Driveability Index if Oil Companies Agreed Not to Argue for Raising the Caps on Distillation Temperatures

889. CARB staff dropped driveability index from its proposal at the Phase 3 hearing because the oil industry agreed to not push for an increase in the T50 and T90 caps. (Simeroth, Tr. 7474-76). When the oil industry agreed to not push for an increase in the caps on T50 and T90, Mr.

Simeroth was able to talk the automobile industry out of pushing for a driveability index. (Simeroth, Tr. 7476). This compromise was part of the Phase 3 regulatory process. (Simeroth, Tr. 7476).

890. Therefore, CARB did not, in fact, change the T50 and T90 cap limits from Phase 2. (RX 64 at 022). CARB left them identical to the Phase 2 caps, while eliminating the proposed DI regulation as well. (RX 64 at 022; CX 7068 (Uihlein, Dep. at 65)).

891. The refiners' other requests for changes in the regulations were not granted in their entirety. (Kenny, Tr. 6604)

f. CARB Did Not Consider the Unocal Patents in Phase 3 Because They Were Still "In Flux"

892. In CARB's Initial Statement of Reasons for Phase 3, it explained that:

The staff began work in early 1998 to develop amendments to provide additional flexibility in the CaRFG regulations. The work began at the request of the refining industry via the Western States Petroleum Association (WSPA). Among other things, the WSPA requested changes to the "cap" limits and the Predictive Model in the CaRFG2 regulations.

(CX 55 at 015). CARB then asserted that the refiners' purpose was to facilitate reducing their reliance on MTBE in blending gasoline. (CX 55 at 015).

893. The rationale for the Phase 3 regulations, according to CARB staff, was to increase flexibility in order to eliminate MTBE from gasoline blending while preserving emissions benefits. (CX 55 at 014-015 (section titled, "Why are Changes to the Existing CaRFG2 Regulations Necessary?")). CARB staff also listed several other objectives for the Phase 3 regulations, but none mention Unocal's patents. (CX 55 at 015).

894. In its Final Statement of Reasons for the Phase 3 regulations, CARB described its purposes in adjusting the distillation temperatures. (RX 64 at 018-019). In its discussion of the

adjustment to the T50 and T90 flat and averaging limits, CARB spoke of flexibility and emissions benefits, but never mentioned the Unocal patents. (RX 64 at 018-019). The flat and averaging provisions were modified to accommodate the elimination of MTBE from gasoline. (RX 64 at 019-020 (“Particularly since removing MTBE from CaRFG raises T50 substantially, the modified T50 specifications provide significantly greater leeway in producing complying CaRFG3 without MTBE.”); *see also* Simeroth, Tr. 7493 (additional flexibility was provided in Phase 3 due to the “loss of the use of MTBE,” which “was viewed as increasing the difficulty of producing complying reformulated gasoline formulas”)). Even though WSPA proposed that CARB further increase the T50 and T90 flat and averaging provisions, CARB rejected that proposal as inconsistent with the Sher Bill. (CX 7045 (Cleary, Dep. at 194-97); RX 64 at 038 (comment 10), 015 (determination that WSPA’s comment was not consistent with the Sher Bill)).

895. According to Mr. Venturini, CARB did not consider the Unocal patent because he believed that it was in a “state of flux.” (Venturini, Tr. 815). This was five years after Mr. Venturini had learned of the patent and, by this time, he was aware that the patent trial had ended with a jury verdict finding infringement. (Venturini, Tr. 814-15). Even so, CARB’s failure to consider the patent stemmed from continuing litigation and concerns with the validity of the patent. (Venturini, Tr. 815-16). Despite CARB’s knowledge of the Unocal patents, it is not CARB’s practice today to ask involved parties at a rulemaking if they intended to file patent applications. (Venturini, Tr. 863-64).

896. Although he had a consulting role for the economic analysis for Phase 3, no one ever discussed whether CARB should consider any or all of the Unocal patents with Dr. Mahdavi, an economist at CARB. (CX 7054 (Mahdavi, Dep. at 48)). Moreover, Mr. Cleary never participated in any discussion with refiners during the development of Phase 3 Regulations in which the Unocal

patent was discussed and no one, including Mr. Dean Simeroth, ever advised him that any such meetings occurred. (CX 7045 (Cleary, Dep. at 157-58)). With that total lack of knowledge regarding any consideration of the Unocal patent, Mr. Cleary put pen to paper as a principal author of the Staff Report (Initial Statement of Reasons) for Phase 3 gasoline. (CX 55 at 003; CX 7045 (Cleary, Dep. at 179-79)). Even at the hearing for Phase 3, Mr. Cleary does not recall the Unocal patent being mentioned, even though he attended. (CX 7045 (Cleary, Dep. at 158-59, 193-94)).

897. Mr. Chan had no understanding why the Unocal patent was not discussed in the documentation for proposing Phase 3 reformulated gasoline regulations or the Final Statement of Reasons. (CX 7044 (Chan, Dep. at 80)). Staff certainly knew about the Unocal patents before the Phase 3 Regulations were proposed or adopted. (CX 7044 (Chan, Dep. at 80-81)).

31. Even After the Phase 3 Rulemaking, Refiners Continued to Meet with CARB to Ask for Flexibility

898. Chevron met with CARB on June 18, 2000. A Chevron slide from that meeting between Chevron and CARB stated, “Why We Are Here,” followed by: “(1) To discuss the impact of Unocal patents in a CARB gasoline world, (2) To understand what might be done to increase refiner flexibility to avoid the patent(s) while maintaining emissions neutrality, and (3) To see if there is anything we can do to help.” (RX 751 at 002; Ingham, Tr. 2714; Gyorfi, Tr. 5276-77).

899. Chevron representatives discussed with CARB key parameters for avoiding Unocal’s patents. (Ingham, Tr. 2716; RX 751 at 005). One proposed way of gaining flexibility to avoid the patents was for gasoline to contain less than 75 percent saturates and more than 8 percent olefins; another was to contain less than 75 percent saturates and allow a T50 of greater than 216 degrees; and a third was to blend gasolines with less than 65 percent saturates. (Ingham, Tr. 2716; RX 751 at 005).

900. Therefore, Chevron proposed that CARB raise the olefin and T50 caps. (Gyorfi, Tr. 5277; CX 751 at 007 (“Raise Olefin and T50 Caps”); {REDACTED}, *in camera*). Chevron specifically discussed T50 as a key variable for flexibility to blend around the Unocal ’126 and ’393 patents. (RX 751 at 005-006; RX 752). Chevron told CARB that it could make these changes without increasing emissions. (Gyorfi, Tr. 5277).

901. Chevron was unsuccessful in its attempts to have CARB alter the T50 and olefin regulations. (Gyorfi, Tr. 5277-80).

902. On July 11, 2001, ExxonMobil met with CARB again after CARB passed its Phase 3 regulations to suggest changes in the specifications. (CX 7049 (Hochhauser, Dep. at 47-49); (CX 2090 at 002 (referred to in testimony as RX 568)).

903. ExxonMobil set out the compositional parameters of the Unocal patents in its presentation materials for the meeting and specifically asked CARB to raise the olefin cap on the regulations from 10% olefins to 16% to help refiners avoid the patents. (Eizember, Tr. 3298-3300; CX 7049 (Hochhauser, Dep. at 53, 125); CX 2090 at 002-003, 005). ExxonMobil’s strategy was to get CARB to adopt a package of adjustments, including a change in the olefin cap, that would make it easier to avoid the numerical claims of Unocal’s patents. (Eizember, Tr. 3300; CX 2090 at 005 (“optimal T50, T90 and olefins improve ability to avoid Unocal patents”)).

904. ExxonMobil told CARB that its proposed changes would maintain or improve environmental benefits and that idle MTBE plants could be converted to produce iso-octene. (Eizember, Tr. 3300; CX 7049 (Hochhauser, Dep. at 51-52); CX 2090 at 002, 006).

905. To prepare its analysis, ExxonMobil used CARB's predictive model and, in Dr. Hochhauser's view, its conclusion that the existing emissions benefits could be maintained was based on sound scientific information. (CX 7049 (Hochhauser, Dep. at 52-53)).

906. In the conclusion of its presentation, ExxonMobil proposed to confirm CARB support, discuss the proposal within WSPA and seek support from other stakeholders to modify the Phase 3 specifications before making a formal proposal to CARB. (Eizember, Tr. 3300-01; CX 2090 at 007). The "other stakeholders" mentioned at the time were auto companies, ethanol advocates and environmentalists. (Eizember, Tr. 3300-01; CX 2090 at 007). "Mr. Simmeroth [sic] suggested some follow-up items" for Exxon, which were "[t]o speak to auto companies and to consider some other regulations" (meaning fuel additive regulations). (CX 7049 (Hochhauser, Dep. at 50)).

907. CARB did not raise the olefin cap in the regulations. (CX 7049 (Hochhauser, Dep. at 53, 124-25)).

908. In fact, there was testimony at trial about the difficulties of blending Phase 3 gasoline. { [REDACTED] } (Sarna, Tr. 6312, *in camera*). { [REDACTED] } (Sarna, Tr. 6312, *in camera*).

32. Unocal Had No Duty to Disclose Its Pending Patent Rights, CARB Had No Expectation of Such Disclosure, and CARB Did Not Rely on the Absence of Patent Rights

a. CARB Rules and Regulations Did Not Require Disclosure of Patent Applications or Issued Patents

909. The California Government Code provides that:

No state agency shall issue, utilize, enforce or attempt to enforce any guideline, criterion, bulletin, manual, instruction, order, standard of general application, or other rule, which is a regulation as defined in subdivision (b) of section 11342, unless the guideline, criterion, bulletin, manual, instruction, order, standard of general application, or other rule has been adopted as a regulation and filed with the secretary of state pursuant to this chapter.

(CX 7029 at 070 (§ 11347.5(a), Agency Guidelines, Criteria, Bulletins, Manuals, Instructions, Orders, Standards of General Application or Other Rules; Adoption as Regulation; Filing; Determination of Status as Regulation); Boyd, Tr. 6830-31).

910. According to CARB's former Executive Director, Mr. James Boyd, this statute applied to CARB as a state agency. (Boyd, Tr. 6833). Mr. Boyd also understood that CARB was within the definition of section 11347.5. (Boyd, Tr. 6895).

911. At the time of the Phase 2 rulemaking, in 1991 and 1992, there was no regulation, guideline, criterion, bulletin, manual, instruction, order, standard of general application or other rule filed with the secretary of state which required anyone to disclose pending patent application rights or patent rights to CARB in connection with any Phase 2 activities. (Boyd, Tr. 6834; *see also* Kenny, Tr. 6510-11). Additionally, there was no place for Unocal to find any written indication that CARB expected disclosure of a patent application. (Boyd, Tr. 6908).

912. Moreover, even as of 1994, there was still no rule, guideline, criterion, bulletin, manual, or anything else on file with the secretary of state that required anyone to disclose patents or patent applications to CARB. (Boyd, Tr. 6896; *see also* Kenny, Tr. 6510-11).

913. CARB could not have forced Unocal to disclose the patent application without a rule that had been filed with the Secretary of State under section 11347.5. (Boyd, Tr. 6910).

914. Mr. Boyd admitted that he does not know if he would have expected a patent application to be brought to CARB's attention, if he would have even wanted to know about a patent application at the time, or if he would have kept the patent application confidential if Unocal had told him about it. (Boyd, Tr. 6821-24; 6887).

915. Although Mr. Boyd then testified, in response to questions from Complaint Counsel on redirect examination, that he would have expected disclosure (Boyd, Tr. 6907), Mr. Boyd admitted that in 1991, there was not one place that Unocal could go to find a written version of Mr. Boyd's "expectation" for someone's disclosure of a patent application. (Boyd, Tr. 6908). Moreover, in 1996, when asked about his expectation for such disclosure under oath in a deposition, Mr. Boyd said he did not know if he would have expected it, or if he would have wanted to know about it. (Boyd, Tr. 6909).

916. Furthermore, even as of 2005, Mr. Boyd again admitted that he did not know if he would have wanted to know about a patent application at the time of the Phase 2 rulemaking. (Boyd, Tr. at 6821-22).

917. Not only did CARB have no written policy, but Unocal was not aware of any policy regarding disclosure of patents or patent applications. Mr. Lamb was not aware of any CARB policies, procedures, or rules that required Unocal to disclose information about patents or pending patent applications to CARB. (Lamb, Tr. 2260). In fact, during the entire eight-year period in which Mr. Lamb had direct responsibility for communicating with CARB on behalf of Unocal, Mr. Lamb was never aware of CARB asking anyone about patents or patent applications. (Lamb, Tr. 2260-61). Similarly, Mr. Roger Beach of Unocal was not aware of any CARB rule, regulation or policy that would have required Unocal to disclose information about pending patents. (Beach, Tr. 1769). Nor

was Mr. Beach aware of any rule, regulation, or policy of CARB's that required Unocal to share with CARB any future licensing plans. (Beach, Tr. 1770).

b. CARB's Requests to Refiners—During and Subsequent to the Phase 2 Process—Neither Required Nor Asked for the Disclosure of Pending Patent Applications or Patents

918. CARB never asked any participant whether they had patents or pending patents during the November 1991 regulations. (Venturini, Tr. 395). Additionally, the Chairwoman of CARB, Ms. Jananne Sharpless, never asked any rulemaking participants whether they had patents or pending patents (CX 7063 (Sharpless, Dep. at 168)), nor did she direct her staff to do so. (CX 7063 (Sharpless, Dep. at 168)).

919. When asked "if a patent is so important, shouldn't you have asked everyone involved if they intended to patent any of this information?" Mr. Venturini testified "It's not our practice and never has been to ask those specific questions." (Venturini, Tr. 862-63). Despite what has happened, it still is not the practice to ask involved parties at a rulemaking if they intended to patent information. (Venturini, Tr. 863-64).

920. Additionally, even knowing of the existence of another patent related to gasoline, the Talbert patent, and having directed someone to investigate it (RFF 999-1002, *infra*), Mr. Dean Simeroth did not ask the oil industry if there were any other patents up through 1994. (Simeroth, Tr. 7470-71).

921. Thus, Unocal participants were not asked about whether Unocal had any patents or patent applications. No one from CARB ever asked Mr. Lamb about whether Unocal had any patents related to any of the research that Unocal discussed with CARB. (Lamb, Tr. 2260). CARB never asked Mr. Lamb whether Unocal had filed any patent applications on any of the research that Unocal

had discussed with CARB. (Lamb, Tr. 2260). CARB never asked whether Unocal intended to file any patents on any of the work that Unocal discussed with CARB. (Lamb, Tr. 2260). CARB never asked to see any Unocal patent applications. (Lamb, Tr. 2260). Similarly, Dr. Jessup was never asked by anyone from CARB about patents or patent applications. (Jessup, Tr. 1595).

922. Similarly, other refiners testified that they were not asked about patent or patent applications. CARB never asked Exxon or Mobil about patent applications in the CARB Phase 2 regulatory process. (Eizember, Tr. 3397). And to the best of Mr. Thomas Eizember's knowledge, CARB never asked Exxon or Mobil about any patent applications in connection with the CARB Phase 3 regulatory process. (Eizember, Tr. 3397). Mr. Timothy Clossey of ARCO could not recall any member of CARB staff ever asking him about patents or pending patent applications. (Clossey, Tr. 5492). And Mr. Donald Bea of Chevron did not recall CARB having ever asked whether Chevron had any patents or had applied for any patents with respect to any of the research it was doing. (CX 7042 (Bea, Dep. at 36)).

923. Furthermore, as discussed further at RFF 950, when CARB specifically asked Chevron to disclose its DI research to other manufacturers, CARB did not ask Chevron to make any representations about any patent rights it might have in the DI research. (Ingham, Tr. 2669-70, 2674, 2680-81; CX 977). And after Chevron granted permission to release the confidentiality of its DI research, CARB never followed up with any request for information regarding rights in the DI research, pending patent applications, or existing patents. (Ingham, Tr. 2685).

c. Standard-Setting Bodies Have Different Rules and Expectations on Whether Disclosure Is Required, But Such a Duty Should be Clear

924. In the Complaint, Complaint Counsel contend that “This case involves Unocal’s subversion of state regulatory standard-setting proceedings relating to low emissions gasoline standards.” (Complaint ¶ 1).

925. Economist David J. Teece reached an number of different opinions based on an examination of disclosure rules of standing-setting organizations. Professor Teece based his opinions on two main sources of information: (1) a survey of standard-setting organizations published and performed by Professor Mark Lemley, a colleague of Professor Teece; and (2) an independent review of the standard-setting organizations that exist in the petroleum industry. (Teece, Tr. 7604-05).

926. Based on his examination, Professor Teece concluded disclosure rules are not uniform, or in his words, “there are some differences in the duties. Certainly, it’s not a one-size-fits-all circumstance.” (Teece, Tr. 7607; *see also* RX 1162A at 027, 032).

927. Professor Teece also concluded that disclosure rules do not necessarily benefit the standard-setting body. (Teece, Tr. 7607-10; RX 1162A at 025). For instance, the standard-setting body would incur administrative costs relating to the collection, dissemination, and clarification of the rules and of the information obtained by the organization. (Teece, Tr. 7610).

928. In addition, and more importantly, Professor Teece concluded that disclosure rules, especially related to patent applications, could undermine the function and usefulness of the standard-setting body in that the innovative firms would face a disincentive to membership in a standard-setting body with stringent intellectual property disclosure requirements. (Teece, Tr. 7610).

Ultimately, the “standard-setting organization could slip into demise because the innovative, inventive firms decide to play elsewhere.” (Teece, Tr. 7610).

929. The standard-setting body would also face greater costs and fewer benefits in analyzing patent applications, as opposed to issued patent claims. (Teece, Tr. 7611; RX 1162A at 026-027). One reason that Professor Teece gave for this is because disclosing patent applications involves the dissemination and evaluation of information that is much less reliable in comparison to actually issued claims of a patent. (RX 1162A at 026). A standard-setting body would also face an accompanying delay in developing standards while participants and the standard-setting body gather and review the disclosed information. (RX 1162A at 025).

930. Moreover, the dissemination and evaluation of a patent application raises questions of illegal or inappropriate sharing of confidential information inside of the standard-setting body. (Teece, Tr. 7611).

931. Professor Teece also determined that disclosure rules could impose significant costs on the participants and members of the standard-setting organization as well as the organization itself. (Teece, Tr. 7608-09). For instance, requiring disclosure of patent applications “is tantamount to asking [members] in some sense to give up valuable, strategic information.” (Teece, Tr. 7608-09). In a competitive environment, disclosure rules would foster “flanking operations,” or one company’s attempts to use its own patent applications to limit the value of a competitor’s potential intellectual property. (Teece, Tr. 7609).

932. Professor Teece testified that he and Complaint Counsel’s expert Professor Carl Shapiro were in agreement on the need for and usefulness of clarity in the disclosure policies of standard-setting organizations. (Teece, Tr. 7611-12; *see also* RX 1162A at 034-035). When there

is clarity, “then firms can decide whether or not they’re going to get involved with that standard-setting organization or not. But absent clarity, there’s unnecessary disputes, and the process is inefficient by virtue of failed expectations or could be.” (Teece, Tr. 7611-12).

933. Finally, Professor Teece also described some of the distinctions between private standard setting bodies and regulatory agencies. In contrast to a standard-setting organization where participation and compliance are voluntary, compliance with the policies adopted by a regulatory body is mandatory. (Teece, Tr. 7612-13; RX 1162A at 037-039). In addition, members in a standard-setting body have direct control over the policies that the organization adopts because they usually have an opportunity to vote on the proposed policies. (Teece, Tr. 7612; RX 1162A at 038). In contrast, only members of the regulatory body, and not the participants in the regulated industry, ultimately decide which regulations to adopt. (Teece, Tr. 7612). “I mean, regulators regulate. In a standard-setting body there’s usually a vote amongst the members, and that’s how the governance works. (Teece, Tr. 7612). Consequently, regulatory bodies are free to adopt regulations despite unanimous industry opposition to those regulations. (RX 1162A at 038).

934. Professor Teece’s opinions relied, in part, on an examination of Professor Lemley’s survey of standard-setting organizations. (Teece, Tr. 7605-06). Professor Teece explained that the Lemley Survey covered 43 standard-setting organizations in the electronics industry. (Teece, Tr. 7605-06). Of the 43 standard-setting bodies, 36 had some kind of intellectual property disclosure policy in place at the time of the survey. (Teece, Tr. 7606; RX 1162A at 031).

935. Professor Teece also explained that 24 of the 43 standard-setting bodies had some kind of more formal, written policy in place relating to the disclosure of intellectual property by their members. (Teece, Tr. 7606; RX 1162A at 031).

936. Of the 43 standard-setting organizations included in the Lemley survey, only six required their members to disclose patent applications. Of those six, four placed a duty on their members to disclose all patent applications. (Teece, Tr. 7606-07; RX 1162A at 031).

d. Chevron's Regulatory Advocacy and Patent Activity at the Time Are Analogous to Unocal's Conduct

(1) Chevron Researched Driveability Index

937. Chevron conducted research in the late 1980s and early 1990s to study the effects of various properties on gasoline exhaust emissions. (CX 7071 (Welstand, Dep. at 6-7)). Chevron's first such study to assess reformulated gasoline properties was known as the two-car project. (CX 7071 (Welstand, Dep. at 6-7)). Chevron concluded from the two-car project that distillation had an effect on vehicle emissions and aromatics did not. (CX 7071 (Welstand, Dep. at 8-9)).

938. After the two-car test, Chevron conducted a five-car program to validate its learning "and specifically targeting the effects of distillation index on exhaust emissions and whether or not aromatics had an effect on exhaust emissions." (CX 7071 (Welstand, Dep. at 9-10)).

939. The five-car program validated Chevron's findings that DI affected exhaust emissions, particularly hydrocarbon emissions; that as DI was lowered, the exhaust emissions of hydrocarbons were reduced; and that there was little, if any effect of aromatics content on exhaust emissions. (CX 7071 (Welstand, Dep. at 12-13)).

940. Chevron then conducted a 20-car program to specifically identify the effect on a fleet of cars. (CX 7071 (Welstand, Dep. at 13)). From that program, Chevron determined what effect a reformulated gasoline had relative to a typical average gasoline—the reformulated gasoline having a lower DI, having MTBE and having a lower RVP than the average gasoline that was not reformulated. (CX 7071 (Welstand, Dep. at 15-16)).

(2) Chevron Began Research Because of Its Business Concerns for Marketing and Refining and Its Desire to Influence CARB

941. Chevron's DI research began when the marketing department asked Chevron's Dr. Michael Ingham to undertake research into driveability index. (Ingham, Tr. 2622). Chevron's marketing department wished to introduce a reformulated gasoline. (Ingham, Tr. 2623). According to Dr. Ingham, it was beneficial for Chevron to make claims about performance and emissions reductions for its fuels in 1989-90 to compete with ARCO's claims of being "green." (Ingham, Tr. 2623-24, 2668-69).

942. Chevron's research was also prompted by Auto/Oil work that suggested that both T90 and aromatics had strong effects on emissions. (RX 250 at 005). Chevron disagreed with Auto/Oil's conclusions and hoped that its research would help it to convince CARB that it should not regulate aromatics in any way that would be more costly for Chevron's refineries to meet. (CX 7071 (Welstand, Dep. at 25); *see also* RX 250 at 005 ("We hope to demonstrate to CARB that reducing aromatics content has only minimal effect on emissions such that regulated aromatics specs remain within Chevron refining capabilities")). As Mr. Welstand explained, "our concern was that we relied on aromatics heavily to provide leaded octane for gasoline; therefore, we didn't want aromatics regulations to limit the use of those aromatics too severely." (CX 7071 (Welstand, Dep. at 26)). Chevron was hoping that showing its research to CARB might influence how CARB came out on the aromatics specification. (CX 7071 (Welstand, Dep. at 27)).

(3) Chevron Presented Its Research to CARB

943. Chevron presented the results of its emissions testing to CARB in August and September of 1990. (CX 7071 (Welstand, Dep. at 28)). In that presentation, Chevron reviewed the results from its 20-car test. (CX 7071 (Welstand, Dep. at 30, 32-33); RX 251).

944. The subject of the meeting was Chevron's reformulated premium unleaded gasoline, and at the meeting Chevron indicated that "a strong relationship had been found between the Driveability Index value of a fuel and exhaust hydrocarbon emissions." (Ingham, Tr. 2667-70; CX 977 at 002).

945. Peter Venturini asked in that meeting if Chevron believed CARB should pursue driveability index as a potential strategy for the Phase 2 gasoline specifications. (CX 7071 (Welstand, Dep. at 33-34); RX 251 at 001). "Our answer was that we believed DI had real emissions benefits." (CX 7071 (Welstand, Dep. at 34-35) RX 251 at 001). Chevron told CARB that DI "did lower emissions. It wasn't a may; it was an absolute." (CX 7071 (Welstand, Dep. at 36-39).

(4) Chevron's Information Was Initially Confidential, but CARB Requested Permission to Publicly Discuss It

946. Chevron's Mr. Welstand held a follow-up meeting with Mr. Dean Simeroth, the Chief of CARB's Criteria Pollution Branch, on October 15, 1990. (CX 7071 (Welstand, Dep. at 40); CX 954 at 002 (referred to in testimony as RX 252)). It was Mr. Welstand's understanding at the time that Mr. Simeroth was in charge of the group that was responsible for the motor fuels regulations. (CX 7071 (Welstand, Dep. at 40)).

947. Mr. Welstand told CARB that Chevron had not made any public disclosure of the emissions benefits of reduced DI, and that it still wanted to keep this information confidential. (CX 7071 (Welstand, Dep. at 43); CX 954 at 003 (referred to in testimony as RX 252)).

948. According to Mr. Welstand, Chevron wanted to keep the information confidential because Chevron U.S.A.'s marketing group planned to commercialize the reformulated gasoline and it had not yet announced the benefits of DI and exhaust emissions. (CX 7071 (Welstand, Dep. at 43-45)). It was Chevron's understanding that CARB would not reveal Chevron's results until Chevron told CARB that it did not need to keep the information confidential anymore. (CX 7071 (Welstand, Dep. at 45)). CARB wanted to know "how soon they would be able to discuss DI publicly." (CX 977 at 003 (referred to in testimony as RX 253); CX 7071 (Welstand, Dep. at 45-46)).

949. Unlike with Unocal, on October 26, 1990, CARB made a formal written request that Chevron make its DI research nonconfidential so CARB could discuss the research with others. (RFF 468-74 (no written request to Unocal); CX 7071 (Welstand, Dep. at 47-48); CX 977 (referred to in testimony as RX 253)).

950. This letter, which was written less than a year before CARB's interactions with Unocal, evidences CARB's desire that Chevron lift confidentiality restrictions. (CX 977 at 002). Specifically, in that request, CARB stated that Chevron had alluded to the relationship between DI and emissions as long as a year before that letter, and that the information had been treated confidential by CARB staff. (CX 977 at 002; Ingham, Tr. 2670). CARB wanted permission to discuss that information with other manufacturers. (CX 977 at 002; Ingham, Tr. 2674). The letter did not contain any request for Chevron to make any representations about rights or pending patent rights it might have on the driveability research. (CX 977; Ingham, Tr. 2680-81).

951. In discussing CARB's request internally, Chevron noted that "the concept, or something very close to it, is out already." (RX 254 at 001). Chevron noted in a memo the same date as CARB's request that CARB's Mr. Dean Simeroth and Mr. Peter Venturini had already "made

repeated references to volatility factors and DI as having possible influences on vehicle emissions” in a meeting between CARB and WSPA on October 23, 1990. (RX 954 at 003 (referred to in testimony as RX 252); *see also* CX 7071 (Welstand, Dep. at 57)). Therefore, Chevron personnel all agreed that the release of the DI information was appropriate. (Ingham, Tr. 2681-82; RX 254).

952. On November 6, 1990, Chevron granted permission to CARB to discuss Chevron’s findings about the relationship between DI and emissions with automobile manufacturers, in order to conduct a test program based in part on Chevron’s findings. (CX 7071 (Welstand, Dep. at 50, 53-54); RX 254 at 002; CX 7042 (Bea, Dep. at 39-40) (“that data was eventually given freely to CARB for their use, and also to WSPA, and that was probably sometime in late ’90”)).

953. Chevron intended the release of information to “help get CARB off aromatics control for their Phase II gasoline specifications,” because Chevron did not want limits on aromatics. (RX 254 at 001; Ingham, Tr. 2683; CX 7071 (Welstand, Dep. at 52-53)). It was “Chevron’s desire to have minimal control on aromatics . . . by showing the Air Resources Board that distillation properties had an effect on emissions, that it was possible to see those as better alternatives than reducing aromatics.” (CX 7071 (Welstand, Dep. at 53)).

954. Even when Chevron granted permission to CARB to use the information, it did not mention pending patent rights or the possibility that patents might be filed on the DI information. (Ingham, Tr. 2682-85; RX 254 at 002). And to Dr. Ingham’s knowledge, in his role as manager of state fuels regulations, CARB never wrote back to Chevron to inquire about rights in the research information. (Ingham, Tr. 2684-85).

(5) Chevron Also Disclosed Its Research and Provided Its Data to Industry Groups

955. At the time Chevron gave CARB permission to publicly discuss its findings, Chevron had already scheduled for Mr. Jeff Gething to present a paper regarding the work to the Society of Automotive Engineers (“SAE”) in late February of 1991. (CX 7071 (Welstand, Dep. at 80-82); RX 259). It considered the SAE presentation and publication to be an important part of gaining recognition for Chevron’s work in “uncovering the relationship between DI and hydrocarbon emissions,” and furthering Chevron’s technical reputation and reputation as a leader on environmental issues. (CX 7071 (Welstand, Dep. at 84-85); CX 958 at 002 (referred to in testimony as RX 260)). Chevron also considered it to be an important “morale-booster.” (CX 958 at 002). In any event, Chevron reasoned that the findings “would become common knowledge any way because of our disclosures to [CARB] In the worst scenario, other companies might claim credit for uncovering the relationship.” (CX 958 at 002 (referred to in testimony as RX 260)).

956. Mr. Gething did make the presentation at the SAE conference in February of 1991 (Ingham, Tr. 2624; CX 7071 (Welstand, Dep. at 80-82); RX 259).

957. Chevron also provided the data from its Driveability Index research to the WSPA data base (Lieder, Tr. 4763-64; CX 7042 (Bea, Dep. at 39-40); CX 1563), and presented its research to Auto/Oil in March of 1991. (Ingham, Tr. 2625).

(6) Chevron Applied for a Patent on Its DI Work

958. In the same time period that Chevron showed its research to CARB and then released its research to be discussed publicly (November 1990), Chevron’s Mr. Jeff Gething submitted an internal Chevron Invention Disclosure Form on the same research: the two-car test, the five-car program and the 20-car program. (CX 7071 (Welstand, Dep. at 60-65); RX 256). Mr. Gething

indicated on the Disclosure Form that the data had been shown to CARB. (Ingham, Tr. 2699-2701; CX 7071 (Welstand, Dep. at 63-64); RX 256 at 003 (“This data has been shown to the California Air Resources Board.”)).

959. Chevron filed a patent application in May of 1991 on its DI work. (Ingham, Tr. 2627, 2685-86; 2691; CX 7071 (Welstand, Dep. at 67, 70-71); RX 258). Mr. Welstand recommended that Chevron not file for a foreign patent because he did not see any business case for it. (CX 7071 (Welstand, Dep. at 68)).

960. Dr. Ingham became aware in “very late 1991 or early 1992” that in May 1991 Chevron had applied for a patent arising out of this driveability index research. (Ingham, Tr. 2627, 2685-86; 2691; CX 7042 (Bea, Dep. at 36); RX 248).

961. Chevron’s patent application was filed after Chevron presented its SAE paper, February 25 to March 1, 1991 (Ingham Tr. 2707-08; RX 259), and after Chevron presented its research to Auto/Oil. (Ingham, Tr. 2625).

**(7) Chevron Adopted an Advocacy Strategy in August of 1991
that Focused on Gaining a Competitive Advantage**

962. Chevron held strategy meetings in the summer of 1991 to develop a strategy regarding the CARB Phase 2 regulations. (CX 7071 (Welstand, Dep. at 88); CX 952 (referred to in testimony as RX 261)). That strategy was driven by concerns for refining operations. (CX 7042 (Bea, Dep. at 86-87); CX 7071 (Welstand, Dep. at 95); RX 262 at 002). The primary objectives of the strategy meetings were to identify Chevron’s competitive advantages and disadvantages from CARB’s proposed regulations, develop a strategy, and develop an action plan. (CX 7071 (Welstand, Dep. at 89); *see also, e.g.*, CX 952 at 005).

963. One example is Chevron's August 23, 1991 strategy meeting regarding the CARB Phase 2 regulations. One of the topics was "competitive advantage," showing that it was important for Chevron to consider what competitive advantage it might be able to gain in connection with the CARB Phase 2 gasoline regulations. (Ingham, Tr. 2687-88; CX 952). Specifically, Chevron planned to take advantage of what it believed to be its strengths (*i.e.*, T90, sulfur and facilities) and to minimize its weaknesses (olefins). (RX 262 at 002; RX 263 at 002).

964. Therefore, Mr. Welstand and others from Chevron met with CARB in September of 1991. (CX 7071 (Welstand, Dep. at 95-98)). In keeping with its strategy, Chevron proposed, among other things, that CARB increase the olefins limit for the regulations. (RX 263 at 003; RX 264).

(8) Chevron Did Not Disclose Its Patent Application at Any Time During Its Phase 2 Advocacy

965. Chevron had a practice of keeping patent applications confidential. (CX 7071 (Welstand, Dep. at 78-79)). Mr. Welstand admitted that he had previously testified that he saw no problem with Chevron keeping its patent applications confidential if the law provided for that. (CX 7071 (Welstand, Dep. at 77-78)). Although Chevron pursued its patent application on DI until sometime in 1993 (Ingham, Tr. 2630-31; CX 971B), Chevron never disclosed to CARB any patents or patent applications related to gasoline formulations or Driveability Index. (Ingham, Tr. 2708; CX 7042 (Bea, Dep. at 36, 40); CX 7071 (Welstand, Dep. at 74)).

e. The Other Refiners' Practices During the Phase 2 and Phase 3 Regulatory Process Show that Disclosure of Patent Applications Was Not Required or Expected

966. In addition to Chevron, other refiners have not disclosed patents or pending patents to CARB. For example, Shell has at least one pending patent application related to ethanol blending for "federal reformulated gasoline containing ethanol." (CX 7052 (Jacobson, Dep. at 71)). It has at

least one issued patent claiming compositions of unleaded gasoline. (RX 430). Shell's designee on the issue, Mr. Jacober, was not aware of any instance where Shell had disclosed a pending patent application to CARB. (CX 7052 (Jacober, Dep. at 79-80, 82)). Mr. Jacober, Shell's designee as to disclosure of patent applications, was unaware of any patent application that had ever been publicly disclosed by Shell. (CX 7052 (Jacober, Dep. at 87-88)).

967. Between 1998 and 2001, the BP companies had at least three pending patents and a statutory invention registration (SIR) that they did not disclose to CARB. (CX 7075 (Wood, Dep. at 6-7, 36, 39, 44-45, 49-51) (testifying that BP did not disclose to CARB the existence of three patent applications and one SIR, although these related to production or potential production of gasoline for sale in California)). In 1998, BP Amoco filed a patent application for a gasoline composition with a low sulfur and low oxygen content. (CX 7075 (Wood, Dep. at 39-41); RX 662). In May 2001, BP filed a provisional patent application for a low-octane gasoline composition for sale in California. (CX 7075 (Wood, Dep. at 38-39, 51-53); RX 663; RX 665). On October 25, 2001, BP filed a patent application entitled, "Components for Blending of Transportation Fuels." (CX 7075 (Wood, Dep. at 49); RX 664). BP filed another application related to "automotive gasoline and blending stocks therefor," which is still pending at the Patent and Trademark Office. (CX 7075 (Wood, Dep. at 53-54); RX 666). And at some point, ARCO also filed a patent application, which it later converted into an application for a SIR. (CX 7075 (Wood, Dep. at 36); RX 668). The BP companies have never disclosed any of their patent applications to CARB or informed CARB of the fact that gasoline-related patent applications were pending. (CX 7075 (Wood, Dep. at 40, 44, 50, 56)). { [REDACTED] [REDACTED] } (CX 7075C (Wood, Dep. at 51, 56, 59), *in camera*).

968. In addition to BP, Mobil filed at least one patent application related to gasoline in the 1990s. (Eizember, Tr. 3396-97). Mobil did not disclose the application to CARB. (Eizember, Tr. 3397). In fact, ExxonMobil's corporate designee on the subject testified that he was unaware of any instance where ExxonMobil had ever disclosed a pending patent application to a trade association or standard-setting body. (CX 7056 (Martinez, Dep. at 87) ("In my career, which has spanned a number of jobs in and out of technology, I'm not aware of any.")).

f. The Refiners Did Not Disclose Unocal's Patent to CARB Upon Learning of Its Issuance

969. Several of the refiners learned of the issuance of the '393 patent in early 1994, nearly a full year before Unocal's 1995 press release. (CX 7076 (Youngblood, Dep. at 40-45); CX 7048 (Hancock, Dep. at 239); CX 7049 (Hochhauser, Dep. at 79-80); CX 7058 (Millar, Dep. at 33); RX 158).

970. Texaco first learned of the '393 patent in March of 1994 through Mr. Mike Kulakowski, a Texaco employee. (CX 7048 (Hancock, Dep. at 239)). Texaco had a copy of the '393 patent in its hands at least as early as March 11, 1994. (CX 7048 (Hancock, Dep. at 240); RX 536).

971. While a Texaco employee, Mr. Kulakowski learned of the issuance of the '393 patent from a Unocal employee while both were attending a CARB workshop: the Unocal employee, Nick Economides, told Mr. Kulakowski that "Peter got his patent." (Kulakowski, Tr. 4512-13).

972. Mr. Kulakowski, as a former Unocal employee, knew of Dr. Jessup's intentions to use the results of his research to obtain a patent on reformulated gasoline as early as late 1990 or early 1991. (Kulakowski, Tr. 4571-73).

973. Mr. Kulakowski was surprised by what Mr. Economides told him, and alerted others at Texaco of the issuance of the '393 patent. (Kulakowski, Tr. 4513). Mr. Kulakowski went back

to Texaco and told his supervisor's supervisor, Mr. Youngblood, General Manager of Texaco Environment, Health and Safety, about the issuance of the patent. (Kulakowski, Tr. 4575). Mr. Youngblood instructed Mr. Kulakowski to obtain a copy of the issued patent. (Kulakowski, Tr. 4575). Mr. Kulakowski obtained a copy of the issued patent from someone in the Texaco research department. (Kulakowski, Tr. 4575).

974. Mr. Kulakowski also informed Texaco management of the issuance of the '393 patent in a handwritten memo dated March 10, 1994. (RX 158). Mr. Kulakowski wrote this memo within days of learning of the issuance of the '393 patent. (RX 158; Kulakowski, Tr. 4576). Specifically, he brought the patent to the attention of Mr. Redeemer and Mr. Moyer, both members of Texaco's Environmental Health & Safety department, and also Mr. Walz and Mr. Hancock of the Texaco Refining department. (RX 158; Kulakowski, Tr. 4576). In the handwritten memo, RX 158, Mr. Kulakowski told Texaco management that he never thought the patent had a chance. (RX 158). After learning of the '393 patent, Mr. Hancock alerted his direct supervisor, the vice-president of refining for Texaco, and together they forwarded the information to their technical department in Beacon, New York, which had the responsibility for intellectual property issues. (CX 7047 (Hancock, Dep. at 31-32)). Thus, Mr. Kulakowski and Texaco were fully aware of the '393 patent by at least March 10, 1994. (RX 158; Kulakowski, Tr. 4576).

975. Mr. Douglas Youngblood, one of Texaco's primary contacts with CARB, expressed his "shock[]" and "surprise[]" that such a patent could be granted. Mr. Youngblood further expressed the opinion that the patent should not have been granted (CX 7076 (Youngblood, Dep. at 45-46)), going so far as to say that its issuance was "ridiculous." (CX 7076 (Youngblood, Dep. at 45-48); *see also* (CX 7076 (Youngblood, Dep. at 53) (stating that his belief in 1994 was that "there was a good

likelihood the patent, if challenged, would not hold”). His colleague, Mr. Steven Hancock, said his initial response was that it was “hard to believe” that a patent issued. (CX 7048 (Hancock, Dep. at 243-44)).

976. Texaco, along with other refiners, employed outside counsel to render an opinion regarding the validity of the patent. (*E.g.*, Gyorfi, Tr. 5259; CX 7048 (Hancock, Dep. at 279); CX 7052 (Jacobson, Dep. at 32); CX 7059 (Moyer, Dep. at 30-31). Texaco, specifically, obtained a legal opinion that the ’393 patent was invalid from outside counsel and engaged in an effort to uncover prior art that could invalidate the patent claims. (CX 7048 (Hancock, Dep. at 277 (“Texaco, first of all, had the opinion the patent was invalid and would be proven so in court”), 279; CX 7059 (Moyer, Dep. at 117) (explaining that, based on the advice of their patent counsel, Texaco believed that the “uncertainty” presented by the patent would likely be mitigated if the patent were challenged”); RX 537 at 001).

977. Mr. Youngblood provided Texaco’s written comments on the proposed predictive model to CARB Board members on June 8, 1994. (CX 7076 (Youngblood, Dep. at 53-54)). He also spoke on Texaco’s behalf at the public hearing on June 9, 1994. (CX 7076 (Youngblood, Dep. at 54-55)). In both instances, Texaco endorsed the adoption of the predictive model. (RX 418 at 001, 008-013). Mr. Youngblood did not tell CARB about the Unocal patent. (CX 7076 (Youngblood, Dep. at 55); RX 418). He explained,

[I]n my mind at that time, the Unocal patent’s ability to stand up was in doubt, so if I had felt that the patent would hold, I would have express that concern, but I thought at the time that the patent was so

ridiculous since it was covering properties that Auto/Oil members and others had been discussing back in 1989, it wouldn't hold. So I think that probably shaded my decisions as far as discussing or not discussing the patent.

(CX 7076 (Youngblood, Dep. at 55-56)).

978. Furthermore, despite knowing, as a Texaco employee and as chair of the WSPA policy committee for the predictive model, that the '393 patent had issued, Mr. Kulakowski did not advise CARB of the existence of the '393 patent, and in fact voted to support CARB's version of a predictive model. (Kulakowski, Tr. 4580, 4646-47).

979. Chevron learned of the '393 patent in approximately February 1994, and first discussed the Unocal patent with CARB on February 1, 1995. (Ingham, Tr. 2728-29).

980. Chevron's Mr. Bea did not recall any discussion of whether to tell CARB about the Unocal Patent in 1994, stating, "Because remember, we were still trying to assess what to heck the impact of the whole patent was, and that was—that was—that was a big job, took a long time." (CX 7042 (Bea, Dep. 130-31)).

981. Mr. Bea explained that they ultimately determined the impact of the '393 patent to be "pretty dramatic" based on the 220 claims that then existed in the patent. (CX 7042 (Bea, Dep. at 131)). He stated that "counsel sort of gave the impression that they thought [the patent] was invalid." (CX 7042 (Bea, Dep. at 131-32)).

982. Chevron testified at a June 1994 CARB public hearing regarding the adoption of the CARB predictive model. Chevron did not advise CARB of the Unocal '393 patent at that time. (CX 7042 (Bea, Dep. at 140)). Mr. Bea was not aware of any discussion regarding informing CARB of the '393 patent at that time. (CX 7042 (Bea, Dep. at 140-141)).

983. Shortly after Chevron learned of the '393 patent, Chevron and Texaco had discussions on the subject. (Gyorfi, Tr. 5260). Chevron and Texaco signed a "joint defense agreement" in July of 1994. (Gyorfi, Tr. 5260-61). And in mid-1994, Chevron made contact with BP, Shell, and Exxon regarding the '393 Patent. (Gyorfi, Tr. 5261). Those other companies joined the Chevron-Texaco joint defense agreement. (Gyorfi, Tr. 5261; CX 7052 (Jacobson, Dep. at 32) (noting that Shell "joined a common defense group and received the opinion of outside counsel that the Unocal Patent '393 was their opinion of patent invalidity and/or noninfringement"))).

984. Mr. Gyorfi explained the delay between when Chevron first learned of the patent and when it first discussed the patent with CARB. He testified that it would have been premature to contact CARB about the '393 patent in April of 1994 because Chevron wouldn't have had enough understanding or information to have been able to make a case to CARB or to describe the patent's impact. (Gyorfi, Tr. 5260).

985. Individuals at Exxon Research and Engineering knew of the '393 patent at least as early May, 1994. (Eizember, Tr. 3249-50; RX 145 at 084). Individuals, including lawyers at Mobil, learned about the '393 patent at least as early as March 22, 1994. (Eizember, Tr. 3252-54; RX 146 at 042-043). In each instance, at least some of those who learned of the patent early on were involved in the CARB Phase 2 regulatory process. (Eizember, Tr. 3245-46, 3254-55).

986. Mr. Eizember also testified that Mobil employees learned of Unocal's patent as early as March 22, 1994. (Eizember, Tr. 3253; RX 146 at 049 (communication among Mobil employees relating to request for legal advice on the '393 patent); *see also* CX 7049 (Hochhauser, Dep. at 79-80) (Dr. Hochhauser first learned of Unocal's '393 patent around May of 1994 and has a vague recollection of discussing the patent with others in the products research division in 1994)).

987. BP first learned of the '393 patent in the middle of 1994, when BP personnel heard about the patent during a conversation with a different API member at an API meeting. (Segal, Tr. 5666-58).

988. The refiners did not bring the patent to CARB's attention, even though CARB was in the midst of developing its predictive model regulation at the time. (*E.g.*, Eizember, Tr. 3257-58, 3269-72 (Mr. Eizember wrote CARB in June 1995 and stated that CARB's cost estimates were too low, but he did not include the patent among the reasons why); CX 7076 (Youngblood, Dep. at 52, 55-56); CX 7042 (Bea, Dep. at 129)).

989. ARCO learned of the '393 patent sometime at the end of 1994, or in January of 1995. (Segal, Tr. 5668; Clossey, Tr. 5464 (ARCO learned of the patent in 1995)). ARCO's general counsel learned of the '393 patent from either the general counsel's office at Chevron or Texaco, during a meeting at the end of 1994 or the beginning of 1995. (Segal, Tr. 5668-69).

990. Unlike the other refiners, Shell first learned of the '393 patent through the Unocal press release which was issued on January 31, 1995. (CX 7052 (Jacober, Dep. at 23)). Shell's designee explained that, to his knowledge, neither the patent attorneys nor anyone in the business units at Shell had requested a patent search related to a patent like the '393 patent. (CX 7052 (Jacober, Dep. at 23)). Shell too believed the patent was invalid. Shell's designee, Mr. Jacober, testified that Shell "did not have to make any specific attempt to avoid the [] claims of the '393 patent" because, *inter alia*, those claims are invalid and unenforceable." (CX 7052 (Jacober, Dep. at 37) (quoting RX 426 at 003)).

991. After Unocal's January 31, 1995 announcement, the refiners did discuss the '393 patent with CARB and told CARB that they believed that the patent was invalid. (CX 7042 (Bea, Dep. at 132-33); CX 7059 (Moyer, Dep. at 118)).

992. Texaco first met with CARB about the '393 patent in February of 1995. (CX 7059 (Moyer, Dep. at 110)). Five months before the meeting, Texaco had already reported internally that it had identified "prior art samples" that purportedly covered 201 out of the 211 claims in the patent, with the search continuing "and impacts of the uncovered claims are being evaluated." (RX 537 at 001). Texaco's attorneys communicated to CARB in that meeting that they believed the validity of the patent to be "weak or negligible" and indicated that it "could be subject to challenge." (CX 7059 (Moyer, Dep. at 113)). Texaco also told CARB that it was uncertain, even at that point, as to what the economic consequences could likely be, and that it appeared that the patent was very broad and covered a fairly significant range of fuels that could be blended to meet the CARB specs. (CX 7059 (Moyer, Dep. at 111)). Texaco may also have told CARB that other patents might exist. (CX 7059 (Moyer, Dep. at 111-12)). Texaco did not ask CARB to do anything about the patent or to the regulations in light of the patent in February of 1995. (CX 7059 (Moyer, Dep. at 116)).

993. Chevron met with CARB regarding the '393 patent in March of 1995. At that meeting, CARB agreed with the refiners' determination of invalidity. (CX 7042 (Bea, Dep. at 133) ("There were some pretty pointed statements, particularly by Peter Venturini, that he couldn't understand how a patent like this could be issued to start with and on something that was so obvious. And that's sort of where we left it.")).

994. Mr. Bea also stated that the March 1995 meeting with CARB had two purposes: "one was to educate CARB on patent law because, you know, they don't normally work in that area . . ."

(CX 7042 (Bea, Dep. at 132)); the second was to discuss the impacts of the patent on the regulations and to determine whether CARB would want to “partake in any challenge to the regulations and would they work cooperatively with us in trying to find prior art.” (CX 7042 (Bea, Dep. at 132)).

g. CARB Did Not Rely on Either the Absence of Competitive Advantage or Patent Protection in Adopting Its Regulations

(1) CARB Had No Formal Policy Regarding Conferring Benefits on Single Firms

995. There was also no guideline, criterion, bulletin, manual, instruction, order, or standard of general application on file with the Secretary of State in 1991 and 1992 which said that CARB could not or would not use technologies protected by patents. (Boyd, Tr. 6834-35). Mr. Boyd, as Executive Officer of CARB, knew of no guideline, criterion, bulletin, manual, instruction, order, standard of general application, or other rule on file with the Secretary of State that would have prohibited CARB from using technologies that were covered by patents in its rulemaking. (Boyd, Tr. 6835).

996. This is supported by the testimony of CARB management, who said: (1) there was no specific legislative mandate that said CARB could not use patented technology in regulations (CX 7063 (Sharpless, Dep. at 152)); (2) competition is not one of the issues that is detailed under the cost-effectiveness guidelines (Venturini, Tr. 817); and (3) at the time of the adoption of the Phase 2 regulations, CARB had no written policy of avoiding actions that conferred monopolies or other market power on individual firms. (Kenny, Tr. 6511-12).

997. Despite memos that purport to describe an “historical” policy, a member of the public would not be able to find that policy in written form. (Kenny, Tr. 6591-92). In fact, Mr. Kenny could

not point to any place where a “no-monopolies” or “no benefits to an individual company” policy appears in written form before March of 1996. (Kenny, Tr. 6592).

(2) CARB Did Not Investigate the Existence of Patent Rights

998. Mr. Venturini testified that he was not aware of anyone from CARB staff being directed to investigate the existence of potential patent rights through whatever means might be available. (Venturini, Tr. 395). Similarly, Mr. Curtis testified that he does not know if, during the whole period of time leading up to the Phase 2 proceeding, anyone at CARB ever did a search of issued patents to determine if any of those patents would be applicable to CARB Phase 2 gasoline. (Curtis, Tr. 5902-03).

(3) The Talbert Patent Example: CARB Did Not Pursue the Intellectual Property Ramifications of the Talbert Patent

999. CARB Criteria Pollutants Chief Mr. Dean Simeroth was aware in 1991 that a gentleman named Mr. William Talbert had a patent issued on gasoline. (Simeroth, Tr. 7468). Mr. Simeroth also said that Mr. John Curtis, Mr. Peter Venturini, and Mr. Fletcher were also aware of the Talbert patent. (Simeroth, Tr. 7469; *see also* Curtis Tr. 5884-85). The Talbert patent was also discussed at least one meeting with the executive staff. (Simeroth, Tr. 7469-70). The executive staff in 1991 included Mr. Jim Boyd, Mr. Bill Sylte, Mr. Tom Cackette, and Mr. Peter Venturini. (Simeroth, Tr. 7469-70).

1000. Mr. Simeroth of CARB testified that Mr. John Curtis was directed to look into the Talbert patent (Simeroth, Tr. 7470-71). But Mr. Curtis testified that he never analyzed the Talbert patent as it might relate to the Phase 2 regulations. (Curtis, Tr. 5884-86). He also asserted that he was not aware of anyone else at CARB having analyzed the Talbert patent. (Curtis, Tr. 5885-86). Even though directed by Mr. Simeroth to look into the patent, Mr. Curtis testified he was unaware

of the details of the Talbert patent because the information had never been provided to CARB. (Courtis, Tr. 5884-85). And even though Mr. Courtis was aware of the Talbert patent, it was not referenced in the Technical Support Document which contains a list of references for the Phase 2 rulemaking, and of which Mr. Courtis was co-author. (Courtis, Tr. 5885-86).

1001. Mr. Jim Aguila, who was in charge of the cost component of the Phase 2 regulations, did not recall Mr. Courtis ever telling him about a Talbert patent or that he had conducted some analysis of the Talbert patent prior to the 1991 rulemaking. (CX 7040 (Aguila, Dep. at 135-36)).

1002. Mr. Courtis was unaware of any effort by any member of CARB staff to deliberately carve around any claims of the Talbert patent in their October 4 proposal to the board. (Courtis, Tr. 5886-87). He was similarly unaware of whether the Board made any effort to avoid overlap between its regulations and the Talbert patent when it made its decisions in the November 1991 board meeting. (Courtis, Tr. 5886-87). Mr. Courtis testified that he had never attempted to evaluate a pending patent application or an issued patent for any reason prior to the adoption of the CARB Phase 2 regulations. (Courtis, Tr. 5886-87).

(4) The MTBE Example: CARB Enacted a Regulation that Was Likely to Benefit ARCO as a Major MTBE Producer

1003. During the period before the November 1991 Board meeting, in which Mr. Courtis had discussions with the refining industry, one of the topics they discussed was the oxygen mandate which had people coming at the issue from, in Mr. Courtis' words, all sorts of angles. (Courtis, Tr. 5894-98). Some refiners favored the use of MTBE in the regulations. (Courtis, Tr. 5894-98). Other refiners were opposed to the use of MTBE; still others favored the use of ethanol. (Courtis, Tr. 5894-98). During the period leading up to the CARB Board meeting, Mr. Courtis knew that ARCO and

others supported an oxygenate requirement, whereas Unocal and others opposed such a requirement. (Courtis, Tr. 5903-05).

1004. CARB knew that ARCO was the leading producer of MTBE, but Mr. Courtis did not do anything to determine what patents ARCO may or may not have had on MTBE at the time of the Phase 2 regulations. (Boyd, Tr. 6792; Courtis, Tr. 5901-02). Nor is he aware of anyone at CARB doing such a thing. (Courtis, Tr. 5901-02). CARB did not do so despite knowing that ARCO was the leading producer of MTBE and declaring MTBE to be a “necessary component of the reformulated gasolines.” (Boyd, Tr. 6998-99; Venturini, Tr. 769; CX 10 at 047). CARB simply did not consider ARCO’s market position or the presence of any patents it may have had on MTBE in making its determination during the Phase 2 rulemaking. (Boyd, Tr. 6792).

1005. Even while CARB was in the process of phasing out MTBE during Phase 3, Mr. Chan did not try to determine competitive market share of ethanol as part of his analysis. (CX 7044 (Chan, Dep. at 81-82, 84)).

1006. Mr. Stegemeier of Unocal testified that regulations can provide an advantage “in the competitive field of gasoline marketing.” (CX 7065 (Stegemeier, Dep. at 39, 44)). One example he gave was the requirement adopted by CARB and the EPA that refiners include MTBE in gasoline: MTBE “was a unique product of our competitor ARCO. We were being forced by the regulations to use a product in our gasoline that cost at least 25 cents a gallon more than gasoline. We had to buy it from our competitor, under law, put it into our gasoline, and therefore suffer the consequence of having our gasoline price higher than theirs.” (CX 7065 (Stegemeier, Dep. at 39)).

(5) The Diesel Example: CARB Enacted a Regulation that Was Likely to Benefit Chevron and Texaco

1007. A second example of regulations conferring a competitive advantage, according to Mr. Stegemeier, was the CARB diesel fuel regulations. (CX 7065 (Stegemeier, Dep. at 39)). Unocal's refineries had a difficult time meeting the regulation, while Chevron "claimed to have a unique ability to meet those regulations," according to Mr. Stegemeier. (CX 7065 (Stegemeier, Dep. at 39)). He recalled Chevron sending an unsolicited letter offering to sell its technology to Unocal for four cents per gallon. (CX 7065 (Stegemeier, Dep. at 39)).

1008. In addition, CARB was aware of Texaco's patent on diesel fuel but posed no objection to Texaco pursuing licensing. (CX 7058 (Millar, Dep. at 67-68)).

(6) The Small-Refiner Exemption Example: CARB Enacted a Regulation that Was Likely to Benefit Small Refiners

1009. CARB included a small-refiner exception in its Phase 2 regulations. (Boyd, Tr. 6865; Venturini, Tr. 268-69, 289; Lamb, Tr. 1956-59). Unocal opposed this provision because it provided benefits and a "windfall" to the small refiners. (Lamb, Tr. 1956-59; Boyd, Tr. 6865).

1010. The oil industry as a whole was concerned about CARB conferring a benefit on the small refiners, thought it was detrimental, and told that to CARB. (Kulakowski, Tr. 4486-87).

1011. But CARB enacted the small-refiner exception anyway. (Venturini, Tr. 268-69). Mr. Venturini testified that the small-refiner exception was something that CARB intentionally provided to assist the small refiners: "we provided some provisions for them to assist them in being able to produce this fuel." (Venturini, Tr. 268-69; Fletcher Tr. 6452-53).

(7) The Phase 1 Detergent Patent Example: CARB Never Followed Up After Learning of a Patent Pending on Detergent Additives During Phase 1

1012. In 1989, Unocal made a presentation to CARB regarding detergent additives during the Phase 1 rulemaking process. (Venturini, Tr. 187-88; CX 1093). At page 027 of the 1989 presentation, the bullet point notes “A Unique Unocal Patent Pending Development.” (CX 1093 at 027).

1013. Dr. Croudace was at the 1989 presentation on Unocal’s detergent additive during which Unocal mentioned that the additive was patent pending. (Croudace, Tr. 544-45, 571-72; CX 1093 at 027 (referred to in testimony as CX 131 at 012)). Unocal disclosed the pending patent to show that the information it was presenting had value, to gain credibility because Unocal had its own products it was testing independent of other additive manufacturers, and to show that Unocal was like many other detergent manufacturers in that it had either a trade secret, patent, or pending patent on its detergent product. (Croudace, Tr. 653-54).

1014. At that meeting, no one from CARB expressed any interest in the fact that there was a patent pending. (Croudace, Tr. 654). No one asked Dr. Croudace for a copy of the patent application. (Croudace, Tr. 654). No one asked any questions about what the claims might be. (Croudace, Tr. 654). No one asked any questions about cost. (Croudace, Tr. 654).

1015. In fact, Mr. Venturini knew that virtually every company had some type of additive package, and believes that most of the other companies had additives that they protected. (Venturini, Tr. 188). Yet CARB staff—aware that companies had patents or pending patents on their deposit of control additives or their detergents—did not ask those companies if they had patents. (CX 7040 (Aguila, Dep. at 10-11)).

1016. Dr. Croudace did not believe that by including the information in the presentation, he had created a rule that he must disclose intellectual property in the future. (Croudace, Tr. 654-55). Dr. Croudace was never aware at any time that CARB had any expectation that he would tell them about patents that might apply to Unocal's products or research. (Croudace, Tr. 655).

(8) The EPA and ASTM Gave CARB a Heads-Up that Patents Could Be Implicated By Setting Standards or Enacting Regulations

1017. Mr. Simeroth attended the Federal Environmental Protection Agency Clean Fuels Negotiating Rule Committee meetings during 1991 where general discussion regarding potential patent rights, confidentiality, and exclusivity occurred. (Simeroth, Tr. 7471). In spite of having patent issues raised directly at the EPA meetings, Mr. Simeroth does not recall telling his staff about these conversations at the EPA. (Simeroth, Tr. 7471).

1018. In addition, CARB staff used ASTM Standards to describe the specifics of their test procedures as part of CARB's regulations in 1991 and 1994, incorporating such standards by reference. (Venturini, Tr. 389). As CARB staff put it, the new regulations incorporated by reference a number of American Society of Testing and Materials (ASTM) test methods. (CX 10 at 009).

1019. Mr. Venturini was certain that staff was very familiar with the ASTM Standards themselves. (Venturini, Tr. 390). RX 13 is a series of ASTM Standards from CARB's files. (Venturini, Tr. 391). The series of ASTM standards contains the following, which Mr. Venturini referred to as "boiler plate language": that users of the standard are "expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility." (RX 13 at 025; Venturini, Tr. 392-93).

B. Unocal Did Not Defraud Auto/Oil

1020. The Complaint alleges that, by presenting its research data and equations to Auto/Oil, Unocal donated its interest in its now-patented inventions to the “work of the Program.” (Complaint ¶ 53). The evidence does not support this allegation.

1021. Auto/Oil members were competitors within the automotive and oil industries who were organized together for research purposes under the National Cooperative Research Act of 1984, 15 U.S.C. § 4301, *et seq.* (CX 4001 at 002; CX 4198 at 009 (“there is competition among both the auto companies and the oil companies”); CX 7073 (Wise, Dep. at 26); Klein, Tr. 2465, 2537 (Shell’s participant in the Auto/Oil group understood that there was competition among the Auto/Oil members)). The obligations of the Auto/Oil members were set forth in a founding membership agreement (“Auto/Oil Agreement”). (CX 4001).

1022. The Auto/Oil Agreement was an integrated agreement as it embodied “the entire agreement of the Members” which “supersed[ed] any other agreements or understandings among the Members.” (CX 4001 at 024). The Auto/Oil Agreement specifically provided that “[n]o amendment or modification or waiver of a breach of any term or condition of this Agreement will be valid unless in a writing signed by each and every Member.” (CX 4001 at 024).

1023. Members of Auto/Oil’s Research Program Committee understood that the Auto/Oil Agreement controlled the rights and obligations of the various members of the Auto/Oil program. (Kiskis, Tr. 3847, 3818-19; Pahl, Tr. 2778-79).

1024. There was no testimony or evidence that the Auto/Oil Agreement was modified by any written agreement signed by each and every member of the Auto/Oil program. Rather, the evidence showed there was no awareness of any such other signed agreement by the parties to the agreement

and the chief lawyer for the oil side of the Auto/Oil program. (Kiskis, Tr. 3850; Klein, Tr. 2550); (CX 7079 (Zimmerman, Dep. at 71-72)).

1025. The Auto/Oil Agreement gave each member the right to pursue independent research “on any matter, including reformulated gasoline.” (CX 4001 at 014). The Auto/Oil Agreement distinguishes between the “Work of the Program” and “Independent Research.” (CX 4001 at 014-015 (work of the Program”); Klein, Tr. 2474 (“Independent Research”)).

1026. The Program had explicit provisions about management, contracting, obligations, funding, and testing for the work of the Program. (CX 4001 at 009 (“The Program will be managed by the Research Planning Task Force. . . .”); CX 4001 at 011 (“No Member of the Program shall enter into any contract on behalf of the Program . . . except with the approval of the Research Planning Task Force.”); CX 4001 at 012 (describing members’ obligations “to contribute such funds as may be necessary to develop and complete all research approved by the Research Planning Task Force. . . .”); CX 4001 at 014 (“ . . . all of the research and testing to be carried out in the Phase I Program will be disclosed in the final report. . . .”)). The work of the Program was the property of the Program to be donated to the public. (CX 4001 at 007).

1027. “Independent research” was work that was conducted, paid for, and published (if at all) by the individual member(s). (CX 4001 at 014-015). Independent research remained the property of that member. (CX 4001 at 014-015 (when a member engages in independent research “the project shall not be deemed to be undertaken by the Program”)).

1028. The Auto/Oil Agreement does not contain any provision which would convert Independent Research into the work of the Program because of disclosure of such independent research. Rather, the Auto/Oil Agreement simply provides that “[a] Member who has undertaken .

. . . an independent research project shall not be obligated . . . [to] disclose . . . the fact that such independent research has been or is being undertaken . . .” (CX 4001 at 014).

1029. Under the Auto/Oil Agreement, neither the Program nor the other Members gained any rights or obligations to independent research by reason of the Auto/Oil Agreement nor any right to participate in independent research. (CX 4001 at 015).

1030. Nothing modifies the Auto/Oil Agreement’s provision that when a member engages in independent research “the project shall not be deemed to be undertaken by the Program.” (CX 4001 at 015).

1031. There is nothing in the Auto/Oil Agreement which requires the disclosure of the existence of a pending patent application or the contents of such an application or any internal discussions a company may have regarding potential royalties. (CX 4001). To the contrary, as stated expressly in the Auto/Oil Agreement, members of Auto/Oil agreed that “[n]o member will utilize the Program for any . . . [e]xchanging of information among competitors relating to costs, sales, profitability, prices, marketing, or distribution of any product, process or service that is not reasonably required to conduct the research and development that is the purpose of such venture. . . .” (CX 4001 at 008).

1032. The Auto/Oil Agreement prohibited members from, among other things, “[e]ntering into any agreement or engaging in any other conduct . . . to restrict or require the sale, licensing, or sharing of inventions or developments not developed through [the Auto/Oil program].” (CX 4001 at 008-009).

1. Unocal Presented the Results of Its Research to Auto/Oil

1033. In September 1991, Dr. Peter Jessup made a presentation to the Auto/Oil Group that was similar to the presentations Unocal had previously made to CARB and WSPA regarding Unocal's emissions research. (Jessup, Tr. 1300, 1544-45; CX 4028 (referred to in Dr. Jessup's testimony as CX 248)).

1034. Unocal's presentation to Auto/Oil included slides that showed what experiments Unocal had conducted in its one-car test and ten-car test to assess emissions effects. (CX 4028). The slides showed the tests fuels which were used and the equations with coefficients that had been developed based on the studies. (Jessup, Tr. 1545). At no time during any of his presentations or disclosures of equations or data to CARB or WSPA or Auto/Oil did Dr. Jessup show the combinations of ranges of motor gasoline that are claimed in Unocal's patents. (Jessup, Tr. 1576).

1035. At the time of Unocal's presentation to Auto/Oil, Dr. Jessup offered to make Unocal's data disk available. (Jessup, Tr. 1546; Klein, Tr. 2551; Segal, Tr. 5629-30).

1036. Dr. Jessup indicated that Unocal had provided data to CARB and that the data was publicly available. (CX 4027 at 010).

1037. Mr. Mallett, a former Unocal employee, recorded in his notes from September 26, 1991 that he "offered our data to Auto/Oil and to all members." He added that, "Peter will send data disk to those who give him business cards." (CX 7055 (Mallett, Dep. at 34-35); CX 293 at 001).

1038. The minutes from the September 25, 1991 Auto/Oil meeting state, "Mr. Jessup explained that the data from Unocal's research has been provided to CARB and is in the public domain." (CX 4027 at 010 (referred to in Dr. Jessup's testimony as CX 291)). The minutes did not

say that the slides Dr. Jessup presented were in the public domain. (Segal, Tr. 5657-58). Rather, the minutes used the word “data.” (CX 4027 at 010).

1039. Dr. Jessup testified that he does not believe he used the words “public domain” in his presentation. (Jessup, Tr. 1546). He simply tried to tell the Auto/Oil members that “if they wanted a copy of the data it was available to them.” (Jessup, Tr. 1546).

1040. No one at Auto/Oil, CARB, or WSPA ever asked Dr. Jessup about patents or patent applications at any time. (Jessup, Tr. 1595).

1041. Dr. Jessup was required by a contract he signed with Unocal to not disclose patent applications outside of Unocal. (Jessup, Tr. 1472-74; CX 450 at 008).

2. Auto/Oil’s Members Were Competitors Who Did Not Owe Each Other Fiduciary Duties

a. Unocal’s Work Did Not Become the “Work of the Program”

1042. The Unocal RFG work was “independent research” belonging to Unocal. Unocal, not Auto/Oil, payed for, conducted, directed and published Unocal’s emissions research. (Jessup, Tr. 1548-49).

1043. Dr. Harvey Klein, Shell’s representative who attended the September 26, 1991 Auto/Oil meeting, testified that he understood that the Unocal RFG work was independent research both before and after Dr. Jessup presented it to Auto/Oil. (Klein, Tr. 2578, 2544, 2501).

1044. Likewise, at the time of the presentation, Ms. Doherty of Sunoco was aware that Dr. Jessup was presenting Unocal’s independent research: research that Auto/Oil did not do, did not request, did not commission, did not pay for, did not approve, never published, and never presented to the public. (Doherty, Tr. 2804-05).

1045. Chrysler's Auto/Oil representative testified that Unocal's "work was not conducted under Auto/Oil." (Burns, Tr. 2430, 2409).

1046. Mr. Wise testified as ExxonMobil's corporate designee on the issue that the first time he ever heard the idea expressed that Unocal's work in relation to reformulated gasoline somehow became the work of the Auto/Oil program was "when the Akin Gump lawyers mentioned it as an issue in the program." (CX 7073 (Wise, Dep. at 16-18)).

1047. Unocal's Chief Executive Officer told Chevron's Chairman of the Board in a letter that "Unocal's reformulated gasoline was not invented openly and cooperatively with CARB and the oil compan[y] leaders. In fact, Drs. Jessup and Croudace conducted their research into the effects of gasoline properties on automobile tailpipe emissions as a wholly independent program. And I would emphasize that their research was funded entirely by Unocal, not one penny coming from CARB, the EPA, the other oil companies, or anyone else." (CX 374 at 001). Although Chevron's Chairman of the Board understood that Unocal's CEO was telling him that the research Unocal had done underlying the patent was independent research, he did not respond to this letter. (Derr, Tr. 5167-68).

1048. The Work of the Auto/Oil program was approved and funded by the Research Planning Task Force, and the auto and oil companies who actually did the work were paid for it. (CX 7073 (Wise, Dep. at 37-39) (testifying that GM and other auto companies were paid for their work in running the tests and Phillips was paid for the work it did on blending the test fuels)). "Essentially contracts were written with each one of these entities to carry out the work." (CX 7073 (Wise, Dep. at 39)).

1049. Shell's representative on the Auto/Oil's Research Program Committee testified that the Unocal RFG work was paid for by Unocal. (Klein, Tr. 2545). Unocal's research that led to Dr.

Jessup's presentation was not authorized by Auto/Oil, nor did Auto/Oil pay for it. (Klein, Tr. 2545, 2465). Similarly, Auto/Oil did not provide any fleets of automobiles or any data analysis facility, and it did not participate in developing the conclusions that Dr. Jessup presented. (Klein, Tr. 2546).

1050. ARCO's representative on the Auto/Oil's Research Program Committee testified that Auto/Oil did not fund any of Unocal's research for the 5/14 Project. (Segal, Tr. 5659, 5596). Nor did Auto/Oil or the Research Program Committee do anything to direct Unocal's research. (Segal, Tr. 5660).

1051. There was no evidence that Unocal ever charged anyone for using the raw emissions data or the slides. (Klein, Tr. 2552; Pahl, Tr. 2778; Segal, Tr. 5660-61).

1052. The Auto/Oil Agreement required that the work of the Program be published. (CX 7073 (Wise, Dep. at 33-34); CX 4001 at 007 ("The Research Planning Task Force shall determine and coordinate the timely release and publication of program results.")).

1053. Unocal's data was never published as part of one of the Auto/Oil publications. (CX 7073 (Wise, Dep. at 27, 34-36); RX 424 at 043-057 (providing a "complete listing of what was published by Auto/Oil"))).

1054. Auto/Oil did not publish Unocal's research in the Program's final report or in any published report or paper and did not present it to the public as the work of the Auto/Oil program. (Doherty, Tr. 2805).

1055. Specifically, none of Unocal's independent research or Unocal's analysis of that research was published in the Phase I Final Report and Program Final Report of the Auto/Oil program. (CX 4016; RX 424; Burns, Tr. 2429-30). CX 4016, a copy of the Phase 1 final report from the Auto/Oil Air Quality Improvement Research Program does not describe Unocal's independent

research or Unocal's analysis of independent research, nor does RX 424, the Auto/Oil program final report that was published in January of 1997. (Burns, Tr. 2428-30).

b. Like Unocal, Other Auto/Oil Members Presented Their Independent Research and Applied for Patents that They Did Not Disclose to Auto/Oil

1056. Chevron's representative to the Auto/Oil Group's Research Program Committee understood that by agreeing to be a participant in Auto/Oil, a company was not giving up its right to conduct its own independent research. (Kiskis, Tr. 3851, 3818-19). He also understood, as Chevron's representative to Auto/Oil, that by signing the Auto/Oil Agreement, Chevron did not give up its rights to pursue patents on its own independent research. (Kiskis, Tr. 3854). And in fact, Chevron conducted independent research. (Kiskis, Tr. 3860).

1057. Chevron presented its driveability index research to Auto/Oil at a workshop in March 1991. (Ingham, Tr. 2625).

1058. Mr. Jeff Gething of Chevron presented its driveability index research publicly at a Society of Automotive Engineers ("SAE") meeting in February 1991 (Ingham, Tr. 2624; RX 259), one year before Drs. Jessup and Croudace presented their research to SAE in February 1992. (Jessup, Tr. 1287, 1542-43; Ingham, Tr. 2650-55; CX 477).

1059. Chevron's representative to the Auto/Oil Group's Research Program Committee understood that at the time he was participating in Auto/Oil, someone could write an SAE paper describing a research project and still seek a patent on the results of that same research. (Kiskis, Tr. 3874-75, 3818-19). Chevron put the DI research into an SAE paper, and at some point released the confidentiality of the DI research to allow CARB to talk to auto manufacturers about it. (Kiskis, Tr. 3880-81). Chevron also filed a patent application on the results of that research. (Kiskis, Tr. 3881).

1060. Dr. Ingham became aware in “very late 1991 or early 1992” that in May 1991 Chevron had applied for a patent for what it believed was an invention arising out of this driveability index research. (Ingham, Tr. 2627, 2685-86; 2691; RX 248). The November 19, 1990 internal invention disclosure form for Chevron’s driveability index research indicated, “This data has been shown to the California Air Resources Board.” (Ingham, Tr. 2699-2701; RX 256 at 003). The patent application was filed after Chevron presented its SAE paper, February 25 to March 1, 1991 (Ingham Tr. 2707-08; RX 259), and after Chevron presented its research to Auto/Oil. (Ingham, Tr. 2625).

1061. It did not occur to Dr. Ingham to go back and tell the Auto/Oil group about Chevron’s patent application. (Ingham, Tr. 2629).

1062. On July 17 and 18 of 1991, Mr. Jack Segal of ARCO presented ARCO’s EC-X research to Auto/Oil. (CX 4011 at 008-009; Segal, Tr. 5639-40).

1063. Even after ARCO presented its EC-X research to the Auto/Oil Program, ARCO planned to file for a patent application based upon its EC-X research. (CX 1582 at 001). According to an internal ARCO document, “The purpose would be, as you suggested, file a patent which we could use defensively or as a bargaining chip.” (CX 1582 at 001). Despite receiving this internal document, Mr. Segal did not inform the authors or recipients of this document that he had already presented the EC-X data to Auto/Oil. (Segal, Tr. 5643-44). In another memo dated July 17, 1992, one year after ARCO presented its EC-X research to Auto/Oil, ARCO indicated that in fact it had applied for a patent related to its EC-X research. (CX 1582 at 002; Segal, Tr. 5644-45). In fact, ARCO filed a patent application related to its EC-X research effective July 9, 1992. (CX 1582 at 004). As of July 17, 1992, one option related to its patent application being considered by ARCO was

to “enforce patent (if obtained) if others seek to enforce other related patents against ARCO Products).” (CX 1582 at 004; Segal Tr. 5646-47).

1064. ARCO’s counsel, Mr. Pruitt, in his July 17, 1992 memorandum, gave the memo’s recipient the option not to convert the patent application to a statutory invention registration at that time. (CX 1582 at 005).

1065. The Auto/Oil members were told that they should not discuss commercial plans that their company may have or discuss anything else relating to commercial production, marketing or pricing. (Klein, Tr. 2521; CX 4022 at 002-003).

1066. ARCO, as a member of the Research Program Committee, understood that it and other members were not supposed to discuss commercial plans that companies may have. (Segal, Tr. 5653). It also understood that RPC members were not to discuss pricing generally or more specifically pricing of products coming out of research. (Segal, Tr. 5654).

1067. Mr. Wise testified that he knew that, as competitors, the members were not to disclose any marketing information, competitive information and commercial plans. (CX 7073 (Wise, Dep. at 26)). He also knew the members were not to disclose pricing information. (CX 7073 (Wise, Dep. at 26)). Antitrust counsel had advised the members accordingly. (CX 7073 (Wise, Dep. at 26)). This was something that was also deeply ingrained in the members from working in a competitive environment. (CX 7073 (Wise, Dep. at 26-27)).

1068. An Auto/Oil document provides: “Q: Will participants in the program be prevented from conducting other research on this subject outside of this program? A: Absolutely not. Participants are free to conduct whatever studies they wish, alone or in different groupings.” (CX 4198 at 009-010). That was one of the ways that the oil companies and automobile companies

could enter into the Auto/Oil Agreement and still preserve competition among them. (Klein, Tr. 2538).

1069. The chief lawyer for the oil side of the program testified that he has no recollection of any claims from any Auto/Oil member that Unocal had breached any of the terms of the Auto/Oil Agreement. (CX 7079 (Zimmerman, Dep. at 79)).

1070. According to the program's antitrust counsel, one of the fundamental antitrust considerations of a program such as Auto/Oil was that it would not restrict participants' efforts outside the group. (CX 7079 (Zimmerman, Dep. at 15-18)).

C. Unocal Did Not Defraud WSPA

1071. The Western States Petroleum Association, generally referred to as WSPA, is a trade organization representing oil producers as well as oil refiners and marketers in five western United States. (CX 7059 (Moyer, Dep. at 10)). Its primary mission is to represent the interests of the industry in those states. (CX 7059 (Moyer, Dep. at 10-11)). WSPA provided a common forum for its members to advance common industry positions with CARB, the Board itself, the executive and top management of the agency, as well as the staff. (CX 7059 (Moyer, Dep. at 11)).

1072. WSPA members, like the Auto/Oil participants, are competitors. (CX 7046 (Grey, Dep. at 8); RX 672 at 001 (describing WSPA as an association of oil companies who made, used, and sold petroleum products (including gasoline) for the western United States)). WSPA's Gasoline Issues Group consisted of representatives from the various refiners who competed with Unocal in California, and Mr. Lamb represented Unocal in this group. (Lamb, Tr. 2264).

1073. One of the things these competitor companies engage in is "to get together and discuss proposed regulations and proposed legislation." (CX 7046 (Grey, Dep. at 8-9)). WSPA's goals

included trying to get the legislative and regulatory people to listen to WSPA's position, and to get them to adopt WSPA's position. (CX 7046 (Grey, Dep. at 13)).

1074. Ms. Gina Grey, who testified by deposition and was known as Gina Nelhams during the relevant time period (CX 7046 (Grey, Dep. at 19); Cunningham, Tr. 4284), worked with the Downstream Committee, which supervised and received input from lower-level committees like the Gasoline Issues Group. (CX 7046 (Grey, Dep. at 5-7)). She also worked directly with the Gasoline Issues Group, which dealt with gasoline issues in California. (CX 7046 (Grey, Dep. at 13-14)).

1075. WSPA had multiple conversations with CARB (CX 7046 (Grey, Dep. at 22-23)), commissioned a cost study (CX 1006 (Cunningham (Turner Mason) Aff.)), and provided comments on the proposed Phase 2 regulations (*e.g.*, CX 10 (Final Statement of Reasons) at 024-25). WSPA sought to provide information that would be helpful to the Air Resources Board in the development of regulations. (CX 7059 (Moyer, Dep. at 12)).

1076. In the spring of 1991, for example, WSPA was involved with CARB, and also GM, in conducting a many-vehicle testing program, the primary emphasis being on driveability index and RVP and their effects on emissions. (CX 7046 (Grey, Dep. at 18)).

1077. Months before Dr. Jessup's presentations to either CARB or WSPA, in January 1991, CARB also asked WSPA to include more variation in T50 and to lower T50 in tests WSPA was conducting in conjunction with a report from Turner Mason, because Auto/Oil was providing data on T90 to CARB and CARB needed more variation on T50 to get the same type of information on T50. (CX 7046 (Grey, Dep. at 19-21); RX677).

1078. The Emissions Testing Ad Hoc Group was a Downstream Committee subcommittee whose "role was specifically to deal with any type of emissions testing that was to be done, to have

technical experts from the companies at the table to review vehicle testing data and determine if any of that data should be incorporated in WSPA[’s] response.” (CX 7046 (Grey, Dep. at 19)).

1079. WSPA operated under a number of Guiding Principles. (CX 7059 (Moyer, Dep. at 18); RX 433 at 002). These included understanding that in working with WSPA, data shared with WSPA would not be presented under the WSPA name unless WSPA approved of the quality of the results. (CX 7059 (Moyer, Dep. at 19)). For information to be presented by WSPA, it had to be agreed to by the parties that it could be accepted and that the information would be available for scrutiny by other members. (CX 7059 (Moyer, Dep. at 19)). The Guiding Principles also included preserving each member’s right to conduct its own research independent of WSPA. (CX 7059 (Moyer, Dep. at 18-19); RX 433 at 002).

1080. Furthermore, “WSPA members and its staff are given guidelines as to behaviors and to avoid even the appearance of impropriety.” (CX 7070 (Wang, Dep. at 14)).

1081. The Complaint alleges that WSPA members were harmed by “a materially false and misleading impression” created by Unocal that Unocal did not have any intellectual property rights associated with its emissions research results. (Complaint ¶ 86).

1082. The allegations regarding WSPA focus on two things: (1) Unocal’s disclosure of its data to WSPA in connection with WSPA forming its position on the proposed regulations; and, (2) Unocal’s failure to disclose its pending patent application or potential royalties in connection with WSPA’s cost analysis for Phase 2. (Complaint ¶¶ 85-90).

1. Unocal Belonged to and Shared Information with WSPA While WSPA Advocated for the Industry Regarding the CARB Phase 2 Regulations

1083. Mr. Lamb of Unocal was a member of WSPA’s Gasoline Issues Group. (Lamb, Tr. 2165-66). In advocating the refining industry position before CARB, WSPA nominated individuals

such as Mr. Lamb to make presentations on behalf of WSPA at public consultation meetings, at board hearings, at private meetings with board members and at private meetings with CARB staff. (Lamb, Tr. 2166). As a member of WSPA, on occasion Mr. Lamb met privately with CARB Board members to present WSPA's position on issues. (Lamb, Tr. 2166).

1084. Mike Kulakowski also represented Unocal at WSPA and participated in WSPA activities related to the CARB Phase 2 regulations, although he later moved to Texaco and continued to work with WSPA but as Texaco's representative. (Kulakowski, Tr. 4622).

1085. Mr. Kulakowski understood, as of 1991, '93, and '94, while he represented Unocal and later Texaco, that it was a common goal of WSPA members to rely on the competitive marketplace to enable individual companies to respond to consumer preferences using their own ingenuity, expertise and market strategy, and that it was a common goal of WSPA members that government policies should be directed at setting air quality and other standards, not specific fuel recipes. (Kulakowski, Tr. 4622-23).

1086. On or about September 10, 1991, Unocal made a presentation to the Emissions Working Group Subcommittee of the Gasoline Issues Group of WSPA. Drs. Peter Jessup and Michael Croudace represented Unocal at this meeting. (CX 271 at 003).

1087. Unocal provided a handout at the meeting, CX 272, to explain its emissions research, specifically the 514 project, and Unocal also offered to supply a data disk. (Segal, Tr. 5616-17).

1088. Although ARCO received Unocal's slides from the WSPA presentation on September 10, ARCO did not pay for receiving those slides. (Segal, Tr. 5660-5661).

1089. After agreeing to make its data base public, Unocal took additional steps to further promote a predictive model. (Lamb, Tr. 2263).

1090. Unocal initiated an effort within WSPA to form a predictive model working group. (Lamb, Tr. 2263-64). This involved merging Unocal's data base into the beginnings of a mega data base at WSPA. (Lamb, Tr. 2263-64). Mr. Lamb also encouraged the formation of a group at WSPA within the Gasoline Issues Group to try to develop a predictive model. (Lamb, Tr. 2263-64).

1091. Mr. Clossey testified that in the fall of 1991, ARCO asked for and received Unocal's data base from its emissions testing program. (Clossey, Tr. 5380-81). Unocal's data came from Mr. Kulakowski and was contained on a computer disk. (Clossey, Tr. 5440-41). The computer disk did not provide any specific recipes or formulas of gasoline that Unocal was claiming were cost-effective, nor did it contain any specific formulas that Unocal was claiming would be easy for ARCO to make in its refineries. (Clossey, Tr. 5442-43). Mr. Clossey did not personally open and look at the Unocal data disk. (Clossey, Tr. 5443).

1092. The data disk given to ARCO by Unocal in connection with the September 10, 1991 WSPA meeting was provided to ARCO free of charge. (Segal, Tr. 5661).

1093. ARCO used the data it received from Unocal in two ways. (Clossey, Tr. 5449-50). The first was to incorporate the data into WSPA's predictive model data base. (Clossey, Tr. 5445-50). ARCO was the company that incorporated Unocal's data into the WSPA data base, and the data that Unocal gave to ARCO was the same data that was incorporated into WSPA's predictive model data base. (Clossey, Tr. 5445-47).

1094. To Mr. Clossey's knowledge, Unocal never sent a bill to WSPA for WSPA's incorporation of Unocal data into the WSPA data base. (Clossey, Tr. 5458). Similarly, Unocal never sent ARCO a bill or charged ARCO for ARCO's review of the Unocal's data that was done in the fall of 1991. (Clossey, Tr. 5458).

1095. The second way ARCO used Unocal's data was to review the disk itself internally at ARCO to provide a peer review to Unocal and to the WSPA predictive model working group. (Clossey, Tr. 5450).

1096. ARCO's first-pass at analyzing Unocal data appears in CX 1592. (Clossey, Tr. 5450, CX 1592). ARCO's summary of Unocal's data was done on September 17, 1991. (Clossey, Tr. 5451). ARCO did not see a strict correlation between T50 and emissions as Unocal had claimed. (Clossey, Tr. 5451). There were other areas as well in which ARCO found that its analysis differed from what it understood to be Unocal's analysis of the data. (Clossey, Tr. 5451). Scientists, when they review the same data, can come to different conclusions, and that's what happened in this instance. (Clossey, Tr. 5451). Mr. Clossey shared its analysis of Unocal's data with Mr. Kulakowski at Unocal and also shared its analysis of Unocal's data with CARB. (Clossey, Tr. 5452).

1097. WSPA did not make the same choices as Dr. Jessup in analyzing emissions data in the 1991 timeframe, in particular they used a binomial model rather than the linear model Dr. Jessup used in coming up with his equations from the Unocal test data. (Jessup, Tr. 1557-58).

1098. WSPA's predictive model data base included data from a number of different companies. (Clossey, Tr. 5447). Mr. Clossey understood that WSPA's goal was to get as much data as it could for its data base so that any predictive model WSPA would develop would be well founded. (Clossey, Tr. 5449). ARCO believed that a broad data base was important to both CARB's efforts to develop the predictive model, as well as to the WSPA's working group's efforts to develop a predictive model. (Clossey, Tr. 5449).

1099. CX 1246 is a copy of a computer disk and its contents prepared by Dr. Jessup and sent to WSPA on or with in a few days of October 25, 1991, the date handwritten on the front of the disk.

(Jessup, Tr. 1558; CX 1246). The disk contains the various fuel and fuel inspection data from Unocal, ARCO EC-X, Chevron, various phases of Auto/Oil, and also the CARB/WSPA/GM RVP-DI study. (Jessup, Tr. 1559-60; CX 1246).

1100. Unocal provided the same data to WSPA that it had previously provided to CARB. (CX 7046 (Grey, Dep. at 42); RX 679).

1101. As the corporate representative on topic 18 of the subpoena to ExxonMobil, Dr. Hochhauser testified he was not aware of any writing which set forth “any agreement, understanding, or rule pursuant to which any data or information presented to WSPA ceased to be owned by its owner upon presentation to WSPA.” (CX 7049 (Hochhauser, Dep. at 54-56)).

1102. Nothing was said about patents or potential patent rights in Unocal’s presentation to WSPA. (Lieder, Tr. 4764).

2. Unocal Had No Duty to Disclose Its Patent Applications to WSPA

a. Unocal Had No Fiduciary Duty to WSPA Members

1103. At his deposition, Mr. Wang did not know what the term “fiduciary” meant and was unable to answer any questions, as WSPA’s Rule 3.33 designee, about fiduciary relationships among WSPA members, or about whether Unocal owed any “fiduciary duties” to other WSPA members. (CX 7070 (Wang, Dep. at 63-66)). Previously, however, he signed a declaration stating that WSPA did not have, nor has it ever had, documents in its custody or control “evidencing any fiduciary relationship between or among WSPA members.” (CX 7070 (Wang, Dep. at 63-66); RX 673). WSPA counsel also sent a letter to Unocal counsel confirming no such documents existed, and specifically stating that, “WSPA is presently aware of no such fiduciary relationships.” (CX 7070 (Wang, Dep. at 67-68); RX 674 at 006).

1104. WSPA specifically denied ever having documents evidencing any fiduciary relationship among the members. (CX 7070 (Wang, Dep. at 68); RX 673 at ¶4 (“WSPA does not possess or have custody or control of any documents evidencing any fiduciary relationship between or among WSPA members. Nor has it possessed or had custody or control of any such documents in the past.”); *see also* RX 674 at 006).

b. WSPA Members’ Status as Competitors Precluded Them from Sharing Potential Royalty or Other Pricing/Cost Information

1105. Lawyers counseled WSPA members on antitrust law, and specifically not to discuss competitively sensitive topics like pricing, costs, business plans and marketing and distribution plans. (Lieder, Tr. 4767; RX 523 at 004).

1106. Under WSPA’s antitrust policies, WSPA counsel identified “appropriate topics [for discussion at WSPA meetings],” which included “the scientific validity or effectiveness of RFG regulations” and “scientific advances in knowledge not accounted for in current regulations.” (RX 523 at 007). It also identified “inappropriate topics [for discussion at WSPA meetings],” which included “data or details regarding the fuels any company proposes to make or sell to comply with RFG regulations, the equipment needed to make the fuels or the quantities that can or will be made;” “the cost or feasibility of complying with RFG regulations,” and “whether the schedule for achieving compliance with RFG requirements should be changed due to cost, economic, equipment availability or permitting considerations.” (RX 523 at 007).

1107. WSPA’s Antitrust Policy stated, “In particular, there should be no discussion or exchange of information among members regarding past, present or future prices or any aspect of such prices (markups, discounts, allowances, credit terms or other pricing policies).” According to the Policy, “Nor should there be any discussion or exchange of information relating to the costs that

members have incurred or expect to incur or any aspect of those costs.” (CX 7070 (Wang, Dep. at 19-22); RX 670 at 007). In addition, “Discussion or exchange of other information that may be competitively sensitive should also be scrupulously avoided.” (CX 7070 (Wang, Dep. at 19-22); RX 670 at 007). These policies, although not necessarily the exact wording of this document, had been in effect throughout Mr. Wang’s time at WSPA. (CX 7070 (Wang, Dep. at 19-22); RX 670 at 007).

1108. Ms. Grey testified that at WSPA, “We have very strict antitrust counsel guidelines and business strategy is one of the items we do not discuss.” (CX 7046 (Grey, Dep. at 50-51)). Specifically, “we have had antitrust counsel guidelines that discouraged any discussion of patents or any other pricing or supply issues relating to our companies.” (CX 7046 (Grey, Dep. at 55-56)).

1109. WSPA members followed this guidance. (RX 671 at 003 (explaining to CARB WSPA’s “long-standing policy of avoiding any discussion, no matter how tangential, of prices or anticipated product availability. . . . This policy is religiously adhered to by WSPA”)).

1110. Within WSPA, patents and patent applications were not discussed, along with “[q]uite a few” other issues that were not discussed. (Jessup, Tr. 1481-82). Dr. Jessup testified, “In the WSPA meeting that I was always in—that I was in, there was always a lawyer present to prevent discussions of certain matters between competing companies.” (Jessup, Tr. 1481-1482). Dr. Croudace confirmed this also: “It was a group that our information was confined to the things that would not lead us to antitrust problems In fact we had—usually had a lawyer sitting there with us.” (Croudace, Tr. 603). Dr. Croudace specifically understood that they were not supposed to talk about cost information or intellectual property rights that companies might hold, for example, “not things that would lead us to anything that would be like price-fixing or something like that.” This included,

“[a]nything that would be dealing with how we make our products in the refineries, what our cost structure is, patents, patent pending, anything that is really exclusive to us.” (Croudace, Tr. 604-05).

1111. Within the Gasoline Issues Group, Mr. Lamb never discussed business plans, licensing plans, potential prices Unocal might charge, and potential or pending patent applications, he believed WSPA policies forbid its members to discuss such topics. (Lamb, Tr. 2264-65).

1112. Mr. Kulakowski knew that when he participated in his WSPA duties it was difficult to exchange cost information with other members of WSPA due to antitrust concerns. He understood it was something to be absolutely avoided. (Kulakowski, Tr. 4625-26).

1113. Mr. Wang, as WSPA’s Rule 3.33 designee, was not aware of any communications between WSPA and Unocal regarding royalty rates, license fees, and/or patents; and to his knowledge, WSPA never asked Unocal about potential patent rights, potential royalty rates, or potential license fees Unocal might receive someday. (CX 7070 (Wang, Dep. at 59-60)). Mr. Wang also confirmed that WSPA did not have, nor has it ever had, documents in its custody or control that relate to these topics. (CX 7070 (Wang, Dep. at 61); RX 673).

1114. Like Unocal, Shell did not provide cost numbers to WSPA in connection with the development of CARB Phase 2 regulations. (Banducci, Tr. 3546). Mr. Banducci testified that he never would have provided Shell's cost numbers for manufacturing CARB Phase 2 gasoline to other refiners, nor would he have discussed marketing plans or pricing with competitors. (Banducci, Tr. 3546-47). He never would have provided such cost numbers because, from his perspective, the competitive environment and danger of venturing into antitrust territory would keep him from doing so. (Banducci, Tr. 3546-47). It was a very well held practice and policy at Shell to not discuss operating or capital cost numbers with competitors. (Banducci, Tr. 3546-47).

c. Unocal Did Not Violate Any WSPA Processes or Procedures

1115. The only specific WSPA procedures the Complaint alleges were violated by Unocal relate to the Turner Mason cost study that WSPA commissioned in 1991. (*See* Complaint ¶¶ 56, 57, 87). According to the Complaint, this cost study, which estimated the costs of the proposed regulations on a cents-per-gallon basis, “could have incorporated costs associated with potential royalties flowing from Unocal’s pending patent rights.” (Complaint ¶ 57).

1116. WSPA’s corporate representative testified that, other than a dues dispute in 1997 (which has since been resolved), WSPA was aware of no WSPA policies or procedures that had been violated by Unocal. (CX 7070 (Wang, Dep. at 68-70)).

1117. Unocal, like many other companies, considered pending patent applications competitively sensitive and had a policy of not disclosing such information. (Jessup, Tr. 1473-74; CX 450; CX 7075 (Wood, Dep. at 12-13, 16-20, 28-29); CX 7067 (Toman, Dep. at 29-30)).

1118. No one ever instructed Mr. Kulakowski that he had an obligation to disclose Unocal’s pending patent application to WSPA. While he was supervising Turner Mason work on WSPA’s behalf, the pending ’393 patent application did not cross his mind. (Kulakowski, Tr. 4629).

1119. Dr. Lieder from Shell did not know of any written agreement or rule that would have required Unocal to disclose a pending patent application or a patent to WSPA. (Lieder, Tr. 4760).

1120. Meanwhile, Ms. Grey agreed that discussion of Unocal’s RFG patents was something WSPA’s antitrust guidelines would suggest is not an appropriate area to talk about at WSPA. (CX 7046 (Grey, Dep. at 57)). She testified that “[t]here was no discussion in any of the meetings, that I can recall, on patents at all.” (CX 7046 (Grey, Dep. at 50-51)).

1121. Dr. Lieder testified at trial that he would have had an expectation that patent applications would have been disclosed to WSPA. (Lieder, Tr. 4764-65). At his deposition in this case, however, he had testified that—based on his understanding of how proprietary material was to be handled in WSPA—he would have no expectations that patent rights would be discussed. (Lieder, Tr. 4764-65). That is because one of the things that WSPA members were told and scrupulously required to understand is that, in industry associations, you do not talk about supply, price, business plans, including anything from which one member could derive economic benefit versus another or for which there is a hint of collusion for the entire association deriving economic benefit. (Lieder, Tr. 4766).

1122. But Dr. Lieder confirmed that prior to February of 1994 (when the patent issued), there was never any mention of patent rights in WSPA’s discussions about data. (Lieder, Tr. 4764).

3. The '393 Patent Was Irrelevant to the Analysis Turner Mason Did for WSPA Because the Analysis Did Not Use Individual Refiner Costs

a. Turner Mason Relied on Prior Studies and Aggregated Data, and Made No Effort to Collect Current Individual Refinery Data or Any Current Information About Patents and Royalties

1123. WSPA contracted with Turner Mason in the early 1990s to create a report on the economics of reformulated gasoline. WSPA used outside contractors when the work involved competitively sensitive information, because the contractor could “de-identify data submitted by the companies,” whereas sharing the data internally at WSPA would raise antitrust concerns. (CX 7046 (Grey, Dep. at 79-81)).

1124. Mr. Cunningham also did a case study on ARCO EC-X because he was requested to do so by the Economics Issues Group. (Cunningham, Tr. 4320-21).

1125. Turner Mason did not perform a cost-effectiveness study. (Cunningham, Tr. 4309).

1126. Mr. Cunningham believes Sierra Research conducted a cost-effectiveness study. (Cunningham, Tr. 4309).

1127. Mr. Cunningham at Turner Mason began work on the WSPA study without a written agreement. (Cunningham, Tr. 4276).

1128. No written agreement between WSPA and Turner Mason for this work was produced or referred to in the hearing, and there is no evidence that any such agreement ever existed.

1129. Don Bea of Chevron was the Chairman of the Economics Issue Group, the group Mr. Cunningham was dealing with, although Mr. Cunningham's main contact at WSPA during the 1991 time frame was Mr. Mike Wang. (Cunningham, Tr. at 4302-03). Mr. Cunningham did not deal with the WSPA legal representative himself in his work he did for the WSPA studies. (Cunningham, Tr. 4302-03).

1130. Mr. Cunningham was not informed that WSPA required that a written agenda for major matters be discussed in advance of meetings and be reviewed by staff and a designated legal committee representative or general counsel before distribution to the committee or working group members. (Cunningham, Tr. 4352).

1131. During the time that Mr. Cunningham did his WSPA study work in 1991 no one gave him a document purporting to be WSPA's antitrust policy that he can recall. (Cunningham, Tr. 4352). Although an antitrust briefing occurred to the WSPA Economics Issue Group on June 26, 1991, Mr. Cunningham was not present for that briefing. (Cunningham, Tr. 4340-41; CX 1150).

1132. There was no separate agreement with any member company on the WSPA study that Mr. Cunningham recalled, and he had no separate agreement between himself and the individual

members of WSPA. In particular, there was no agreement between Unocal and Mr. Cunningham for the WSPA study. (Cunningham, Tr. 4276-77).

1133. When Turner Mason did its work for WSPA in 1991, it used the same LP model and the same assumptions that it had used in the Auto/Oil study completed the previous year. (RX 347 at 001). Mr. Cunningham assured WSPA that using the same information, “will have essentially no effect on the answers in our assessment of the economics [sic] impacts of CARB Phase 2 gasoline regulations.” (RX 347 at 001).

1134. In the 1990 Auto/Oil study, Turner Mason offered significant caveats about its work, noting, “this bulletin does not purport to present estimates of costs of producing what has come to be referred to as ‘reformulated gasoline.’” (RX 342 at 002). The report warned, “[c]ost estimates were based on the use of presently available refinery technology and therefore do not include provisions for potential technological improvements.” (RX 342 at 006). “Potential future technology improvements were excluded because they could not be quantified.” (RX 343 at 003).

1135. CX 1153, minutes of a July 8, 1991 WSPA meeting with Mr. Cunningham, states that the cost information should reflect impacts of the Federal Clean Air Act and that the oxygenate requirement will effect some of the costing relationships significantly. (Cunningham, Tr. 4344). Those minutes, however, do not show anyone from Unocal present at the meeting. (Cunningham, Tr. 4343; CX 1153).

1136. Mr. Cunningham has never seen meeting minutes from a July 23, 1991 meeting in Phoenix which he testified occurred. (Cunningham, Tr. 4303).

1137. In connection with the Turner Mason economic study, WSPA “made requests to companies to send substantial information to Turner Mason.” (CX 7070 (Wang, Dep. at 48)). Mr.

Wang could not recall, however, whether it was WSPA itself or Turner Mason that actually made the request to member companies. (CX 7070 (Wang, Dep. at 47-50)).

1138. When pressed repeatedly about “whether WSPA required its members to submit information that those members deemed to be competitively sensitive to Turner Mason,” Mr. Wang would only go so far as to testify that there was an “expectation” that members would submit data and that they were “encouraged” to do so. (CX 7070 (Wang, Dep. at 57)). He could not say members were “required” to submit data: “I can’t answer the question any other way than I have.” (CX 7070 (Wang, Dep. at 56-57)).

1139. Similarly, Ms. Grey was asked several times in various ways whether member companies were “required” to submit their competitively sensitive data, when WSPA contracted for a study, such as the economic study by Turner Mason. (CX 7046 (Grey, Dep. at 81-83)). She would not say that members were ever required to submit their competitively sensitive data to Turner Mason, the most she would say was there was an “expectation” they would do so. (CX 7046 (Grey, Dep. at 81-83)).

1140. With respect to the Turner Mason study he performed for WSPA, Mr. Cunningham previously testified that he did not ask any of the refiners for cost information and did not try to make a survey of what individual refinery costs were, but instead calculated the typical or average cost of the industry independently. (Cunningham, Tr. 4305). Mr. Cunningham also previously testified that no one on his staff asked any of the refiners what their costs were and they were not trying to make a survey. (Cunningham, Tr. 4306). Mr. Cunningham had an opportunity to review his deposition and make corrections to the testimony where he said he did not ask any of the refiners for cost information and that no one on his staff asked any of the refiners what their costs were, and he made two pages

of corrections to his deposition, but not a single change was made for his answers to those questions. (Cunningham, Tr. 4306-07).

1141. Mr. Kulakowski was involved on behalf of WSPA in directing the work performed with a refinery LP model by Mr. Cunningham of Turner Mason in an effort to estimate costs of CARB Phase 2 reformulated gasoline. (Kulakowski, Tr. 4623). The Turner Mason report did not include any costs from individual refiners. (Kulakowski, Tr. 4623-24).

1142. In 1991, Mr. Kulakowski was unaware of anyone collecting individual refining costs in connection with the Turner Mason study conducted on WSPA's behalf. (Kulakowski, Tr. 4627).

1143. Mr. Wang did not know whether WSPA ever asked Unocal or anyone else to give Turner Mason data on potential royalty rates that might be negotiated as a result of intellectual property. (CX 7070 (Wang, Dep. at 59)).

1144. CX 1155, a telecopy from Mr. Cunningham to Mr. Wang at WSPA, does not have any Table I of investment data, and the word royalty does not appear anywhere in CX 1155. (Cunningham, Tr. 4302-04; CX 1155).

1145. Mr. Cunningham knows there have been times when he actually sent out requests for information from WSPA members and did not receive responses back from all the members. (Cunningham, Tr. 4277).

1146. The request for a proposal from WSPA does not provide that the contractor is supposed to validate the model asking refiners for their individual cost information, nor does the request for a proposal state that the contractor is entitled to demand cost information from WSPA members or that the WSPA members have to give Mr. Cunningham cost information. (Cunningham, Tr. 4278-79; CX 1151). Calibration is an adjustment to fit the rates or material balances whereas a

validation is a more extensive process that actually opens up the model and allows it to reproduce history completely. (Cunningham, Tr. 4281).

1147. In CX 1152, Mr. Cunningham proposed that one model be used and stated that it was too costly and difficult to use multiple models since a survey would have to be done if multiple models were going to be used, meaning a survey of refiners. (Cunningham, Tr. 4282; CX 1152 at 002). Ultimately, a single model for the WSPA study was done. (Cunningham, Tr. 4282).

1148. Mr. Cunningham also told Ms. Nelhams that the tight schedule required reliance on existing models, pricing and supply and demand assumptions, and he proposed either modifying the assumptions consistent with Turner Mason projections or using the original Auto/Oil assumptions. (Cunningham, Tr. 4283; CX 1152 at 003).

1149. Mr. Cunningham told WSPA he would lay out his assumptions for WSPA's review and approval. (Cunningham, Tr. 4283).

1150. Mr. Cunningham's proposal (CX 1152) includes no statement that he will be requiring individual refiners to give individual cost information, or that individual members of WSPA will be required to tell him about potential intellectual property. (Cunningham, Tr. 4283).

1151. In Mr. Cunningham's letter to Ms. Nelhams, he enclosed proposed assumptions, most of which were taken from his recent work for Auto/Oil. (Cunningham, Tr. 4284). Mr. Cunningham received approval to use the Auto/Oil assumptions and base case from Doug Hopkins. (Cunningham, Tr. 4284; RX 347).

1152. Out of the entire list of tables enclosed with RX 347, only one table separates out royalties as a line item. (Cunningham, Tr. 4285; RX 347 at 002).

1153. The Auto/Oil Economics Bulletin, dated January 1992 as published, states that “[c]ost estimates were based on the use of presently available refining technology and therefore do not include provisions for potential technological improvements.” (RX 342 at 006). That bulletin does not say that potential technology costs were included. (Cunningham, Tr. 4287-88; RX 342 at 006).

1154. The Bulletin further states that AQIRP, the acronym for Auto/Oil Air Quality Improvement Program, and its consultants made numerous assumptions; that the consultants provided projections, data and computations based on their own independent perspectives and sources of information; and that the consultants’ contributions do not reflect the plans of individual program participants, each of which continues to develop its own approaches to improving air quality. (Cunningham, Tr. 4288-89; RX 342 at 006). RX 342 does not say information came from the individual refiners. (Cunningham, Tr. 4289). Mr. Cunningham acknowledged knowing that Unocal was one of the individual program participants in this context. (Cunningham, Tr. 4288-89; RX 342 at 006).

1155. Purvin & Gertz and Turner Mason were consultants to the Auto/Oil program, and provided the forecast or future supplies of raw materials and demands for all types of refined projects and pricing relationships as inputs to the refinery LP model. (Cunningham, Tr. 4288-89).

1156. RX 343, which Mr. Cunningham co-authored, was to provide the complete technical details to support the Auto/Oil Technical Bulletin, with the qualification that “calculated costs were based on commercially proven refining technology. Potential future technology improvements were excluded because they could not be quantified.” (Cunningham, Tr. 4290-91; RX 343 at 003).

1157. Mr. Cunningham and his co-authors observed in RX 343 that, “each oil company continues to conduct its separate research, planning, manufacturing, trading and marketing activities.” (Cunningham, Tr. 4291; RX 343 at 003).

1158. Mr. Cunningham elaborated, “as noted above, individual process unit costs were reviewed by oil industry experts on the Economics Committee,” but this paragraph does not discuss other costs being reviewed aside from these individual process unit costs. (Cunningham, Tr. 4292-93; RX 343 at 039).

1159. Curve type investment costs in RX 343 were said to have an inherent accuracy of only plus or minus 25%. (Cunningham, Tr. 4293; RX 343 at 039-040).

1160. A patent is not a cost to the patent holder. (Cunningham, Tr. 4293).

1161. In his work for Auto/Oil, Mr. Cunningham spoke with Mr. Gene Motte of Unocal, who reviewed the investment information and told Mr. Cunningham his numbers were 5% to 10% below what Unocal would have used in their internal numbers and that Mr. Cunningham’s entire royalty portfolio for process plans was 5% to 10% too low. (Cunningham, Tr. 4293-94).

1162. Mr. Cunningham testified that he estimated his own figure from information given to him by Mr. Motte, as well as information from Chevron, and put that combined figure into his linear program, although no antitrust lawyers were present when he asked Chevron or Mr. Motte for that information, and he never told any antitrust lawyer from WSPA that he aggregated information from the two companies and used it that way. (Cunningham, Tr. 4295-96).

1163. Mr. Cunningham does not know of any WSPA antitrust policy that would allow only two companies’ information to be aggregated. (Cunningham, Tr. 4296).

1164. RX 343 does not include any table of investment data like the one Mr. Cunningham included in his July 1991 letter to Ms. Nelhams, nor is there any table in this exhibit that separates out paid up royalties as a line item. (Cunningham, Tr. 4297; RX 343; RX 347).

1165. A July 12, 1991 letter from Mr. Cunningham reflecting changed assumptions and revised tables, does not attach any tables where royalty is shown as a line item. (Cunningham, Tr. 4347; CX 1158).

1166. In connection with work relating to API, Mr. Cunningham testified that he asked Mr. Motte of Unocal for royalty information on heavy gasoline hydrocracking, because he knew there was royalty information on hydrocracking, given that a number of people were licensing hydrocracking processes and each of them carried a licensing or royalty fee. (Cunningham, Tr. 4297). Mr. Cunningham did not know, however, whether Unocal had a patent on the technology. (Cunningham, Tr. 4297-98).

1167. Mr. Motte did not indicate whether the paid up royalty information provided to Mr. Cunningham was confidential. (Cunningham, Tr. 4298).

1168. Mr. Motte was looking at an investment table for gas, oil, and distillate hydrocracking, according to Mr. Cunningham, and indicated that the royalty amount was a little bit higher than the information Mr. Cunningham was using. (Cunningham, Tr. 4298-99). Mr. Cunningham knew this because Mr. Motte had a copy of the tables from the LP model that indicated paid up royalties on several different processes, but RX 341, which included the full set of final tables for the API screening study, does not have any tables showing royalties as a line item. (Cunningham, Tr. 4300-02; RX 341).

1169. Mr. Cunningham understood that Mr. Motte was referring to a page of basic investment data relating to paid-up royalties for individual process units, specifically taken from Auto/Oil work. (Cunningham, Tr. 4293-95; RX 347 at 005).

1170. Mr. Kulakowski, who worked at Unocal when Mr. Cunningham collected information for the WSPA study, confirmed that Mr. Cunningham used Unocal royalty data from a previous study without asking Unocal's permission. (Kulakowski, Tr. 4626-28). Mr. Kulakowski believes that the information originated with UOP. (Kulakowski, Tr. 4628). Like Mr. Cunningham (Cunningham, Tr. 4297-98), Mr. Kulakowski did not know whether the technology these royalty numbers related to was patented, a trade secret or if it was licensed knowhow. (Kulakowski, Tr.4627-28).

b. WSPA's Turner Mason Report Submitted to CARB for Phase 2

1171. Turner Mason prepared a report that WSPA submitted to CARB in connection with the Phase 2 rulemaking. (Courtis, Tr. 5877-78). While the Turner Mason report used refinery linear programs to predict costs, it was different than the approach CARB had intended to take (but never completed) with refinery linear programs. (Courtis, Tr. 5877-78). Specifically, the Turner Mason linear program model was a hypothetical representation of an average refinery, whereas, CARB had intended to build and validate models of five separate refineries. (Courtis, Tr. 5877-78). Turner Mason then used the hypothetical representation of an average refinery to estimate costs as a result of the Phase 2 regulations. (Courtis, Tr. 5877-78).

1172. CX 1106 is the actual study Mr. Cunningham did for WSPA, which reflects that others had been hired to evaluate cost-effectiveness, not Turner Mason, and suggests that CARB should exclude T50 from the Phase 2 regulations. (Cunningham, Tr. 4314). The study also indicates that

even minimal reformulation is going to require significantly more ether, which included MTBE. (Cunningham, Tr. 4315).

1173. In 1991, Mr. Cunningham knew that ARCO had process patents on MTBE and that ARCO had licensed that technology, and it was publically known what ARCO's license was in order to get their MTBE technology for an MTBE plant. (Cunningham, Tr. 4315-16). Notwithstanding this knowledge, Mr. Cunningham listed MTBE as a raw material cost. (Cunningham, Tr. 4316). Mr. Cunningham further admitted he used historical pricing to get his MTBE cost and then upped it by a half a cent a gallon and did not use royalty information to do so. (Cunningham, Tr. 4318-19).

1174. All of the calculated reformulation costs were based on modeling aggregation of refineries and do not apply to any individual refinery, and the probable real range of individual refinery costs would be wider than indicated. (Cunningham, Tr. 4319; CX 1106 at 019).

1175. CX 1106 also contains a discussion on individual property changes with cost curves as incremental costs on controlled properties. (Cunningham, Tr. 4319-20, CX 1106 at 037-042). No separate curve on T50 was done, however, because Mr. Cunningham did not consider T50 to be an independent variable. (Cunningham, Tr. 4319-20).

1176. Mr. Cunningham wrote a letter to Don Bea on or about July 9, 1991, informing him that a typical 8% DCFROI (discanted cash flow return on investment) in current dollars occurred with project post audits, which Mr. Cunningham did not share with CARB staff or the CARB Board. (Cunningham, Tr. 4345-47; CX 1157 at 002). Mr. Cunningham also told Mr. Bea there was much variability on risk factors, and that he had observed a number of projects where one or several risk factors made the real rate of DCFROI zero or negative, which he also did not tell the CARB Board or CARB staff. (Cunningham, Tr. 4346-47; CX 1157 at 003).

1177. CX 1106 reflects that the investment costs used in the LP models were estimated and had a plus or minus 25% accuracy figure. (Cunningham, Tr. 4321; CX 1106 at 062).

1178. No where in CX 1106 does Mr. Cunningham state he attempted to quantify potential technology cost or potential intellectual property cost. (Cunningham, Tr. 4321-22; CX 1106).

1179. Page 99 of CX 1106 has a Table I very similar to the Auto/Oil table attached to RX 347. (Cunningham, Tr. 4322; CX 1106 at 099; RX 347 at 005).

1180. A change made to the table included a reference to coker light gasoline desulfurization splitter with an acronym CGS in Table I; Mr. Cunningham added the CGS notation because additional processing was needed to reach low sulfur levels and he knew about that technology because a company called Merichem commercialized it. (Cunningham, Tr. 4322-23).

1181. Mr. Cunningham could not identify any other place in CX 1106, aside from Table I, where the term royalty is used, and each of the royalties listed in Table I is for paid up royalties is on individual process units. (Cunningham, Tr. 4323; CX 1106 at 099).

c. CARB Knew Turner Mason Did Not Include Individual Refinery Costs in the Material Provided to CARB

1182. WSPA communicated its antitrust policies to CARB over the years. (CX 7070 (Wang, Dep. at 27-28)). In March of 1990, for example, WSPA's antitrust counsel, Mr. Philip Verleger, specifically advised Mr. Peter Venturini of CARB that—as a trade association—WSPA could not discuss certain subjects with CARB. (RX 166 at 001). Those subjects included “market sector, market share, supply, cost, or strategies of individual companies to comply with the regulation.” (RX 166 at 001-002). Mr. Verleger explained, “Any [CARB] regulatory strategy based on obtaining such information through WSPA is therefore hampered by a broader public policy concern governing the conduct of a trade association and its members.” (RX 166 at 002).

1183. A June 20, 1995 letter from Mr. Henderson at WSPA to Ms. Jean Woeckener at CARB, informing CARB that WSPA would provide no opinion with respect to certain question relating to a draft questionnaire proposed by CARB, stated, “WSPA’s long-standing policy of avoiding any discussion, no matter how tangential, of prices or anticipated product availability because of the potential for the discussion to be misconstrued as an attempt to engage in anticompetitive behavior.” (RX 671 at 003). Mr. Wang agreed this accurately described WSPA’s policy, and that the policy was “religiously adhered to by WSPA.” (CX 7070 (Wang, Dep. at 34-35); RX 671 at 003).

1184. Mr. Henderson’s letter expressed concern that statements in CARB’s draft questionnaire implied that WSPA had “promote[d] the concept of a single gasoline formulation to be manufactured by all companies.” According to Mr. Henderson on behalf of WSPA, “To the contrary, the standards were mandated by CARB and gasoline formulations which could comply with the standards has [sic] been pursued by each company on an individual and highly competitive basis.” (RX 671 at 002). Mr. Wang confirmed this was an accurate reflection of WSPA’s view as expressed to CARB at that time. (CX 7070 (Wang, Dep. at 36-37); RX 671 at 002).

1185. Mr. Cunningham did not survey individual companies on their individual understandings relating to gasoline prices and costs, and he underscored this point in his comments to CARB at the hearing: “There was no survey made, because of antitrust considerations on individual companies’ data.” (CX 773 at 217-218).

1186. The Turner Mason report submitted to CARB states, under limitations, “no individual refinery cost (proprietary/antitrust preclude).” (Cunningham, Tr. 4323-24; CX 1106 at 073).

1187. From CARB's side, Mr. Venturini acknowledged that he knew the Turner Mason report did not include individual refinery costs, and he understood that the reason the Turner Mason report did not include individual refinery costs was a concern by Turner Mason as to whether antitrust law would preclude them from getting that information. (Venturini, Tr. 796-97).

1188. Mr. Venturini does not have a personal recollection of actually reading the Turner Mason report at any time. (Venturini, Tr. 798).

1189. The Turner Mason report biased the estimating accuracy to the high side calculating investment costs with the cost range of -15 +35%. (Venturini, Tr. 801-02).

1190. To Mr. Venturini's personal knowledge, CARB staff did not rely on page 99 of CX 1106 in proposing regulations to the Board in 1991. (Venturini, Tr. 807; CX 1106 at 099).

1191. Mr. Venturini was unaware of whether the column "Royalty \$ MMPDR" meant paid up royalty. (Venturini, Tr. 807; CX 1106 at 099).

1192. Mr. Courtis and CARB staff criticized Turner Mason's methodology. In particular, Mr. Courtis would have used different assumptions and methodologies for the analysis, and believed Turner Mason included costs that it should have left out. (Courtis, Tr. 5879-81). Further, CARB staff criticized Turner Mason for trying to do a property-by-property incremental analysis. (Courtis, Tr. 5879-81).

1193. Mr. Aguila recalls that staff had issues with the linear programming cost estimates done by Turner Mason and thought that what Turner Mason had done was "strange." (CX 7040 (Aguila, Dep. at 108-09)). He specifically recalls that the approach Turner Mason took to develop a composite refinery represented a further deviation from an actual refinery. (CX 7040 (Aguila, Dep. at 108-09)).

1194. Mr. Aguila also took issue with some assumptions Turner Mason imputed into their model, to the extent that he felt the results would be suspect. (CX 7040 (Aguila, Dep. at 110)).

1195. Ms. Jananne Sharpless, who chaired the CARB Board at the time, assumed that the Turner Mason, DRI/McGraw-Hill, and Sierra Research studies were on the high end on a range of scale of things. (CX 7063 (Sharpless, Dep. at 119)). Each conducted different types of cost-effectiveness analyses to Ms. Sharpless' recollection, and all three of those studies found a much higher figure for cost-effectiveness analysis than CARB staff found. (CX 7063 (Sharpless, Dep. at 118)).

1196. In looking at information as a whole, Ms. Sharpless tends to believe a more neutral party is apt to have a more neutral view of the world, and it has been her experience in regulatory proceedings that when it comes to cost-effectiveness industry estimates tend to be on the high side. (CX 7063 (Sharpless, Dep. at 118-19)).

1197. Ms. Sharpless doubts that she reviewed Turner Mason's report in its entirety at the time CARB received it. (CX 7063 (Sharpless, Dep. at 174)).

1198. The October 1992 "Final Statement of Reasons for Rulemaking, Including Summary of Comments and Agency Response," (CX 10), includes the following CARB response concerning Turner Mason's work:

The Turner Mason LP model is claimed to be designed to be representative of an 'average' California refinery. Moreover, within California, there is great variability among individual refineries. On the one hand, newer refineries, such as Arco's, may provide for reduced compliance investment requirements due to the synergism found relative to the efficiency associated with newer technology

equipment. On the other hand, older refineries would require increased investment requirements, due to the limitations associated with older process units.

(CX 10 at 083).

1199. “We believe that Turner Mason incorporated very conservative assumptions into the LP model which would tend to increase the result and cost of compliance,” CARB further responded in the Final Statement of Reasons. Therefore, “[t]he end affect [sic] is that the model results will be skewed towards a higher cost.” (CX 10 at 083).

1200. As the Final Statement of Reasons explains:

When calculating cost-effectiveness, staff attempted to be conservative whenever accurate information was not available. With respect to the cost of compliance, staff has confidence in the estimated investment costs requirements provided by refiners because these estimates represent actual impacts on the specific refineries, not hypothetical projections provided by the linear programming model developed by Turner Mason for the oil industry cost study.

(CX 10 at 085).

d. Mr. Cunningham of Turner Mason Criticized CARB’s October 4, 1991 Staff Proposal

1201. In a Turner Mason “Critique of 10/4/91 CARB Staff Report,” dated November 6, 1991, Mr. Cunningham, along with others at Turner Mason, criticized the October 4, 1991 CARB staff proposal, contending that property limits should be separated out for proper analysis. (Cunningham, Tr. 4307-08; RX 501 at 001).

1202. Mr. Cunningham criticized the CARB staff proposal by pointing out that the costs were composite costs and not broken out by single property limits, and that the composite costs selected by CARB staff were 40% too low. (Cunningham, Tr. 4308; RX 501 at 001).

1203. Mr. Cunningham also identified the capital cost used by CARB staff as 40% to 50% too low. (Cunningham, Tr. 4309; RX 501 at 001).

1204. Mr. Cunningham said that the return on investment used was too low. Using a lower return on investment leads to a lower overall cost figure. (Cunningham, Tr. 4309; RX 501 at 001).

1205. Mr. Cunningham further stated that, “[t]here is no need for the proposed flat limits, nor the T50 limit, which cannot be readily controlled.” (Cunningham, Tr. 4310; RX 501 at 002).

1206. A discussion had occurred of the status of CARB LP models, according to Mr. Cunningham, which indicated that the models had not been fully validated and were way behind schedule; there is no statement, however, that CARB staff was abandoning its LP model approach. (Cunningham, Tr. 4310-11; RX 501 at 003).

1207. Mr. Cunningham concluded that the author of CARB’s proposal lacked adequate refining and gasoline blending technology background, but Mr. Cunningham never told CARB or CARB staff that view. (Cunningham, Tr. 4311).

1208. Mr. Cunningham also stated in Turner Mason’s critique that CARB staff incorrectly assumed they could estimate other annual costs, raw materials, and operating investment costs at 50%, whereas Turner Mason’s study showed an 80% relationship between operating and annual costs, and that the cases showed a range of 40% - 500%. (Cunningham, Tr. 4312; RX 501 at 004). He never told the CARB staff or CARB Board that, depending on the case, his cases showed a 40% - 500% range for raw material and operating costs. (Cunningham, Tr. 4312).

1209. Mr. Cunningham elaborated in RX 501 that there is no uniform percent because raw materials, operating costs, and capital costs compete with each other in optimizing the linear program. (Cunningham, Tr. 4312-13).

1210. Mr. Cunningham concluded in Turner Mason's criticism of the CARB staff proposal that for maximum cost-effective pollution reduction, the legislature and CARB should consider proposing taxes, controls, and incentives to get vehicles that are super-emitters off the road, but he never gave that conclusion to the CARB staff or CARB. (Cunningham, Tr. 4313; RX 501 at 004).

1211. What CARB adopted was not a proposal or scenario Mr. Cunningham had analyzed in the report Turner Mason submitted to CARB on behalf of WSPA. (Cunningham, Tr. 4314).

1212. Mr. Cunningham felt that the approach CARB was proposing was not the most cost-effective. (Cunningham, Tr. 4313).

e. WSPA and Turner Mason at the November 1991 CARB Meeting

1213. WSPA released its final report on the anticipated costs of complying with CARB's Phase 2 standards on November 18, 1991. (CX 1106 ("WSPA Study of the Cost Impacts of Potential CARB Phase 2 Gasoline Regulations")).

1214. CX 280 is a handout Mr. Cunningham also provided to CARB staff on November 7 or 8, 1991, which warns that industry studies cannot be made with individual refinery costs, facilities, raw materials, product slates, and specifications—information that is proprietary and limited by antitrust concerns. (Cunningham, Tr. 4339; CX 280 at 038). Groups of three or more refiners must be used in order to make the results public. (Cunningham, Tr. 4340; CX 280 at 038). Mr. Cunningham or someone on his staff wrote that statement; and Mr. Don Bea (or someone else at WSPA) also reviewed and agreed to the language. (Cunningham, Tr. 4338-39; CX 280 at 038).

1215. Mr. Cunningham was present at the November 1991 CARB Board meeting over the two-day period. (Cunningham, Tr. 4325). CX 773 is a transcript from the meeting on November 21, 1991. (Cunningham, Tr. 4324-25; CX 773).

1216. As reflected at page 29 of the transcript, Mr. Fletcher from CARB stated that emissions reduction analysis was done through the use of Auto/Oil regression analysis and that T50 impacts were not reflected in that regression equation, something Mr. Cunningham understood at the time. (Cunningham, Tr. 4325-26; CX 773 at 029).

1217. Mr. Caccamo also spoke at this CARB meeting on behalf of WSPA, and said that the cost of the new gasoline was not 16¢ but closer to 23¢ a gallon, a figure Mr. Cunningham believed came from the Turner Mason study. (Cunningham, Tr. 4326-27).

1218. Mr. Caccamo also answered at the November Board meeting, in response to a question from Board member Lagarias, that the cost estimates were not based on the current proposal in front of the Board but on the original staff proposal. (Cunningham, Tr. 4327).

1219. The Turner Mason study did not attempt to balance interest, as Mr. Caccamo describes on page 197 of CX 773. Part of what Mr. Cunningham told the CARB Board was that he had a hard time analyzing something that was not fully defined, and that to try and do something like that would be speculation. (Cunningham, Tr. 4328; CX 773 at 215).

1220. Mr. Cunningham explicitly informed the CARB Board that no survey was undertaken because of antitrust considerations on individual companies' data. (Cunningham, Tr. 4329-30).

1221. Mr. Cunningham also told the Board that MTBE had been accounted for as a raw material cost and not as an operating or capital cost. (Cunningham, Tr. 4330).

1222. Mr. Cunningham stated to the Board that T50 is not controllable and that they should consider eliminating T50 from the regulations. (Cunningham, Tr. 4330). He went on to explain to the board that processing to control T50 was new technology, not known to man. (Cunningham, Tr.

4330-31). With technology that is less developed one normally includes a larger contingency. (Cunningham, Tr. 4330-31).

1223. Every change to properties in the Phase 2 regulations that the CARB Board made, in comparison to the November 21, 1991 proposal, after hearing Mr. Cunningham's presentation and others who participated, was more rigid than what was initially proposed. (Cunningham, Tr. 4351).

4. Despite Knowing of the '393 Patent During Development of the Predictive Model, WSPA Did Not Advocate for a Model with No Caps or Limits on Properties, which Unocal Sought

1224. When WSPA formed its Predictive Model Working Group sometime in 1991, its purpose was to develop a predictive model to use in discussions with CARB so CARB would adopt a predictive model for its Phase 2 regulations. (CX 7049 (Hochhauser, Dep. at 41)).

1225. Dr. Lieder testified that the focus of the WSPA predictive model group was to assemble the largest, most technically and scientifically sound data base that WSPA could share with CARB while working with it in building a predictive model. (Lieder, Tr. 4687).

1226. The group, which included Dr. Jessup, shadowed CARB during the period 1991 to 1994 and used the same mega-dataset CARB was using in the development of its predictive model, in order to "follow along what CARB was doing," as well as to develop WSPA's own predictive models from the dataset. (Jessup, Tr. 1477-79).

1227. In September 1991, Dr. Jessup was gathering data sets to use in the development of a predictive model that could be offered to CARB. (CX 7046 (Grey, Dep. at 45)). WSPA considered it important "that anything we produce is scientifically and technically robust." (CX 7046 (Grey, Dep. at 44-45); RX 679).

1228. WSPA ultimately did develop a potential predictive model for submission to CARB. (CX 7046 (Grey, Dep. at 47)).

1229. WSPA believed that a predictive model would give more flexibility to the refiners than a set of specifications would. (CX 7046 (Grey, Dep. at 54)). In addition, WSPA believed that it would be a more cost-effective way to do the regulations. (CX 7046 (Grey, Dep. at 54)). WSPA continues to hold these views. (CX 7046 (Grey, Dep. at 54-55)).

1230. One thing that WSPA understood was important to CARB was that CARB did not want any “back-sliding,” in terms of changes to the emissions benefits. (CX 7046 (Grey, Dep. at 75)).

1231. CARB delayed the development of the predictive model. (RFF 782-83). CX 315, an internal WSPA memo dated August 31, 1992, set forth the general industry belief that CARB’s “[d]elay or deferral of the predictive model will further limit planning for flexibility offered by the model and will eventually deny the accompanying cost-effectiveness from the use of the predictive model.” (CX 315 at 002). WSPA and Unocal shared this view. (Kulakowski, Tr. 4544-45).

1232. Dr. Jessup offered to take the different sets of data that had been made available to the group and combine them. (Lieder, Tr. 4694). On October 4, 1991, Dr. Jessup presented the combined data sets to the group. (Lieder, Tr. 4706-07). The combined data sets included data from Unocal, Auto/Oil and the GM/WSPA/CARB study. (Lieder, Tr. 4761). It also included data from the Chevron Driveability Development Test, often referred to as “DI.” (Lieder, Tr. 4763-64; CX 1563). Peter Jessup was one of two individuals who was really helping the predictive model group to move forward in its process. (Lieder, Tr. 4710).

1233. When CARB released a version of a predictive model, “WSPA would do an analysis of the model that CARB had produced . . . and go and complain about things they didn’t like.”

(Jessup, Tr. 1478-79). During this time period, CARB “came out with a string of models. They would come out with a model and WSPA would have some input into it and they would come out with another, and that went on nine or ten times.” (Jessup, Tr. 1480).

1234. There were two committees at WSPA working on the development of the predictive model. (Kulakowski, Tr. 4532). One was the Technical Group, which worked primarily with the issues surrounding the data base; the other was the Policy Group, chaired by Mr. Kulakowski, which worked on how the model would be integrated into the regulatory scheme. (Kulakowski, Tr. 4532-33). WSPA formed the Policy Group because CARB was raising non-technical issues with the Technical Group, and the Technical Group was not well equipped to handle those issues. (Kulakowski, Tr. 4533).

1235. Mr. Kulakowski’s Policy Group was to make recommendations to CARB regarding what to do in the adoption of the predictive model. (Kulakowski, Tr. 4646).

1236. While chair of the WSPA Predictive Model Policy Group, Mr. Kulakowski was employed by Unocal until 1993, and worked at Texaco after 1993. (Kulakowski, Tr. 4512-13 (1993 change in employment), 4536-37 (chair of policy group), 4642 (chair of policy group during Phase 2), 4550 (head of predictive model policy group in 1994 timeframe)).

1237. Mr. Kulakowski continued to work for WSPA on the predictive model in and after 1993. (Kulakowski, Tr. 4642). During that period, Unocal was pushing for adoption of the Federal RFG model which did not have caps on T50. (Kulakowski, Tr. 4642).

1238. A month before CARB adopted its predictive model, Unocal, through Dr. Peter Jessup, told WSPA that its desire was for a predictive model with no caps on any fuel properties, including

no caps on T50. (Kulakowski, Tr. 4644-45; CX 1762 at 002, 037). At the time, Mr. Kulakowski was aware both of Unocal's desire for no caps and of the '393 patent. (Kulakowski, Tr. 4644-45).

1239. Mr. Kulakowski, as a Texaco employee and chair of WSPA Predictive Model Policy Group, was fully aware of the issuance of the '393 patent and Unocal's desire that there be no caps on any fuel property, including T50, in the predictive model; Mr. Kulakowski recommended to CARB, on behalf of WSPA, that it adopt a predictive model with caps on fuel properties. (Kulakowski, Tr. 4646-47).

1240. Despite his knowledge of both the issuance of the '393 patent and Unocal's desire that there be no caps on any properties in the predictive model, WSPA never told CARB that the predictive model should not have any caps or limits applied to it. (Kulakowski, Tr. 4550-51).

1241. Mr. Kulakowski attended the CARB hearing on the amendments to the Phase 2 regulation, including the predictive model on June 9, 1994. (Kulakowski, Tr. 4552-53).

1242. Again knowing of both the issuance of the '393 patent and of Unocal's opposition to caps on the properties of the predictive model, Mr. Kulakowski, as an employee of Texaco and representative of WSPA, testified at the June 9, 1994 CARB hearing on the predictive model that "WSPA's approach in the development of the predictive model has been that the final model must address three issues to be acceptable. First, it could not reduce the enforceability of the regulations. Second, it had to ensure the emissions benefits of the Phase 2 program. And finally, it had to provide flexibility to gasoline producers. We believe the model being proposed by the staff today addresses these three issues, with positive results." (Kulakowski, Tr. 4554).

1243. WSPA did not recommend adoption of, and CARB did not adopt, the Unocal emissions equations set forth in CX 22. (Kulakowski, Tr. 4650-51).

1244. After Mr. Kulakowski joined Texaco, and after he and the company knew the '393 patent issued, Mr. Kulakowski and Texaco advocated to CARB in favor of adoption of the CARB predictive model and told CARB that it would save Texaco 2-3 cents per gallon in production costs. (Kulakowski, Tr. 4651-52; RX 161).

1245. While aware of the existence of the '393 patent, Mr. Kulakowski and Texaco also informed CARB that it was their view that the CARB Phase 2 model ultimately adopted was cost-effective. (Kulakowski, Tr. 4652). At no time did Mr. Kulakowski or Texaco tell CARB that the CARB Phase 2 predictive model was not cost-effective because of the '393 patent. (Kulakowski, Tr. 4652-53).

V. COMPLAINT COUNSEL CANNOT PROVE THAT UNOCAL HAS, OR IS DANGEROUSLY LIKELY TO ATTAIN MONOPOLY POWER

A. Complaint Counsel Have Failed to Establish that Unocal Has Market Power in the Alleged Relevant Gasoline Market

1246. The Complaint alleges that Unocal has obtained and exercised market power in a relevant market for CARB-compliant summertime reformulated gasoline produced and supplied for sale in California. (Complaint ¶¶ 73, 75).

1247. Complaint Counsel have not presented evidence supporting the existence of any market power or dangerous probability of success of obtaining such market power in this alleged relevant gasoline market. Complaint Counsel's economic expert, Professor Shapiro, offered no opinions with respect to whether Unocal has obtained or exercised monopoly power in this alleged relevant market. (Shapiro, Tr. 7326; CX 1720A; CX 1799A).

1248. Professor David Teece, one of Unocal's economic experts, opined that Unocal does not have, and never has had, market power in the gasoline market in California. (Teece, Tr. 7525;

RX 1162A at 044-046). Unocal exited from the gasoline market in California when it sold its California refining and marketing operations to Tosco in 1997; its market share today is zero. (Teece, Tr. 7526; RX 1162A at 044).

1249. Even when Unocal was a participant in the gasoline market, its market share was only approximately 15 percent. (Teece, Tr. 7525-26; RX 1162A at 045). This amount is far below any threshold that an economist would consider as supporting an allegation of market power. (Teece, Tr. 7525-26). In Professor Teece's opinion, this level of market share is inconsistent with the possession of monopoly power or a dangerous probability of success of obtaining such power. (RX 1162A at 045).

1250. Professor Teece opined that a scenario in which Unocal could re-enter the gasoline market by forcing refiners to sell their refining and marketing operations to Unocal would be extremely unlikely. (Teece, Tr. 7526-27). Such a scenario is not consistent with Unocal's business strategy. (Teece, Tr. 7527). Moreover, Unocal has demonstrated a willingness to license its technology, which calls into question the viability of any strategy under which Unocal would leverage its patent portfolio to enter the refining market in California. (Teece, Tr. 7527, RX 1162A at 045). And, should Unocal ever attempt such a strategy, it is likely that the Federal Trade Commission would intervene to block Unocal from gaining market power through the acquisition of California refineries. (Teece, Tr. 7527, RX 1162A at 045-046).

B. Complaint Counsel Have Failed to Establish that Unocal Has Market Power in the Alleged Technology Market

1251. Professor Shapiro opined that there is a "relevant market for low emissions RFG technology required to produce gasoline compliant with CARB's summertime RFG regulations." (CX 1720A at 021). Professor Teece agreed that Professor Shapiro's definition of a technology

market is reasonable. (Teece, Tr. 7528). Professor Shapiro's defined technology market, however, is not the one defined in the Complaint in this proceeding. (Complaint ¶ 74; Teece, Tr. 7528; RX 1162A at 046-047).

1. There Is No Direct Evidence of Monopoly Power

1252. Professor Shapiro also opined that Unocal possesses monopoly power in this technology market. (CX 1720A at 026-031). Professor Shapiro claimed the fact that Unocal has received and is seeking to charge a patent royalty greater than zero for gasoline made or sold in California is "direct evidence" of Unocal's monopoly power. (Shapiro, Tr. 7427-28, *in camera*; CX 1720A at 026-027, CX 1799A at 002).

1253. Professor Shapiro began his analysis by assuming that Complaint Counsel will prove the allegation contained in ¶ 3 of the Complaint: "Through its knowing and willful misrepresentations and other bad faith, deceptive conduct, Unocal created and maintained the materially false and misleading impression that it did not possess, or would not enforce, any relevant intellectual property rights that could undermine the cost-effectiveness and flexibility of the CARB RFG regulations." (Shapiro, Tr. 7117-18; CX 1720A at 010). Professor Shapiro described this allegation as the principal basis for his opinions. (Shapiro, Tr. 7117-18).

1254. Starting with this assumption, Professor Shapiro opined that the process undertaken by CARB to gather information from parties interested in the proposed CARB RFG regulations was "technology competition in action," i.e., a competition among owners of competing technologies for RFG to get their technology adopted by CARB in a forthcoming RFG regulation. (Shapiro, Tr. 7180-81; CX 1720A at 014-015).

1255. Next, Professor Shapiro asserted, based on his assumption, that Unocal offered its technology on a non-proprietary basis in order to influence CARB to get its technology adopted. (CX 1720A at 015). Any statements in Professor Shapiro's reports to the effect that "Unocal made its technology available on a non-proprietary basis" or "offered its patents on a royalty-free basis" are not assertions of fact by him, but rather only reflect his standing assumption. (Shapiro, Tr. 7131-33).

1256. Professor Shapiro then stated, "We know from direct observation of the actual technology market in operation that Unocal's competitive offer for its RFG technology was a royalty of zero." (Shapiro, Tr. 7075; CX 1720A at 015). Professor Shapiro's "observation" of a royalty-free offer is an assumption he made, not an opinion to which he testified. (Shapiro, Tr. 7185). The assumption that Unocal made a royalty-free offer of its patents to CARB in 1991 is a fundamental basis of Professor Shapiro's analysis and opinions. (Shapiro, Tr. 7242).

1257. From this "observation," Professor Shapiro opined that, "a royalty rate of zero is the competitive price for the technology that Unocal developed and ultimately patented." (CX 1720A at 015; Shapiro, Tr. 7427-28). This opinion, that the "competitive price" for Unocal's valuable RFG technology is "zero" is the fundamental lynchpin of Professor Shapiro's conclusion that Unocal is a monopolist. (Shapiro, Tr. 7242).

1258. Professor Shapiro has no formed no opinion about whether the evidence in the record actually supported his principal assumption. (Shapiro, Tr. 7118). Professor Shapiro acknowledged that if this assumption is not proven to be true, then there is no support for a finding that Unocal engaged in anti-competitive behavior and no support for his opinion that any market power Unocal may have was acquired through anti-competitive means. (Shapiro, Tr. 7118).

1259. There is no evidence to support the underlying assumptions upon which Professor Shapiro based his “direct evidence of Unocal’s market power.” First, there is no evidence that either CARB or Unocal believed Unocal had made a royalty-free offer of any patent rights it might someday obtain. (RFF 1260-76, *infra*). Second, there is no evidence that Unocal made any statements in the context of a “technology competition” from which a competitive price could be derived. (RFF 1277-82, *infra*).

a. There Was No Evidence at Trial that Unocal Offered a Royalty-Free License to Its Patents

1260. The text of the August 27, 1991 letter makes no mention of a pending patent application or intellectual property rights, much less a “royalty-free license.” (CX 29).

1261. In the last paragraph of Mr. Lamb’s letter, when he stated that he now considered “this data to be non-proprietary and available to CARB,” Mr. Lamb meant that Unocal was lifting the confidentiality of the data and that he intended to convey to CARB that CARB could now use Unocal’s data base, not that he intended to grant a royalty-free license. (Lamb, Tr. 2238, 2254-55).

1262. Mr. Lamb testified that when he wrote the August 27, 1991 letter to CARB, he did not intend to give up any future rights Unocal might have if a patent were to issue some day. (Lamb, Tr. 2254-55). Mr. Lamb had no authority to make any such royalty-free offer on behalf of Unocal. (Lamb, Tr. 2255). Mr. Roger Beach never authorized Mr. Lamb to give up Unocal’s patent rights or to offer anyone a royalty-free license on any patent that might issue to Unocal. (Beach, Tr. 1768). In fact, Mr. Beach stated that he did not even have the authority to authorize Mr. Lamb to make such offers or to make such offers himself. (Beach, Tr. 1768). No member of the Fuels Issues Team—including Mr. Lamb—had any authority to give up Unocal’s potential intellectual property rights in communicating with CARB. (Miller, Tr. 1451-52).

1263. Unocal's internal memoranda from 1991 confirm that Unocal believed it was releasing the confidentiality of its data; not granting a royalty-free license to any patents that it might someday receive. (CX 266; CX 1755). The first memo, minutes of an August 22, 1991 Fuels Issues Team meeting, states clearly that Unocal intended to "notify CARB that it will waive its rights to confidentiality of the 5/14 project data." (CX 266 at 004). The second memo—written by Mr. Lamb the day after he sent the August 27, 1991 letter to CARB—updated Mr. Beach on the status of Unocal's equivalency assurance efforts. (Lamb, Tr. 2262; CX 1755). Mr. Lamb informed Mr. Beach that CARB had advanced from agreeing to consider a predictive model to proposing that a model be included as a certification alternative along with a recipe fuel and vehicle testing. (Beach, Tr. 1767-68; CX 1755, referred to in testimony as CX 263). Mr. Lamb then told Mr. Beach, "we have agreed to make our 514 data public." (Lamb, Tr. 2263; CX 1755). This was a direct reference to the August 27, 1991 letter lifting the confidentiality of Unocal's data base. (Lamb, Tr. 2262-63).

1264. Similarly, there was no evidence that CARB considered this letter to be a royalty-free offer for Unocal's patents. Mr. Venturini testified that at the time CARB received the letter, the thought did not occur to him that it had anything to do with patent rights. (Venturini, Tr. 821-22).

1265. Mr. Boyd, the CARB staff member to whom the letter was directed, testified that he was familiar with the subject matter of Mr. Lamb's letter. (Boyd, Tr. 6710-11). Mr. Boyd testified that CARB had learned that Unocal had undertaken an extensive scientific study and was interested in acquiring the data from this study. (Boyd, Tr. 6710-11). Mr. Boyd recalled that Unocal originally had deemed its data to be confidential, but that he learned at some point "that Unocal intended to make that data available, that a letter and the data were coming to the agency. And ultimately I was informed that the letter had arrived." (Boyd, Tr. 6711-12).

1266. No witness from CARB testified that he or she believed Unocal had made a royalty-free offer to license any patents it might receive. No one from CARB ever told Mr. Lamb that Unocal had given its patent rights away. (Lamb, Tr. 2324). No one from CARB ever told Mr. Lamb that they believed Lamb's August 27, 1991 letter conveyed a royalty-free license to any potential RFG patents that Unocal might receive. (Lamb, Tr. 2256). There are no documents from CARB that state or imply that Unocal had granted a royalty-free offer to license any future patents.

1267. Instead, the documents and testimony relating to the events of 1995—when CARB first learned of Unocal's '393 patent and Unocal's intent to license—show that CARB did not believe that Unocal had granted a royalty-free license to Unocal's patents. (RFF 826-30, *supra*; RFF 1268, *infra*).

1268. The memo that CARB's Mr. Jim Ryden drafted in March 1995 does not state or imply that Unocal had already granted a royalty-free license to its patent by sending its August 27, 1991 letter to CARB. (CX 812). Moreover, in April 1995, CARB requested permission from Unocal that it be allowed to infringe Unocal's patent in April of 1995 for the limited purpose of its upcoming test program. (Boyd, Tr. 6738, 6818; Lamb, Tr. 2257-60; CX 50; CX 49). In the exchange of correspondence on this request, CARB never suggested that Unocal could not enforce its patent rights, nor did CARB suggest that Unocal had already granted a license to its patents. (CX 50).

1269. Professor Shapiro could not point to a single statement or a single document that would constitute this alleged "royalty-free" offer by Unocal. (Shapiro, Tr. 7282, 7286). He testified that he was not aware of any contemporaneous evidence that Unocal intended to make a royalty-free offer in 1991. (Shapiro, Tr. 7275). He did not know when the alleged royalty-free offer was made by Unocal, nor did he know who made this alleged "royalty-free" offer. (Shapiro, Tr. 7278-29, 7281).

Likewise, Professor Shapiro was unable to name the individual to whom the alleged royalty-free offer was made. (Shapiro, Tr. 7281). Professor Shapiro agreed that, unless Unocal had some economic incentive or motivation to make a “royalty-free” offer, it might be difficult for the fact finder to believe that Unocal would give away for free something as potentially valuable as its RFG patents. (Shapiro, Tr. 7287).

1270. Professor Teece opined that there was no reasonable basis for Professor Shapiro’s opinion with respect to direct evidence of monopoly power because it is based upon assumptions that cannot be grounded in the facts of this case. (Teece, Tr. 7528-35; RX 1162A at 073-078, 080-086).

1271. Professor Teece described Professor Shapiro’s “chain of logic” as follows: “that Unocal offered up its patents to CARB royalty-free. It did so in the context of what he (Professor Shapiro) calls a technology competition. Therefore, since competition was involved, the price of zero, he assumes, must be the competitive price.” (Teece, Tr. 7528). Professor Teece noted that Professor Shapiro’s “chain of logic” reaches the conclusion that since the competitive price for Unocal’s patents is zero, anything greater than zero indicates that Unocal has market power. (Teece, Tr. 7528).

1272. Professor Teece testified that for a number of reasons Professor Shapiro’s assumption that Unocal’s August 27, 1991 letter was the economic equivalent of royalty-free license lacked any support in the record. (Teece, Tr. 7529-30).

1273. First, Professor Teece has read hundreds of technology transfer agreements over the years. (Teece, Tr. 7530). He testified that in his opinion the August 27, 1991 (CX 29) letter simply does not resemble an agreement to license or transfer technology. (Teece, Tr. 7530).

1274. Second, Professor Teece noted that the record does not support an assumption that Unocal was granting a royalty-free license to its patents, since there is no evidence that either Unocal or CARB believed that there had been a royalty-free grant of Unocal's patent rights. (Teece, Tr. 7530-31).

1275. Third, Professor Shapiro's assumption that the designation of research data as "non-proprietary" is the equivalent of a royalty-free offer of patent rights is contrary to the common and established practice of publishing research data in advance of the granting of patent rights arising out of that same research. (RX 1162A at 014, 077-078). As a scholar in the field of innovation, Professor Teece opined that it was not reasonable to infer anything about the existence of patent rights from a company's agreement to make data available or to publish research results. (Teece, Tr. 7531, RX 1162A at 014, 077-078). Professor Teece explained that in his extensive experience studying the management of technology and the commercialization of new technology, it is common for companies to publish their research results and to subsequently receive patents and licensing revenues. (Teece, Tr. 7531-32; RX 1162A at 014). Professor Teece gave an example of the Cohen-Boyer patent relating to gene-splicing technology. (Teece, Tr. 7532; RX 1162A at 077-078). The researchers published the results of their research, and no one assumed that the publication of the research meant that there would never be any patent rights. (Teece, Tr. 7532; RX 1162A at 077-078). In fact, the researchers subsequently received a patent on their gene-splicing invention and the universities who owned the patent received hundreds of millions of dollars in licensing fees. (Teece Tr. 7532; RX 1162A at 077-078).

1276. Patent expert Nancy Linck also testified that it is not unusual for researchers publicly to disclose their research in public forums or in literature without any indication as to whether a patent application is pending. (Linck, Tr. 7783-84; RX 1163 at 010).

b. There Is No Evidence at Trial of a “Technology Competition” from Which a Competitive Price Could Be Derived

1277. Professor Shapiro’s opinion that the process undertaken by CARB to gather information from parties interested in the proposed CARB RFG regulations was “technology competition in action” (Shapiro, Tr. 7180-81; CX 1720A at 014-015) is also not supported by any evidence in the record. Professor Shapiro agreed that for there to be technology competition going on, the participants must understand that there is competition going on. (Shapiro, Tr. at 7181). There was no evidence in the record that any of the participants in the rulemaking had any such understanding.

1278. Professor Shapiro could not identify any contemporaneous evidence by CARB or any of the other participants in the CARB regulatory process in 1991 that referred to that process as “technology competition.” (Shapiro, Tr. 7180). He also could not identify any testimony of any trial witness that referred to the CARB regulatory process in 1991 as “technology competition.” (Shapiro, Tr. 7180). There was no testimony or documentary evidence at trial that anyone understood the rulemaking proceeding to be one in which a competitive price for technology was to be derived.

1279. Professor Teece testified that it was improper to characterize the CARB Phase 2 rulemaking as a “technology competition.” (Teece, Tr. 7533). While the rulemaking had elements of a political competition, Professor Teece testified that it was not a technology competition of an economic kind from which a competitive price for Unocal’s patents could be derived. (Teece, Tr.

7533-34). Indeed, Professor Shapiro characterized what was going on in front of CARB in 1991 as “lobbying.” (Shapiro, Tr. 7182).

1280. In a true economic competition, one would expect to see that the different competitors were aware of one another, and one would expect to see the establishment of objective criteria by which the competition was to be mediated and the price was to be determined. (Teece, Tr. 7533-34). Professor Teece saw no such evidence that any of these elements were present in the CARB Phase 2 rulemaking. (Teece, Tr. 7534). In fact, Professor Shapiro conceded that this “technology competition” was as much about which technology to pick rather than about a price. (Shapiro, Tr. 7184). Professor Shapiro testified that even participants in the 1991 CARB regulatory process that did not have a financial interest in the outcome of the rulemaking were also participants in the asserted technology competition. (Shapiro, Tr. 7183-84).

1281. Absent any evidence that CARB engaged in an economic competition in which a competitive price could be determined, Professor Teece testified that Professor Shapiro’s opinion that the CARB Phase 2 proceedings constituted a “technology competition” was not well-founded. (Teece, Tr. 7534; RX 1162A at 074).

1282. Professor Shapiro himself agreed that it does not make any sense at all for an economist to use an assumption that is demonstrably untrue. (Shapiro, Tr. 7314-15). Because there is no evidence to support the principal assumptions underlying Professor Shapiro’s opinion that there is direct evidence of Unocal’s monopoly power, Professor Shapiro’s opinion on this point will be disregarded.

c. Professor Shapiro Performed No Analysis of What the Competitive Rate Would Be, Assuming Unocal Engaged in Deception Rather than Made a Royalty-Free Offer

1283. The only analysis performed by Professor Shapiro in his expert report and rebuttal report is based on his “fundamental” assumption that Unocal had made an offer to license its patents for a royalty of zero. (Shapiro, Tr. 7242; CX 1720A at 015; CX 1799A at 002). He set forth no analysis in his reports, and provided no analysis at trial, based on the assumption that Unocal had made a misrepresentation regarding the existence of actual or potential patents rather a royalty-free license offer. (CX 1720A; CX 1799A; Shapiro, Tr.).

1284. At trial, Professor Shapiro did testify on cross-examination that his analysis would be similar in the case of deception rather than a good faith royalty-free offer. (Shapiro, Tr. 7171). Although Professor Shapiro stated on cross-examination that the model that he had used in his report to measure the alleged increase in Unocal’s market power flowing from its conduct, which was based on a good faith offer, would be similar in the case of deception, he did not identify any such similarities. (Shapiro, Tr. 7170-71).

1285. Professor Shapiro’s model was based on the assumption that the variable R1, which Professor Shapiro used to represent the expected royalty associated with the Phase 2 RFG regulations, would be zero. (Shapiro, Tr. 7170-71). He contended that the model would work in the case of deception but that “[r]ather than simply R1 equals zero, the calculations would be a bit different.” (Shapiro, Tr. 7171). In his report, Professor Shapiro equated R1 with the competitive price by stating that the level of R1 represents “the outcome of negotiations between the decision-maker and the input supplier” (CX 1720A at 012) and stated that because Unocal offered its technology on a royalty-free

basis in order to influence CARB, the competitive price was zero. (CX 1720A at 015; Shapiro, Tr. 7171). Under his testimony at trial, in the case of deception, R1 would not equal zero.

1286. On cross-examination, Professor Shapiro was asked to assume that a company has a patent “that it is able to license for annual fees of a hundred thousand dollars to each of a number of other firms” and that the company misrepresents to regulators that it has no patents and thereby causes regulators to adopt regulations that elevate the value of a license to \$1 million per year. (Shapiro, Tr. 7264). Professor Shapiro agreed that under these circumstances, it would not be correct to conclude that the competitive price was zero simply because the patent holder made the misrepresentation. (Shapiro, Tr. 7264-66).

1287. Professor Shapiro similarly testified that if one assumed the same set of facts except that one now assumes that the company failed to disclose its patents when it was under an affirmative duty to disclose them, such failure would not cause the competitive price at the time of the failure to be zero. (Shapiro, Tr. 7267).

1288. Professor Shapiro subsequently stated that “I have to change some of my early answer[s],” because “if a company lies and says its technology will be available on a royalty-free basis, even if it’s been charging for that, maybe it’s doing that to sell other products or for other commercial reasons, and I think that does change the competitive price.” (Shapiro, Tr. 7268-69).

1289. The reason given by Professor Shapiro for changing his answer did not address the economics of the competitive price and was based on his “concern[] that there could be benefits to the company of that lying that would persist even if we were to hold that company to the hundred-thousand-dollar fees because it had represented zero.” (Shapiro, Tr. 7271).

1290. Further, Professor Shapiro acknowledged that the logic involved in calculating the competitive price is different in the cases of good faith offer and misrepresentation. (Shapiro, Tr. 7273).

1291. Even after attempting to withdraw his answers regarding deception, Professor Shapiro testified that a fraudulent offer to sell the Brooklyn Bridge for \$1 million would not establish that the competitive price for the bridge is \$1 million. (Shapiro, Tr. 7274).

2. The Royalty Rates Unocal Receives for Non-CARB Gasoline Show the Competitive Price Is Not Zero

1292. Professor Teece testified that even if one assumes that Unocal engaged in the misconduct alleged in the Complaint, the competitive price for Unocal's patents would not be zero as Professor Shapiro alleges. (Teece, Tr. 7540-41). Rather, under that hypothetical, the competitive price would be benchmarked by the price that is actually being paid in the transactions between Unocal and its licensees for gasoline outside the state of California. (Teece, Tr. 7540-41). Professor Teece testified that these rates can serve as a competitive benchmark since they were arrived at in arms-length negotiations for royalties outside the state of California, and thus the royalties paid under these agreements are not tainted by the misconduct alleged in the Complaint. (Teece, Tr. 7541-44).

1293. { [REDACTED]

[REDACTED] } (Shapiro, Tr. 7431-32, *in camera*).

{ [REDACTED]

[REDACTED] } (Shapiro, Tr. 7432, *in camera*). Despite this

acknowledged express preference for observing actual market transactions, Professor Shapiro rejected the use of Unocal's arms-length licenses with refiners outside California to establish the competitive price for Unocal patents because "only a handful of refiners and blenders outside of

California have taken licenses, suggesting most producers outside California do not find it to be economically attractive to license Unocal's technology at the asked price." (CX 1799A at 022;

Shapiro, Tr. 7433-34, *in camera*). { [REDACTED]

[REDACTED] }
(Shapiro, Tr. 7434, *in camera*).

1294. Professor Teece disagreed with Professor Shapiro's assertion that the prices Unocal receives outside California are not a useful competitive benchmark because the transaction volumes are too low. (Teece, Tr. 7547-48). Professor Teece noted that there were a number of agreements outside California, that non-trivial sums are being paid under these agreements, and that these agreements were negotiated in arms-length transactions. (Teece, Tr. 7547-48). For these reasons, Professor Teece concluded that these transactions were a reliable benchmark for a competitive rate. (Teece, Tr. 7548).

1295. Professor Shapiro also asserted that if Unocal's royalty rates outside California were accepted as a competitive benchmark for use inside California, Unocal would have an incentive strategically to elevate those rates and thus to advantage itself in California. (CX 1799 at 023). Professor Teece rejected this speculation because there was no evidence to support it. (Teece, Tr. 7548-49).

1296. { [REDACTED] } (Shapiro, Tr. 7207-08, *in camera*). Professor Teece testified that the rates Unocal receives outside California do not reflect the competitive price for gasoline inside California. (Teece, Tr. 7547). { [REDACTED]

[REDACTED] } (Shapiro, Tr. 7433, *in camera*). Professor Teece likewise noted that the demand for cleaner-burning fuels is higher in California because the state has traditionally had dirtier air. (Teece, Tr. 7547). This greater demand implies that one would expect to see a price somewhat above the rate associated with states outside of California. (Teece, Tr. 7547).

3. Complaint Counsel Have Failed to Show Indirect Evidence of Market Power

1297. In addition to his opinion relating to what he called direct evidence of monopoly power, Professor Shapiro analogized “coverage” rates to market share and opined that the high coverage rate of gasoline produced by the refiners—while not as important as the “direct evidence”—is an indication of Unocal’s alleged monopoly power. (CX 1720A at 027; CX 1799A at 024-027). Professor Shapiro opined that coverage or “matching” rates are a good proxy for infringement rates. (Shapiro, Tr. 7330-31).

1298. Because Unocal and its licensees base royalty payments upon matching gallons rather than infringing gallons, Professor Shapiro concluded that Unocal and its licensees must consider matching to be a good proxy for infringement. (Shapiro, Tr. 7157; CX 1799A at 026). { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3757-59, *in camera*). { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3758, *in camera*). { [REDACTED]

[REDACTED]

[REDACTED] } (Strathman, Tr. 3758, *in camera*).

1299. { [REDACTED]

[REDACTED]

[REDACTED], *in camera*). { [REDACTED]

[REDACTED]

[REDACTED], *in camera*).

1300. Professor Teece disagreed with Professor Shapiro's opinion that matching rates are a good proxy for infringement rates or a good proxy for market power. (Teece, Tr. 7549-50, 7555-56).

a. "Matching" or "Overlap" Is Not Synonymous with Infringement

1301. Professor Teece opined that for Unocal to have market power arising out of its patents, it is not enough that gasoline falls within the numerical limitations of Unocal's patent claims. (RX 1162A at 090). Rather, Unocal would need to have the ability to exclude others from making and selling such gasoline, which in turn requires the evaluation of issues such as claim construction, infringement and patent validity. (RX 1162A at 090).

1302. Unocal owns five patents related to reformulated gasoline. (RX 1165A at 012). Each of the patent claims relate to certain gasoline compositions based on the numerical values of specific gasoline properties. (RX 1165A at 012). The claims limitations in these patents, however, require more to prove infringement than simply matching numerical property limitations of specific patent claims. (RX 1165A at 012-013).

1303. Complaint Counsel have made no attempt to prove that any of the gasoline made or sold in California infringes Unocal's patents. Instead, Complaint Counsel's expert, Mr. Blake Eskew, compared the numerical property limitations of Unocal's five patents to the numerical properties of

gasoline batches made by major California refiners and concluded that 93 percent of gasoline produced by major California refiners to comply with the summertime CARB Phase 2 “matched” certain limitations in Unocal’s patent claims. (CX 1709 at 021). Mr. Eskew testified that he knew that each of the claims of all five patents requires an additional limitation other than just meeting the numerical limitations. (Eskew, Tr. 2889).

1304. This matching analysis performed by Mr. Eskew is not the same as an infringement analysis. (Eskew, Tr. 2898; Teece, Tr. 7555; Sarna, Tr. 6355-56). Mr. Eskew was not asked to conduct an infringement analysis of the data from refiners, nor was he asked to interpret or construe all the limitations and all of the claims of the patents. (Eskew, Tr. 2887-88).

1305. Professor Shapiro relied upon Mr. Eskew’s matching analysis and concluded that this matching rate is “useful as an indicator of the presence or absence of market power.” (CX 1720A at 027). Professor Shapiro, however, admitted that infringement rates would be a more significant indicator of market power and further admitted that he has used Mr. Eskew’s matching rates as a proxy because no one had shown him that the two are materially different. (Shapiro, Tr. 7330-31).

1306. None of the refiner witnesses testified that they infringe Unocal’s patents. In their depositions, each corporate representative asked about issues relating to infringement was instructed not to answer these questions. (Engibous, Tr. 3928-29; {REDACTED}, *in camera*; CX 7048 (Hancock, Dep. at 198-99, 204-05, 252-53); CX 7050 (Ibergs, Dep. at 62-63, 64-65, 70, 92-93, 93-94); CX 7078 (Youngman, Dep. at 81, 93-94, 108-09)).

1307. In the pending patent litigation, the refiners have submitted expert testimony by Mr. Robert Cunningham that gasolines made with ethanol do not infringe Unocal’s patents. (Cunningham, Tr. 4356-57). After the Phase 3 regulations were approved, MTBE was banned and

ethanol became the only oxygenate option for refiners. (Venturini, Tr. 400; Sarna, Tr. 6153). In recent years, the gasoline in California has been blended with ethanol, not MTBE. (Eskew, Tr. 2889).

1308. In his testimony in the pending patent litigation, Mr. Cunningham took the position that ethanol containing gasoline was not a traditional motor gasoline and thus did not fall within the preamble to the '393 patent requiring an unleaded gasoline suitable for combustion in an automotive engine. (Cunningham, Tr. 4356). Unocal's other four patents all contain this preamble language. (Cunningham, Tr. 4358-59). Whether ethanol containing gasolines are covered by the Unocal patents is a matter of claim construction. (Cunningham, Tr. 4358-59).

1309. Although Mr. Eskew had some awareness of the argument by which refiners contend in pending litigation with Unocal that gasoline blended with ethanol does not meet the claim limitation "in unleaded gasoline fuel suitable for combustion in an automotive engine," he was not asked to express a specific opinion of whether gasoline blended with ethanol is covered by the claim limitation "an unleaded gasoline fuel suitable for combustion in an automotive engine." (Eskew, Tr. 2890).

1310. The judge in the district court has not yet decided the dispute between Unocal and the defendant refiners as to whether gasolines made with ethanol infringe Unocal's patent. (Strathman, Tr. 3660).

1311. If the court were to construe Unocal's patent claims as not including gasolines made with ethanol, then such a claim construction could dramatically reduce any infringement rate of Unocal's patents. (Teece, Tr. 7558-60). Professor Shapiro admitted that a finding that gasolines made with ethanol do not infringe would cause Unocal's alleged market power to be "greatly reduced." (Shapiro, Tr. 7332-33).

1312. The only evidence of infringement at trial was proffered by Unocal expert Richard Stellman. Mr. Stellman performed an infringement analysis on the '393 patent and the composition claims (but not the method claims) of the '126 patent. (Stellman, Tr. 7912-16; RX 1165A at 014-016). Mr. Stellman determined that the refiners who were defendants in the patent infringement litigation with Unocal infringed the '393 patent less than 1/10 of 1 percent in 2002. (Stellman, Tr. 7914; RX 1165A at 014-015). { [REDACTED] [REDACTED] [REDACTED] } (RX 1165 at 017, 047, *in camera*). Mr. Stellman noted, however, that the refiner defendants in the '393 litigation have challenged some of his conclusions regarding infringement and that the court in that case has not yet determined whose interpretation is correct. (RX 1165A at 015).

1313. Mr. Stellman did not form an opinion of infringement for the other patents or claims other than the '393 claims in the first 40 claims of the '126 patent. (Stellman, Tr. 7915). All of the remaining claims are method or process claims and none have been construed by a court. (Stellman, Tr. 7917; RX 1165A at 015).

b. Infringement Rates Alone Are Not a Good Proxy for Market Power

1314. While an economist attempting to assess market share in a technology market might want to look at infringement rates, infringement rates alone are not a sufficient basis from which to draw conclusions about market share or market power. (Teece, Tr. 7550).

(1) The Largest Part of the Market Is Not Paying for the Use of Unocal's Patents

1315. In a technology market, the fact that a company's patents are being used does not necessarily imply anything about the company's market share or about whether the company has market power. (Teece, Tr. 7550). This is because one of the unique aspects of a market for intellectual property (as opposed to goods) is that people can use intellectual property without paying for it. (Teece, Tr. 7550-51). So the fact that there may be evidence that a company's patents are being used does not mean one can conclude that the company has monopoly power, if those who are using the patents are not paying for that use. (Teece, Tr. 7551).

1316. The proper measure of Unocal's share of the relevant technology market is the usage that is paid for or that would be made of Unocal's technology if the refiners were paying for it. (RX 1162A at 055).

1317. None of the major California refiners have licensed from Unocal. (Teece, Tr. 7555).
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (Strathman, Tr. 3765-66, *in camera*). Several refiners testified that they had not considered licensing from Unocal. Chevron's Mr. Gyorfí testified that his company received a clear direction from its chairman that Chevron was not going to seek a license from Unocal. (Gyorfí, Tr. 5267). [REDACTED]
[REDACTED] }, *in camera*).

1318. [REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED], *in camera*).

1319. Just as none of the major California refiners have licensed, none are paying for the use of Unocal's patents. (Teece, Tr. 7551). [REDACTED]

[REDACTED] (Strathman, Tr. 3770, *in camera*). [REDACTED]

[REDACTED] (Strathman, Tr. 3760-61, *in camera*). [REDACTED] (Strathman, Tr. 3761, *in camera*).

1320. Professor Teece testified that it is especially problematic to attempt to infer market power when the largest portion of the industry is not paying anything to Unocal. (Teece, Tr. 7551).

(2) The Refiners Do Not View Unocal's Patents as Valid

1321. One conclusion that can be drawn from the observation that the industry is not paying is that the major refiners do not believe that Unocal's patents are valid. (Teece, Tr. 7564). Indeed, a number of the refiners testified that they believed the Unocal patents to be invalid. Mr. Cunningham, an expert retained by the major refiners in California, testified that he believes the '393 and '126 patents are invalid. (Cunningham, Tr. 4269). Valero disputes the validity of the patents. (Simonson, Tr. 5985). Mr. Michael Hoffman from BP/ARCO testified that it was his belief that the Unocal patents were inappropriately granted. (Hoffman, Tr. 4982-83; RX 1054 at 001).

1322. Mr. Clossey, BP/ARCO's corporate designee, testified that BP determined in 2001 that its refinery managers could continue their operations as they were at the time without violating the company's position of not infringing valid patents. (Clossey, Tr. 5473). This position—that refinery managers would not be infringing valid patents by continuing their normal operations—continued to be the position held by BP/ARCO as of the end of discovery in this proceeding. (Clossey, Tr. 5475-77). { [REDACTED] } (RX 1165 at 036, *in camera*).

1323. { [REDACTED] }
{ [REDACTED] }
(Dowling, Tr. 3793, *in camera*). { [REDACTED] }
{ [REDACTED] }
{ [REDACTED] }
(Dowling, Tr. 3793-94, *in camera*).

1324. Similarly, Chevron's Mr. Engibous testified that there was "an uncertainty on what the future of the Unocal patents mean, and that has different ramifications on what we might do in establishing a blend strategy." (Engibous, Tr. 3892). This "uncertainty" relates to what the future is going to hold with respect to the Unocal patents. (Engibous, Tr. 3933-34). There is also some uncertainty as to what infringement will ultimately mean or not mean with respect to the five patents. (Engibous, Tr. 3935-37).

1325. Other than the '393 patent, none of the method or process claims of the other four patents have been construed by a court. (Stellman, Tr. 7917). Although the '393 patent was found not invalid in the patent infringement litigation, the '393 patent and the '126 patents are undergoing

reexamination and both have received rejections by the Patent and Trademark Office. (Strathman, Tr. 3661-64). At least one of the requests for reexamination was made by the defendant refiners. (Strathman, Tr. 3662).

(3) In Large Part, the Refiners Are Not Attempting to Avoid Unocal's Patents

1326. Another reason why infringement rates alone are not necessarily indicative of market power is because an infringement rate measured at a particular point in time says nothing about what work-around solutions exist that, if implemented, could reduce or eliminate infringement on a particular claim or patent. (Teece, Tr. 7551-52).

(a) The Refiners Have Reduced Their Infringement of the '393 to Nearly Zero, at Essentially No Cost

1327. The history of what happened with the '393 patent is an example of how work-around solutions can reduce infringement rates. (Teece, Tr. 7552).

1328. Mr. Stellman's infringement analysis of the '393 patent shows that the volume of infringed gasoline dropped from 25.8 percent in 1996 down to the level of 1/10 of 1 percent by the year 2002 for California gasoline made during the summertime. (Stellman, Tr. 7914-15).

1329. Representatives from each of the major California refiners stated that they are able to blend around the claims of the '393 patent at little or no cost, and that they were aware of the means to blend around the '393 patent as of the spring of 1995, although such efforts were not implemented until much later. (Gyorfi, Tr. 5255-56; Engibous, Tr. 4036; RX 224 at 005; RX 85 at 003-004; RX 92 at 003-004; RX 207A at 003-008; RX 215 at 002-004; RX 224 at 003-008; CX 7043 (Boone Dep. at 50-51); RFF 1330-37, *in camera, infra*).

1330. When the efforts to avoid were implemented, for most refineries the change involved little or no capital investment. { [REDACTED] }; Eizember, Tr. 3266-67; CX 7050 (Ibergs, Dep. at 65-67); CX 7077 (Youngman, Dep. at 29-31); RX 91 at 003-004; RX 215 at 003-004; cf., { [REDACTED] }; CX 7058 (Millar, Dep. at 23-25) (Texaco invested slightly more than \$1 million).

1331. Shell's Bakersfield, Los Angeles and Martinez refineries successfully blend around the claims of the '393 patent at little or no cost. (CX 7048 (Hancock, Dep. at 227-28)). Shell represented that, by taking steps to avoid the patent, the Martinez refinery reduced its matching of the numerical property claims to about 1.2 percent in 1997, 0.8 percent in 1998, 9 percent in 1999 (when the refinery did not focus on avoiding the patent) and 0.5 percent in 2000. (RX 215 at 002-003). { [REDACTED] } (RX 1165 at 042, *in camera*).

1332. Shell's Bakersfield refinery actually saved two cents per gallon once it made the decision to produce non-infringing oxygenated gasoline. (CX 7043 (Boone, Dep. at 41-42)). Another way in which Shell's Bakersfield avoided infringement of the '393 patent was to produce 91 octane premium rather than 92 octane. (CX 7043 (Boone, Dep. at 44); RX 91 at 003-004). There was essentially "no cost" associated with switching to 91 octane. (CX 7043 (Boone, Dep. at 49-50); RX 91 at 003). The Bakersfield refinery made the decision to take these steps to avoid infringing after the Supreme Court denied cert in March 2001. (CX 7043 (Boone, Dep. at 43-44, 54)). { [REDACTED] } (RX 1165 at 040, *in camera*).

1333. Texaco blends around the claims of the '393 patent for essentially no cost. (CX 7058 (Millar, Dep. at 23); RX 85). The Texaco Wilmington refinery was not instructed to take any financial measures to blend around the '393 patent until late 1997. (CX 7058 (Millar Dep. at 37-38)).

{ [REDACTED]
[REDACTED] } (RX 1165 at 041, *in camera*).

1334. { [REDACTED]
[REDACTED]
[REDACTED] } (CX 7048 (Hancock, Dep. at 247-48), *in camera*). On or about February 20, 2001, the Los Angeles and Bakersfield refineries received instructions from the Vice President of refining to make whatever changes were operationally necessary at the refinery to ensure that no gasoline was blended and shipped that would match the numerical property ranges of the Unocal '393 patent. (CX 7048 (Hancock, Dep. at 245)). This coincided and was in response to the Supreme Court's denial of certiorari on the *Unocal v. ARCO* litigation involving the '393 patent. (CX 7048 (Hancock, Dep. at 245-46)). The Bakersfield, Los Angeles, and Martinez refiners successfully blend around the claims of the '393 patent at little or no cost. (CX 7048 (Hancock, Dep. at 227-28)).

1335. BP/ARCO stated that it can easily blend around the numerical property ranges of the '393 patent at essentially no cost and that it had the ability to do so in April 1996. (RX 92). ARCO did not begin blending around the '393 patent until 1997 or 1998. (CX 7077 (Youngman, Dep. at 45); Clossey, Tr. 5466-67). It was Mr. Youngman's understanding, as BP's corporate designee on the subject, that BP was not making any gasoline in 2003 that fell within the scope of the '393 patent claims. (CX 7078 (Youngman, Dep. at 106)). Mr. Youngman also believed that BP did not make

any gasoline within the scope of the claims in 2002. (CX 7078 (Youngman, Dep. at 106)). Mr. Youngman was not aware of any costs incurred by BP at the Carson/Los Angeles refinery to avoid the claims of the '393 patent. (CX 7078 (Youngman, Dep. at 52)).

1336. Exxon blends around the '393 patent at minimal cost. (RX 207A). { [REDACTED] } (Eizember, Tr. 3578-79, *in camera*). { [REDACTED] } (Eizember, Tr. 3569-72, *in camera*). { [REDACTED] } (Eizember, Tr. 3572, *in camera*). { [REDACTED] } (Eizember, Tr. 3573, *in camera*). { [REDACTED] } (Eizember, Tr. 3573, *in camera*). On February 20, 2001, after the U.S. Supreme Court decided not to hear the appeal of the patent case, ExxonMobil instructed its refineries to “not produce or ship any motor gasoline compositions falling within the parameters of the Unocal patent '393 claims.” (RX 143). Up until that point, according to Exxon, it had relied on “sound legal advice that the patent was invalid and unenforceable.” (RX 143). { [REDACTED] } (RX 1165 at 037-039, *in camera*).

1337. Under normal operating conditions, Chevron can avoid the '393 patent at essentially no cost and has had this ability since April 1995. (RX 224 at 004-005; Gyordi, Tr. 5255-56). From January 1995 until November to December 1996, Chevron did nothing to avoid the claims of the '393

patent, based on “strong guidance from counsel that these patents were invalid,” from November or December 1996 to January 1998, Chevron took a “minimalist cost approach,” directing its refineries only not to exceed 74.9 percent saturates; and { [REDACTED]

[REDACTED] } (Engibous, Tr. 4039-40, *in camera*; Gyorfi, Tr. 5263-67; *see also* Lieder, Tr. 4783-84, 4813-14, *in camera* { [REDACTED]

[REDACTED] } { [REDACTED] } (Engibous, Tr. 4033-34, 4036-37, *in camera*; RX 224 at 004-005). { [REDACTED] } (RX 1165 at 037-038, *in camera*).

1338. Professor Teece testified that the '393 patent does not provide Unocal with monopoly power. (Teece, Tr. 7552). No one is paying anything under this patent, and moreover, the low infringement numbers indicate that there are substitutes in the marketplace. (Teece, Tr. 7552-53). There can be no market power attached to such a small share. (Teece, Tr. 7552-53).

(b) { [REDACTED]

1339. { [REDACTED] } (See RFF 1340-54, *in camera, infra*).

i) BP/ARCO

1340. As lead engineer in BP/ARCO's Carson refinery, Mr. Gary Youngman testified that he was not aware of any directive to avoid any of the claims in the four Unocal patents other than the '393 patent. (CX 7078 (Youngman, Dep. at 83)). Mr. Youngman was BP/ARCO's corporate designee on the topic of any changes to ARCO's refineries or refinery operations to avoid the numerical properties of Unocal's patents. (CX 7078 (Youngman, Dep. at 6); RX 451). { [REDACTED] [REDACTED] [REDACTED] } (CX 7078C (Youngman, Dep. at 52), *in camera*).

1341. Mr. Timothy Clossey testified that with respect to the four patents, other than the '393, ARCO/BP had been able to abide by its policy of not infringing valid patents by making no significant changes in its operations. (Clossey, Tr. 5473-74). Mr. Clossey was designated as BP's corporate representative on the topic of any decision that BP/ARCO made with respect to whether or not the company should attempt to avoid the numerical property limitations set forth in the claims of Unocal's gasoline patents. (Clossey, Tr. 5461).

ii) Valero

1342. { [REDACTED] [REDACTED] [REDACTED] [REDACTED] } (Simonson, Tr. 6064, *in camera*; see also Simonson, Tr. 6045, *in camera*).

Mr. Simonson was Valero's corporate designee on the topic of the Benecia refinery's blending capabilities and patent avoidance. (RFF 46; RX 275).

iii) Chevron

1343. As of August of 2003, the close of discovery, Chevron had not given consideration to trying to avoid the numerical property limitations of the other patents other than the '393 and '126. (Gyorfi, Tr. 5282-84). This was because Chevron felt it didn't know enough about them yet. (Gyorfi, Tr. 5284). With respect to the '126 patent, Chevron analyzed the composition claims (but not the method claims) and determined that it would request that CARB broaden the regulatory blending space—specifically to raise the olefin limit from 10 to 12 percent. (Gyorfi, Tr. 5268-9). CARB has not raised the olefin limit in response to Chevron's request. (Gyorfi, Tr. 5280). Mr. Gyorfi was Chevron's corporate designee on the topic of any decision that Chevron made with respect to whether or not the company should attempt to avoid the numerical property limitations set forth in the claims of Unocal's gasoline patents. (Gyorfi, Tr. 5258; RFF 30).

1344. {

_____ }

(Engibous, Tr. 4060-61, *in camera*). Mr. Engibous was Chevron's corporate designee on the topic of any changes to Chevron's refineries or refinery operations to avoid the numerical properties of Unocal's patents. (Engibous, Tr. 3926; RX 105).

iv) Texaco/Shell/Equilon

1345. According to corporate designee Mr. Robert Hancock, Texaco and Shell have never directed their refineries to avoid the numerical property ranges of any Unocal patent other than the

'393 patent. (CX 7048 (Hancock, Dep. at 248-49)). Mr. Hancock was designated to testify as to the Bakersfield and Wilmington/Los Angeles refineries on behalf of Texaco, Shell Oil Product US, and Equilon on the topics of any changes to their refineries or refinery operations to avoid the numerical properties of Unocal's patents and on the topic of any decision the companies made with respect to whether or not to attempt to avoid the numerical property limitations set forth in the claims of Unocal's gasoline patents. (CX 7048 (Hancock, Dep. at 141-46)).

1346. Another Shell witness, Mr. Bruce Irion, testified that no steps have been taken at Shell and Equilon refineries to avoid the numerical property limitations of any of the four patents other than the '393 (CX 7051 (Irion, Dep. at 83-84)). From 1994 to 2000, Mr. Bruce Irion was responsible for ensuring that Shell's—for a period, Equilon's—Martinez refinery would be compliant with CARB and EPA reformulated specifications. (CX 7051 (Irion, Dep. at 5, 10)).

1347. { [REDACTED] } (Stellman, Tr. 8077, *in camera*). { [REDACTED] }
{ [REDACTED] }
(RX 1165 at 040, 038, *in camera*). { [REDACTED] }
{ [REDACTED] }
{ [REDACTED] } (RX 1165 at 036, 041, 043, *in camera*).

v) **ExxonMobil**

1348. { [REDACTED] }
{ [REDACTED] }

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] (Eizember, Tr. 3573-74, *in*

camera). [REDACTED]

(Eizember, Tr. 3574, *in camera*). [REDACTED]

[REDACTED]

[REDACTED] (Eizember, Tr. 3574-76, *in camera*).

1349. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] (Eizember, Tr. 3580-81, *in camera*). [REDACTED]

[REDACTED] (Eizember, Tr. 3581, *in camera*). [REDACTED]

[REDACTED]

(Eizember, Tr. 3581, *in camera*).

1350. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] (Eizember, Tr. 3576-77, *in camera*). [REDACTED]

[REDACTED]

[REDACTED] (Eizember, Tr. 3577, *in camera*).

1351. { [REDACTED]
[REDACTED] } (RX 1165 at 039, *in camera*). { [REDACTED]
[REDACTED]
[REDACTED] } (RX 1165 at 036-047, *in camera*). { [REDACTED]
[REDACTED] } (RX 1165 at 039, *in camera*). { [REDACTED]
[REDACTED]
[REDACTED] } (RX 1165 at 039, *in camera*). { [REDACTED]
[REDACTED] } (RX 1165 at 039, *in camera*).

1352. { [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (Sarna, Tr. 6254-58, 6261-66, *in camera*; CX 1710 at 007-010, *in camera*).

1353. { [REDACTED]
[REDACTED]
[REDACTED] }
(Stellman, Tr. 8078-79, *in camera*; RX 1165 at 024-029, *in camera*). { [REDACTED]
[REDACTED]
[REDACTED] } (RX 1165 at 024-029, *in camera*).

1354. { [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (Stellman, Tr. 8083-84, *in camera*; RX 1165

at 025, *in camera*). { [REDACTED]
[REDACTED] }

(RX 1165 at 025, *in camera*). { [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (RX 1165 at 025, *in camera*).

**(c) There Was No Credible Evidence that Refiners
Have Considered Capital Investment Options or
Partial Avoidance Options**

1355. { [REDACTED]
[REDACTED] } (*See, e.g.*, RFF 1340, *in
camera*, 1342, *in camera*, 1344, *in camera*, 1345-46). { [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] } (*See* RFF 1356-57, *in camera, infra*).

1356. { [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] }, *in camera*).

1357. { [REDACTED]
[REDACTED]
[REDACTED] }, *in camera*).

1358. Complaint Counsel proffered the testimony of expert witness Mr. Michael Sarna, who opined that there are no “practical steps” refiners can do that would enable them to maintain their current CARB 2 production and avoid the Unocal patents. (CX 1710 at 004). But Mr. Sarna’s opinion was limited to the current configuration of the refineries and he did not look at any modification that required a unit shutdown. (CX 1710 at 004; Sarna, Tr. 6382-85). Mr. Sarna also was not asked to consider whether there were steps refiners could take which would allow them to reduce (but not completely avoid) matching. (Sarna, Tr. 6380-81).

1359. Professor Shapiro could not point to anything in his reports describing the efforts of refiners to avoid infringing the Unocal patents. (Shapiro, Tr. 7335-36). In fact, at the time Professor Shapiro wrote his report he did not know whether or not refiners had made serious efforts to blend around or otherwise avoid the claims of the Unocal patents. (Shapiro, Tr. 7336).

1360. Professor Teece gave a hypothetical example to illustrate why high matching rates do not indicate that infringement rates would be high or otherwise demonstrate that Unocal has any market power. (Teece, Tr. 7556-65, RX 1207 (demonstrative)). Unocal’s five patents together contain hundreds of claims, but if for simplicity’s sake one assumed a hypothetical patent with just five patent claims with various matching rates associated with each claim, it is possible to see how a variety of factors could, in Professor Teece’s words, “create a wedge” between the matching rate and the infringement rate. (Teece, Tr. 7557). Professor Teece showed how factors such as a claim being held invalid, a claim being construed narrowly (such as a construction that the claim did not include gasolines blended with ethanol), a claim having an easy work-around solution (such as is observed with the ’393 claims) and CARB changing the regulations to make it easier to blend within a particular claim (as the refiners have requested of CARB) could affect a hypothetical matching rate

on a claim by claim basis such that a theoretical total matching rate of 93 percent was reduced to just 8 percent in Professor Teece's example. (Teece, Tr. 7556-65, RX 1207 (demonstrative)).

1361. Complaint Counsel have not established that matching rate is synonymous with infringement. (RFF 1360). Complaint Counsel have also not established that any actual infringing amounts on the hundreds of claims at issue cannot be reduced through a combination of work-around solutions, court determinations of claim validity or narrow claim construction, and/or regulatory relief from CARB. (RFF 1358-59). Complaint Counsel have thus not established that the matching rate identified by Mr. Eskew and Mr. Stellman is an indication of any actual market power Unocal has in the relevant technology market. Professor Shapiro's opinions with respect to this indirect evidence of market power will therefore be disregarded.

VI. COMPLAINT COUNSEL HAVE FAILED TO PROVE ANY ANTICOMPETITIVE EFFECT OF UNOCAL'S ALLEGED MISREPRESENTATIONS

A. Complaint Counsel Did Not Prove that Unocal's Alleged Misrepresentations to CARB Caused Anticompetitive Harm

1362. The Complaint alleges that Unocal's misrepresentations "caused" CARB to adopt regulations that substantially overlapped with Unocal's patent claims. (Complaint ¶¶ 45, 76). The Complaint also alleges that "but for" Unocal's fraud, CARB would not have adopted RFG regulations that substantially overlapped with Unocal's patent claims and/or that the terms upon which Unocal could have enforced its patents would have been substantially different. (Complaint ¶¶ 5, 80, 90). Likewise, with respect to the alleged fraud against the refiners, the Complaint alleges that but for Unocal's fraud, WSPA and Auto/Oil participants would have advocated that CARB adopt regulations that minimized or avoided infringement and/or that the refiners would have advocated that CARB

negotiate license terms substantially different than Unocal was later able to obtain. (Complaint ¶¶ 90(a), 90(b)).⁴

1363. The Complaint also alleges that Unocal's conduct caused, "harm to consumers in the downstream product market for 'summer-time' reformulated gasoline in California." (Complaint ¶ 5).

1364. Professor James Griffin testified as an expert economic witness for Unocal. One of the areas in which Professor Griffin offered testimony was on the question of identifying the economic effects of the alleged Unocal fraud against both CARB and against the refiners. (Griffin, Tr. 8332).

1365. To analyze the economic consequences of Unocal's alleged misconduct, Professor Griffin necessarily analyzed what would have happened "but for" Unocal's misconduct—what Professor Griffin termed "but for worlds." (Griffin, Tr. 8332-33).

1366. Professor Griffin testified that such an analysis follows a two-step approach: First one must determine whether Unocal's alleged misbehavior resulted in economic harm; then, if such harm is found, the second question is whether that harm resulted in antitrust injury. (Griffin, Tr. 8333; RX 1211 (demonstrative)).

1367. Professor Griffin described his "but for" world analysis as follows: "[Y]ou've got to look first at the economic position of refiners and consumers in the actual world as it actually occurred, and then we've got to compare what—how would those people have behaved in a but-for

⁴ The Complaint also alleges that the refiners would have been able to incorporate knowledge of Unocal's pending patent rights in their capital investment and refinery reconfiguration decisions to avoid and/or minimize potential infringement. (Complaint ¶ 90(c)). This allegation is discussed in Section VI.B, *infra*.

world, a world in which there had been none of the alleged misbehavior on Unocal's part. And then by comparing the actual world to the but-for world, we can—it tells us whether economic harm has occurred.” (Griffin, Tr. 8334).

1368. In reaching his opinions in this matter, Professor Griffin analyzed four “but for” worlds. (Griffin, Tr. 8337-38). The first he called “default to EPA.” (Griffin, Tr. 8337-38). The assumption behind this “but for” world is that had CARB known about Unocal's patent application, it would have simply shut down its rulemaking and defaulted to the EPA regulations. (Griffin, Tr. 8338). The second “but for” world is one Professor Griffin coined “design-around the patents.” (Griffin, Tr. 8338). This second “but for” world is based upon the presumption that had CARB known of the patent application, it would have passed regulations designed to escape the patents. (Griffin, Tr. 8338). The third “but for” world Professor Griffin considered is that had CARB never seen Unocal's data, it would have remained “blissfully ignorant” of T50. (Griffin, Tr. 8338). Finally, Professor Griffin looked at whether the “but for” world equaled the actual world, that is, whether CARB, even if it had known of the pending application, would have enacted the same regulations that it did. (Griffin, Tr. 8338-39).

1369. To analyze these various “but for” worlds, Professor Griffin used three basic methodologies: revealed preference analysis, hypothetical choice analysis and a linear program model. (Griffin, Tr. 8339).

1370. “Revealed preference” analysis is the bedrock of empirical economics. (Griffin, Tr. 8340). Professor Griffin described revealed preference analysis as a methodology which allows one to look at the behavior of individuals or regulatory agencies and infer from decisions made at one point in time what their behavior would have been at other points in time. (Griffin, Tr. 8339-40). A

number of Nobel laureates have applied revealed preference analysis to the behavior of regulatory agencies. (Griffin, Tr. 8340-41). Professor Griffin himself has used revealed preference methodology in his past work as an economist. (Griffin, Tr. 8341).

1371. Professor Shapiro agreed that revealed preference analysis is a commonly used methodology among economists. (Shapiro, Tr. 7109). In fact, Professor Shapiro used revealed preference analysis in his work on this case. (Shapiro, Tr. 7109).

1372. Another methodology Professor Griffin considered is “hypothetical choice” analysis. (Griffin, Tr. 8341-42). In this methodology, an economist analyzes what people say they will do when presented with a hypothetical question such as “what would you do if” (Griffin, Tr. 8341-42). This methodology is primarily used in the field of environmental economics. (Griffin, Tr. 8342).

1373. Professor Griffin considered two forms of hypothetical choice analysis: contemporaneous hypothetical choice and retrospective hypothetical choice. (Griffin, Tr. 8342-43). Under contemporaneous hypothetical choice, people respond to a question about what they would do today. (Griffin, Tr. 8342-43). In contrast, retrospective hypothetical choice analysis is when people are asked to look back in time and reconstruct what they would have done had conditions been different. (Griffin, Tr. 8343).

1374. Since economists prefer looking at what people actually do rather than what they say they will do, revealed preference is generally preferred by economists over hypothetical choice. (Griffin, Tr. 8344). Hypothetical choice can be useful when there are no direct “revealed preference” observations available. (Griffin, Tr. 8344). Economists prefer contemporaneous hypothetical choice to retrospective hypothetical choice because it is difficult for the human brain to go back in time and assimilate the various conditions that might have existed at an earlier time. (Griffin, Tr. 8344).

1. Complaint Counsel Did Not Show that Default to EPA Was a Viable Choice for CARB

1375. The first “but for” world that Professor Griffin analyzed is the “default to EPA” but for world. (Griffin, Tr. 8344-45). This but for world was posited by Complaint Counsel and is based upon the testimony of Mr. Peter Venturini. (Griffin, Tr. 8345). The “default to EPA” but for world was the only alternative that Professor Shapiro empirically considered in arriving at the opinions he gave in this case. (Shapiro, Tr. 7354, 7366).

1376. Mr. Venturini testified as CARB’s designated witness regarding the actions which CARB staff and/or CARB would or would not have taken in 1991, 1992, 1993, and 1994 if the alleged acts of fraud had not occurred. (Venturini, Tr. 785-86). Mr. Venturini testified that he felt uniquely qualified to speak to those topics. (Venturini, Tr. 787).

1377. As CARB’s designated witness, Mr. Venturini testified that if CARB had known about the pending patent application there would not have been a CARB regulation in 1991, but rather CARB would have just taken the federal EPA regulations. (Venturini, Tr. 787-90). Anything beyond that would require “pure speculation.” (Venturini, Tr. 790).

1378. Mr. Venturini further testified that CARB would not have approved any regulation that was covered by a patent application regardless of the potential infringement rate and regardless of the actual cost of avoiding the patent. (Venturini, Tr. 788-89).

1379. Professor Griffin concluded that the default to the EPA scenario posited by Complaint Counsel, Professor Shapiro, and Mr. Venturini was not viable. (Griffin, Tr. 8345-46).

1380. Preliminarily, Professor Griffin noted the serious air pollution problem that California faced in the early nineties. (Griffin, Tr. 8346). Some of the material Professor Griffin reviewed showed that California had three times more days deemed “unhealthy” from an air quality standpoint

than the next dirtiest state, Texas. (Griffin, Tr. 8347; RX 1213 (demonstrative), RX 1164A at 075). Professor Griffin testified that other material he reviewed showed that the EPA regulations would have resulted in significantly dirtier air than the CARB Phase 2 regulations. (Griffin, Tr. 8350; RX 1214 (demonstrative); RX 1164A at 076; RFF 1382-84).

1381. In analyzing the “default to EPA” but for world, Professor Griffin compared Mr. Venturini’s recent testimony—which was an example of retrospective hypothetical choice—with statements made by CARB at the time of the adoptions of the Phase 2 regulations—which are examples of contemporaneous hypothetical choice statements. (Griffin, Tr. 8353). Professor Griffin noted that Mr. Venturini’s statement that CARB would have just taken the EPA regulations is “diametrically opposed” to what CARB stated in its Final Statement of Reasons. (Griffin, Tr. 8353-57; RX 1164A at 028).

1382. In the Final Statements of Reasons, CARB rejected a suggestion that the Phase I EPA regulations should be adopted in lieu of the staff’s proposal for the CARB Phase 2 regulations, stating that this proposal is “not realistic because the California Clean Air Act mandates very substantial reductions in ozone forming compounds at the earliest practicable date. The emissions reductions resulting from the federal reformulated gasoline do not achieve the same emission reductions as staff’s proposals.” (CX 10 at 094; RX 1164A at 028).

1383. Also in the Final Statement of Reasons, CARB stated that implementing only the federal gasoline standards without any CARB Phase 2 regulations “would leave the state far short of obtaining the emissions reductions needed to meet either the federal or state ambient air quality standards. The result would be far greater likelihood of sanctions on transportation funds and new

source growth, and an imposition of a greater burden on California industries to reduce emissions.” (CX 10 at 178; RX 1164A at 028).

1384. CARB Chairwoman, Ms. Sharpless, similarly testified that although various companies that advocated for application of federal RFG instead of California’s own reformulated gasoline regulations, CARB rejected that approach. (CX 7063 (Sharpless, Dep. at 215-16)). Ms. Sharpless explained that the federal regulation was looking at national air quality, which was not as severe as the air quality problem in California, and that the federal regulation would not have attained the amount of emissions reductions resulting from California’s RFG specifications. (CX 7063 (Sharpless, Dep. at 216)).

1385. Professor Griffin concluded that CARB’s contemporaneous statements should be relied upon rather than the retrospective hypothetical choice statements of Mr. Venturini in his recent testimony. (Griffin, Tr. 8357-58). This conclusion is not only supported by the fact that economists prefer contemporaneous statements to retrospective statements, but also by further economic analysis of the real world effects of what defaulting to the EPA regulation would have meant. (Griffin, Tr. 8358).

1386. Professor Griffin considered whether California would have been able to offset the emissions reductions lost if CARB had elected not to adopt the Phase 2 regulations, and concluded that obtaining those emission reductions elsewhere would have been “very, very costly and very problematic.” (Griffin, Tr. 8358-59).

1387. At the November 1991 meeting where the Board adopted the CARB Phase 2 regulations, the Board heard testimony and arguments that it should adopt the strictest feasible CARB Phase 2 standards, because otherwise the local air quality districts would have to impose additional

and far more costly burdens upon the local economy in attempting to find other ways to meet the federal clean air requirements. (Pedersen, Tr. 8130-31; CX 773 at 309-321).

1388. Likewise, on the day the Phase 2 hearings began, ARCO argued in a press release that “If clean air standards aren’t met by reformulated gasoline, then the financial burden would be borne by stationary sources, including many small business that would have to submit to stricter regulations. This ultimately would be much more detrimental to the state’s economy.” (Clossey, Tr. 5514; CX 1591 at 002). The clean air standards to which Mr. Babikian was referring included both federal and state laws. (Clossey, Tr. 5514-15).

1389. Unocal’s environmental regulation and enforcement expert, Mr. William Pedersen, opined that the adoption of federal RFG was not a realistic alternative for CARB during its 1991 rulemaking process. (Pedersen, Tr. 8061; RFF 1514-24, *infra*).

1390. There was no testimony from any witness at trial as to how CARB would have obtained the necessary emissions reductions from other sources had it not passed the Phase 2 regulations. Ms. Sharpless could not identify any other option that could have been adopted to achieve the same emissions reductions as Phase 2 RFG in 1991. (CX 7063 (Sharpless, Dep. at 196)).

1391. In Mr. Pedersen’s opinion, additional controls on large stationary sources could not offer the same emissions reductions as the CARB reformulated gasoline standards because California had already imposed tight regulations on such sources and because additional controls would be very expensive. (Pedersen, Tr. 8048-49).

1392. Moreover, the Phase 2 RFG emission benefits were essential to achieve EPA approval for California’s proposed SIP. (Pedersen, Tr. 8032). In preparing its state implementation plan, California did not have any practical alternative methods to achieve the emissions reductions

attainable through the CARB reformulated gasoline regulations. (Pedersen, Tr. 8063-64; RX 1186 at 033). As a result, California was effectively foreclosed from adopting any RFG regulations that would have provided for meaningfully less substantial air quality benefits than the Phase 2 RFG regulations that were actually adopted. (Pedersen, Tr. 8062-63; RX 1186 at 005).

1393. The testimony of CARB officials confirmed that they understood that Phase 2 RFG emissions benefits were needed to achieve the mandates of the federal Clean Air Act and were a necessary part of California's State Implementation Plan. (Kenny, Tr. 6608-10; CX 7054 (Mahdavi, Dep. at 26-27); *see also* Boyd, Tr. 6809-10; Simeroth, Tr. 7473-74, 7478-79; CX 7044 (Chan, Dep. at 77); CX 7063 (Sharpless, Dep. at 179-80, 183)). For example, at one public Board meeting in December 1995, Mr. Boyd told the Board that "as I've said before, the SIP doesn't work without California cleaner burning gasoline." (RX 331 at 025). Mr. Kenny, CARB's former Executive Officer, likewise testified that the Phase 2 regulations formed a "huge part" of the predicted emissions reductions in California's SIP. (Kenny, Tr. 6608-10). Moreover, Mr. Kenny testified that the state implementation plan for California just barely met its goals. (Kenny, Tr. 6608 ("Q. . . . the state implementation plan for California was getting by by the skin of your teeth; right? A. Correct.")).

1394. If a state does not adopt an adequate SIP on a timely basis, then the EPA is required to promulgate and implement a Federal Implementation Plan ("FIP") to correct the deficiencies. (RX 1186 at 006). Professor Griffin noted that in the event that CARB would not have been able to come up with offsetting emissions abatements from other sources to meet an acceptable state implementation plan, then California would have been threatened with the Federal Implementation Plan. (Griffin, Tr. 8367).

1395. The proposed Federal Implementation Plan was politically unacceptable to leaders in the state of California. (Pedersen, Tr. 8017-18; RFF 1552-56). For example, the Governor's Office, with the assistance of Dr. Reza Mahdavi from CARB, also published a report analyzing the costs and cost-effectiveness of the proposed FIP. (Boyd, Tr. 6807-08; RX 334). In this report, the Governor's Office stated that the proposed FIP would cost Los Angeles residents at least \$8 billion in direct costs and \$16.3 billion in lost output. (RX 334 at 001).

1396. Professor Griffin compared these proposed costs (at least \$24 billion just for Los Angeles) with a hypothetical world in which all of the summertime CARB gasoline was produced pursuant to the royalty schedule under which Unocal is willing to license its patents and concluded that this cost would be just \$100 million a year—a small fraction of the costs California was threatened with if it could not meet its federal clean air act obligations. (Griffin, Tr. 8368-69; RX 1164 at 031, 185, *in camera*). Professor Griffin concluded (as did Mr. Pedersen), that the alleged scenario in which CARB defaults to EPA is not a plausible one. (Griffin, Tr. 8369).

1397. Professor Shapiro asserted in his report that “Unocal’s deception has harmed competition in the market for low-emissions RFG technology required to produce gasoline compliant with CARB’s summertime RFG regulations. Unocal’s deception improperly excluded alternative low-emissions RFG technologies and enabled Unocal to obtain monopoly power and engage in *ex post* opportunism.” (Shapiro, Tr. 7390; CX 1720A at 032). At trial, however, Professor Shapiro could give only a single example of an “alternative technology” was the “excluded” by the assumed Unocal deceptions, and that was EPA Phase I. (Shapiro, Tr. 7391).

1398. In the model Professor Shapiro used for his lock-in analysis, Professor Shapiro chose the default to EPA regulations as the but for alternative CARB would have chosen. (Shapiro, Tr.

7366). Although Professor Shapiro's analysis was based on the premise that CARB would have adopted EPA's regulations instead of the Phase 2 RFG regulations, he did not study whether the EPA alternative was superior to any of the alternative regulations. (Shapiro, Tr. 7152). At trial, Professor Shapiro denied that all the evidence demonstrates that the EPA regulations would have been disastrous for the California economy, but he himself did no analysis of the viability of this option. (Shapiro, Tr. 7367-68; CX 1720A, CX 1799A).

1399. Consequently, Professor Shapiro was unable to state whether the EPA regulations would have been more or less costly than the actual CARB RFG regulations, taking Unocal's patent royalties into account. Indeed, Professor Shapiro could not rank the costliness of EPA regulations, CARB regulations with royalties of 1.7 cents per gallon, or CARB regulations with royalties of 5.75 cents per gallon. (Shapiro, Tr. 7153-54). He could not rank these alternatives as they existed in either 1991 or 1995. (Shapiro, Tr. 7225-26).

1400. Similarly, Professor Shapiro could not state whether the EPA alternative would have been more or less costly in reducing emissions on a per-unit basis than the Phase 2 RFG regulations assuming Unocal royalties of 1.7 cents per gallon. (Shapiro, Tr. 7729-30). He could not provide this analysis for either 1991 or 1995. (Shapiro, Tr. 7231).

1401. Because he did not conduct an evaluation of the costs associated with various regulatory options available in 1991, Professor Shapiro could not rule out that the next best alternative to CARB regulations with no patent royalties would have been the same regulations with a royalty of 1.7 cents per gallon. (Shapiro, Tr. 7153-54, 7160). Indeed, because Professor Shapiro was unable to rank the costliness of EPA regulations against CARB regulations with royalties of 5.75 cents per gallon (Shapiro, Tr. 7153-54), his testimony cannot rule out that the RFG regulations with a patent

royalty of 5.75 cents per gallon would be superior to the EPA regulations from the standpoint of cost-effectiveness.

1402. Given the overwhelming evidence set forth above and at (RFF 1514-1610, *infra*), the Court concludes that defaulting to the EPA regulations was not a viable option for CARB.

2. Complaint Counsel Did Not Establish that CARB Would Have Designed Around the Unocal Patents

1403. The second “but for” world that Professor Griffin analyzed was whether CARB would have designed around the Unocal patents had it known of Unocal’s pending patent application. (Griffin, Tr. 8369-70). Professor Griffin chose to analyze this situation because it was described in Complaint Counsel’s answers in response to an interrogatory asking what Complaint Counsel contends CARB would have done in the absence of Unocal’s alleged misconduct. (Griffin, Tr. 8369–70; RX 1164A at 036-038).

1404. Applying revealed preference analysis, Professor Griffin concluded that CARB had systematically demonstrated an unwillingness to alter its regulations to allow refiners to blend around the Unocal patents. (Griffin, Tr. 8370-71).

1405. There were a number of observations that led to Professor Griffin’s conclusion on this point. (Griffin, Tr. 8370-81). First, the assertions in Complaint Counsel’s interrogatory answer referenced above state that CARB “would have adopted regulations with higher flat limits and caps for T50 and/or other parameters.” (RX 1164A at 037). The interrogatory answer also proposed raising flat and cap limits on parameters such as olefins and T90. (RX 1164A at 037).

1406. The effect of a number of the regulatory alternatives suggested by Complaint Counsel is that they amount to a relaxation of the parameter caps in the Phase 2 predictive model. (Griffin, Tr. 8373; RX 1164A at 039). Professor Griffin demonstrated how a hypothetical relaxation of a cap

limit, such as moving T50 from 220 to 225, or moving olefins from 10 to 12, would enlarge the legal blend space and make it potentially possible to have a greater space in which to potentially blend outside the patents but inside the CARB regulations. (Griffin, Tr. 8375-80; RX 1164A at 039). Professor Griffin demonstrated hypothetically how a cap could be raised or relaxed while the emissions benefits from a fuel with that higher cap could be unchanged, if the refiner went lower on another property and thus ensured that the emissions benefits were the same as the predictive model's reference fuel. (Griffin, Tr. 8377-78).

1407. Unocal, however, had initially proposed that CARB adopt a predictive model with no caps, which Professor Griffin describes as the "ultimate vehicle for blending around." (Griffin, Tr. 8371, 8379; *see also* RFF 543-44, 800)). When CARB ultimately adopted a predictive model, however, the model was limited by caps. (Griffin, Tr. 8380). This is one example of CARB expressing a revealed preference for limitations, or caps, on fuel properties. (Griffin, Tr. 8380).

1408. Professor Griffin testified to additional examples of what he observed to be CARB's revealed preference for not changing or relaxing any of its fuel parameter limitations. (Griffin, Tr. 8380). He noted that there were a number of times when refiners came to CARB after they were aware of Unocal's patents and asked for a relaxation of certain parameters, such as when ExxonMobil went to CARB and requested that CARB raise the olefin limit to 16 percent to allow ExxonMobil to reduce its matching rate. (Griffin, Tr. 8380). CARB did not grant these requests. (Griffin, Tr. 8380; *see also* RFF 836-908). Given CARB's actual behavior, Professor Griffin saw no support for Complaint Counsel's "design around the patents" but for world. (Griffin, Tr. 8380-81).

1409. Professor Griffin was unable to test the cost implications of this design around but for world because Complaint Counsel did not provide him with enough specificity, since the

interrogatory answer upon which this analysis was based did not state how CARB have changed its regulations. (Griffin, Tr. 8372). This in turn made it impossible for Professor Griffin to determine what the resulting matching rates would be or what the implied cost of making gasoline under those unspecified regulations would be. (Griffin, Tr. 8372).

3. Complaint Counsel Did Not Establish that Unocal's Conduct Caused to Regulate T50 Nor Did They Establish that the Regulation of T50 Caused the Alleged Harm

1410. The next but for world that Professor Griffin considered was the “blissful ignorance” of the T50 world. Professor Griffin explained that the assumption behind this but for world is that in the absence of the Unocal data, CARB would have never learned of the importance of T50; therefore, the regulations that would subsequently have been adopted would have not had a T50 component. (Griffin, Tr. 8381). This assumption came from Complaint Counsel and “blissful ignorance” was a phrase that Complaint Counsel had coined. (Griffin, Tr. 8381).

1411. The Complaint alleges that CARB reasonably relied on Unocal's alleged misrepresentations in setting a T50 specification and that Unocal's alleged misrepresentations “caused” CARB to adopt a T50 specification and to include T50 in the predictive model. (Complaint ¶¶ 43, 45).

1412. Professor Griffin used a revealed preference methodology to test the viability of this but for world. (Griffin, Tr. 8381). Professor Griffin examined a number of observations of CARB's actual behavior and concluded that CARB's revealed preference was for regulating T50. (Griffin, Tr. 8381-82).

1413. For example, Professor Griffin testified to a number of observations relating to the period of time leading up to the adoption of the Phase 2 regulations that relate to CARB's revealed

preference as to T50. (Griffin, Tr. 8382). Professor Griffin noted that as early as January of 1991, CARB told WSPA that CARB considered T50 a critical specification. (Griffin, Tr. 8382; RX 677; Lieder, Tr. 4756). Also, in early June, prior to the meeting between CARB and Unocal, CARB met with ARCO and requested the specifications for T50 on ARCO's EC-X gasoline. (Griffin, Tr. 8382; *see also* RFF 345-49, *supra*). Before Unocal ever stated that it would lift the confidentiality of its data, CARB was proposing regulations on T50. (Griffin, Tr. 8382; *see also* RFF 411-13, *supra*). And, during this time period there were other entities, such as Toyota and some of the auto manufacturers, coming to CARB and indicating the importance of T50. (Griffin, Tr. 8382; *see also* RFF 317-38, 360, *supra*).

1414. Professor Griffin also made a number of observations based upon CARB's behavior at a later point in time. (Griffin, Tr. 8382-83). Several of the refiners went to CARB, asking for changes in the way that T50 was regulated. (Griffin, Tr. 8383; *see also* RFF 839-41, *supra*). In one instance, Professor Griffin testified, a refiner asked CARB to alter the slope coefficient on T50 in its predictive model so that it resembled the value in the EPA model. (Griffin, Tr. 8383; *see also* RFF 847-48, *supra*). Other refiners asked for the caps on T50 to be raised to enable them to better avoid matching the Unocal patents. (Griffin, Tr. 8383; *see also, e.g.*, RFF 839-41, 846, 855, *supra*). Professor Griffin noted that in each instance CARB refused the refiners' requests. (Griffin, Tr. 8383). Even in the Phase 3 rulemaking, Professor Griffin noted, the caps on T50 have remained the same. (Griffin, Tr. 8383).

1415. Given these observations of CARB's revealed preference, Professor Griffin testified that this but for "blissful ignorance" world was not a plausible one. (Griffin, Tr. 8383).

1416. Professor Griffin was not able to do any additional analysis of this alleged but for world because he was not provided with any information regarding what the limitations on the other parameters would be, or even what additional parameters—such as Driveability Index—might have been regulated instead of T50. (Griffin, Tr. 8383-84). Thus, it was not possible to determine what the emissions would be under this regulatory scenario, whether additional emissions abatement would be needed from other sources, or what the matching rates would be under this scenario. (Griffin, Tr. 8384-85).

1417. Despite the Complaint's allegations that Unocal "caused" the regulation of T50, Professor Shapiro did not "assume that Unocal's deception led to T50 or a certain level of T50." (Shapiro, Tr. 7137). Further, Professor Shapiro neither assumed nor concluded that CARB would have adopted a different regulation, without T50, absent Unocal's conduct. (Shapiro, Tr. 7141-42).

1418. Significantly, Complaint Counsel's refining expert, Mr. Sarna, testified that it is the slope of the response curves in the CARB predictive model—and not the actual cap limits for T50 or any other parameter—that makes it difficult for the refiners to avoid the Unocal patents to any significant extent. (Sarna, Tr. 6388). Mr. Sarna explained how the relative steepness and shape of the slopes of the various parameters in the predictive model affect refiners' blend around capabilities. (Sarna, Tr. 6388). In order to offset going higher on certain parameters such as T50 and T90—which have a steep response to emissions at the high end of the curve—a refiner must lower to a much greater extent parameters such as aromatics and sulfur—which have a flatter response at the low end. (Sarna, Tr. 6388). The refiners are almost universally using the predictive model to certify their gasoline. (Simeroth, Tr. 7479-81; RX 190 at 019 (stating that the predictive model is "[u]sed for virtually all gasoline produced"))).

1419. This Court finds that nothing Unocal said or did caused the relative steepness or shapes of the slopes of the various response curves in the CARB predictive model. (*See* RFF 806-14, *supra*). CARB's predictive model does not use Unocal's equations. (Kulakowski, Tr. at 4649-51; *see* RFF 807, *supra*).

1420. Moreover, the data from Unocal's emissions tests accounted for less than 10 percent of the total data in the Phase 2 predictive model. (CX 7045 (Cleary, Dep. at 167); CX 53 at 030-031, 150-151).⁵ Unocal's data did not have a large effect on the model's responses. (CX 7045 (Cleary, Dep. at 11); *see* RFF 806, *supra*).

1421. Just as CARB's predictive model data base contains Unocal's data, the EPA's complex model data base also includes Unocal's data. (Lamb, Tr. 2267-68, CX 7045 (Cleary, Dep. at 167-68)). There are many differences between the two models, however (*see* RFF 810-11, *supra*), and, in particular, the response curve of T50 to emissions changes is much steeper in the CARB model than in the EPA model. (Eizember, Tr. 3280-81; [REDACTED] [REDACTED], *in camera*. [REDACTED] [REDACTED] (Lieder, Tr. 4849-50, *in camera*). [REDACTED] [REDACTED] (Lieder, Tr. 4849-50, *in camera*). [REDACTED] [REDACTED] (Lieder, Tr. 4849-50, *in camera*).

⁵ The CARB Phase 3 predictive model included even more data points than the Phase 2 data base (CX 7045 (Cleary, Dep. at 105)), hence Unocal's data accounts for an even smaller percentage of the current predictive model data base.

1422. Unocal unsuccessfully argued to WSPA in favor of the EPA model. (Kulakowski, Tr. 4642). In fact CARB rejected the EPA model, a hybrid CARB-EPA model, and the model offered by WSPA, because CARB felt its approach was more appropriate. (CX 7045 (Cleary, Dep. at 181-82)). CARB staff chose to use a statistical approach that was recommended by an independent consultant retained by CARB named Dr. David Rocke. (CX 7045 (Cleary, Dep. at 132)). In its Final Statement of Reasons for the CARB Phase 2 Predictive Model, CARB did not list Unocal among the parties supporting the predictive model. (CX 54 at 013).

4. The Evidence Demonstrates that the CARB Regulations Would Be the Same, Even Absent Unocal's Alleged Misrepresentations

1423. The final CARB but for world that Professor Griffin addressed was the but for world in which the actual world is the same as the but for world. (Griffin, Tr. 8385). This was a world that Professor Griffin constructed. (Griffin, Tr. 8385). Professor Griffin testified that for there to be economic harm resulting from Unocal's conduct, it is essential to be able to conclude that CARB would have behaved differently. (Griffin, Tr. 8338-89, 8385-86). If CARB would not have behaved any differently had it known of the patents, then there is no economic harm. (Griffin, Tr. 8338-89).

1424. Professor Griffin analogized his final but for world hypothesis to the null hypothesis that the FDA sets up for a drug company seeking to bring a new drug on the market. (Griffin, Tr. 8338-39, 8385). In that setting, the FDA says to the drug company that it assumes that "this drug is not effective and it's your burden to prove that—you've got to be able to reject that hypothesis." (Griffin, Tr. 8339).

1425. Likewise, Professor Griffin set up the hypothesis that the but for world equals the actual world because an economist would need to be able to reject such a hypothesis before one could ever conclude that there has been some injury in this case. (Griffin, Tr. 8339).

1426. In his analysis of whether the but for world equals the actual world, Professor Griffin made a number of strong assumptions about what CARB would have known in the but for world. (Griffin, Tr. 8386). He gave “perfect foresight” to CARB, that is, he assumed that not only did CARB know of Unocal’s patent application in 1991, but also that CARB had perfect foresight into the future and would be able to know that five patents would ultimately issue and that Unocal would come up with its licensing plan and licensing rate. (Griffin, Tr. 8386). Beyond that, Professor Griffin also assumed that the courts will ultimately rule that Unocal’s patents are valid and that they are ultimately construed in such a way that the matching numerical rates on the patents turn out to equal infringement rates. (Griffin, Tr. 8386-87).

1427. In the real world, neither CARB nor anyone else could have had such perfect foresight. (Griffin, Tr. 8387). Economists, however, frequently make strong assumptions such as perfect foresight to simplify their analysis in areas such as this where they are attempting to look into an uncertain future. (Griffin, Tr. 8387). In this case, Professor Griffin was very comfortable in using his perfect foresight assumption because it represents a very conservative approach. (Griffin, Tr. 8387). Here, a perfect foresight assumption gives CARB the maximum incentive to behave differently. (Griffin, Tr. 8387-88). Professor Griffin explained that if even under this strong assumption he was able to reject the idea that CARB would have behaved differently, then he would be on very firm ground if his ultimate conclusion proved to be that the actual world and the but for world are the same. (Griffin, Tr. 8387-88).

1428. To analyze this but for world, Professor Griffin constructed the hypothesis that CARB would have behaved no differently—that it would have adopted the same regulations—had it known

of Unocal's pending patent application. (Griffin, Tr. 8388). To test this hypothesis, Professor Griffin expected to find that one of two conditions was present. (Griffin, Tr. 8388-89).

1429. First, Professor Griffin testified, one would expect to find that the constraints which CARB was facing at the time were such that the regulations together with the Unocal patents were the best alternative available to CARB, even if it meant that the refiners would have to pay royalties. (Griffin, Tr. 8389). The second condition Professor Griffin looked to was whether CARB really cared about patent rights, or whether it expressed indifference to them. (Griffin, Tr. 8389).

1430. To analyze this first condition, Professor Griffin looked at the constraints CARB was facing at the time, and then determined what additional costs the Unocal royalties would entail and how that would have affected CARB's decision-making. (Griffin, Tr. 8389).

1431. Professor Griffin explained that he looked to CARB's own cost-effectiveness calculations. (Griffin, Tr. 8390). CARB's analysis was not one of cost-minimization, but rather was expressed as a threshold concept in which CARB considered its previous experience in achieving emissions abatements. (Griffin, Tr. 8390). These past expenditures, expressed as costs per ton of pollutants abated, in effect create a ceiling or threshold for its cost-effectiveness determination. (Griffin, Tr. 8390). CARB indicated that it considered anything under this maximum threshold to be "cost-effective." (RX 1164A at 045; *see also* RFF 722-23, *supra*).

1432. Professor Griffin then examined whether the Unocal royalties, if added to the cost-effectiveness calculations which CARB did in 1991, would push the cost of the regulation above the threshold which CARB considered to be cost-effective. (Griffin, Tr. 8390-91).

1433. In 1991, CARB had determined that the cost of the regulation was \$11,000 per ton. (Griffin, Tr. 8391; *see also* RFF 730, *supra*). To determine what effect the Unocal royalties would

have on this number, Professor Griffin assumed that 100 percent of the summertime gasoline was subject to a royalty under Unocal's published royalty rate of 1.6 cents per gallon and applied this calculation to CARB's demand projections out to the year 2005. (Griffin, Tr. 8392; RX 1164A at 045; RX 1164 at 185, *in camera*). He then divided that cost by the emissions reductions that correspond to Phase 2 gasoline and came up with a number of approximately \$2,000 per ton. (Griffin, Tr. 8392; RX 1164A at 045; RX 1164 at 185, *in camera*). Professor Griffin then followed CARB's methodology for attributing costs to criteria pollutants and divided this \$2,000 number by two. (Griffin, Tr. 8392; RX 1164A at 045; RX 1164 at 185, *in camera*). That additional \$1,000 was then applied to CARB's high end estimate of \$11,000 per ton, for a resulting high end cost estimate of \$12,000 per ton, assuming Unocal royalties on 100 percent of CARB summertime gasoline. (Griffin, Tr. 8394; RX 1164A at 078).

1434. In Figure 4 of his report, Professor Griffin prepared a chart showing the cost-effectiveness numbers from other recent emissions abatement methods that CARB had considered in determining that its Phase 2 regulations were cost-effective. (Griffin, Tr. 8393-95, RX 1164A at 078, *see also* CX 52 at 077). The threshold set by the other methods was in excess of \$30,000 per ton. (Griffin, Tr. 8395, RX 1164A at 078, *see also* CX 52 at 077). Professor Griffin concluded that the cost of the CARB regulations, even with the Unocal royalties, was well below the threshold set by other emission abatement methods. (RX 1164A at 046).

1435. As further support for his conclusion that CARB would have deemed the regulations cost-effective even had it known of Unocal's patents, Professor Griffin noted that there were several contemporaneous hypothetical choice statements made by CARB that supported this opinion. (Griffin, Tr. 8395; RX 1164A at 045-046). First, CARB staff had specifically stated in 1991 that an

increase of \$1,000 per ton didn't "have a significant impact on the cost-effectiveness of the regulations." (Griffin, Tr. 8395, RX 1164A at 045, CX 773 at 052). Moreover, CARB had also indicated in its Final Statement of Reasons that even a 25 percent increase in the cost of the regulations would not alter CARB's view that the regulations were cost-effective. (Griffin, Tr. 8395; RX 1164A at 045, CX 10 at 184).

1436. The second consideration Professor Griffin looked at in testing his hypothesis about whether the but for world was synonymous with the actual world was whether CARB cared about patent rights. (Griffin, Tr. 8395). Professor Griffin applied a revealed preference methodology to this portion of his analysis. (Griffin, Tr. 8395-96). He concluded that a number of such observations showed that CARB had a demonstrated indifference to patented technology. (Griffin, Tr. 8396).

1437. For example, Professor Griffin testified, Unocal went to CARB in 1989 and told CARB that Unocal had a patent pending on a gasoline additive. (Griffin, Tr. 8396; *see also* RFF 1012-16, *supra*). CARB never asked Unocal about this application and did no follow-up. (Griffin, Tr. 8396). Professor Griffin further noted that CARB did not subsequently ask any of the Phase 2 participants about whether they had any patent applications. (Griffin, Tr. 8396). And, even after Unocal announced its first patent in 1995 (and after subsequent patents issued to Unocal in 1997 and 1998), CARB did not ask about patent applications in its Phase 3 rulemaking. (Griffin, Tr. 8396-97; *see also* RFF 919, *supra*). Professor Griffin testified that these observations suggest that CARB had a revealed indifference to patent rights. (Griffin, Tr. 8397; RX 1164A at 046-047).

1438. Professor Griffin's ultimate conclusion was that the only realistic alternative was that the but for world is synonymous to the real world; that is, that CARB would have behaved exactly the same as it did in the real world had Unocal not engaged in the alleged misconduct. (Griffin, Tr.

8397). Professor Griffin concluded that this means that there would be no economic harm resulting from Unocal's conduct. (Griffin, Tr. 8397).

5. Complaint Counsel's Expert Did Not Evaluate Whether CARB Would Have Behaved the Same but for Unocal's Conduct

1439. Complaint Counsel did not offer expert testimony on whether there was economic harm resulting from Unocal's alleged misrepresentations to CARB. Although Professor Shapiro testified that Unocal's conduct caused competitive harm because Unocal was "seeking" to collect royalties on its patents that were greater than the alleged competitive price of zero (Shapiro, Tr. 7067, 7078), he did not evaluate whether Unocal's allegedly deceptive conduct brought about harm that would not have occurred absent that conduct. (Shapiro, Tr. 7135).

1440. In fact, Professor Shapiro acknowledged that "I don't actually know factually one way or another about these specific causation elements as you might call them." (Shapiro, Tr. 7135).

1441. Professor Shapiro agreed that the simple fact that a superior technology has the effect of keeping inferior technologies from succeeding in the marketplace is not a cause for competitive concern. (Shapiro, Tr. 7392-93). He also agreed that if the superior product leads to monopoly, that might actually be a better outcome for consumers because the new product may be so superior to other products that consumers are actually better off. (Shapiro, Tr. 7392).

1442. Professor Shapiro did not perform any analysis to compare the alternatives that would have been available to CARB absent Unocal's alleged deception to the actual regulations that it adopted to determine whether any alternative would have been superior from a cost-effectiveness standpoint when taking Unocal's patent royalties into account. (Shapiro, Tr. 7144).

1443. In his report Professor Shapiro listed seven alternative regulations that were available to CARB in 1991, but he admitted at trial that the fact that these alternatives were “available” does not mean that they were “cost-effective or attractive.” (Shapiro, Tr. 7147; CX 1720A at 007).

1444. Professor Shapiro did not study, and therefore has no opinion regarding, whether any of the seven alternatives he identifies in his report were preferable, in 1991 or now, to the alternative that CARB actually adopted. (Shapiro, Tr. 7150, 7224-30). Indeed, Professor Shapiro cannot identify the “next best alternative” to the regulations actually adopted by CARB that was available to CARB in 1991. (Shapiro, Tr. 7150-51). Professor Shapiro is also unable to rank in order any of the alternatives available to CARB in 1991, and today, from least to most costly. (Shapiro, Tr. 7150, 7154-56, 7224-30; RX 1159, RX 1160, RX 1161).

1445. Professor Shapiro specifically admitted that “to talk about cause and even in the colloquial sense, the common sense use of the word, one has to have a view if they didn’t engage in deception, something else happened, some but-for world, and then what will happen, so you need to specify the alternative conduct.” (Shapiro, Tr. 7142). Despite this acknowledgment, however, Professor Shapiro testified that his analysis of market power, “is not based on any assumption or conclusion about precisely what would have happened if Unocal had behaved differently.” (Shapiro, Tr. 7142).

1446. At trial Professor Shapiro backed away from the assertion in his report that “there is considerable evidence that Unocal did in fact influence CARB’s chosen specification,” and in fact testified that he is not asserting that that statement is true. (Shapiro, Tr. 7139-41; CX 1720A at 018). Although Professor Shapiro contended that CARB had “relied” on Unocal’s alleged misrepresentations, he admitted that he was merely saying that CARB acted after the alleged

misrepresentation occurred rather than saying that the misrepresentation had caused CARB to act in a particular way. (Shapiro, Tr. 7164-66).

1447. Professor Shapiro does not assert nor assume for purposes of his analysis that the alleged deceptive conduct had any effect on the CARB Phase 2 RFG limits. (Shapiro, Tr. 7134-37). Most crucially, Professor Shapiro testified that “I am not assuming or concluding necessarily that CARB would have done any particular—that its regulations would have been different in any particular way if not for these representations.” (Shapiro, Tr. 7166).

1448. In light of all the evidence and testimony at trial, the Court finds that there is no evidence that the harm to consumers as alleged in the Complaint was caused by any of Unocal’s alleged misrepresentations to CARB.

B. Complaint Counsel Did Not Prove that Unocal’s Alleged Misrepresentations to Refiners Caused Anticompetitive Harm

1449. In addition to alleging that the overlap between the CARB regulations would have been different in the absence of Unocal’s alleged fraud, the Complaint also alleges that but for Unocal’s fraud, refiners would have been able to incorporate knowledge of Unocal’s pending patent rights in their capital investment and refinery reconfiguration decisions to avoid and/or minimize potential infringement. (Complaint ¶ 90(c)). Both Professors Teece and Griffin addressed this alleged “but for” world in their testimony.

1. The Refiners’ Testimony Is Not Economically Rational and, if True, Would Have Increased Gasoline Prices

1450. Professor Teece reviewed the testimony of the refiners’ corporate representatives about what each refiner claims it would have done had it been aware of Unocal’s pending patent application. (Teece, Tr. 7587-88). Professor Teece looked first at whether such testimony was

consistent with rational economic behavior. (Teece, Tr. 7588). Second, Professor Teece analyzed what such behavior would have meant for California gasoline prices. (Teece, Tr. 7588).

1451. A number of the refiners testified that if they had known that Unocal had a pending application, they either would not have invested in CARB Phase 2 gasoline, or that if they did invest, they would have made reduced levels of investment. (Teece, Tr. 7588). A reduced or minimal investment scenario would mean that refiners would produce less CARB-compliant gasoline. (RX 1162A at 067).

1452. For example, Mr. Thomas Eizember, testifying on behalf of ExxonMobil, stated that had his company known of Unocal's patent application in the early 1990s, the minimal investment alternative for CARB Phase 2 gasoline would have had increasing attractiveness. (Eizember, Tr. 3207). With the CARB Phase 2 project it adopted, the Benicia refinery produced approximately 100,000 barrels per day of CARB gasoline. (Eizember, Tr. 3152-53). Under the minimal investment plan that it considered, production would have dropped to approximately 40,000 barrels per day. (Eizember, Tr. 3306-07).

1453. Significantly, both Exxon and Mobil knew of Unocal's patent before their respective company management approved of their CARB 2 investment projects. (Eizember, Tr. 3312-13, 3317-18, 3404, 3416; RX 233).

1454. Mobil approved its plan for reconfiguring the Torrance refinery on April 26, 1994—after it learned of the '393 patent. (Eizember, Tr. 3317-18; RX 233).

1455. With respect to Exxon, Mr. Eizember himself made the recommendation to his management at Exxon for reconfiguring the Benicia refinery to produce CARB Phase 2 gasoline. (Eizember, Tr. 3312-13). Mr. Eizember testified that it was the role and responsibility of Exxon

Research and Engineering Company to investigate patents or patent applications as Exxon's refining division assessed the options for the refineries' construction plans for CARB Phase 2 gasoline. (Eizember, Tr. 3404). Individuals within the Research and Engineering company knew of the issuance of the '393 patent before Mr. Eizember made his recommendation to Exxon management about refinery reconfigurations to meet the CARB Phase 2 specifications; they just didn't tell him about the patent. (Eizember, Tr. 3416).

1456. On the topic of what changes ARCO would have made to its refinery configuration plans had it known of Unocal's patent application, BP/ARCO designated one of its former vice presidents, Kenneth Riley, to speak for the company. (CX 7061 (Riley, Dep. at 11); RX 451 at 001-004). Mr. Riley testified that, if ARCO had known of Unocal's pending patent application, "and to the extent that it was not completely satisfied it would not be enforced, [ARCO] would not have proceeded with the project to make CARB Phase II gasoline." (CX 7061 (Riley, Dep. at 12, 21-22)).

1457. In the early 1990s, ARCO considered three potential investment alternatives for its CARB Phase 2 reconfiguration project. (Hoffman, Tr. 4978; CX 5052 at 036). ARCO chose to implement the "full capital investment" option, under which it expected to be able to produce 142,000 barrels per day of CARB Phase 2 gasoline. (Hoffman, Tr. 4978). ARCO projected that it would only be able to produce 99,000 barrels per day of CARB gasoline under the alternate minimum capital case, and only 58,000 barrels per day under the base, zero investment case. (Hoffman, Tr. 4979; CX 5052 at 036). The zero investment case is the one Mr. Riley said ARCO would have chosen had they known of Unocal's pending patent application. (CX 7061 (Riley, Dep. at 12, 21-22)).

1458. Professor Teece testified that there would have been severe economic implications had ARCO actually made this choice. (Teece, Tr. 7591). First, the reduced CARB 2 production (58,000

barrels per day versus 142,000 barrels per day) would mean that ARCO would not be able to meet the needs of its traditional customers, requiring that ARCO either dramatically scale back its marketing operations (and the whole scale of its business) or to import and export gasoline outside of California. (Teece, Tr. 7591). ARCO outlined some of the consequences of this zero investment scenario in CX 5052. (Teece, Tr. 7591; CX 5052 at 036).

1459. Under this no investment scenario, if ARCO produced only 58,000 barrels per day of CARB-compliant gasoline, the remainder of its gasoline production—a little under 100,000 barrels per day—would be conventional gasoline. (Teece, Tr. 7592; CX 5052 at 036). This conventional gasoline would need to be exported outside of California. (Teece, Tr. 7592). The only market for significant quantities of conventional gasoline would be either the Gulf Coast or the Far East. (Teece, Tr. 7592-93). There would be significant price penalties and transportation cost penalties associated with exporting such gasoline. (Teece, Tr. 7592-93).

1460. Moreover, if a company such as ARCO had made only 58,000 barrels per day of CARB-compliant gasoline (as it could make under its zero investment scenario), ARCO would be unable to meet its marketing commitments in California without obtaining the remaining quantities through either imports or exchanges. (Teece, Tr. 7593). Alternatively, ARCO would need to dramatically reduce its marketing outlets. (Teece, Tr. 7593).

1461. Professor Teece opined that the costs associated with such a minimal investment scenario could be approximately 25 cents per gallon for exports to the Gulf Coast, and somewhat north of 30 cents per gallon for exports to the Far East. (Teece, Tr. 7593; RX 1162A at 068-069). In Professor Teece's opinion, such a minimal or no investment scenario would have been an "extreme

response” to a patent application, and one that was not consistent with rational economic behavior. (Teece, Tr. 7593-94).

1462. Like ARCO, Exxon, and Mobil, Chevron’s designated witness testified that Chevron would have made reduced CARB 2 investments had it known of Unocal’s pending patent. (Gyorfi, Tr. 5289-90).

1463. Mr. Lance Gyorfi was Chevron’s designated witness on the topic of what changes the company would have made had it known of Unocal’s pending patent application. (Gyorfi, Tr. 5288). In reconfiguring its refineries to produce CARB Phase 2 gasoline, Chevron opted to make discretionary investments that allowed it to produce 235,000-250,000 barrels per day of CARB Phase 2 summertime gasoline. (Gyorfi, Tr. 5218-19, 5229). This was 55,000-70,000 barrels per day more than Chevron’s marketing demand in California in the mid-1990s. (Gyorfi, Tr. 5286-87). Chevron chose to make the discretionary investments because it believed that the market was going to be short of CARB gasoline and the margins would improve and those projects would have a good rate of return. (Gyorfi, Tr. 5287).

1464. Mr. Gyorfi testified that if Chevron had known of the claims of all of the Unocal patents and had understood that there could be a 5.75 cents per gallon royalty associated with infringement that Chevron would have only invested what it needed to make 180,000 barrels per day of CARB-compliant gasoline and would not have made the discretionary investments. (Gyorfi, Tr. 5289-90). The 180,000 would have fallen within the numerical property limitations of one or more of the Unocal patents. (Gyorfi, Tr. 5290-91).

1465. As a second step in his analysis of the but-for worlds described by the refiners’ testimony, Professor Teece took the allegations of one representative refiner at face value and looked

at what the effect on the California market would be if this refiner (Chevron) had actually made less CARB-compliant gasoline as Mr. Gyorfi claimed it would have done. (Teece, Tr. 7599-600; RX 1162A at 070-072; RX 1205 (demonstrative)).

1466. Professor Teece noted that Mr. Gyorfi had testified at his deposition that Chevron would have built the capacity to make 50,000 barrels per day less of CARB-compliant gasoline had it known of Unocal's patent. (Teece, Tr. 7601). At trial, Mr. Gyorfi had testified that Chevron would have built even less capacity (55,000 to 70,000 barrels per day less), but Professor Teece used the 50,000 barrels per day number for his analysis. (Teece, Tr. 7601).

1467. Next, Professor Teece took the total summertime California gasoline production of 799,000 barrels per day and calculated that Mr. Gyorfi's hypothetical reduction was 6.26 percent of the market. (Teece, Tr. 7602; RX 1162A at 071-072; RX 1205 (demonstrative)). To calculate the effect this reduction would have on the price of gasoline, he then applied an elasticity-of-demand estimate he had previously calculated (-.25) and testified that using this elasticity estimate, a 6.26 reduction in supply would increase wholesale gasoline prices by 25 percent. (Teece, Tr. 7602-03; RX 1162A at 071-072; RX 1205 (demonstrative)). In June 1996, the wholesale price for gasoline was 63 cents per gallon, thus Professor Teece estimated that Mr. Gyorfi's hypothetical supply reduction would have increased this price by 25 percent, or by 16 cents per gallon. (Teece, Tr. 7602, RX 1162A at 072, RX 1205 (demonstrative)).

1468. Thus, Professor Teece concluded in his report that if just one of the refiners had actually done what it said it would do, then gasoline prices in California would have been substantially higher than they actually were, by an amount that is dramatically higher than any amount that Unocal successfully sought for licensing its patents. (RX 1162A at 072).

1469. Texaco's representative, Mr. Hancock, testified that Texaco would not have invested in the CARB Phase 2 projects at the Los Angeles and Bakersfield refineries and in fact would have shut down those refineries if it had known of the existence of the Unocal patent in 1992. (CX 7048 (Hancock, Dep. at 258-59, 264)).

1470. Professor Teece also looked at the viability of shutting down a California refinery in response to a pending patent application. (Teece, Tr. 7597-98). Professor Teece concluded that it would be a complete overreaction for a company such as Texaco to have shut down a refinery as a result of a pending patent. (Teece, Tr. 7599). By shutting down a refinery, not only is a company abandoning any effort to get value out of the existing capital stock, but it also faces a significant environmental cleanup problem. (Teece, Tr. 7598).

1471. In fact, there was no evidence at trial that any of the major refineries have shut down as a result of Unocal's five issued patents. Instead, a number of companies testified about their decisions to enter the market even after Unocal's patents had issued. (Dowling, Tr. 3679-85; Hoffman, Tr. 4971-72; Simonson, Tr. 5978-81).

1472. For example, Mr. Hoffman testified that BP/Amoco acquired ARCO in 2000. (Hoffman, Tr. 4970). This was BP/Amoco's first entry into the California market. (Hoffman, Tr. 4971-72). Tesoro, likewise, made significant investments in the market for CARB gasoline beginning in 2002, purchasing the Golden Eagle refinery in Martinez, California in April of 2002 at a cost of approximately \$945 million plus inventory costs of approximately \$130 million. (Dowling, Tr. 3679-82). This was Tesoro's first refinery in California. (Dowling, Tr. 3680).

1473. Tesoro had full knowledge of the Unocal patents for reformulated gasoline when it made its significant investments at Golden Eagle. (Dowling, Tr. 3685). Tesoro CARB 3 project

investments at Golden Eagle have resulted in a significant increase in the ability of the Golden Eagle refinery to produce CARB gasoline. (Dowling, Tr. 3680-81). Tesoro has publicly touted the purchase as a positive business move. (Dowling, Tr. 3684-85).

1474. Like BP/Amoco and Tesoro, Valero's 2000 acquisition of the Benicia refinery was Valero's first entry into the California refining market. (Simonson, Tr. 5978). At approximately one billion dollars and roughly one-third the size of Valero, this was the largest and "single most important" acquisition in Valero's history. (Simonson, Tr. 5978-79; RX 276 at 011).

1475. After it acquired the Benicia refinery, Valero acquired the Wilmington refinery as part of a merger with Ultramar Diamond Shamrock ("UDS"). (Simonson, Tr. 5979). With the UDS merger, Valero also acquired retail stations in California. (Simonson, Tr. 5980).

1476. By the end of 2000, approximately 60 percent of Valero's entire slate of gasoline was CARB-compliant gasoline, which was significantly more than the industry average of 45 percent. (RX 276 at 006).

1477. After Valero acquired the Benicia refinery, Valero made process improvements to increase gasoline production at that refinery. (Simonson, Tr. 5980-81). Those improvements increased CARB gasoline production as well. (Simonson, Tr. 5981).

1478. In the year 2000, Valero had record operational accomplishments, record throughputs, record sales and record earnings. (RX 276 at 005). Valero has touted its acquisition of the Benicia refinery as "a big part of Valero's success story" and one of the "most profitable [refineries] in the United States." (RX 276 at 005, 012). As stated in Valero's 2000 Annual Report, "[i]t was a year that will go down in Valero's history as a pivotal turning point—because the acquisition of our refinery in Benicia, California has literally taken Valero to a whole new level." (RX 276 at 005).

1479. {

} (Simonson, Tr. 6073, *in camera*; RX 276 at 012). {

} (Simonson, Tr. 6073-74, *in camera*; see also RX 276 at 006 (describing the margins for CARB gasoline as “dramatic”)).

2. Professor Griffin’s Model Shows that, Even with Perfect Foresight, Refiners Would Not Have Behave Significantly Differently, Even Absent Unocal’s Alleged Fraud

1480. Professor Griffin also looked at the potential “but for” world of the refiners. (Griffin, Tr. 8397-98). As noted above, the Complaint alleges that but for Unocal’s fraud, refiners would have been able to incorporate knowledge of Unocal’s pending patent rights in their capital investment and refinery reconfiguration decisions to avoid and/or minimize potential infringement. (Complaint ¶ 90(c)). Unlike Professor Teece’s analysis, which was based on actual testimony of the refiners, Professor Griffin did an empirical analysis, using a linear programming model to directly test the allegations set forth in subsection c of ¶ 90 and thus determine how differently the refiners would have made their capital investment and refinery reconfiguration decisions, if they had perfect foresight in 1991. (Griffin, Tr. 8398). Professor Griffin’s analysis assumed that the CARB regulations remain the same in this but for world as they are in the actual world. (Griffin, Tr. 8398).

1481. As he had with his earlier analysis for CARB, Professor Griffin assumed that the refiners had perfect foresight: that they knew in 1991 the scope of all five patents that would ultimately issue, that they knew the royalty rates Unocal would announce in 2001, and that the patents would be held to be valid. (Griffin, Tr. 8398). Professor Griffin also assumed that a matching analysis would be an infringing analysis. (Griffin, Tr. 8398).

1482. Professor Griffin testified that this perfect foresight assumption with respect to the refiners was a conservative one, because it gave the refiners the maximum incentive to do something differently in 1991. (Griffin, Tr. 8400). Professor Griffin explained that he designed his model to be a very good test of the effect of deception on the refiners' reconfiguration plans. (Griffin, Tr. 8401).

1483. Professor Griffin's analysis used a linear programming model. (Griffin, Tr. 8401). In his past experience, Professor Griffin has utilized linear programming models to help analyze a variety of economic problems such as deriving short-run marginal cost curves and short-run average cost curves, and estimating statistical cost functions. (Griffin, Tr. 8402). In the area of petroleum refining economics, linear programming models are regularly used by economists to analyze economic issues, and are in fact the preferred methodology. (Griffin, Tr. 8402-03).

1484. The design of the model began with certain materials that were commercially available. (Griffin, Tr. 8404). Professor Griffin used a large data set leased from the PACE corporation, a large consulting company that does refining economics. (Griffin, Tr. 8404). This data set is widely used in the refining industry. (Griffin, Tr. 8404). Professor Griffin also used a solution algorithm leased from a company called Haverly Systems. (Griffin, Tr. 8404-05). This tool, like the PACE data set, is commonly used for refining economic studies. (Griffin, Tr. 8405). As is customary for a refining industry economist, Professor Griffin utilized the assistance of other individuals in calibrating the PACE data set, combining it with the Haverly Systems algorithm, and in modifying the data for California. (Griffin, Tr. 8405). Professor Griffin formulated the problem the model was attempting to solve, oversaw the validation of the model, and then interpreted the results from the perspective of an economist. (Griffin, Tr. 8405-06).

1485. When he did his original report in this matter, Professor Griffin provided Complaint Counsel with a copy of his linear programming model and arranged for them to lease the PACE data set and the Haverly Systems algorithm. (Griffin, Tr. 8586).

1486. The model that Professor Griffin used for his analysis in this case is a composite model that embodied the 12 California area refineries. (Griffin, Tr. 8401). The implicit assumption of a composite model such as the one Professor Griffin used is that all of the process capacities that existed in the various 12 California refineries are at one location, and the whole industry is modeled as if the capital is fungible between refineries. (Griffin, Tr. 8406).

1487. Composite models are commonly used by economists in both the industry and in academia. (Griffin, Tr. 8406-07). In California, composite models have been used by WSPA, the California Energy Commission and Turner Mason. (Griffin, Tr. 8406-07). Composite models are also routinely used by the Department of Energy in its modeling work. (Griffin, Tr. 8407).

1488. The linear programming model represents many different processing capacities through a series of mathematical equations. (Griffin, Tr. 8410). Professor Griffin's model used more than 3,000 equations and had 4,900 variables. (Griffin, Tr. 8410). The variables represented different processing or blending options. (Griffin, Tr. 8410-11).

1489. There are two general concerns expressed with respect to limitations of linear programming models. (Griffin, Tr. 8412). One is that the models can over-optimize, the other is that they are deterministic rather than stochastic. (Griffin, Tr. 8412).

1490. The problem with over-optimization is that the model will suggest that it can solve problems that are more difficult to solve in the real world. (Griffin, Tr. 8412). Despite the fact that there may be 3,000 equations in a linear programming model, the real world is more complicated, and

there may be real-world problems that have not been modeled in the composite linear program. (Griffin, Tr. 8412).

1491. Professor Griffin addressed the over-optimization concern in his model in a number of ways. (Griffin, Tr. 8413). First, the model was calibrated to ensure that it could produce the products actually demanded in the real world. (Griffin, Tr. 8413). Next, Professor Griffin forced the model to be a cost-minimizing model, which meant the model could not make the products it wanted to make (which could be influenced by over-optimization tendencies), but rather only those actually demanded in the marketplace. (Griffin, Tr. 8413-14). Finally, any residual over-optimization concerns are alleviated by the fact that Professor Griffin utilized the model to look at a delta between two cases, such that even if both cases are still affected by an over-optimization potential, the delta between those two cases will not be. (Griffin, Tr. 8414).

1492. Professor Griffin testified that the second concern with linear programming models is that they are deterministic, that is, that they don't reflect the randomness of the real world, but rather blend to a specific formula with a specific set of characteristics. (Griffin, Tr. 8415-16). Professor Griffin was concerned about this potential to be deterministic, and so he developed specific procedures to model the gasoline variability, by creating three types of blends for his model to make: matching blends, non-matching blends and "gray" blends. (Griffin, Tr. 8416-17). A "gray" blend was one which would match a certain percentage of the time, thus building a stochastic component into the model's deterministic tendencies. (Griffin, Tr. 8417).

1493. Professor Griffin was ultimately comfortable that the LP model he used provided a meaningful basis for his economic analysis of the but for world. (Griffin, Tr. 8417).

1494. In attempting to look at what California refineries would have done (given perfect foresight and absent any alleged fraud by Unocal), Professor Griffin first modeled the California refining industry as of January 1993. (Griffin, Tr. 8411-12). He put in place all of the processing units that California refineries had at the time, then posed two different questions. (Griffin, Tr. 8411-12). In both cases, he asked the model to solve for the optimal capacity investments to meet 1997 marketplace demands for all the various refinery products, such as CARB gasoline, diesel fuel, and jet fuel. (Griffin, Tr. 8411-12). But in one case, he asked the model to assume there are no patents (and hence, zero royalties). (Griffin, Tr. 8411-12). In the second case, Professor Griffin asked the model to assume that the Unocal royalty schedule is in place, such that the model knows that if it intends to make certain matching blends it will need to pay a royalty on those blends. (Griffin, Tr. 8411-12).

1495. In both cases, the model was told to minimize costs. (Griffin, Tr. 8418-19). And in both cases the model had 24 blends of gasoline to choose from, including matching, non-matching and gray blends. (Griffin, Tr. 8418).

1496. Professor Griffin testified that in the first case (assuming no patents/royalties), the model chose to build capacity in nine different process units, costing a total of approximately \$1.7 billion. (Griffin, Tr. 8419). In the second case, assuming that matching gasoline would pay a royalty, the model chose to spend approximately \$1.75 billion on those same process unit capacities. (Griffin, Tr. 8419-20; RX 1219 (demonstrative); RX 1164 at 079, *in camera*).

1497. The chart set forth at RX 1164 at 079 (which was presented in a public format at trial as demonstrative RX 1219) shows the nine different process unit capacities that the composite model chose to build, the amount of that capacity and what the model chose to spend in both the zero royalty

case, and in the second case in which the model assumed that matching gasoline would bear a royalty. (Griffin, Tr. 8419-22; RX 1219 (demonstrative), RX 1164 at 079, *in camera*).

1498. The difference between the two cases for the composite model is approximately \$50 million. (Griffin, Tr. 8422). Professor Griffin concluded from his analysis of these results that the difference between the two cases was small, that the but for worlds were thus very similar, and that there was nothing to prevent the refineries from making that small \$50 million in additional investments at a later point in time if they chose. (Griffin, Tr. 8422-23). Professor Griffin concluded that there was thus no economic harm to the refiners. (Griffin, Tr. 8423).

3. Complaint Counsel Proffered No Reliable Evidence of What Refiners Would Have Done but for Unocal's Alleged Fraud

1499. Complaint Counsel presented no quantitative economic analysis on the question of whether there had been any economic harm to the refining industry as a result of Unocal's alleged misrepresentations. Instead, Complaint Counsel proffered the testimony of Mr. Michael Sarna, who opined that there were certain steps that California refiners could have taken to reduce their overlap with the patents had they considered the patents in their original modification plans. (Sarna, Tr. 6390-92).

1500. Mr. Sarna opined that even had the refiners taken all the steps described in his report, they would have been provided only with "moderate blend around capabilities" and could not have completely avoided the Unocal patents. (Sarna, Tr. 6417-18, 6420; RX 1154 at 011).

1501. Significantly, Mr. Sarna did no quantitative economic analysis of these steps, and did not quantify any costs. (Sarna Tr. 6408).

1502. Mr. Sarna testified that in order for the refiners to have considered the steps outlined in his report, they would have had to know something more than that Unocal had a pending patent

application. (Sarna, Tr. 6392-93). First, they would have had to know what the claims were with respect to T50, olefins, T90, and parafins. (Sarna, Tr. 6393). The refiners would also have had to have known that CARB would adopt a predictive model that would allow them to go above the flat limits. (Sarna, Tr. 6395).

1503. Moreover, Mr. Sarna testified that the slopes of the response curves of the various parameters in relation to emissions limit, to a large extent, the gasoline that a refiner can make under the predictive model. (Sarna, Tr. 6388). The response curves in the predictive model tell a refiner how much lower one property needs to be to offset a higher value in another property. (Sarna, Tr. 6395). In order to determine whether a refiner can successfully blend around the patents, a refiner would need to look at the response curves for T50, T90, olefins, aromatics, and sulfur—as well as everything else included in the model. (Sarna, Tr. 6389-90).

1504. The CARB predictive Phase 2 predictive model was not approved until June 1994. (Sarna, Tr. 6395-96). The final version of the Phase 3 predictive model came out in 2000. (Sarna, Tr. 6396).

1505. If the refiners had wanted to do an economic analysis of the various changes that Mr. Sarna claimed they could have made in their original refinery configuration plans, they would have needed to know the royalty rate that Unocal and the refiners would ultimately agree upon. (Sarna, Tr. 6400).

1506. Moreover, before the refiners could have made any decision to have incorporated the various steps outlined by Mr. Sarna, the refiners would have had to have made the assumption that the patent would be found valid and that their gasolines would be found to have infringed. (Sarna, Tr. 6404-05). And when Mr. Sarna put together his analysis of the various changes that the refiners

could have made, Mr. Sarna assumed that the refiners would have viewed Unocal's patent as valid. (Sarna, Tr. 6405).

1507. In reality, however, every major refiner in California considered the '393 patent to be invalid. (See RFF 976, 981, 983, 990-93, 1321-22, 1336-37, *supra*, 1508). For example, Texaco attorneys believed that the validity of the patent was "weak or negligible." (CX 7059 (Moyer, Dep. at 113)). Mr. Gyorfi testified that Chevron "had strong guidance from counsel that these patents were invalid" (Gyorfi, Tr. 5264), and that he was "absolutely incredulous" that Chevron lost the '393 jury trial. (Gyorfi, Tr. 5266).

1508. Even after the refiners lost the '393 patent case, many continued to maintain claims of invalidity. For example, Chevron's guidelines to its managers and supervisors for discussing the "Chevron Position on Unocal's Patents of Reformulated Gasoline" stated that Chevron "continue[d] to believe that Unocal's patent is invalid and unenforceable and that ultimately [Chevron] will prevail." (Gyorfi, Tr. 5298; RX 296 at 002). It also states that Chevron's customers would not be affected. (Gyorfi, Tr. 5298-99; RX 296). Chevron maintained that it had a right to continue to challenge the patent, to appeal any decision of the trial court, and to "continue to produce gasoline which may fall within the scope of what we consider to be invalid and unenforceable claims of the Unocal patent." (Gyorfi, Tr. 5299; RX 296 at 002). It stated, "Our lawyers believe that regardless of the outcome in the trial court the patent claims are invalid and unenforceable. Thus, we have the legal right to continue our business even if that means producing for the present within the scope of those claims." (Gyorfi, Tr. 5300; RX 296 at 002).

1509. When the refiners made their actual decisions about what investments to make to comply with CARB Phase 2, they did economic studies to determine if their investments would be

justified. (Sarna, Tr. 6406). In these studies, the refiners looked at the estimated costs of the investments that would need to be made in order to comply. (Sarna, Tr. 6407). In addition, they looked at estimates of what they believed the price of CARB 2 gasoline would be, and also considered costs for other types of products—such as conventional gasoline—that would be made under different refinery configurations. (Sarna, Tr. 6407). The refiners then conducted various sensitivity analyses and then put together written reports for their managements so that management could determine whether the CARB investments they were proposing to make were economically justified. (Sarna, Tr. 6408).

1510. Exxon, for example, prepared a report for its management regarding Exxon's Phase 2 proposals. (Sarna, Tr. 6408-09; CX 5054). In this report, CX 5054, Exxon discussed the costs of the proposed CARB 2 project, and performed a discounted cash flow analysis for the proposed project compared to a base case of producing conventional gasoline for export to the Far East. (Sarna, Tr. 6410; CX 5054 at 002-007). Exxon compared various options, looked at the capital requirements for each, and looked at how much CARB gasoline would be sold under the different options. (Sarna, Tr. 6413-14; CX 5054 at 008-012). Exxon performed different sensitivity analyses based upon what potential CARB prices might be. (Sarna, Tr. 6414; CX 5054 at 009).

1511. Mr. Sarna, however, did not set forth in his report any sort of quantitative analysis such as that performed by Exxon. (Sarna, Tr. 6416). Mr. Sarna admitted that his report does not outline the costs of any of the proposed projects listed in the report. (Sarna, Tr. 6416-17). The report does not set forth what the overlap rate on the Unocal patents would be under different scenarios. (Sarna, Tr. 6417-18). Mr. Sarna's report does not discuss what the prices of CARB gasoline were estimated

to be. (Sarna, Tr. 6418). It sets forth no royalty rate assumption. (Sarna, Tr. 6418). Similarly, it contains no analysis of return on capital employed. (Sarna, Tr. 6419).

1512. In short, Mr. Sarna did not set forth any quantitative economic analysis to demonstrate whether it would have been economically viable for the refiners to have selected any or all of the steps that were outlined in his report. (Sarna, Tr. 6419). And most significantly, although he opines that refiners could have performed these steps in their original modification plans to provide them with moderate blend around capabilities, he did not offer any opinion in his report as to whether the refiners could take these steps today. (Sarna, Tr. 6421).

1513. In light of all the evidence and testimony at trial, the Court finds that there is no evidence that any such harm to consumers as alleged in the Complaint was caused by any of Unocal's alleged misrepresentations to refiners.

C. Testimony that There Would Have Been No Regulation Is Not Credible Given The Then-Existing Regulatory Structure

1514. Mr. William Pedersen is an expert in the field of environmental regulation and the operation of the federal Clean Air Act. Mr. Pedersen testified to the pressures that CARB faced in implementing environmental regulation. (Pedersen, Tr. 7990-91).

1515. Given the state's severe air quality situation, which in 1991 CARB characterized as "the worst air pollution problem in the U.S." (CX 10 at 178), it was a very difficult challenge for California to develop a state implementation plan ("SIP") that satisfied the requirements of the 1990 Clean Air Act, as Unocal's expert Mr. Pedersen opined. (Pedersen, Tr. 8029).

1516. The emissions reduction benefits of CARB's Phase 2 RFG regulations played an essential part in achieving EPA approval for California's proposed SIP. (Pedersen, Tr. 8032).

1517. Mr. Pedersen analyzed many of the potential alternatives to CARB's Phase 2 regulations, and demonstrated that California did not have any practical alternative ways to achieve the emissions reductions it could attain with Phase 2 RFG. (RX 1186 at 033; Pedersen, Tr. 8064).

1518. In addition, Mr. Pedersen explained, the emissions control measures proposed by the EPA in its federal implementation plan ("FIP"), which would take effect in the absence of an approved SIP, were politically unacceptable to California state leaders. (Pedersen, Tr. 8017-18).

1519. Adoption of federal RFG also was not a realistic alternative for CARB during its 1991 rulemaking process, given the circumstances as explained by Mr. Pedersen. (Pedersen, Tr. 8061).

1520. Mr. Pedersen pointed to the CARB Phase 2 Staff Report and the Final Statement of Reasons to show that the emissions reductions from federal RFG were not enough to make that a viable option, noting that the Staff Report, for example, prepared in October 1991, indicated that California RFG achieved one and a half times the reduction in volatile organic compounds and four times the reduction in nitrogen oxide emissions, compared to federal RFG. (Pedersen, Tr. 8058-59; CX 52 at 066 (referred to in testimony as RX 52)).

1521. The emissions reductions resulting from the federal RFG specifications would not be sufficient to meet the rate-of-progress requirements and to demonstrate to the EPA a credible projection of attainment on schedule. (Pedersen, Tr. 8059).

1522. The Final Statement of Reasons similarly, and unambiguously rejected federal RFG as an option, because implementation of the federal standards would have left California far short of achieving needed emissions reductions, and would have increased the likelihood of sanctions on California under the Clean Air Act. (Pedersen, Tr. 8061).

1523. Mr. Pedersen further opined that the federal Phase II regulations, which were closer in emissions reductions to the California Phase 2 specifications, were not temporally available as an option for CARB during its rulemaking, because documents contemporaneous with the California Phase 2 rulemaking revealed that federal Phase II RFG specifications were not known to CARB at the time. (Pedersen, Tr. 8292-95). As CARB wrote in justifying its rejection of the federal regulations in its Final Statement of Reasons, “the federal gasoline regulations are not completely defined.” (Pedersen, Tr. 8294; CX 10 at 178).

1524. Mr. Pedersen concluded that CARB could not adopt the federal Phase II RFG specifications without an unwarranted delay, based on CARB’s statements in the Final Statement of Reasons. (Pedersen, Tr. 8295; CX 10 at 161).

1. The Federal Clean Air Act Restricted the Flexibility that CARB Had to Adopt RFG Regulations with Lower Emissions Reductions than Reflected in the Phase 2 Regulations

a. The Federal Clean Air Act

1525. The federal Clean Air Act was amended into its modern form in 1970. (Pedersen, Tr. 7991). Those amendments require the EPA to issue air quality standards, and require states to prepare implementation plans for areas that fail to meet the EPA standards. (Pedersen, Tr. 7992-94). Clean Air Act amendments in 1977 and 1990 left this basic structure intact. (Pedersen, Tr. 7992).

1526. Once the EPA sets standards for certain pollutants, all states with pollution levels exceeding those requirements must adopt a SIP according to a prescribed schedule. (RX 1186 at 005-006; CX 7063 (Sharpless, Dep. at 219)). A state’s SIP comprises the compendium of pollution control measures identified by the state to bring its polluted areas into compliance with the EPA’s air quality standards. (Pedersen, Tr. 7995).

1527. The SIP must demonstrate how adoption of the identified control measures will achieve attainment of air quality standards by a certain point in time. (CX 7063 (Sharpless, Dep. at 219-20)).

1528. The Clean Air Act requires the EPA to review submitted SIPs and either to approve or reject the proposed SIPs. (Pedersen, Tr. 7997-98).

1529. The 1970 amendments to the Clean Air Act required attainment of air quality standards no later than 1977, which proved to be impossible without the use of drastic control measures that were politically unacceptable. (Pedersen, Tr. 7994, 7996-97). In 1977, Congress amended the Clean Air Act to extend the air quality attainment deadline to 1987. (Pedersen, Tr. 7997; RX 1186 at 005-006).

1530. In November 1990, Congress amended the Clean Air Act once again. (Pedersen, Tr. 7995).

1531. In this amendment, Congress established a much more tightly articulated scheme for attaining air quality standards for ozone than the statutory scheme established by the superceded provisions of the Clean Air Act. (Pedersen, Tr. 8011).

1532. Under the 1990 Clean Air Act, all ozone nonattainment areas were classified as “Marginal,” “Moderate,” “Serious,” “Severe,” or “Extreme.” (Pedersen, Tr. 8011). The required attainment dates were staggered for each classification, with an attainment deadline of 1993 for “Marginal” areas and an outermost attainment deadline of 2010 for “Extreme” areas. (Pedersen, Tr. 8011; RX 1186 at 009; CX 7063 (Sharpless, Dep. at 222)). The controls that the FIP would impose would be more rigid and onerous for the higher classifications. (CX 7063 (Sharpless, Dep. at 222)).

1533. Significantly, several highly populated areas in California were classified as Serious, Severe, or Extreme under the 1990 Clean Air Act classifications. (Pedersen, Tr. 8019; RX 1186 at 015-016; CX 7063 (Sharpless, Dep. at 222); Kenny, Tr. 6551-52 (each region had attainment dates based on the severity of its air quality)).

1534. The 1990 amendments required states to prepare implementation plans to attain ozone standards by dates applicable to each nonattainment area, as well as to meet other significant requirements, including that the SIP must provide for reductions by 1996 in ozone-forming compounds of 15 percent compared against a 1990 baseline. (Pedersen, Tr. 8011-12).

1535. Additionally, by the end of 1994, states were required to submit (for any areas classified as “Serious” or above) a SIP revision to reduce emissions of VOC by an annual average of 3% from the end of 1996 until the attainment of the national air quality standards. (RX 1186 at 017; Pedersen, Tr. at 8012; CX 7062 (Sharpless, Dep. at 223)).

1536. Should a state fail to submit an acceptable implementation plan, the 1990 Clean Air Act requires that the EPA impose sanctions such as tightening up the new source permitting requirements and restricting that state’s highway funds; and if the state still does not cure the deficiencies within two years, the EPA shall promulgate a federal implementation plan for the state. (Pedersen, Tr. 8021; RX 1186 at 006; Kenny, Tr. 6552; Boyd, Tr. 6795-96; CX 7054 (Mahdavi, Dep. at 55); CX 7063 (Sharpless, Dep. at 220)).

b. Interplay Between FIP and California’s SIPs

1537. One air quality standard specified by the EPA covers ozone. (Pedersen, Tr. 7992-93). Complex chemical reactions of volatile organic compounds (“VOCs”)—or hydrocarbons—and nitrogen oxides (“NOx”), in the presence of sunlight, produce ozone; and gasoline use creates VOC

emissions both through evaporation and through combustion, while combustion also creates NOx emissions. (RX 1186 at 006; Pedersen, Tr. 7993).

1538. Because California has always had the most severe ozone pollution problem in the United States, with Los Angeles traditionally the country's worst ozone problem area, ozone is the pollutant of the greatest concern in California. (RX 1186 at 007; Pedersen, Tr. 7993).

1539. California submitted a state implementation plan in 1982, pursuant to the 1977 Clean Air Act amendments, although it was clear in the plan that many areas of California would fail to achieve the required air quality standards by 1987. (Pedersen, Tr. 7999-8001). Despite this deficiency, the EPA did not reject the 1982 SIP. (Pedersen, Tr. 7999-8001).

1540. The Clean Air Act gives broad authority to citizen environmental groups to sue the EPA for failing to satisfy a non-discretionary statutory duty. (Pedersen, Tr. 8003). In this case, the EPA did not reject the deficient SIP and impose a FIP by the deadline proscribed in the 1977 amendments. (Pedersen, Tr. 7999). Citizen groups sued the EPA for overlooking the absence of an attainment demonstration in the 1982 California SIP. (Pedersen, Tr. 8003; RX 1186 at 006-007; *see also* Kenny, Tr. 6552).

1541. In response, the EPA entered into a consent decree to promulgate a FIP by February 28, 1991 for major urban areas in California, pursuant to which it proposed a FIP for the South Coast Air Quality Management District of California in September 1990. (Pedersen, Tr. 8005; RX 1186 at 007, 009; CX 7063 (Sharpless, Dep. at 222); Kenny, Tr. 6552).

1542. Among other things, the proposed 1990 FIP would have required: (1) limits on the RVP of all summer gasoline; (2) other unspecified limits on gasoline properties; (3) greatly tightened

emissions standards for new motor vehicles; and (4) “caps” on total emissions from various types of economic activities. (RX 1186 at 007-008).

1543. With this consent decree still pending, however, the 1990 Clean Air Act amendments extended the statutory deadlines for attainment of air quality standard and superceded the previous SIP submission deadlines for states, requiring new SIP proposals by 1992, with the first major set of measures to take effect by November 1994. (Pedersen, Tr. 8005, 8011; RX 1186 at 009).

1544. After enactment of the amendments in November 1990, the EPA successfully argued to the district court that it should not be required to promulgate a FIP by February 28, 1991, because the consent decree was predicated on a deadline no longer in effect, given states had until at least 1992 to submit a SIP. (Pedersen, Tr. 8005-06; RX 1186 at 009).

1545. The Ninth Circuit reversed the district court in July 1992, and held that the EPA must still promulgate a FIP for the South Coast, Ventura, and Sacramento regions of California, which the EPA did in February 1994. (Pedersen, Tr. 8007-08; RX 1186 at 010-011).

1546. In 1994, the CARB Board approved a SIP (Kenny, Tr. 6556-57; RX 820 (the SIP)), including a broad range of control measures affecting both stationary and mobile emissions sources, which California submitted to the EPA in November 1994. (Pedersen, Tr. 8025; RX 1186 at 022).

1547. In 1995, Congress lifted the EPA’s obligation to promulgate a FIP under the 1977 amendments, as interpreted by the Ninth Circuit, and brought California into same deadlines as the rest of country, halting imposition of the proposed FIP. (CX 7038 at 009; RX 1186 at 041).

1548. In 1996, the EPA approved the SIP submitted by California. (Kenny, Tr. 6553).

c. The Provisions of the 1994 Proposed FIP Were Unacceptable to the State of California

1549. The February 1994 proposed FIP for the South Coast, Ventura, and Sacramento regions of California was published in the Federal Register in May 1994. (Pedersen, Tr. 8010).

1550. The measures proposed by the EPA in the FIP included progressively restrictive emissions caps for businesses such as bakeries, restaurants and oil refineries, as well as restrictions on the number of stops out-of-state trucks could make in California, and substantial fees on aircraft takeoffs and landings. (Pedersen, Tr. 8013).

1551. The Executive Officer for CARB at the time of the Phase 2 rulemaking, Mr. Boyd, stated that the 1994 FIP was the only FIP the EPA proposed, and he believed “the FIP would apply as a default if the requirements of the Federal Clean Air Act were not met.” (Boyd, Tr. 6799-6800).

1552. Mr. Pedersen opined that the emissions control measures proposed by the EPA in its FIP, which would take effect in the absence of an approved SIP, were politically unacceptable to California state leaders. (Pedersen, Tr. 8017-18). Mr. Pedersen’s opinion is consistent with the conduct and public advocacy of the Governor of California at the time, Pete Wilson, who hired an outside consulting firm to conduct a review and economic analysis of the proposed FIP and its consequences for the state. (CX 7054 (Mahdavi, Dep. at 56-57); Boyd, Tr. 6805-08).

1553. Dr. Reza Mahdavi recalled that Governor Wilson was extremely concerned about the economic consequences that would be thrust on the state, were the FIP implemented. (CX 7054 (Mahdavi, Dep. at 59)). Mr. Boyd was similarly concerned with the costs facing California under an imposed FIP. (Boyd, Tr. 6797).

1554. The Governor’s Office, with the assistance of Dr. Mahdavi from CARB, also published a report analyzing the costs and cost-effectiveness of the proposed FIP. (RX 334; Boyd,

Tr. 6807-08). The report found that the proposed FIP would cost Los Angeles residents at least \$8 billion in direct costs and \$16.3 billion in lost output. (RX 334 at 001). For the state as a whole, the FIP would result in at least \$8.4 billion lost in direct costs, \$17.2 billion in lost output, and 165,000 lost jobs, they concluded. (RX 334 at 001). The report described the magnitude of the job losses that would result from the implementation of the federal regulation as “comparable to nearly one-half of the 1990-93 recession.” (RX 334 at 001; Boyd, Tr. 6807). The report also qualified these numbers with the caveat that they “are undoubtedly underestimates.” (RX 334 at 001 (emphasis in original)).

1555. Dr. Mahdavi, co-author of the report, testified that they concluded the FIP was excessively expensive and would be twice as expensive as the SIP. (CX 7054 (Mahdavi, Dep. at 59-60)). Mr. Boyd, executive officer of CARB, understood that the FIP could result in these severe economic costs. (Boyd, Tr. 6802, 6807-08).

1556. In addition to publishing the report, Governor Wilson sent a letter to then-President Clinton outlining the “severe economic hardships” that a FIP would impose, and requesting the President’s assistance in blocking the imposition of a FIP. (RX 863 at 001, 003; Boyd, Tr. 6802).

1557. At the time, Mr. Boyd acknowledged that he was familiar with the economic costs referred to in the Governor’s letter (Boyd, Tr. 6802), and believed the FIP would have imposed these hardships on California. (Boyd, Tr. 6807-08).

1558. Possible regulatory alternatives available under a FIP include traffic or transportation control measures. (CX 7054 (Mahdavi, Dep. at 55-56); CX 7063 (Sharpless, Dep. at 217)). But Ms. Sharpless believed Californians would not accept traffic controls such as restrictive driving days. (CX 7063 (Sharpless, Dep. at 223)).

1559. Given these facts, the Court finds testimony that California officials did not view the imposition of a FIP as a threat is not credible given the strong opposition that the political leadership in California voiced to the proposed 1994 FIP. (*See* RFF 1549-58).

1560. California could avoid the costs of the proposed FIP by submitting and receiving EPA approval of a SIP that satisfied the requirements of the 1990 Clean Air Act. (Pedersen, Tr. 8018).

1561. Indeed, CARB officials realized this and understood that the emissions benefits of the Phase 2 regulations were a critical portion of the emission reductions that would allow California to avoid an unacceptable FIP. (Boyd, Tr. 6803-04; 6808-10).

1562. California submitted a state implementation plan to the EPA in November 1994, which incorporated a broad range of control measures affecting both stationary and mobile sources of emissions. (Pedersen, Tr. 8025; RX 1186 at 022).

d. The EPA Would Not Have Approved California's Proposed SIP Without the Emissions Benefits Attributable to the California Phase 2 RFG Regulation

1563. California faced a dire situation in 1991 with respect to air quality, CARB's Phase 2 Statement of Reasons observed that "California has the worst air pollution problem in the U.S." (CX 10 at 178), with mobile sources constituting a major part of the problem (CX 7063 (Sharpless, Dep. at 52)).

1564. Similarly, the October 1, 1989 Report to the California Legislature published by the AB 234 study panel (the California Advisory Board on Air Quality and Fuels), found that "Los Angeles has the worst air quality in the nation, exceeding air quality standards on two of every three days." (CX 1021 at 008; CX 7063 (Sharpless, Dep. at 76-77)).

1565. A 1996 CARB “Background Paper” entitled “Clean-Air Benefits” states that, although California has been the world leader in requiring stringent emission controls, “five of the seven cities in the United States with the worst air-quality problems are in California, and 90 percent of Californians still breathe polluted air.” (RX 202 at 001).

1566. CARB officials understood that Phase 2 RFG emissions benefits were needed to attain the mandates of the federal Clean Air Act. (Kenny, Tr. 6608-10; CX 7054 (Mahdavi, Dep. at 26); *see also* Boyd, Tr. 6809-10; Simeroth, Tr. 7473-74, 7478-79; CX 7044 (Chan, Dep. at 77); CX 7063 (Sharpless, Dep. at 179-80, 183)).

1567. At one public Board meeting in December 1995, Mr. Boyd told the Board, “as I’ve said before, the SIP doesn’t work without California cleaner burning gasoline.” (RX 331 at 025; RX 331).

1568. Chairwoman Sharpless similarly stated, in a letter to Mr. Rick Cunnington, dated December 23, 1991, that the emissions reductions from Phase 2 are necessary to meet both state and federal air quality standards. (CX 7063 (Sharpless, Dep. at 213); RX 114).

1569. CARB’s former Executive Officer, Mr. Kenny, testified consistent with Mr. Pedersen’s opinion regarding the difficulty in developing an acceptable SIP: that achieving the needed emissions reductions was extraordinarily difficult and that the California SIP achieved those goals only by the “skin of its teeth.” (Kenny Tr. 6608; Pedersen, Tr. 8029; RX 1186 at 024).

1570. According to Mr. Kenny, the Phase 2 regulations formed a “huge part” of the predicted emissions reductions in California’s SIP. (Kenny, Tr. 6608-10). More importantly, Mr. Kenny concurred that the emissions reductions claimed in the SIP submitted to the EPA for approval barely

met the federal Clean Air Act requirements. (Kenny, Tr. 6608 (“Q . . . the state implementation plan for California was getting by by the skin of its teeth; right? A. Correct.”)).

1571. The emissions reductions attributed to Phase 2 RFG accounted for a quarter of the total reductions identified in California’s state implementation plan. (RX 202 at 002 (“The reductions in ozone-forming emissions from the use of cleaner-burning gasoline will account for approximately 25 percent of the total ozone reductions expected from all new pollution-control measures to be implemented in California in the next several years.”); RX 331 at 025 (quoting Mr. Boyd as stating that “cleaner-burning gasoline will provide one-fourth of the emission reductions needed in our most important SIP.”); RX 190 at 003 (presentation by Mr. Brisby of CARB in 2000 stating that one benefit of cleaner-burning gasoline was “1/4 of SIP reductions in 1996”); Kenny, Tr. 6610; Boyd, Tr. 6808-10; Simeroth, Tr. 7473-74, 7478-79; Pedersen, Tr. 8035, 8203).

1572. Mr. Pedersen calculated that Phase 2 RFG accounted for about half of the emissions reductions needed for the South Coast to meet the 1990 Clean Air Act requirement of a 15-percent reduction in ozone-forming compounds by 1996. (Pedersen, Tr. 8036-40; RX 1186 at 029).

1573. Mr. Kenny testified that in 1996 California was well within the target emissions reductions for VOC, and that California had attained a 37-ton margin. (Kenny, Tr. 6566-67).

1574. Had California defaulted to the federal standards, however, Mr. Pedersen calculated that Phase 2 RFG had roughly twice the VOC reduction benefits of federal RFG. (Pedersen, Tr. 8289). Mr. Pedersen determined that the VOC emissions reductions attributable to Phase 2 RFG, for the South Coast Air Basin, was 108 tons. (Pedersen, Tr. 8289; RX 1186 at 029). Under Phase 2 RFG, then, California attained roughly 54 more tons in VOC emissions than it would have under the federal regulation for the South Coast. (Pedersen, Tr. 8289; RX 1186 at 029). Thus, had California

defaulted to the federal standards, it would not have attained a 37-ton surplus, and instead would have been short of meeting the required VOC reductions by roughly 17 tons. (Pedersen, Tr. 8289; RX 1186 at 029).

1575. Phase 2 RFG also played a key part in the state's long-term low-emission vehicle control measure. (Pedersen, Tr. 8032-33; RX 1186 at 032; (CX 7063 (Sharpless, Dep. at 208-11)).

1576. California's SIP for the South Coast Air Basin region relied heavily on control measures that would be invented in the future to show attainment of the ozone standard, and additionally took the unprecedented step of assigning back to the federal government the responsibility to achieve reductions in ozone-forming compounds. (Pedersen, Tr. 8029-30; RX 1186 at 023-024).

1577. Ms. Sharpless could not identify any other option that could have been adopted to achieve the same emissions reductions as Phase 2 RFG in 1991. (CX 7063 (Sharpless, Dep. at 196)).

1578. In fact, the emissions reductions in the year 2000 from Phase 2 alone were equivalent to those resulting from the Phase 1 RVP measures, the low aromatics diesel fuel regulations, and the LEV Clean Fuels Regulations, combined. (CX 7063 (Sharpless, Dep. at 182-83)).

1579. In its 1996 background paper, CARB observed, "[n]o other single pollution-control measure comes close to that amount [of emissions reductions from Phase 2 RFG]" (RX 202 at 002), vindicating CARB's belief in adopting the Phase 2 regulations that, "[n]o other measures can provide the dramatic emissions benefits provided by Phase 2 RFG." (CX 10 at 111).

1580. CARB also stated that alternative emission reduction measures, such as enhanced inspection and maintenance programs and vehicle scrapping programs, should not be "viewed as alternatives to the need for Phase 2 RFG, since all measures are needed to address California's severe

air pollution problem.” (CX 10 at 111, 120 (“In order to meet the state and federal ambient air quality standards, all feasible controls need to be adopted, including both Phase 2 RFG specifications and the low emission vehicles program.”)).

1581. CARB lacked alternatives to the Phase 2 regulations that would have enabled it to obtain equivalent emissions reductions from other sources, as reflected at the November 21, 1991 CARB Board hearing, when Chairwoman Sharpless remarked that “it’s not as though we’re talking about, you know, having a lot of options out there that we can consider.” (CX 773 at 195).

1582. For instance, additional controls on large stationary sources could not offer the same emissions reductions as RFG, because California had already imposed tight regulations on such sources, and because additional controls would be very expensive. (Pedersen, Tr. 8048-49).

1583. Regulation of small business could not achieve emissions reductions similar to RFG, because of the administrative cost and difficulty of regulating small entities, and because of the political difficulty involved in imposing strict regulation on small business. (Pedersen, Tr. 8051).

1584. Similarly, traffic controls could not be used in place of RFG, because of the political unacceptability of traffic controls. (Pedersen, Tr. 8053).

1585. Nor could California have replaced the emissions reductions from RFG with additional controls on new vehicles, because California had already enacted maximum controls on new vehicles, and because the benefits of vehicle regulation usually require 10-20 years to achieve. (Pedersen, Tr. 8053).

1586. Other sorts of unconventional measures were unlikely to be able to replace the emissions reductions of RFG, either, due to difficulties in designing and implementing such programs. (Pedersen, Tr. 8056).

1587. As Mr. Pedersen summarized the scenario, “the Clean Air Act constraints applicable to California during the 1990 to ‘95 period effectively foreclosed CARB from adopting any RFG regulations that would have provided for meaningfully less substantial air quality benefits than the Phase 2 RFG regulations that it actually adopted.” (Pedersen, Tr. 8062-63; RX 1186 at 004).

1588. Therefore, California could not have foregone the substantial emissions reductions attributable to Phase 2 RFG and still reasonably expected to receive EPA approval of its state implementation plan. (Pedersen, Tr. 8296).

2. The California Clean Air Act Also Restricted the Flexibility that CARB Had to Adopt RFG Regulations with Lower Emissions Reductions than those Reflected in the Phase 2 Regulations

1589. In addition to the requirements of the federal Clean Air Act and national air quality standards, CARB was restricted by the mandates of the state clean air act, which compelled it to enact rules for reducing emissions from mobile and vehicular sources by January 1, 1992. (CX 1665 at 190 (Cal. Health & Safety Code § 43018(b)); CX 817 at 002). CARB completed its Phase 2 RFG rulemaking on November 22, 1991, only 40 days ahead of the deadline. (CX 817 at 002).

1590. Mr. Boyd testified that CARB’s primary responsibility in 1991 was to achieve state air quality standards by the earliest practicable date. (Boyd, Tr. 6810).

1591. CARB’s Board resolution enacting the Phase 2 regulations includes the following:

The state and federal health-based ambient air quality standards for ozone, CO, and PM10 are regularly and significantly exceeded in many areas of California, and the state and federal nitrogen dioxide (NO2) standards are exceeded in the South Coast Air Basin, and the state standards for sulfates are exceeded in the South Coast Air Basin.

(CX 817 at 005). “In several areas of the state it is likely that the state ozone and PM10 standards will not be achieved until some time after the year 2000,” CARB added. (CX 817 at 005).

1592. In its resolution enacting the 1991 Phase 2 regulations, the CARB Board concluded that the regulations were essential to satisfy both the state and federal mandates:

The emission reductions resulting from the Phase 2 reformulated gasoline regulations approved herein are a necessary component in the attainment of the state ozone, PM10, CO, NO2, and sulfate standards in the nonattainment areas of the state, and in the maintenance of the standards in the remainder of the state.

(CX 817 at 005-006 (“The [Phase 2] regulations approved herein are necessary and appropriate to attain and maintain the state and national ambient air quality standards identified above and to reduce exposure to toxic air contaminants.”)). Ms. Sharpless confirmed this herself in a letter to Mr. Rick Cunnington, dated December 23, 1991. (CX 7063 (Sharpless, Dep. at 213); RX 114).

1593. In fact, in adopting the Phase 2 regulations, CARB believed that “[n]o other measures can provide the dramatic emissions benefits provided by Phase 2 RFG.” (CX 10 at 111).

1594. CARB likewise concluded in its Phase 2 rulemaking that “[i]n the early years of implementation, the Phase 2 RFG regulations will reduce motor vehicle emissions more than any measure recently adopted by the ARB.” (CX 10 at 092).

3. CARB Specifically Considered and Rejected the Federal RFG Specifications

1595. CARB specifically considered the federal RFG specifications during the California Phase 2 rulemaking, and again considered specific aspects of the federal regulation during the Phase 3 rulemaking. However, CARB rejected that alternative both times, even after knowledge of the issued claims of ’393 patent. (CX 7063 (Sharpless, Dep. at 215-16); Venturini, Tr. 792-93; CX 10 at 094, 123, 129, 178; CX 52 at 065-067; {REDACTED}, *in camera*; CX 7049 (Hochhauser, Dep. at 91-92)).

1596. Ms. Sharpless testified that various companies advocated for application of federal RFG standards instead of trying to pass California's own regulations, an approach that CARB rejected. (CX 7063 (Sharpless, Dep. at 215-16)).

1597. As Ms. Sharpless explained, the federal regulation focused on national air quality, which was not as problematic as the air quality in California, and the federal regulation would not have attained the amount of emissions reductions resulting from California's RFG specifications. (CX 7063 (Sharpless, Dep. at 216)).

1598. Furthermore, the federal standard would have been a lesser standard, and the South Coast Air Quality Management District and the Board of Supervisors of the County of Ventura advocated for the most stringent measures possible. (CX 7063 (Sharpless, Dep. at 216)).

1599. According to Mr. Venturini, the CARB Board concluded that the federal RFG regulations could not meet California's Clean Air Act requirements. (Venturini, Tr. 792; CX 10 at 178).

1600. Moreover, Mr. Venturini conceded that the list of alternatives in the "Analysis of Alternatives" section of the Technical Support Document does not include going to the federal RFG specifications. (Venturini, Tr. 792-93; CX 5 at 163).

1601. CARB considered and rejected the possibility of adopting the federal rules instead of the Phase 2 rules, based on the insufficiency of the federal rules to achieve the necessary reduction in emissions, concluding as follows: "Implementation of only the federal gasoline standards would leave the state far short of obtaining the emissions reductions needed to meet either the federal or state ambient air quality standards. The result would be far greater likelihood of sanctions on

transportation funds and new source growth, and an imposition of a greater burden onto other California industries to reduce emissions.” (CX 10 at 178).

1602. As CARB staff wrote, “The Phase 2 RFG regulations . . . are expected to bring about substantially greater emission reductions than the federal gasoline standards.” (CX 10 at 123, 129).

1603. Elsewhere in its Phase 2 Final Statement of Reasons, CARB said that the “commenter’s suggestion of adopting the Phase I federal reformulated gasoline requirements in lieu of the staff proposal is not realistic because the California Clean Air Act mandates very substantial reductions in ozone forming compounds at the earliest practicable date. The emissions reductions resulting from federal reformulated gasoline do not achieve the same emission reductions as staff’s proposals.” (CX 10 at 094).

1604. Likewise, in the Initial Statement of Reasons for Rulemaking for the Phase 2 regulations, CARB compared the federal RFG specifications to the California Phase 2 specifications and rejected the alternative of adopting the EPA approach because “[t]he staff does not believe this approach will provide the most environmental benefit to California.” (CX 52 at 065-067).

1605. In its Final Statement of Reasons, CARB expressed its belief that the EPA was behind schedule in proposing its own Phase I regulations and that the EPA would be behind schedule in meeting the Phase II promulgation deadlines, as well:

Unfortunately, the U.S. EPA’s efforts to adopt reformulated gasoline regulations has taken longer than expected. Although EPA was required by the federal Clean Air Act to promulgate the 1995 reformulated gasoline regulations by November 15, 1991 (FCAA § 211(k)(1), the agency has yet to issue final regulations. It appears unlikely EPA will meet it’s [sic] schedule for the year 2000 regulations. It is thus apparent that waiting for the federal regulations would result in unwarranted delays of the state program.

(CX 10 at 161; *see also* CX 53 at 025 (“The federal Phase II RFG requirements are implemented four years later than the California Phase 2 RFG regulations, thus foregoing significant benefits during these years.”)).

1606. Mr. Kenny admitted that at the time of the CARB Phase 2 rulemaking, he had limited knowledge of the federal Phase II program and was only aware that “the EPA had an obligation to propose a second phase for reformulated gasoline,” and that he knew the federal Phase II regulation “would be more stringent” than the federal Phase I regulation was. (Kenny, Tr. 6563).

1607. After CARB learned of Unocal’s patents in 1996, CARB reaffirmed that adoption of EPA-style regulations would have been insufficient to meet California’s Clean Air Act requirements. (RX 202 at 004 (“Metropolitan areas outside California that are using the federal gasoline will switch to an even cleaner Phase 2 U.S. EPA gasoline in 2000. But even this Phase 2 gasoline offers only about two-thirds of the clean-air benefits of California’s cleaner-burning gasoline.”)).

1608. During the California Phase 3 rulemaking, refiners suggested that CARB adopt specifications that more closely resemble the federal regulations, seeking to “flatten” the T50 response curve, for example, to more closely resemble the EPA complex model. (Eizember, Tr. 3280-81; {REDACTED}, *in camera*; RX 576 at 012, *in camera*). {REDACTED} {REDACTED} (Lieder, Tr. 4850, *in camera*).

1609. In addition, refiners asked CARB to replace the T50 and T90 parameters with the “E200” and “E300” parameters used by the EPA in its regulation. (CX 7049 (Hochhauser, Dep. at 91)). Although Mr. Hochhauser believed CARB staff was agreeable to using E200 and E300 instead of T50 and T90, that change never came to pass. (CX 7049 (Hochhauser, Dep. at 91-92)).

1610. This Court finds, in light of all the evidence and the testimony at trial, Complaint Counsel have failed to prove that, but for the alleged fraud, CARB would not have adopted or defaulted to the federal regulation.

VII. NEITHER CARB NOR THE REFINERS ARE LOCKED-IN

A. Complaint Counsel Did Not Establish Either CARB or Refiner Lock-In

1611. The Complaint alleges that CARB cannot now change its regulations to provide sufficient flexibility for refiners to avoid Unocal's patent claims (Complaint ¶ 94) because CARB is "locked in" to its Phase 2 regulations (Complaint ¶ 6).

1612. At a general level, Professor Teece defined lock-in as occurring when one has made a commitment to a particular course of action and there are high or significant switching costs associated with moving to a different course of action. (Teece, Tr. 7566). The policy relevant lock-in that is significant in this matter is to look at whether a decision maker made a commitment based on ignorance of Unocal's pending patents and then determine whether, if the decision maker had known of Unocal's pending patents, they would have made a different decision. (Teece, Tr. 7567). Then, to find out whether there is a lock-in, there should be an evaluation of whether the decision maker, now knowing of Unocal's pending patents, has high switching costs associated with adopting a course of action that is economically equivalent to the original course of action that would have been adopted. (Teece, Tr. 7567; RX 1162A at 056).

1613. Similarly, Professor Shapiro agreed that "'Lock-in' is just a little more graphic word for switching costs, significant switching costs, and it has inherent in it the notion that one had choices ex ante and that one made a choice and now you're stuck with it in the sense that it is hard to switch, in the sense that your options are reduced in comparison to what they were earlier. That

is, your options are reduced or less attractive.” (Shapiro, Tr. 7345-46). In his rebuttal report, he stated that the correct way to measure lock-in is to “take the *ex post* switching costs that CARB would have to bear to modify its RFG regulations after learning of Unocal’s patents and compare those costs with the *ex ante* costs of adopting those same alternatives to its RFG regulations.” (RX 1799 at 006). Both of Unocal’s economic experts offered a substantively identical definition. (RX 1162A at 056; Griffin, Tr. 8424-25).

1614. In this case, there are two entities for whom the question of lock-in is relevant—CARB and the refiners. (Teece, Tr. 7567). Professor Griffin performed an empirical analysis of both CARB and refiner lock-in. (Griffin, Tr. 8332, 8424).

1615. Professor Griffin testified that in his empirical analyses he considered that there were two necessary conditions for a lock-in to apply. (Griffin, Tr. 8424-25). First, one must look at whether the decision maker would have made a different decision *ex ante*. (Griffin, Tr. 8425). If that condition is satisfied, then the second necessary condition is to consider *ex post* whether the decision maker is now precluded from achieving what could have been achieved *ex ante*. (Griffin, Tr. 8425).

B. There Is No Evidence that Refiners Are Locked-In as a Result of Unocal’s Conduct

1616. With respect to his refiner lock-in analysis, Professor Griffin first looked to whether the refiners would have made a different set of investment decisions had they know of Unocal’s pending patent rights. (Griffin, Tr. 8424-26). The *ex ante* analysis described generally by Professor Griffin is precisely the analysis he performed in looking at the “but for world” of the refiners using his linear programming model. (Griffin, Tr. 8425; *see* RFF 1480-98, *supra*). Using such an analysis, Professor Griffin determined that because his model showed that what the refiners would have done

had they known of the Unocal patents and royalties was very similar to what the refiners would have done not knowing that information, there was no refiner lock-in. (Griffin, Tr. 8425-26).

1617. Despite the fact that the first necessary condition for refiner lock-in was not met, Professor Griffin also modeled an *ex post* case to test if the second condition was present. (Griffin, Tr. 8426). To model the *ex post* condition for the refiners, Professor Griffin modeled two different cases with his composite linear program model. (Griffin, Tr. 8426-27). Both cases were set up to model California in 1997, using the actual refinery configurations that California refiners had chosen to invest in. (Griffin, Tr. 8426-27). The first case tested what the matching rate was without making any changes to the composite refinery configurations; the second case allowed the model to make investments to lower the matching rate if the costs of the equipment were cheaper than paying the royalty. (Griffin, Tr. 8426-27).

1618. Professor Griffin determined from his model that the matching rate was 88 percent in the first case and dropped to 79 percent in the second case, where the model was allowed to make investments to avoid a royalty. (Griffin, Tr. 8427).

1619. Professor Griffin noted that when he performed his *ex ante* modeling of the “but for” world of the refiners (*see* RFF 1480-98, *supra*), the matching rate for the 1993 case in which the composite refinery built the optimal investments with perfect foresight of Unocal’s patents was 80 percent. (Griffin, Tr. 8427). Professor Griffin thus concluded that his model showed that in 1997 refiners could have made cost-effective investments that would have enabled them to have achieved the same matching rate that they would have had if they had perfect foresight as to the scope of Unocal’s patents and royalties in 1993. (Griffin, Tr. 8427-28).

1620. Based upon his linear programming modeling work, Professor Griffin determined that given the Phase 2 regulations, there was no lock-in based on sunk investments such that refiners were foreclosed from achieving the same matching rate that would have been optimal if they had perfect foresight of the Unocal patents at the time that they made their Phase 2 investments. (RX 1164A at 060). There is thus no *ex post* refiner lock-in. (Griffin, Tr. 8427-28).

1621. Professor Shapiro did not address refiner lock-in his analysis. (Griffin, Tr. 8433). He did not dispute Professor Griffin's conclusion that even if refiners had known of Unocal's patents and royalty schedule before investing in refinery upgrades to comply with the Phase 2 RFG regulations, there was little they would have done differently. (Shapiro, Tr. 7377). Professor Shapiro noted only that he "understand[s] the methodology" of Professor Griffin's analysis, but that he had "not checked the calculations." (Shapiro, Tr. 7377).

1622. In his rebuttal report, Professor Shapiro also did not refute Professor Griffin's conclusion that given the Phase 2 regulations, there was no lock-in based on sunk investments. (Shapiro, Tr. 7381).

1623. Although Complaint Counsel proffered the testimony of refining expert Mr. Michael Sarna to opine on certain questions relating to what the refiners could have done had they known about Unocal's patent claims, Mr. Sarna offered no analysis of any investment costs, royalty costs or matching rates. (Sarna, Tr. 6416-19). He did not opine as to whether the steps he says refiners could have taken would be economically viable. (Sarna, Tr. 6419).

1624. Mr. Sarna only offered opinions as to what refiners *could* have done; he did not opine as to whether it would have been economically preferable for refiners to have done something differently had they known of Unocal's patents. (Sarna, Tr. 6419). Moreover, Mr. Sarna offered no

opinion as to whether the refiners could take the steps today that he claims they could have taken *ex ante*. (Sarna, Tr. 6421).

1625. Professor Griffin testified that Mr. Sarna's opinions do not provide any basis for an economist to make any conclusions about lock-in:

[H]e identifies some process investments that refiners could have made back at an earlier point, but he never asks the question of, well, would they have made those, are they economic to make, given the royalties. And then he never bothers to ask the question after the fact, well, was there any reason that these process units couldn't have been added later on. And there's no analysis of cost. There's no analysis of the resulting matching rates. There's nothing here that would allow me to reach any of [sic] conclusions regarding lock-in.

(Griffin, Tr. 8433).

1626. Likewise, Professor Teece opined that to perform a meaningful analysis of lock-in one must ask the same question for the *ex ante* and *ex post* periods, which Mr. Sarna does not do. (RX 1162A at 063). Also, Professor Teece noted that neither Professor Shapiro nor Mr. Sarna address the economic questions relating to refiner lock-in, namely what would be the costs and benefits of any proposed *ex ante* alternatives. (RX 1162A at 063-064).

1627. Based upon all the evidence in this matter, the Court determines that Complaint Counsel have not established refiner lock-in.

C. There Is No Evidence that CARB Is Locked-In as a Result of Unocal's Conduct

1628. Professor Griffin did an analysis of whether CARB was locked in as a result of any Unocal conduct. (Griffin, Tr. 8433-34). The test he formulated for his analysis of CARB lock-in was the same as his "but for" world analysis, that is, taking the clock back in time, if CARB had known about Unocal's patents, would they have made a different regulatory choice? (Griffin, Tr. 8433-34).

1629. Because Professor Griffin had determined that the actual world and the but for world were identical with respect to what CARB would have done (*see* RFF 1438, *supra*), he concluded that the first necessary condition for a lock-in was not present. (Griffin, Tr. 8434, 8437). Since CARB would have made the same choice, *ex ante*, there can be no lock-in. (Griffin, Tr. 8437).

1630. In his report, Professor Griffin also addressed Complaint Counsel's theory that CARB was locked in as a result of the California legislature's passage of the Sher bill. (RX 1164A at 052-053). Professor Griffin noted that while such a legislative act can place constraints upon CARB, this is not the sort of constraint that economists would call a "lock in." (RX 1164A at 053). Rather, the Sher bill is a political choice made by the legislature with full knowledge of Unocal's patents. (RX 1164A at 053 (footnote 19)).

1631. As noted above, Professor Shapiro recognizes that lock-in "has inherent in it the notion that one had choices *ex ante* and that . . . your options are reduced in comparison to what they were earlier. That is, your options are reduced or less attractive." (Shapiro, Tr. 7345-46). Professor Shapiro testified that lock-in has a temporal element that requires a comparison of two different periods of time. (Shapiro, Tr. 7346).

1632. But despite his express acknowledgment that lock-in requires a showing that the *ex post* alternative is "reduced or less attractive" than the *ex ante* option(s), Professor Shapiro did not perform this analysis. (Shapiro, Tr. 7148-58, 7224-32; RX 1159 (demonstrative); RX 1160 (demonstrative); RX 1161 (demonstrative)). As Professor Teece concluded, Professor Shapiro's analysis failed to identify any economically-rational cost-reducing regulatory option that was available to CARB in the but-for world that ceased to be available to CARB after learning of Unocal's intellectual property rights. (RX 1162A at 055).

1633. Professor Shapiro's lock-in analysis was based upon the premise that CARB would have adopted Phase I EPA regulations rather than the CARB Phase 2 regulations, had it known of Unocal's patent application. (*See Shapiro*, Tr. 7366-67). Significantly, Professor Shapiro could not state whether the EPA alternative would have been a more or less costly means of reducing emissions on a per-unit basis than the CARB regulations taken together with a 1.7 cent per-gallon Unocal royalty. (*Shapiro*, Tr. 7229-30).

1634. Professor Griffin noted that there were numerous problems associated with Professor Shapiro's lock-in analysis. (*Griffin*, Tr. 8438-39; RX 1164A at 064-074). Professor Griffin testified that Professor Shapiro performed no analysis of the plausibility of his default to the EPA alternative; performed no analysis of the costs of emissions abatement associated with this alternative; and did not opine as to whether such regulations have enabled CARB to have minimized the total cost of emissions abatement. (*Griffin*, Tr. 8437-39; RX 1164A at 066-067).

1635. In addition, as set forth above, Professor Shapiro framed his definition of lock-in in terms of switching costs: "Lock-in is just a little more graphic word for . . . significant switching costs." (*Shapiro*, Tr. 7345-46). But Professor Shapiro's lock-in analysis was based upon sunk costs and not switching costs. (*Shapiro*, Tr. 7062, 7173-74).

1636. The position taken by Professor Shapiro on this issue at trial was the same as the position that he had taken in his expert report but differed from the position that he had taken in his rebuttal report. (CX 1720A at 011-012, 027-028; CX 1799 at 006). In the rebuttal report, in response to criticism from Professor Teece, Professor Shapiro asserted that his analysis was based on switching costs, rather than sunk costs. (CX 1799 at 006). The approach that Professor Shapiro professed to have taken in his rebuttal report—measuring lock-in by examining whether switching costs prevent

an economic actor from adopting *ex post* an action that it could have taken *ex ante*—is the one that Professors Griffin and Teece opined was the correct approach. (RX 1162A at 103; RX 1164A at 186-193).

1637. But in spite of his definition acknowledging that lock-in is created by switching costs, in his report and at trial Professor Shapiro evaluated lock-in based on the sunk costs that refiners invested to comply with the CARB Phase 2 RFG regulations. (Shapiro, Tr. 7082-84). Professor Shapiro asserts that “specific investments” are equal to the sunk costs that already have been sunk by refiners in order to configure their refineries to comply with the CARB Phase 2 RFG regulations. (CX 1720A at 011-012, 027-028). He concluded that those costs would be stranded, or wasted, if CARB were to adopt an alternative regulatory scheme. (Shapiro, Tr. 7060-62, 7064).

1638. Professor Shapiro performed his lock-in analysis by comparing the investments to comply with the Phase 2 RFG regulations to investments that the refiners would have had to make had CARB elected to adopt the EPA regulations instead. (Shapiro, Tr. 7082-83). Professor Shapiro did not offer any opinions about the investments that would have been made under any other alternative regulation.

1639. Professor Teece testified to what he believed was a fundamental flaw in this part of Professor Shapiro’s analysis. (Teece, Tr. 7568-81). When analyzing lock-in, an economist cannot measure switching costs in the abstract, but rather must consider what one is switching from to what one is switching to. (Teece, Tr. 7568). An economist should consider what one is switching to by analyzing the next best alternative. (Teece, Tr. 7568-69). Professor Shapiro did not do this. (Teece, Tr. 7569).

1640. As an example to explain the flaw in Professor Shapiro's analysis, Professor Teece discussed a hypothetical Professor Shapiro testified to in which a renter is considering moving to either Apartment 1 or Apartment 2. (Teece, Tr. 7571). In his example, Professor Shapiro showed what initial maximum rent the tenant would be willing to pay for Apartment 1 before he moves in. (Teece, Tr. 7571; CX 7096 at 001 (demonstrative)). Professor Shapiro then attempted to demonstrate that after the tenant spends \$2,500 to move into Apartment 1, the landlord can now raise the rent by \$2,500 (the sunk moving costs) because the tenant's maximum willingness to pay has increased by that amount. (Teece, Tr. 7571-72; CX 7096 at 002 (demonstrative)).

1641. Professor Teece noted that while Professor Shapiro's math was correct in this hypothetical, he had not framed it correctly, and that this problem reflects a concern Professor Teece has with Professor Shapiro's analysis in this case. (Teece, Tr. 7573).

1642. In illustrating this concern, Professor Teece reiterated the importance of looking at alternatives when discussing lock-in and switching costs. (Teece, Tr. 7573). In Professor Shapiro's apartment hypothetical, once the tenant moves to Apartment 1, the only alternative the tenant has is moving out of Apartment 1 and into Apartment 2 (where the presumed "switching costs" are \$1,500). (Teece, Tr. 7578).

1643. Professor Teece prepared a modified demonstrative exhibit showing what happens if one changes the hypothetical and gives the tenant a better choice than moving into Apartment 2, based on leveraging the investment that the tenant had already made in moving to Apartment 1. (Teece, Tr. 7573-74). In Professor Teece's example, he created Apartment 1A, which was in the same neighborhood as Apartment 1, such that the moving costs to go from Apartment 1 to 1A were only

\$50 (as compared to \$1,500 to move into Apartment 2). (Teece, Tr. 7573-78; RX 1202 (demonstrative)).

1644. Professor Teece showed through his Apartment 1A example how the maximum rent the landlord can extract was not increased by the sunk costs of \$2,500, but rather was increased by the amount of the minor switching costs of moving across the street to Apartment 1A. (Teece, Tr. 7573-78; RX 1202 (demonstrative)). Assuming that there is a choice available to the tenant that enables the tenant to leverage the initial investment he made moving into Apartment 1 by simply moving across the street, then the amount the landlord can charge *ex ante* will be very similar to what he can charge *ex post*. (Teece, Tr. 7573-78; RX 1202 (demonstrative)). Although Professor Teece's example still contains the option of the tenant spending \$1,500 to move to Apartment 2, the next best alternative is Apartment 1A, which would be preferable to the tenant. (Teece, Tr. 7573-78; RX 1202 (demonstrative)).

1645. Professor Teece testified that his modified example was designed to show two things: (1) the importance of switching costs rather than sunk costs, and (2) that the answer one gets depends critically upon the available alternatives. (Teece, Tr. 7575).

1646. By applying the conceptual framework of the apartment example to the refiners' investments to make CARB 2 gasoline, Professor Teece testified as to the implications this apartment hypothetical has for the analysis Professor Shapiro has done in this case. (Teece, Tr. 7576-78). Professor Teece testified that Professor Shapiro has framed the problem incorrectly, because the only alternative to CARB Phase 2 that Professor Shapiro has considered is EPA Phase I. (Teece, Tr. 7578-79). EPA Phase I is analogous to Apartment 2 in Professor Shapiro's hypothetical. (Teece, Tr. 7578-

79). Professor Teece opined that EPA Phase I is a straw man that is not an attractive alternative at all. (Teece, Tr. 7578-79).

1647. Just as the hypothetical Professor Shapiro gave at trial did not analyze the option of Apartment 1A, in his work in this case, Professor Shapiro did not analyze more attractive alternatives—such as a modification of the CARB regulations. (Teece, Tr. 7578-79). In his testimony, Professor Teece noted a number of examples in which refiners made proposals to CARB asking for changes to the existing regulations to make it easier to blend outside the scope of the patents, such as RX 751 and CX 2090 (referred to in testimony as RX 568). (Teece, Tr. 7581-84).

1648. By specifying an artificial and unrealistic alternative such as EPA Phase I, Professor Shapiro was able to conclude that there is lock-in and the potential for the extraction of monopoly rents. (Teece, Tr. 7580-81). But this conclusion was simply a product of the fact that Professor Shapiro has not looked for the next best alternative in his analysis. (Teece, Tr.7580-81).

1649. Professor Griffin opined that, after learning of Unocal's patents, CARB could have relaxed the cap limits in the predictive model on any or all of the Phase 2 regulated parameters without increasing the predicted emissions level and without imposing any direct costs on refiners. (RX 1164A at 039). Professor Shapiro did not dispute this statement. (Shapiro, Tr. 7372). But Professor Shapiro never performed the analysis to determine whether it was possible for CARB to adopt alternative regulations with modified parameters. (Shapiro, Tr. 7372-75).

1650. For purposes of his analysis, Professor Shapiro did not consider the possibility that CARB could adopt alternative regulations that would allow refiners to make use of the original investments that they had made to comply with the Phase 2 RFG regulations. (Shapiro, Tr. 7383-84). For example, he did not analyze what, if any, investment would be stranded if CARB raised the cap

of T50 by a few degrees. (Shapiro, Tr. 7384). Professor Shapiro never measured any investment that was specific to a particular parameter of the Phase 2 RFG regulations. (Shapiro, Tr. 7370-71).

1651. Thus, Professor Shapiro did not discuss in his reports how much, if any, of the refiners' "specific investment" would be "stranded" if CARB were to choose other alternatives, such as modestly raising the cap on olefins, or by modestly raising the cap on T50. (Shapiro, Tr. 7383-84). Professor Shapiro concluded merely that once CARB learned of Unocal's patents, it was "harder to turn to other industries as a way of obtaining emissions reductions in order to get clean air." (Shapiro, Tr. 7071).

1652. The Complaint specifically alleges that in reasonable reliance upon Unocal, CARB used Unocal's equations to set a T50 specification. (Complaint ¶ 43). Professor Shapiro did not analyze whether there were specific investments that would be stranded upon the adoption of a regulation with no T50 regulation or a modified T50 specification.

1653. Unocal's refinery expert, Mr. Richard Stellman, opined that California refiners made no modifications to lower T50 in and of itself; instead, refineries controlled T50 through operational and procedural changes. (Stellman, Tr. 7904-05). Representatives of each of the California refineries confirmed that there were no modifications made solely to control T50. (CX 7048 (Hancock, Dep. at 155); {REDACTED}, *in camera*; CX 7050 (Ibergs, Dep. at 38, 42); Engibous, Tr. 3932-33; Eizember, Tr. 3309-10).

1654. As noted above, Professor Shapiro's lock-in analysis is dependent upon his conclusion that the investments made for CARB Phase 2 are stranded investments. (Shapiro, Tr. 7060-61, 7064). Professor Griffin reached different conclusions about the quantum of "stranded investments" and

applied his results to the model Professor Shapiro designed to test for *ex post* opportunism. (Griffin, Tr. 8439-47; RX 1164A at 070-074; RX 1221 (demonstrative); RX 1222 (demonstrative)).

1655. Professor Griffin noted that Professor Shapiro had opined that the refiners had redundant capacity of \$1.5 billion (the amount that was spent on CARB 2 investments). (Griffin, Tr. 8443-44). But Professor Griffin concluded that the CARB regulations would have been no different, even absent any alleged fraud by Unocal. (Griffin, Tr. 8436-37; *see* RFF 1438, *supra*). Thus, Professor Griffin opined that a better measure of redundant capacity would be the amount of investments that the refiners would not have spent if the regulation had remained unchanged and if the refiners had perfect knowledge of Unocal's patents. (Griffin, Tr. 8444-45).

1656. The chart Professor Griffin prepared for his refiner but for world analysis showing the differences between the two LP cases (one in which the composite refinery builds Phase 2 investments with no knowledge of the patents, and one in which it is given full knowledge) shows this redundant capacity. (Griffin, Tr. 8445; RX 1164 at 079, *in camera*; RX 1219 (demonstrative)). What Professor Griffin's model demonstrated was that had the composite refinery known about the patents, it would have built slightly less capacity in its fluid cat cracking naphtha splitter. (Griffin, Tr. 8445). This net difference in capacity—2582 barrels, resulting in an investment of \$1.6 million—provides a means by which to measure the redundant investment. (Griffin, Tr. 8445-46). Applying an annual cost recovery factor of 17 percent, Professor Griffin calculated that the annualized cost of redundant capacity was \$285,000, which comes to four-thousandths of a cent per gallon. (Griffin, Tr. 8446).

1657. In contrast, using his CARB 2 investments based upon his default to EPA assumption, Professor Shapiro determined that the measure of Unocal's monopoly premium was 1.8 cents per

gallon. (Griffin, Tr. 8446). The results of the two analyses do not just reflect a difference in magnitude between the two expert calculations; rather Professor Griffin’s analysis—showing a four-thousandths of a cent increase *ex post* with a perfect foresight assumption—demonstrates that the *ex ante* and *ex post* competitive rates are identical, resulting in a conclusion that Unocal has no monopoly power. (Griffin, Tr. 8446; RX 1164A at 070-074).

1658. Based upon all the evidence in the record, the Court determines that Complaint Counsel have failed to show any CARB lock-in as a result of Unocal’s alleged misconduct.

VIII. THE OPINIONS AND TESTIMONY OF COMPLAINT COUNSEL’S EXPERT ARE NOT RELIABLE

A. Professor Shapiro’s Opinions and Testimony Are Not Reliable Because They Are Based Upon the Assumption that Unocal Made a “Royalty-Free” Offer of Its Patents to CARB, Which Is Contradicted by the Record

1659. Professor Shapiro admitted that the Complaint does not allege that Unocal made a “royalty-free” offer of its patents to CARB. (Shapiro, Tr. 7250).

1660. Professor Shapiro stated in his Rebuttal Report that: “[f]or my purposes, it does not particularly matter just *how* Complaint Counsel proves its allegation against Unocal, and just what role the August 1991 letter plays in that proof. The *starting point* of my analysis is the assumption that this allegation is proven.” (CX 1799A at 005 (emphasis in original); Shapiro, Tr. 7254).

1661. Professor Shapiro testified that his opinions and analysis would not be any different if the August 27, 1991 letter had never been sent. (Shapiro, Tr. 7255-56).

1662. Professor Shapiro testified that if a seller tells a buyer that the seller does not have any of what the buyer wants to buy, that is different than if the seller offers to sell the product to the buyer for the price of zero. (Shapiro, Tr. 7262-63).

1663. Specifically, Professor Shapiro agreed that if a shopper goes into a grocery store and asks the grocer stocking the produce shelf if they have any bananas and the grocer replies that the store doesn't have any bananas, the grocer has not offered to sell the bananas for free. (Shapiro, Tr. 7263).

1664. Professor Shapiro thus agreed that the statement that "We have none of whatever it is the buyer wants to buy" is not the economic equivalent of offering to sell the product for free. (Shapiro, Tr. 7263).

1665. Professor Shapiro claimed that while the above statement is true for bananas, patents are "different." (Shapiro, Tr. 7263-64).

1666. Professor Shapiro offered no explanation in his reports or in his trial testimony for why he believes patents are "different" than physical goods in this regard.

1667. Professor Shapiro was not aware of any contemporaneous evidence that Unocal intended to make a "royalty-free" offer in 1991. (Shapiro, Tr. 7275).

1668. Professor Shapiro asserted that the motivation for Unocal to make the "royalty-free" offer was to, first, get CARB to move in the direction of a predictive model, and, second, to show CARB the significance of T50. (CX 1720A at 015-017; Shapiro, Tr. 7247-48).

1669. Professor Shapiro agreed that economic incentives can change over time. (Shapiro, Tr. 7289).

1670. Professor Shapiro agreed that what CARB was telling people it was planning to do with regard to its RFG regulations changed over time. (Shapiro, Tr. 7289-90).

1671. Professor Shapiro testified that the purported strategy by Unocal only makes sense if it feared that, but for the “royalty-free” offer by Unocal, CARB would do something less favorable to Unocal. (Shapiro, Tr. 7290).

1672. Professor Shapiro agreed that, to understand incentives, it is important to look at what options are available at a particular point in time. (Shapiro, Tr. 7291).

1673. Professor Shapiro agreed that the extent to which Unocal was highly fearful of some less desirable outcome, it would have a greater incentive to make the assumed “royalty-free” offer. (Shapiro, Tr. 7291-93).

1674. Professor Shapiro agreed that in order to evaluate Unocal’s alleged incentives to make the assumed “royalty-free” offer, one needs to know what CARB was saying over time about what its plans were and what Unocal believed CARB’s plans were and what alternatives were on the table at any particular point in time. (Shapiro, Tr. 7293).

1675. Professor Shapiro believed that Unocal’s primary incentive to make the assumed “royalty-free” offer was to get CARB to move in the direction of a predictive model. (Shapiro, Tr. 7294-95).

1676. Professor Shapiro agreed that the options that are available at a particular point in time are what is relevant to assessing Unocal’s incentives. (Shapiro, Tr. 7302-03).

1677. Professor Shapiro testified that “Unocal’s position, quite understandably, in terms of pushing T50 or the level of T50 or predictive model, would depend on what the alternative that was—was out there or that they were concerned about at that moment.” (Shapiro, Tr. 7304).

1678. Professor Shapiro agreed that, in doing the economic analysis of economic incentives and motivations, it makes no sense to look at the incentives and motivations to do something without also looking at the incentives and motivations not to do that particular act. (Shapiro, Tr. 7310).

1679. Professor Shapiro agreed, for example, that any analysis of a person's economic incentive and motivation to rob banks would be misleading without an analysis of the counter-veiling incentives of the possibility of getting caught. (Shapiro, Tr. 7311).

1680. Professor Shapiro agreed that firms have an important interest in their reputations, and that this interest can be a powerful disincentive to engage in opportunistic behavior. (Shapiro, Tr. 7312).

1681. Professor Shapiro agreed that Unocal has an economic interest in preserving its reputation as a fair and good business. (Shapiro, Tr. 7312).

1682. Professor Shapiro agreed that it does not make any sense for an economist to use as an assumption something that is demonstrably untrue. (Shapiro, Tr. 7314-15).

1683. Professor Shapiro agreed that before August 27, 1991, CARB had already indicated in a draft proposed regulation its interest in regulating T50. (Shapiro, Tr. 7315-16).

1684. Professor Shapiro was not sure one way or the other whether prior to August 27, 1991, CARB had already indicated in a draft regulation that it was committed to moving in the direction of a predictive model. (Shapiro, Tr. 7316).

1685. Professor Shapiro agreed that it is not customary for a successful bidder at an auction to continue bidding after the auctioneer has said "sold." (Shapiro, Tr. 7317).

1686. Although his opinion that Unocal had an incentive to make a "royalty-free" offer of its patents to CARB is important to his analysis, in his Report and Rebuttal Report Professor Shapiro

failed to analyze any disincentives Unocal had to engage in the alleged misrepresentation, including harm to its reputation. (CX 1720A; CX 1799A; Shapiro, Tr. 7312-13).

1687. Those of Unocal's goals that Professor Shapiro opines were the incentives for Unocal to make its alleged "royalty-free" offer—convincing CARB of the importance of T50 and getting CARB to commit to moving in the direction of a predictive model—had been accomplished before August 27, 1991. (CX 207; RX 198; RX 184; Shapiro, Tr. 7294-307).

B. Professor Shapiro's Opinions and Testimony Are Not Reliable Because They Are Based Upon An Insufficient Factual Foundation and Unwarranted Assumptions

1688. Professor Shapiro was uncertain of whether CARB ever asked anyone in connection with either the Phase 2 or Phase 3 rulemaking proceedings whether they had any relevant intellectual property. (Shapiro, Tr. 7233).

1689. Professor Shapiro was not aware whether or not CARB has ever proposed or adopted any rule that would require disclosure of patents. (Shapiro, Tr. 7234).

1690. At trial, Professor Shapiro could not recall that Mr. Peter Venturini had testified in his deposition that he did not construe Unocal's August 27, 1991 letter as having anything to do with patents. (Shapiro, Tr. 7253).

1691. Professor Shapiro agreed that he was shown important documents at his deposition that he had not seen before. (Shapiro, Tr. 7293-94, 7301).

1692. These documents played no role in his analysis. (Shapiro, Tr. 7301).

1693. Professor Shapiro did not know if he considered CX 207, an internal Unocal memorandum authored by Dr. Croudace, before writing his reports. (Shapiro, Tr. 7296-97).

1694. Professor Shapiro agreed that other refiners in addition to Unocal wanted a predictive model. (Shapiro, Tr. 7299).

1695. Professor Shapiro did nothing to investigate whether or not the benefits to Unocal of a predictive model were greater or lesser than the benefits to other refiners. (Shapiro, Tr. 7300).

1696. Compared to his knowledge of Unocal's strategy, Professor Shapiro did not know the strategies of the other refiners regarding the Phase 2 rulemaking proceeding in as much detail. (Shapiro, Tr. 7300).

1697. Professor Shapiro claimed that it would not have been helpful to an economic analysis of what the competitive price is for Unocal's patents to have investigated all of the offers of the other participants in his alleged "technology competition." (Shapiro, Tr. 7300-01).

1698. Professor Shapiro claimed that it would not be helpful to know all of the competing offers by all of the bidders in the "technology competition" that he claims occurred, and to compare these offers to the regulations that were actually adopted, in trying to determine who the successful bidder was. (Shapiro, Tr. 7300-01).

1699. At the time that his deposition was taken, Professor Shapiro did not know that Unocal actually opposed the setting of a T50 parameter at the November 1991 public meeting on the proposed Phase 2 regulations. (Shapiro, Tr. 7303-04).

1700. Professor Shapiro did not know whether or not he considered RX 198, a draft proposed regulation, in his analysis. (Shapiro, Tr. 7305-06).

1701. This draft proposed regulation, dated July 21, 1991, was made public by CARB on or around August 1, 1991. (RX 198; Venturini, Tr. 361-62).

1702. RX 198 contains a proposal by CARB to set a T50 parameter of 190° F. (RX 198 at 012).

1703. At his deposition Professor Shapiro did not know whether or not CARB had made available public drafts of proposed rules prior to August 27, 1991 that contained a commitment to work towards the adoption of a predictive model. (Shapiro, Tr. 7308).

1704. Professor Shapiro was not aware of anything in his report that references RX 198. (Shapiro, Tr. 7308).

1705. In Appendix C to his initial Report, Professor Shapiro enumerates the materials he considered in preparing his report. (CX 1720A at 054-058).

1706. The Bates numbers that correspond to RX 198 do not appear on Professor Shapiro's Appendix C. (CX 1720A at 054-058).

1707. RX 184 is a notice dated August 1, 1991 of a public meeting to be held by CARB on August 14, 1991, to discuss "Phase 2 specifications for reformulated gasoline." (RX 184 at 001).

1708. RX 184 contains a draft dated July 21, 1991 of CARB's proposed Phase 2 RFG regulations. The draft contains a proposed T50 specification of 200°F and also contains the statement that: "[t]he ARB intends to develop predictive models based on past and current vehicle emissions testing programs." (RX 184 at 028, 035).

1709. The Bates numbers that correspond to RX 184 do not appear on Professor Shapiro's Appendix C (CX 1720A at 054-058).

1710. Professor Shapiro did not consider RX 184 in his reports or analysis. (Shapiro, Tr. 7310).

1711. Professor Shapiro agreed that RX 184 and RX 198 are relevant to assessing Unocal's incentives in August of 1991 to make the assumed "royalty-free" offer and how those incentives

changed over time, but he admitted that he did not consider those documents in his reports. (Shapiro, Tr. 7316-17).

1712. There is a vast amount of evidence in the record relevant to Professor Shapiro's opinions which he never considered before writing his Report and Rebuttal Report. (CX1720A at 054-058).

1713. For example, even assuming the validity of Professor Shapiro's characterization of the Phase 2 rulemaking process as a "technology competition," Professor Shapiro did not consider documents or testimony (including CX 773, RX 73, RX 80, RX 437, RX 434, CX 7076 (Youngblood, Dep. at 40)) that establish facts contrary to his opinion that Unocal "won" the technology competition. (CX 1720A at 054-058).

1714. On November 21 and 22, 1991, CARB held a public Board meeting to discuss the proposed RFG specifications. (CX 773; CX 774). Comments at the meeting by participants and by CARB Board members give insight into the nature of the rulemaking proceeding, reveal the motives for CARB's adoption of the provisions of Phase 2, and indicate who supported and opposed the specifications. (CX 773; CX 774). Yet these important documents are not included in Appendix C in Professor Shapiro's report. (See CX 1720A at 054-058).

1715. In addition, throughout the Phase 2 rulemaking process, other major refiners, with the notable exception of ARCO, voiced opposition to the Phase 2 proposal. (RX 437 at 001; RX 434 at 007).

1716. In fact, Unocal's positions did not prevail, and CARB aligned itself with one of Unocal's competitors, ARCO, adopting regulations that closely resemble the positions advocated by ARCO throughout the regulatory proceedings. (See, e.g., RX 73 (ARCO representative observing

that CARB staff decided to go with ARCO's recommendation on T50 and to drop its proposed D.I. specification, despite industry opposition); RX 80 at 001 ("Our work became the standard, and the resulting reformulated gasoline specifications will effect everyone in California in the years to come. . . This small group of nine revolutionized the refining industry for years to come."); CX 773 at 146 (including a statement from an ARCO representative at the November meeting who declared that the "specifications that CARB was looking at on October 4 are very, very similar to the specifications of EC-X. They're almost identical.").

1717. Professor Shapiro does not list on his Appendix C, and, therefore could not have considered, the deposition testimony of the following fact witnesses in making his report: Mr. Banducci, Mr. Clossey, Mr. Engibous, Mr. Gyorfi, Mr. Hancock, Mr. Aguila, Ms. Sharpless, Mr. Youngman, and Mr. Youngblood, among others. (CX 1720A at 054-058).

1718. In addition, Professor Shapiro did not consider the documents or testimony in the record that establish facts contrary to his belief that Unocal made a royalty-free offer of its technology. (*E.g.*, CX 50).

1719. Professor Shapiro did not consider the letter from CARB's Executive Officer, James Boyd, to Unocal after disclosure of the pending patent claims, asking that Unocal not raise infringement issues regarding a test program that CARB had planned. (CX 50 at 001; CX 1720A at 054-058). In that letter, Mr. Boyd did not make any reference to a prior royalty-free offer made by Unocal to CARB. (*See* CX 50).

1720. Likewise, Professor Shapiro did not consider the documents or testimony in the record that establish that the refiners could have blended around the '393 patent for little-to-no cost as early as 1996. (*E.g.*, RX 85; RX 91; RX 92; RX 207A; RX 215; RX 224). Nor did he consider the

depositions of the refiners' declarants: Mr. Boone, Mr. Hancock, Mr. Irion, Mr. Millar, and Mr. Engibous. (See CX 1720A at 054-058).

1721. Nor did Professor Shapiro review the testimony of refiners' representatives who stated that they had made no efforts to blend around the claims of the other four Unocal patents (*see, e.g.*, CX 7050 (Ibergs, Dep. at 65-67, 70-78); [REDACTED], [REDACTED], *in camera*; CX 7051 (Irion, Dep. at 83-84); CX 7047 (Hancock, Dep. at 128-30)), or the following witness's deposition testimony: Mr. Clossey, Mr. Engibous, Mr. Gyorfi, Mr. Hoffman, Mr. Lieder, and Mr. Simonson.

1722. Professor Shapiro also did not consider the CARB Cost-Effectiveness Guidance document, one of the key cost-effectiveness documents that are in the record (RX 195), or any of the following CARB witness's deposition testimony regarding RX 195: Mr. Aguila, Mr. Mahdavi, Ms. Sharpless, and Ms. Witherspoon. (CX 1720A at 054-058).

1723. The Cost-Effectiveness Guidance document indicates that CARB had a broad cost-effectiveness standard in which a regulation was "deemed" cost-effective so long as it reduces emissions at a cost comparable to other measures, on a per ton basis. (RX 195 at 006).

1724. Professor Shapiro also failed to consider the slides from a presentation that Texaco representative Mr. Douglas Youngblood made at an informal October workshop. (RX 436). In this presentation, Mr. Youngblood advocates for an incremental cost-effectiveness analysis, rather than an aggregate one. (RX 436 at 002).

1725. Refiners have testified that they made no investments or refinery modifications exclusively to comply with the T50 specification of the Phase 2 regulations. (*E.g.*, CX 7050 (Ibergs,

Dep.at 38, 42); [REDACTED]
[REDACTED], *in camera*; Engibous, Tr. 3932-33).

1726. Professor Shapiro did not consider the deposition testimony of these witnesses. (CX 1720A at 054-058). Therefore, he cannot determine which if any of the refinery investments, on which his opinions are based, were made exclusively to comply with the T50 specification in the Phase 2 regulation.

1727. Finally, in adopting a capped predictive model, CARB rejected Unocal's position that the alternative method for producing CARB-compliant gasoline should be a pure performance standard, or a predictive model without caps. (*See* CX 33 at 002, 006-007).

1728. In fact, Unocal provided comments to CARB opposing or critiquing CARB's fuel specifications for RVP (CX 33 at 007-009), T90 (CX 33 at 009), sulfur (CX 33 at 009-010), oxygen (CX 33 at 010-011), olefin (CX 33 at 011-012), aromatics (CX 33 at 012-013), benzene (CX 33 at 014), and T50 (CX 33 at 016).

1729. Unocal also pressed CARB to adopt a predictive model as soon as possible. (CX 33 at 002, 006-007).

1730. However, contrary to its promise to adopt a predictive model by spring 1992 (CX 774 at 021 (Sharpless); CX 773 at 027-028 (Fletcher); CX 817 at 008-009 (Resolution 91-54, which directs the Executive Officer to develop the predictive model and schedule a hearing for its adoption in the spring of 1992)), CARB rejected each of Unocal's positions and adopted a predictive model with caps in 1994. (*See* CX 54 at 005).

1731. This model differs from the EPA model and from the model that Unocal supported. (RFF 810-11).

C. Professor Shapiro's Opinions and Testimony Are Not Reliable Because They Are The Product Of Flawed Analytical Methods

1732. Professor Shapiro uses an economic model of CARB decision-making which assumes that CARB is a "cost minimizer." (Shapiro, Tr. at 7168; CX 1720A at 011, 062).

1733. Professor Shapiro disagreed at trial that his model assumes that "The goal of the decision maker is to pick the product specification that yields the highest net value." (Shapiro, Tr. 7355).

1734. But in his deposition Professor Shapiro agreed that in his Report he wrote that his model assumes that: "[t]he goal of the decision maker is to pick the product specification that yields the highest net value" (CX 1720A at 011; Shapiro, Tr. 7355).

1735. Professor Shapiro disagreed with the proposition that CARB had a very broad cost-effectiveness standard. (Shapiro, Tr. 7356).

1736. Professor Shapiro could not describe what CARB's cost-effectiveness standard is. (Shapiro, Tr. 7357).

1737. In fact, CARB does have a very broad cost-effectiveness standard. (*E.g.*, CX 5 at 145; CX 10 at 184; CX 52 at 074; RX 195 at 006-007; Curtis, 5851-57).

1738. At trial, Professor Shapiro testified that he believed that CARB was seeking to achieve reductions in admissions in the most cost-effective manner possible. (Shapiro, Tr. 7357).

1739. But in his deposition, Professor Shapiro answered the same question differently. There, he said, "I guess not in the narrow sense of cost . . . if you define it narrowly, I think it is probably not true." (Shapiro, Tr. 7357-58).

1740. For purposes of Professor Shapiro's economic model, the cost term in his equation includes everything CARB cares about. (Shapiro, Tr. 7358).

1741. But Professor Shapiro could not describe everything that CARB in fact cares about. (Shapiro, Tr. 7358).

1742. Professor Shapiro testified that the cost term in his equation excludes everything CARB does not care about. (Shapiro, Tr. 7358-59-60).

1743. But Professor Shapiro could not identify the things that CARB does not care about. (Shapiro, Tr. 7359-60).

1744. Professor Shapiro testified in his deposition that: "I've got an extremely general formulation that is not dependent on exactly what CARB's preferences are." (Shapiro, Tr. 7359-60).

1745. Professor Shapiro testified that the concepts of cost-effectiveness, fairness, enforceability, economic impact on the California economy, and air quality can all be captured by one single function in his mathematical formula. (Shapiro, Tr. 7360).

1746. At trial, Professor Shapiro denied that he cannot break down the value of the air quality element in his single cost function, nor the value of the fairness element, nor the value of the effect on the California economy. (Shapiro, Tr. 7364).

1747. But in his deposition, in answer to the same questions, Professor Shapiro answered "I could not do it and I do not need to do it." (Shapiro, Tr. 7364-65).

1748. Ultimately, at trial Professor Shapiro agreed that he could not tell the Court how CARB valued each of the various considerations in either 1991 or 1995 that Professor Shapiro lumped together in his single cost function. (Shapiro, Tr. 7365).

1749. Professor Shapiro agreed that his model assumes that CARB's preferences on such issues as the values it ascribes to air quality, fairness, and the effective regulations on the California

economy have not changed over time. (Shapiro, Tr. 7365). Professor Shapiro admits, however, that there have, in fact, been changes. (Shapiro, Tr. 7365-66).

1750. Professor Shapiro acknowledged that his economic model does not include all elements of reality. (Shapiro, Tr. 7366).

1751. Professor Shapiro's economic model of CARB's decision-making is flawed and is therefore unreliable.

IX. UNOCAL WAS JUSTIFIED IN NOT DISCLOSING ITS PENDING PATENT APPLICATION

1752. The Complaint alleges that Unocal engaged in fraud by failing to disclose its pending patent application while telling CARB and the industry that the data provided to those groups from its emissions research work was "non-proprietary" or "in the public domain." (Complaint, *e.g.* ¶¶ 3, 5, 76, 77, 81, 82, 88, 89).

1753. Dr. Nancy Linck testified as to the many reasons why Unocal's nondisclosure of its pending patent application was justified. (Linck, Tr. 7773, 7777-79; RX 1163 at 007-010). Her opinions are supported by the testimony of both Unocal and witnesses from many of the major oil companies, who testified regarding their policies and practices of not disclosing pending patent applications. (RFF 1789-1803).

1754. Dr. Linck and others also testified that disclosure of the fact of a patent application, or even of the application itself, generally provides very little if any helpful information to a competitor or regulatory agency who is seeking to avoid what will ultimately be the final issued patent claims. (Linck, Tr. 7772-73; RX 1163 at 007).

A. Patent Applications Are Inherently Uncertain

1755. The uncontroverted testimony of Unocal’s expert, Dr. Nancy Linck, establishes the numerous uncertainties inherent in the patent prosecution process. (Linck, Tr. 7758-68; RX 1163 at 004-007).

1756. One reason for the uncertainty is in the process of determining patentability; that is, the process of determining whether an invention is new and nonobvious to one of ordinary skill in the art in view of the inventions that have preceded the current invention—which are referred to as the “prior art.” (Wirzbicki, Tr. 920; Linck, Tr. 7758-59; RX 1163 at 005-006).

1757. When a patent applicant files the application, the applicant does not know the universe of prior art that may be asserted against it. (Wirzbicki, Tr. 1101; Linck, Tr. 7758-59; RX 1163 at 004). Accordingly, when a patent application is pending, “it is very difficult to predict when, or even if, a patent will ever be issued from that application” once the prior art is known. (RX 1163 at 005; Linck, Tr. 7759-61).

1758. If a patent does issue from the application, it is also uncertain what the scope of the coverage as defined by the claims will be. (Linck, Tr. 7760 (“There really is no way of knowing”); RX 1163 at 005). Although a patent application is filed with an original set of claims, the vast majority of applications are amended before they ever reach their final form. (Linck, Tr. 7758 (noting, “[t]he scope almost always changes”); RX 1163 at 005).

1759. A patent applicant may amend its pending patent claims to avoid prior art that is discovered or asserted against the patent in prosecution, or for other reasons. (Wirzbicki, Tr. 1101) (explaining that amendments to the claims are allowed “[b]ecause the inventor is not deemed to be so prescient as to know what the prior [art] is that he’s going to face or what kind of problems during

the course of a prosecution will occur”); Linck, Tr. 7759-60; RX 1163 at 004-006). Often an amendment narrows the scope of the claim. (Linck, Tr. 7760; RX 1163 at 005).

1760. It is also possible that what is considered to be the basic claim may change in view of prior art that either the Patent Trademark Office (PTO) or the applicant discovers. (Linck, Tr. 7819; RX 1163 at 006).

1761. Even after initial allowance of some of the claims, uncertainty remains. Dr. Linck testified of instances when an examiner may change his or her mind and withdraw the allowance. (Linck, Tr. 7766-67, 7821 (“It’s happened to me a number of times in my career.”); RX 1163 at 006).

1762. Uncertainty can remain even after a patent issues because of processes such as reissuance or reexamination. Claims can also be disclaimed after issuance. This change actually occurred with respect to the ’393 patent, where many of the claims were disclaimed after issuance after Unocal worked with outside counsel for several months. (Linck, Tr. 7768; RX 1163 at 006). A disclaimer has the same effect as canceling the claims; the disclaimed claims are treated as though they never existed. (Wirzbicki, Tr. 1104; Linck, Tr. 7771).

1763. Finally, the meaning of patent terms and scope of patent claims are often debated in litigation, injecting additional and ongoing uncertainty into the process until the patent claims are construed by the court in light of the patent specification, prosecution history and prior art. (Linck, Tr. 7772; RX 1163 at 007). This, too, occurred with the ’393 patent, where the litigating refiners asserted that the claim language encompassed any hydrocarbon composition with the numerical characteristics capable of running an automobile engine. The court construed the claims more narrowly in light of the specification and prosecution history, limiting the claims to motor gasoline.

The Federal Circuit affirmed the narrower claim construction. (Linck, Tr. 7772; RX 1163 at 007; *Union Oil Co. of Cal. v. Atlantic Richfield Co.*, 208 F.3d 989, 996 (Fed. Cir. 2000)).

1764. The uncertainty of litigation continues throughout the appellate process, especially since a substantial number of cases appealed to the Federal Circuit are reversed for a variety of reasons. (RX 1163 at 007).

1765. Given these uncertainties, notifying a competitor or regulatory agency of the existence of a patent application provides very little guidance as to what a patent ultimately will cover. (Linck, Tr. 7772-73; RX 1163 at 007). Dr. Linck testified that premature disclosure of a patent application to competitors or a regulatory agency could have a chilling effect on competitors or lead to overly restrictive regulations. (Linck, Tr. 7774-74). She explained,

The purpose of the patent system is that the disclosure is meant to enable others to learn and to build on what is out for them to read and understand and actually make improvements on. The claims are, as I said earlier, the scope of protection, the exclusionary right for the patentee. Once a patent issues, one that's interested in working in the field or a regulatory agency that's interested in developing standards that don't cover what are [*sic*] claimed have the document to look at. They can try to design around the claims. But in fact if that happens before the patent issues, and they try to design around claims as of yet unknown scope, they could very well avoid an area of development that in fact would become available to them once the patent issues.

(Linck, Tr. 7773-74).

B. Unocal's Patent Application of 1990 Went Through Numerous Changes Before It Issued as the '393 Patent in 1994, and Subsequently as Other Patents

1766. Unocal filed the application for the '393 patent on December 13, 1990. (CX 1788 at 082; RX 793 at 002).

1767. Mr. Wirzbicki had no way of knowing when he filed the application whether the originally-filed claims would issue in the form in which they were filed or whether they would have to be amended. (Wirzbicki, Tr. 1083).

1768. Unocal's patent application had not even been pending for a year when CARB approved the Phase 2 regulations on November 22, 1991. (*Compare* CX 1788 at 082; CX 10 at 007). In fact, on November 14, 1991, just a week before the CARB meeting, the patent office examiner issued a rejection of all pending claims in the application. (Wirzbick, Tr. 1108-09; Linck, Tr. 7764; CX 1788 at 215). A rejection means that the examiner has found a statutory or judicial basis for deciding that a particular claim is not patented. (Wirzbicki, Tr. 1109).

1769. Mr. Wirzbicki had no knowledge at that point—and no way of knowing—whether any of those claims would ultimately be allowed. (Wirzbicki, Tr. 1112-13). He testified that, if he had had to report on the status of the patent application on November 21, 1991—at the time the CARB Phase 2 regulations were adopted—he would have had to say that all of the claims in the application were rejected. (Wirzbicki, Tr. 1112).

1770. During prosecution of the '393 patent, Mr. Wirzbicki had no way of knowing whether any of the Unocal patent claims ever would be allowed to issue by the Patent and Trademark Office. (Wirzbicki, Tr. 1112-13; Linck 7761; RX 1163 at 005). And in fact not one of the originally-filed claims was allowed to issue in the '393 patent. (Wirzbicki, Tr. 1083-84, 1089). Mr. Wirzbicki testified:

Q. [Y]ou were asked yesterday about whether you were confident that you would get a patent. Do you recall that?

A. Yes, I do.

Q. Could you explain what you were confident of?

A. I'm almost always confident when I write a patent application and send it in to the Patent Office that I'm going to get a patent

some way, somehow. Now does that mean I can predict the future? No. Very often—I won't say very often, but sometimes I can't get a patent. That's just the breaks.

Q. Were you confident with respect to any particular specific claim?

A. No.

Q. And in fact you didn't get any of the claims as originally filed, correct?

A. I don't believe I did.

(Wirzbicki, Tr. 1088-89).

1771. Unocal's claims were amended and narrowed several times throughout the prosecution process as Mr. Wirzbicki discovered, or the patent examiner asserted, potential prior art during the course of the prosecution. (CX 1788 at 189, 245, 370; Wirzbicki, Tr. 1092-100, 1114-15; Linck, Tr. 7769).

1772. Ultimately, on February 22, 1994, after several amendments, the application issued as United States Patent No. 5,288,393 ('393). (RX 793). This was two years after the November 22, 1991 passage of the Phase 2 regulations. (CX 10 at 007; RX 1163 at 010).

1773. Contemporaneously with the issuance of the patent, then-CFO of Unocal, Mr. Neal Schmale, and Mr. Roger Beach discussed the possibility of licensing the patent. (CX 7062 (Schmale, Dep. at 70-72)). Mr. Schmale testified:

[A]nd what we basically said was let's make really, really sure that this is going to be a good patent, because we are going to be really embarrassed, really embarrassed, if we go out and ask for licensing—ask for license revenues on something that doesn't turn out to be a good patent. And so we asked whoever, somebody, to go back and—I'm not using the words we used then, but I'm using my own words right now—to go back and make really, really sure, to scrub this and make sure we had a good patent. Because we didn't want to go out and start saying we were going to charge people for something and then discover that this thing wasn't—wouldn't stand up.

(CX 7062 (Schmale, Dep. at 71-72)).

1774. After the patent issued, a number of the issued claims were disclaimed, reducing the number of claims in the patent from the 221 original claims to the 41 claims that remain today. (CX 1788 at 460, 477; Wirzbicki, Tr. 1085). CX 1796A at 004 is a chart showing the numerical property limitations of the 41 remaining claims of the '393 patent. (Wirzbicki, Tr. 1084-95).

1775. Litigation ensued on the 41 remaining claims of the '393 patent. (See RFF 187).

1776. One of the most hotly-contested issues in litigation was the scope of the patent's claims. (*Union Oil Co. of Cal. v. Atlantic Richfield Co.*, 208 F.3d 989, 996 (Fed. Cir. 2000); Linck, Tr. 7772; Wirzbicki, Tr. 1086-76; RX 1163 at 007). The district court construed the claims narrowly in light of the specification and prosecution history, limiting the claims to motor gasoline, and the Federal Circuit affirmed the narrower claim construction. (*Union Oil Co. of Cal. v. Atlantic Richfield Co.*, 208 F.3d 989, 996 (Fed. Cir. 2000); Linck, Tr. 7772; Wirzbicki, Tr. 1086-87; RX 1163 at 007).

C. The Focus of Refiners' Validity, Infringement and Blend-Around Analyses Has Been on the Scope of the Claims of Each Newly-Issued Patent

1777. As Dr. Linck explained, the final issued claims of a patent provide the basis for analyzing validity, infringement, or design-around issues. (Linck, Tr. 7773-74; RX 1163 at 005-006).

1778. Refiners' witnesses testified similarly. Representatives from Valero and Texaco, for example, testified that justed knowing that a patent application existed related to reformulated gasoline would not provide much helpful information. (CX 7076 (Youngblood, Dep. at 47); CX 7050 (Ibergs, Dep. at 109); CX 7048 (Hancock, Dep. at 275-76)). In order to make decisions or understand the patent, a refiner would have to know "exactly what the patent covered." (CX 7048 (Hancock, Dep. at 275); see also (CX 7050 (Ibergs, Dep. at 109) (stating that he would have to "know what the claims were"))).

1779. Indeed, with the Unocal patents, all five of Unocal's RFG patents are based on the same disclosed invention for reducing emissions (Wirzbicki, Tr. 881), but each patent has different claims. (*Compare* RX 793, CX 618, CX 619, CX 620, CX 621).

1780. As each patent has issued, the refiners have analyzed the claims of the newly-issued patent to consider validity, infringement, and blend around issues arising from the newly-issued claims. (*See, e.g.*, CX 7052 (Jacober, Dep. at 32) (explaining that, when Shell learned of the '393 Patent, it had to conduct an analysis of the patent to "figure out what the claims were"); (RX 537 at 001) (analyzing the potential prior art and validity issues for the '393 patent on a claim-by-claim basis); (Eizember, Tr. 3573-74, *in camera*) { [REDACTED] [REDACTED] [REDACTED] }.

1781. With regard to the Unocal patents, refiners have not said they will change their operations in light of the patents unless and until they feel that they know and understand the scope of the claims. (*See, e.g.*, Gyorfi, Tr. 5283-84) (stating that Chevron had not given any consideration to the claims of any of the patents other than the compositional claims of the '393 and the '126 patents because Chevron felt that it did not know enough about those claims yet).

D. The Importance of Maintaining the Confidentiality of Patent Applications During the Patent Application Process

1782. The law during the time the '393 patent application was pending provided for the confidentiality of patent applications until the patent issued. (Linck, Tr. 7774-75; 35 U.S.C. § 122 (1991); 37 C.F.R. § 1.14 (1991)).

1783. Expert Linck explained numerous reasons why a patent application is typically kept in confidence during its pendency. (Linck, Tr. 7773, 7776-79; RX 1163 at 007-010). Much of the basis arises from the uncertainties of the patent process. (Linck, Tr. 7777; RX 1163 at 009-010).

1784. One primary reason for confidentiality is to allow the applicant to retain the trade secret value of the invention if for some reason the invention is determined not to be patentable. (Linck, Tr. 7777; RX 1163 at 009).

1785. Another reason for maintaining confidentiality is due to the problems that disclosure can cause in light of the securities laws. (Linck, Tr. 7779). Publicly disclosing that one has a patent application could lead to allegations that the “public and/or investors were led to attribute or interpret the patent application as an indication of value to the company at a time when the company has not made such a determination or when the company feels it is too speculative to even engage in an attempt to value the potential patent.” (RX 1163 at 009; Linck, Tr. 7779).

1786. Disclosing the “existence of the patent application less than publicly outside the company may lead to issues with securities laws.” (RX 1163 at 009).

1787. A confidentiality policy regarding patent applications lessens the risk that a company will be accused of misleading investors or other securities violations. (Linck, Tr. 7779; RX 1163 at 009).

1788. One other business reason for maintaining confidentiality is to avoid the potential for provoking an interference with the application. (Linck, Tr. 7778-79; RX 1163 at 008).

E. The Policy of Unocal and Others in the Industry Was to Keep Patent Applications Confidential

1789. Within Unocal in the early 1990s, a Unocal employee who believed he or she had invented something could file a document with the company, known as a “disclosure of invention” or a “conception sheet.” (Wirzbicki, Tr. 874).

1790. The conception sheet was then reviewed by a committee, who decided whether or not to file a patent on the invention. (Wirzbicki, Tr. 874).

1791. Unocal often chose not to file a patent application but instead to keep the invention as a trade secret or use it for some other purpose. (Wirzbicki, Tr. 875).

1792. If Unocal did file a patent application, under the law that was in place until recently, Unocal had a right to keep its patent application confidential until the patent issued. (Linck, Tr. 7774-75).

1793. It was Unocal’s policy and normal practice to keep its patent applications confidential. (Beach, Tr. 1769; Miller, Tr. 1433, 1435). Mr. Beach testified that one reason for this was to avoid any allegations of selective disclosure. (Beach, Tr. 1769).

1794. The policy of maintaining the confidentiality of patent applications was well understood by Unocal’s employees. (Beach, Tr. 1769).

1795. Unocal also had antitrust compliance policies that governed what its employees could and could not disclose to its competitors. (Beach, Tr. 1770-71). Unocal also had policies that prohibited its employees from disclosing potential business plans to its competitors. (Beach, Tr. 1772).

1796. Unocal employees signed patent and secrecy agreements requiring them to maintain the confidentiality of company secret information. (Miller, Tr. 1435).

1797. RX 837, for example, is a patent and secrecy agreement dated February 1982 signed by then-Unocal employee Mr. Michael Kulakowski. (Kulakowski, Tr. 4581; RX 837). In it, Mr. Kulakowski agreed “not to disclose to others, except as required by his employment or by law, any company invention, any company information, or any matter or thing connected with company business as to which such disclosure might possibly be contrary to the best interests of company.” (Kulakowski, Tr. 4581). Mr. Kulakowski testified that, throughout his employment with Unocal, he knew that he was not to disclose any company invention, company information, or company business which might be contrary to Unocal’s interests, and conducted himself in accordance with his agreement. (Kulakowski, Tr. 4582).

1798. Disclosure of any internal company secret information required permission from the appropriate individuals in the company. (Beach, Tr. 1664). If someone asked about the existence of a pending patent there was a procedure for Unocal employees to follow. (Miller, Tr. 1437).

1799. Unocal’s policies and practice were in keeping with the rest of the industry. Like Unocal, ExxonMobil has a policy that patent applications are company information that must be held secret and must not be disclosed to outside parties without approval. (CX 7056 (Martinez, Dep. at 80-81)). ExxonMobil’s corporate designee, Mr. Martinez, testified that the purpose of ExxonMobil maintaining the secrecy of patent applications is “to potentially profit from the information that it is keeping secret or protecting from disclosure to the public[.]” (CX 7056 (Martinez, Dep. at 81)). He further explained that the policy of maintaining such information as secret is “the basics—basics of competitive advantage.” (CX 7056 (Martinez, Dep. at 81)). ExxonMobil’s policy has been in place for at least twenty-five years. (CX 7056 (Martinez, Dep. at 82-83)). Mr. Martinez also testified that, when ExxonMobil is involved in trade associations, it is guided not only by its policies regarding the

secrecy/release of company information, but also by its antitrust policy regarding the discussion of prices and competitive commercial information. (CX 7056 (Martinez, Dep. at 85)).

1800. Valero has a policy regarding the confidentiality of inventions that governs the disclosure of patent applications. (CX 7064 (Sinclair, Dep. at 42); *see also* RX 291). Under that policy, as with Unocal, a Valero employee may not disclose a pending patent application “unless the company management decided to disclose.” (CX 7064 (Sinclair, Dep. at 43); *see also* RX 291). Its employees sign a confidentiality and inventions agreement, under which they promise not to disclose inventions without management approval. (RX 291; CX 7064 (Sinclair, Dep. at 43-44)).

1801. Chevron’s general practice over the last twenty years and still today is not to disclose information about unpublished patent applications. (CX 7067 (Toman Dep. at 29-30)). Chevron’s corporate designee testified specifically that Chevron’s reasoning in not disclosing the information in an unpublished patent application is “to prevent other companies from learning about the information, to delay them in their own research efforts, principally aimed at competitors.” (CX 7067 (Toman Dep. at 31)). He also testified that it was important to Chevron and its related entities that employees protect potentially valuable intellectual property information from disclosure to third parties. (CX 7067 (Toman Dep. at 31)).

1802. Both ARCO and “heritage BP” considered patent applications to be confidential information up until the time the patent issued. (CX 7075 (Wood, Dep. at 12, 19)). (Mr. Wood did not address heritage Amoco’s position on this point.) Both companies had general policies not to disclose pending patent applications. (CX 7075 (Wood, Dep. at 12-13, 19)).

1803. In general, the refiners’ practices were the same as Unocal’s; that is, not to disclose pending patent applications publicly, or to trade associations or standard-setting bodies. (CX 7052

(Jacober, Dep. at 87-88) (Mr. Jacober, Shell's designee as to disclosure of patent applications, was unaware of any patent application that had ever been publicly disclosed by Shell); (CX 7048 (Hancock, Dep. at 300) (Mr. Hancock, Texaco's corporate designee on the issue, was not aware of any instances where Texaco had disclosed a pending patent application to any party other than the Patent and Trademark Office); (CX 7056 (Martinez, Dep. at 87) (ExxonMobil's corporate designee, Mr. Martinez testified that he was unaware of any patent application that had been disclosed by ExxonMobil to a trade association or standard-setting body: "In my career, which has spanned a number of jobs in and out of technology, I'm not aware of any"); (CX 7067 (Toman Dep. at 50) (In his research in preparing for his deposition, Chevron's designee found no instances of disclosure by Chevron U.S.A. of unpublished patent applications to standard-setting bodies))).

F. Unocal's Disclosure of Research Data and Equations to CARB, and to the Industry, Did Not Affect the Validity of Its Patent Rights or Its Right to Maintain Confidentiality of Its Patent Application

1804. The Complaint in this case specifically alleges that Unocal "made its emissions research results, including the test data and equations underlying its '5/14 Project,' publicly available." (Complaint ¶ 40). It also alleges that Unocal acted fraudulently in stating to CARB and industry organizations that the emissions research data that it provided to those groups was "nonproprietary" or "in the public domain." Complaint ¶¶ 2(a), 41, 58, 78(b), 84).

1805. Dr. Linck testified that it is not unusual for scientists to present or publish their research once a patent application is on file "without any indication as to whether a patent application has been applied for." (RX 1163 at 010; Linck, Tr. 7783-84). Disclosing research results is a different matter from disclosing a patent application:

Scientists need to publish. It's just something they do. They need to get together with other scientists and talk about their work

* * * *

They're not permitted to disclose pending patent applications or the claims in the applications. But frankly, they don't ask to disclose patent applications and the claims. It's not the kind of thing scientists want to do. It's really an apples-and-oranges situation, scientific interchange with scientific papers and presentations versus patents, that the former is for scientific purposes and the latter is really for business purposes.

(Linck, Tr. 7784).

1806. The testimony of BP's corporate designee, Mr. Wood, demonstrates this point—i.e., that the decision to allow scientists to publish their work in a paper or presentation does not affect BP's practices requiring confidentiality of patent applications. (CX 7075 (Wood, Dep. at 15-16)). Mr. Wood testified about instances where BP, Amoco, or ARCO inventors and scientists occasionally published their work in papers or presentations but the companies still maintained the confidentiality of their patent applications. (CX 7075 (Wood, Dep. at 15-16)). Chevron's conduct related to its Driveability Index (DI) research (RFF 955-56) provides another pointed example.

1807. Once a patent application is on file, as was the case with Unocal here, publication has no effect on patentability. (RX 1163 at 010).

1808. Publishing and discussing research results allows others to read the information and learn from it but not to practice an invention that is later claimed in an issued patent. (*See* Linck, Tr. 7773-74, 7878; Wirzbicki, Tr. 1137).

1809. Research results—including equations and test data—may provide the basis for a patentable invention or may have trade secret value and be bought and sold as such. (Linck, Tr. 7754-55; Wirzbicki, Tr. 1079). The equations, data and other research results themselves might be referred to as an invention or part of an invention but equations and data themselves are not a patentable invention. (Linck, Tr. 7754-56; Wirzbicki, Tr. 1079; RX 1163 at 004-005 (explaining the difference

between an invention and a patentable invention)). Even with an issued patent, others may use, read, build on, and learn from the research and information that is disclosed in the patent but, after a patent issues, may not practice the claimed invention. (Linck, Tr. 7755, 7773-74, 7878; Wirzbicki, Tr. 1137).

X. UNOCAL'S CONDUCT IS IMMUNE FROM ANTITRUST SCRUTINY UNDER NOERR PENNINGTON

A. The Context of the Proceeding—the Political and Quasi-Legislative Nature of CARB's Proposed Rulemaking

1810. The Phase 2 RFG program was more ambitious than the first phase and was intended to achieve further and more dramatic reductions in emissions from mobile sources by regulating gasoline composition. (RFF 221). To develop these regulations, CARB embarked upon a process of extensive informal consultations with various interest groups to obtain ideas for how best to structure its regulatory program. (*E.g.*, RFF 229-32).

1. Expectations of Truthful Representation

a. The Political Nature of CARB's Rulemaking

1811. CARB sent notice on October 4, 1991, that it would hold a Board meeting to consider the Phase 2 regulations commencing on November 21, 1991. (CX 767 at 001; Kenny, Tr. 6610-12). That October 4 notice of the rulemaking was the formal beginning of the rulemaking record for the CARB Phase 2 regulations. (CX 767 at 002; Kenny, Tr. 6610-11).

1812. The Complaint alleges that “Unocal’s misrepresentations were made in the course of quasi-adjudicative rulemaking proceedings.” (Complaint ¶ 96). The official notice states, however, that “[t]he public hearing will be conducted in accordance with the California Administrative Procedure Act, Title 2, Division 3, Part 1, Chapter 3.5 (commencing with section 11340) of the

Government Code,” a quasi-legislative section of the code. (CX 767 at 010; Kenny, Tr. 6612-13). According to the testimony of Michael Kenny, who was CARB’s general counsel at the time of the Phase 2 RFG rulemaking, CARB rulemakings are quasi-legislative. (Kenny, Tr. 6535). The enactment of the Phase 2 RFG regulations, specifically, was a quasi-legislative activity. (Kenny, Tr. 6650). As Mr. Kenny testified, the quasi-legislative rulemaking function is similar to the process used by the legislature in adopting laws. (Kenny, Tr. 6664-65). Mr. Kenny acknowledged that quasi-legislative and quasi-adjudicative proceedings are different, and that quasi-adjudicative proceedings involve the application of law to a specific set of facts. (Kenny, Tr. 6648, 6650-51; RX 71).

1813. CARB viewed the rulemaking process as “an iterative process” that “involves the ongoing communication between the regulated public as well as the consuming public. It involves the board staff participation in those conversations.” (Kenny, Tr. 6519).

1814. ARCO’s Mr. Uihlein described fuels rulemaking processes, generally:

. . . [I]n any rulemaking, particularly fuels rulemaking, there are a lot of stakeholders, and some—not all—and CARB’s not even a single stakeholder some of the time. Again you’ve got Stationary Source Division, who’s responsible for the emissions portion of it. You’ve got Enforcement Division, who’s responsible for enforcing it. You’ve got the automakers, who, you know, have their—who, you know, want to protect and have, you know, certain views about—about what actually happens with the vehicles, and then you’ve got environmental groups that, you know, have an interest. They want—they are very concerned about protecting the environment and want to make absolutely sure that if you say something’s emissions neutral, that it actually is emissions neutral.

(CX 7068 (Uihlein, Dep. at 32-33)). Mr. Uihlein also mentioned the ethanol trade associations and MTBE forces as included in the WSPA’s definition of “stakeholders.” (CX 7068 (Uihlein, Dep. at 33-34)). The different stakeholders each had different opinions. (CX 7068 (Uihlein, Dep. at 80)). According to Mr. Kenny, people lobbied CARB as to cost and other issues during the Phase 2

regulation process. (Kenny, Tr. 6622-23). Mr. Kenny, as General Counsel, was aware that people were lobbying CARB. (Kenny, Tr. 6622-23).

1815. Many organizations, including environmental groups, oil companies, auto manufacturers, and other interested parties provided their views through written comments to the CARB Board. (CX 838 at 1553-3620). There are thousands of pages of written comments contained in the official rulemaking record. (CX 838 at 1553-3620).

1816. Examples of this lobbying of CARB include a letter from The Blue Diamond Growers, who grow almonds in California. (CX 838 at 1606). In its letter to CARB Chairwoman Sharpless, it advocates for adoption of the Phase 2 regulations: “[T]he regulations before [Ms. Sharpless] on reformulated gasoline are important to the air quality in the Sacramento area where Blue Diamond employees live and work, and they are important to the air quality of the Central Valley, where our product is grown.” (CX 838 at 1606; Kenny, Tr. 6623-24).

1817. Another example of this lobbying found in the rulemaking record is a letter from the California Farm Bureau Federation to CARB, which copies California Governor Pete Wilson among others. In this letter, the California Farm Bureau Federation voices its opposition to the proposed regulations. (CX 838 at 1610-1611; Kenny, Tr. 6624).

1818. Still another example of lobbying of CARB in the official rulemaking record is a letter from Ford Motor Company to CARB advocating for, among other things, more aggressive specifications for Phase 2 gasoline. (CX 838 at 1689; Kenny, Tr. 6625-26).

1819. In addition to receiving written comments, in the course of the process for Phase 2, CARB Board members and staff met informally on numerous occasions with representatives of the

automobile industry, the refining industry, and health and environmental advocacy groups. (*E.g.*, RFF 239). CARB encouraged its staff to meet with as many parties as possible. (Kenny, Tr. 6652).

1820. The record shows that Board members met with registered lobbyists, including ARCO lobbyists, during the formal rulemaking. (Kenny, Tr. 6656-57). For example, ARCO made *ex parte* communications with Board members (including Supervisor Bilbray, Mr. Lagarias, Mrs. Ichikawa, and Dr. Wortman). (Fletcher, Tr. 6969-72). Additionally, an *ex parte* contact occurred between Dr. Boston and Bob Trunek although Mr. Fletcher did not recall that Bob Trunek was from ARCO. (CX 774 at 225-226; Fletcher, Tr. 6972). Chairwoman Jananne Sharpless also met with representatives of ARCO. (Fletcher, Tr. 7027).

1821. A Board member also disclosed contact with one Mr. Naylor during the formal rulemaking process. (CX 774 at 226; Kenny, Tr. 6656-57). Mr. Naylor was a lawyer at the Nielsen Merksamer firm in Sacramento and was a lobbyist under California's definition of lobbyist. (Kenny, Tr. 6656-57; CX 774 at 224). Commissioner Lagarias, a Board member, disclosed his contact with Mr. Naylor, which took place while Mr. Naylor was advocating on ARCO's behalf. (Kenny, Tr. 6657; CX 774 at 224). At the time, ARCO was advocating certain positions before the Air Resources Board in connection with Phase 2 regulations. (Kenny, Tr. 6657).

1822. Participants in CARB's Phase 2 rulemaking viewed the process as a political one. Many—if not most—refiners were among the interested parties who petitioned CARB as part of CARB's Phase 2 rulemaking process, either individually or through industry groups. (RX 178; *e.g.*, {REDACTED}, *in camera*, 4744-46; Clossey, Tr. 5347-49; Segal, Tr. 5688-90; Eizember, Tr. 3214-16; CX 7068 (Uihlein, Dep. at 20-21, 78-79, 83-83); CX 7042 (Bea, Dep. at 18-20, 31, 112)). Furthermore, during the period leading up to the November 21 and 22 CARB Board meeting,

different refiners had different points of view about what should be done with respect to the CARB Phase 2 regulations. (Kulakowski, Tr. 4637). According to Mr. Michael Kulakowski, Unocal was not the only refiner trying to influence the final regulations. (Kulakowski, Tr. 4637). Mr. Kulakowski expected that each of Unocal's competitors would attempt to influence the final regulations in the way that they saw it fit with respect to their own business objectives. (Kulakowski, Tr. 4637-38).

1823. As discussed extensively above in Section IV.A. of Respondent's Findings of Fact, Unocal participated in the Phase 2 rulemaking process, both through public and private meetings with CARB (*e.g.*, RFF 361, 423, 498, CX 252), and by offering written and oral comments. (CX 33; RFF 537-40).

1824. Mr. Dennis Lamb of Unocal, who was in charge of Unocal's communications with CARB, was not a registered lobbyist. (Lamb, Tr. 2161). He did, however, file quarterly reports of his advocacy activities before CARB. (Lamb, Tr. 2161-62). These quarterly reports, which included the dollars spent on his advocacy efforts and the names of his contacts, were sent to an individual at Unocal with responsibility for state government relations, who collected such reports from Unocal employees and then forwarded the information onto the state of California. (Lamb, Tr. 2162-63).

1825. As Unocal's primary contact with CARB during this time period, Mr. Lamb viewed his role as one of advocating Unocal's interests to CARB. (Lamb, Tr. 2164). Over the years he engaged in a wide variety of formal and informal communications with CARB staff and Board members. (Lamb, Tr. 2164-65). In addition to written letters, these communications included oral comments at hearings, participation in public workshops, one-on-one private consultations with Board members, and private communications with CARB staff. (Lamb, Tr. 2164-65).

1826. Before its Phase 2 advocacy efforts, Unocal had advocated before CARB on a number of other issues, such as alternative fuels and issues relating to diesel fuels. (Lamb, Tr. 2166-67). An example of its previous advocacy is a proposal which would have required refiners to construct a mandated number of service stations to sell alternative fuels such as M85 and to sell a mandated volume of such fuels. (Lamb, Tr. 2167). A wide variety of groups with different interests—including suppliers of alternative fuels, environmentalists, and auto companies—advocated different positions before CARB. (Lamb, Tr. 2167-68). Unocal opposed the proposal, and after a private meeting with the Chairman of CARB, successfully convinced CARB to modify the proposal in a manner that was more favorable to refiners such as Unocal. (Lamb, Tr. 2168-69).

1827. With respect to the CARB Phase 2 regulations, Mr. Lamb was involved at the inception of Unocal's advocacy efforts before CARB. (Lamb, Tr. 2169-70). Many different groups communicated with CARB about the proposed Phase 2 regulations, including auto manufacturers, alternative fuel suppliers—particularly oxygenate suppliers and methanol suppliers—environmental groups, and groups involved in the supply and distribution chain such as service stations operators, terminal operators, and pipeline operators. (Lamb, Tr. 2170). Additionally, members of the local air districts were vocal in advocating their interests before CARB. (Lamb, Tr. 2170). Elected officials also took positions before CARB with respect to the Phase 2 regulations, generally in favor of the more stringent versions of the proposed regulations. (Lamb, Tr. 2171-72). Finally, members of the refining industry constituted a key group that advocated before CARB on the Phase 2 regulations. (Lamb, Tr. 2172).

1828. The refiners, however, did not speak with one mind, but rather advocated different positions before CARB. For example, Texaco's Mr. Chuck Lieder testified that there were competing

interests at stake in the CARB regulatory processes and there always had been. (Lieder, Tr. 4753). The auto companies had a voice in the process, as did the environmentalists, oil companies, and private citizens. (Lieder, Tr. 4753-54).

1829. ARCO advocated a very different position than the other refiners, and did so by meeting frequently with several key CARB figures, including members of the Board. (Clossey, Tr. 5487-88; RX 589 at 003). ARCO's representative, Mr. Timothy Clossey, prepared a list of the individuals and organizations that ARCO contacted as part of its attempts to influence CARB's actions relating to reformulated gasoline. (Clossey, Tr. 5487; RX 589 at 003). This list was Mr. Clossey's best effort to respond to the topic on which he had been designated as BP/ARCO's corporate representative. (Clossey, Tr. 5487-88). The list of individuals and organizations that ARCO contacted as part of its attempts to influence CARB's actions includes CARB Board members, three CARB chairmen, CARB's executive officer, and the chief deputy to a CARB chairman. (Clossey, Tr. 5488; RX 589 at 003). It also includes 25 CARB staff members. (Clossey, Tr. 5488, RX 589 at 003).

1830. In the course of these efforts, ARCO also "met with governmental agencies, CARB staff . . . political leaders and members of the Governor's cabinet." (RX 83 at 006; RX 589 at 003). ARCO also held "dozens" of meetings with CARB officials (Clossey, Tr. 5485-86). In addition, Mr. Clossey and other ARCO representatives contacted each individual CARB Board member, Governors George Deukmejian and Pete Wilson, members of the governors' staffs, several members of the California legislature, and representatives of several other California state agencies, including the California Environmental Protection Agency and the California Energy Commission. (Clossey, Tr.

5488, RX 589 at 003). Finally, ARCO contacted members of the ethanol industry and representatives from various environmental groups. (Clossey, Tr. 5488-89; RX 589 at 003).

1831. As a result of the contrary positions between ARCO and the other refiners, ARCO in effect split the herd of refiners, which allowed CARB to play one part of the industry against the other. (Kulakowski, Tr. 4638-39). For example, ARCO sent a letter to Ms. Sharpless on October 31, 1991, stating that CARB staff was being lobbied heavily to relax various specifications, including T50 and T90. (CX 7063 (Sharpless, Dep. at 144); RX 187). ARCO urged CARB not to change such specifications. (CX 7063 (Sharpless, Dep. at 144-45)).

1832. Texaco participated in the CARB Phase 2 rulemaking process as well. (CX 7059 (Moyer, Dep. at 8-9)). Its participation included meeting with CARB individually and working through WSPA in an effort to influence CARB's development of the Phase 2 regulations. (CX 7059 (Moyer, Dep. at 14)). Texaco determined that "the only realistic option" for its Phase 2 strategy would be "to oppose the regulation at the political level by trying to demonstrate the economic impact on the state." (RX 441 at 002). But ARCO and the automobile companies supported the regulations, which posed an obstacle to a political challenge. (RX 441 at 002). As one Texaco participant expressed it, "[t]he fact that ARCO, a major refiner, marketer, and political contributor in California, is supporting the proposed specifications for gasoline greatly undercuts the ability of WSPA or any individual company from persuading [CARB] from adopting something close to the proposed regulations." (RX 439 at 002).

1833. Thus, Texaco relied heavily on the services of lobbyists to provide it with access to members of the administration and other elected officials. (CX 7059 (Moyer, Dep. at 37-39)). It employed two legislative advocates in Sacramento, at least one of which was then a registered

lobbyist within the meaning of California laws and regulations. (CX 7059 (Moyer, Dep. at 38-39)). It had legislative advocates in Sacramento to provide it with access to various members of the administration and other elected officials and to use that access to communicate Texaco's message. (CX 7059 (Moyer, Dep. at 37-38)).

1834. Texaco assigned then-employee Mr. Gavin McHugh, a registered lobbyist (CX 7057 (McHugh, Dep. at 9)), to "develop and implement a lobbying strategy to influence CARB's decision on the final adoption" of the Phase 2 RFG regulations. (RX 435 at 003 (referred to in testimony as RX 94); CX 7057 (McHugh, Dep. at 55-56)). Mr. McHugh does not have a technical or scientific background in the oil industry. (CX 7057 (McHugh, Dep. at 14)). His current job as a government affairs consultant requires him to advocate for the interests of his private clients to the California legislature and regulatory agencies. (CX 7057 (McHugh, Dep. at 8-9)).

1835. Mr. McHugh drafted a "Legislative/Regulatory Action Plan. (RX 95). The plan noted, among other things, that CARB's draft RFG regulation "resembles the specification for ARCO's ECX [*sic*] gasoline." (RX 95 at 002). Noting that "ARCO is a major player in California politics" (RX 95 at 002), Mr. McHugh argued that a unified industry position against the regulations would be required to counter ARCO's influence. (RX 95 at 002). One of the recommended steps in the action plan was, "[i]f appropriate, as a courtesy, inform CARB that we intend to take our lobbying activities beyond CARB." (RX 95 at 005).

1836. In the course of his lobbying, Mr. McHugh met with the policy staff of the Governor of California. (CX 7057 (McHugh, Dep. at 30, 32-33)). Mr. McHugh believed that the Governor's office could influence CARB in the development of the Phase 2 RFG regulations. (CX 7057

(McHugh, Dep. at 32)). He also attended “lots of meetings” with representatives of the California legislature in connection with the Phase 2 RFG rulemaking. (CX 7057 (McHugh Dep. at 37, 40)).

1837. As the official rulemaking began and CARB proceeded toward the November meeting, the other refiners’ political lobbying efforts intensified in an attempt to counter ARCO’s extensive lobbying in favor of regulations that favored its commercial interests. (RX 99 at 002-004 (November lobbying activities); RX 439 (Texaco memo describing CARB’s endorsement of ARCO); RX 437 at 001, 007, 011 (Texaco’s speculation that the regulations gave ARCO a significant competitive advantage)).

1838. In November 1991, Mr. McHugh prepared an update for his superiors on his advocacy efforts in conjunction with the Phase 2 RFG rulemaking. (CX 7057 (McHugh, Dep. at 80-81); RX 98). In the update, Mr. McHugh explained that his “basic approach” was “to generate ‘political heat’ and attention on CARB over proposed reformulated gasoline specifications.” (RX 98). The “political heat” exerted on CARB Board members was accomplished in several different ways.

1839. First, WSPA members, including Texaco, took on individual assignments “to contact key legislators, administration personnel and CARB Board members.” (RX 98 at 001). Second, where *ex parte* considerations prevented direct contact with CARB Board members, legislators were asked to contact Board members directly on WSPA’s behalf. (RX 98 at 001).

1840. The memorandum then describes, in substantial detail, Texaco’s and WSPA’s political activities geared toward influencing the CARB regulations. (RX 98). Significantly, among these activities was an upcoming meeting with “key policy staff” in the Governor’s office between WSPA lobbyists, Mr. McHugh, a Chevron lobbyist, Unocal’s Mr. Dennis Lamb, Unocal lobbyist Ms.

Jennifer Stettner, and others. (RX 98 at 001). The purpose of the meeting was to bring the Governor's policy staff "on-line as to WSPA's concerns about the CARB proposal." (RX 98 at 001).

1841. Mr. McHugh's memo also contains a description of Texaco's meeting with the chief of staff to Republican Assemblywoman Andrea Seastrand, whom they convinced to contact CARB Board member Betty Ichikawa regarding their concerns over CARB's proposal. (RX 98 at 001).

1842. The memorandum also discusses Texaco's planned meeting, scheduled for just six days before the CARB Board meeting, with Democratic Assemblyman Richard Katz. (RX 98 at 001). "He is a very influential member and we are going to request he send a letter to CARB Chairwoman Jananne Sharpless expressing concerns over the CARB proposal." (RX 98 at 001). The memorandum further details other meetings with California politicians and their staff, in which Texaco and other WSPA member companies requested that politicians and their staffers contact CARB Board members and even the Governor. (RX 98 at 001-002).

1843. The memorandum noted that WSPA members were "making several editorial board visits each day in areas around the state where CARB members reside" and had instituted a fax campaign to gain political support. (RX 98 at 002).

1844. Mr. McHugh also expressed concern in his November 1991 memo that "ARCO is working against us" with respect to the Phase 2 RFG regulations. (RX 98 at 002). Nonetheless, Mr. McHugh was confident that "significant movement is occurring at CARB on this issue" and that he intended "to continue pushing CARB to motivate as much movement as possible." (RX 98 at 002).

1845. Mr. McHugh, along with Unocal's Mr. Lamb, did in fact attend a meeting to lobby members of the Governor's policy staff with respect to WSPA's proposed approach to the Phase 2 RFG regulations. (RX 99 at 001). In another memorandum, Mr. McHugh summarized the "benefit

of the meeting” as making clear to the Governor’s policy staff that ARCO and the rest of the oil industry were divided over CARB’s proposal and that “there are some obvious competitive issues at work here.” (RX 99 at 002).

1846. His memorandum states:

We do know that ARCO is aggressively working this issue. So far, they have focused their efforts on CARB members and administration personnel. In light of ARCO’s profile in Sacramento, we should not underestimate their ability to mass resources behind this effort.

(RX 99 at 004).

1847. Texaco and other WSPA members continued to focus their advocacy efforts on countering ARCO’s lobbying. (RX 99 at 004). Aware that “ARCO is aggressively working this issue” with “administration personnel and CARB members,” and concerned that ARCO would go “so far as to twist arms” in favor of regulations that mimicked its EC-X fuel, WSPA sought to “keep the pressure on to motivate as much movement [away from those regulations] as possible.” (RX 99 at 004).

1848. In addition to Texaco, Chevron communicated with CARB or CARB staff directly through private meetings and workshops and also participated in the WSPA efforts. (CX 7042 (Bea, Dep. at 31 (private meetings), 112 (working through WSPA))). During the process, Chevron thought it important “that we had a good relationship with CARB to make sure that they would be receptive to whatever it is we were trying to bring to their table for them to think about.” (CX 7042 (Bea, Dep. at 19)).

1849. Chevron advocated positions that the company thought would work to its own advantage. (CX 7042 (Bea, Dep. at 86-88); Ingham, Tr. 2644 (when advocating, Mr. Ingham had

Chevron's best interests in mind)). In doing so, Chevron representatives met privately with CARB staff 22 times between 1990 and 1994. (CX 7042 (Bea, Dep. at 31-32)).

1850. Chevron viewed the process as one in which ARCO "continued to dictate the terms of the debate at the hearing." (RX 528 at 003). Most fundamentally, according to Chevron, the adoption of the regulations was driven by the fact that "decisions of this Board [CARB] are influenced largely by politics rather than science." (RX 528 at 003-004) ("Of course, overriding each of these issues is the fact that regulations aimed at our industry historically tend to be viewed as politically-effective even if not cost-effective.")).

1851. Chevron described the "unusual alliance of interests" in that "[m]embers of the oil industry (ARCO, Ultramar), auto industry, environmental, community, and local air districts were united in calling on the Board to adopt a stricter regulation than that presented by staff at the hearing." (RX 528 at 003). Ultimately, major refiners lobbying for more flexible regulations "had no effective strategy that could cope with the politically powerful alliance of the oil industry's market leader (ARCO), a significant independent (Ultramar), the automobile industry, local air districts, medical associations and environmentalists." (RX 528 at 004).

1852. In addition to ARCO, WSPA and its constituent members, the air quality management districts, and auto manufacturers expressed their views to the Board. (CX 7063 (Sharpless, Dep. at 185-86, 208-11)). The districts' advocacy to CARB included advocacy regarding the importance of Phase 2 regulations to their emissions reduction plans. (CX 7063 (Sharpless, Dep. at 185-86)). These districts wanted as stringent a regulation as could be adopted. (CX 7063 (Sharpless, Dep. at 186)). As for autos, General Motors, the Motor Vehicles Manufacturers Association, and Ford Motor Company told CARB at the November meeting that the Phase 2 regulations fit into their plans to meet

low-emissions vehicle requirements. (CX 7063 (Sharpless, Dep. at 208-09); CX 774 at 140, 156-158, 162). According to the auto companies, they could more economically achieve their regulations if the fuel itself could remove some of the emissions problems. (CX 7063 (Sharpless, Dep. at 210-11)). In fact, the Final Statement of Reasons listed the Motor Vehicle Manufacturers Association, Ford, GM, Chrysler, Toyota, ARCO Products, environmentalists, environmental regulatory authorities, and other businesses in support of CARB's most stringent proposed regulations. (CX 10 at 023-024).

1853. As described elsewhere in these findings, the result of the Board's meeting to approve the Phase 2 regulations was a victory for ARCO. (RFF 565-85). As ARCO's Timothy Clossey wrote, ARCO engaged in "successful lobbying efforts that led to CARB's adoption of reformulated gasoline specifications essentially identical to EC-X." (RX 83 at 002).

1854. ARCO's Timothy Clossey claimed credit for these successful lobbying efforts. (RX 83 at 002; *see generally* RFF 569-81). Mr. Clossey emphasized that ARCO had devised, and successfully executed, a plan "to convince California regulators to adopt reformulated gasoline specifications that mirror" the company's EC-X fuel. (RX 83 at 002). ARCO's representatives "met with governmental agencies, CARB staff, . . . political leaders and members of the Governor's cabinet." (RX 83 at 006).

1855. Mr. Clossey wrote that if ARCO had not developed EC-X, "it is likely that regulators would have continued their drive to regulate gasoline out of existence." (RX 83 at 002). He further stated that the regulators were blocked in these efforts because ARCO had been able to show that EC-X had equal emissions benefits to M85 and other alternatives, that it provided equal energy security, that it could be implemented more readily than alternatives and it was "far and away" the most cost-effective option. (RX 83 at 002). ARCO was able to "operate effectively in this political and

regulatory environment” and “influence the regulatory process such that the final regulation adopted is essentially identical in every aspect to [ARCO’s] proposal.” (RX 83 at 006).

1856. Mr. Clossey wrote that the challenge was “to package and present the detailed and complex scientific data in a way which would result in the ultimate adoption of reformulated gasoline standards that would mirror the EC-X formula.” (RX 83 at 005). In his memo, Mr. Clossey also noted that members of the petroleum industry “fought the ARCO invention at almost every step.” (RX 83 at 005-006). Unocal was one of the petroleum industry members that fought ARCO’s invention. (Clossey, Tr. 5530).

1857. Mr. Clossey also stated that the challenge of “selling” the new invention was particularly challenging for his group, since they were not lobbyists or politicians: “To operate effectively in this political and regulatory environment was quite new to the team members, but was critical to the success of the project.” (RX 83 at 006). Mr. Clossey testified that EC-X was the new invention referred to in his memo. (Clossey, Tr. 5532). In their efforts to “sell” the ARCO invention, Mr. Clossey wrote that “[m]embers of the team made numerous public presentations at seminars, CARB public hearings and Fuels conferences. They also met with governmental agencies, CARB staff and AQMD staff, even political leaders and members of the Governor’s cabinet.” (RX 83 at 006). These meetings with government agencies, political leaders, and members of the Governor’s cabinet were a critical component of ARCO’s project. (Clossey, Tr. 5551).

1858. Ultimately, Mr. Clossey wrote, “the ARCO team controlled the flow of the deliberations and dominated the CARB hearing at which the fuel specs were considered.” (RX 83 at 006).

1859. Following the adoption of the Phase 2 regulations, the other major oil companies explicitly framed CARB's decision as a politically influenced outcome. According to Texaco, "CARB has demonstrated that it can and will disregard sound science and economic arguments," meaning that "[o]verwhelming political opposition is [the] only recourse." (RX 434 at 007). Chevron's analysis echoed this analysis. Among the reasons Chevron identified for WSPA's failure to persuade CARB of the merits of its position was "the political nature of the decision-making process." (RX 528 at 003). In reviewing the adoption of the regulations, Chevron concluded that "decisions of this Board are influenced largely by politics rather than science." (RX 528 at 003). In the future, it suggested, WSPA should place more emphasis on the "political elements" over the technical, as "a different balance between science and politics may result in more effective participation in similar processes." (RX 528 at 004).

1860. Following the adoption of the regulations, Texaco explored various potential options to challenge the regulations. (RX 100). Realizing the "inherent political realities" that existed after the approval of the regulations in 1991, Texaco's vice-president of Public and Governmental Affairs, Mr. Frank Miller, stated that "CARB can and will disregard sound science and economic arguments. Therefore, overwhelming political opposition is the only alternative." (RX 100 at 003).

1861. Texaco and WSPA continued to lobby political actors regarding Phase 2 RFG even after CARB adopted its regulations in November 1991. (RX 101; CX 7057 (McHugh, Dep. at 110-12)). Texaco met with legislators and discussed potential lobbying strategies to delay the implementation date of the Phase 2 RFG regulations and achieve removal of the small refiner exception provisions in the regulations. (RX 101). Texaco also considered implementing a lobbying strategy to persuade the Governor to have CARB to reopen the Phase 2 RFG regulations for

additional consideration of cost-effectiveness and other options to reduce emissions. (RX 102 at 011).

1862. Even in the context of the 1994 predictive model amendments, the political nature of the regulatory advocacy process was revealed by Mr. Michael Kulakowski's move from Unocal to Texaco. (Kulakowski, Tr. 4647-49). While Mr. Kulakowski was employed by Unocal and was part of the WSPA predictive model policy committee, he understood it was in Unocal's best interests to advocate for a predictive model akin to the federal RFG predictive model. (Kulakowski, Tr. 4647-49). While employed by Unocal, Mr. Kulakowski was supportive of Unocal's position. (Kulakowski, Tr. 4647-49). When Mr. Kulakowski started his work with Texaco, he learned that Texaco's interests were best served by advocating for the predictive model in the form ultimately adopted by CARB. (Kulakowski, Tr. 4647-49). Texaco was advocating for the CARB predictive model because it perceived that it was in its best business interests. (Kulakowski, Tr. 4647-49). When Mr. Kulakowski went to Texaco, he changed his position about which predictive model should be advocated for from the one that was more akin to the U.S. EPA model to the CARB model which was ultimately adopted. (Kulakowski, Tr. 4647-49). In fact, he debated his former Unocal boss, Mr. Lamb, on the issue. (Kulakowski, Tr. 4649).

1863. Moreover, the political nature of the process continued into the Phase 3 rulemaking with ARCO's efforts to influence CARB by: meeting with CARB directly; meeting with Winston Hickox, head of the California EPA; and—according to its corporate designee, Mr. Uihlein—meeting with various environmental organizations such as the NRDC, Sierra Club, and Union of Concerned Scientists. (CX 7068 (Uihlein, Dep. at 78-79)). Mr. Uihlein characterized these meetings as efforts to influence CARB's actions:

Because . . . it's a public process where they take input from all concerned groups. The environmental organizations are one of those concerned groups. They want to—they're very protective of the benefits that they get from a program. They're always looking, you know, for additional benefits where possible, but at the—in this context they definitely wanted to make sure that it was no worse.

(CX 7068 (Uihlein, Dep. at 79-80)).

1864. This view was echoed by Mr. Simonson, formerly of Exxon, now of Valero. (RX 707 at 004). According to Mr. Simonson, the “flexibility process” brought out environmental groups and auto companies, who were asking for more stringent regulations. (RX 707 at 004; Simonson, Tr. 5993). Specifically, the auto companies asked CARB to lower sulfur, T50, and Driveability Index. (RX 707 at 005; *see also* RX 287 at 011; CX 7051 (Irion, Dep. at 75-76)). There was a clear difference of opinion among the various participants in the Phase 3 process. (RFF 881-85).

1865. Exxon reported that CARB was “[u]nder pressure to move quickly, [and] finalize by year end” and that there were “[m]any stakeholders, difficult, often conflicting positions; [and] high political exposure.” (RX 707 at 005). Mr. Simonson testified that there was general disagreement between Exxon and the auto companies in the 1999 time period regarding CARB Phase 3 regulations. (Simonson, Tr. 5995). Exxon specifically challenged the auto companies’ technical arguments regarding the sulfur specification and Driveability Index, as well as the policies behind regulating Driveability Index. (Simonson, Tr. 6001-02; RX 287 at 011-012). Exxon recognized that its proposals for relaxation of the CARB specifications and revision of the predictive model raised issues of “[p]olitical acceptance of emissions increases.” (CX 1749 at 010). An Exxon internal document dated September 2, 1999, describes a plan to meet with CARB staff to express Exxon’s concerns about the increased stringency of the CARB Phase 3 regulations and to “advise them that we will convey the same messages to the Governor’s staff.” (RX 1003).

1866. Ultimately, as described in RFF 889-91, CARB brokered a Phase 3 deal between the auto companies and the oil companies in which CARB would agree to drop the proposed DI index if the oil companies agreed not to push for higher T50 levels.

b. CARB Phase 2 Procedures Were Not Designed to Insure That Interested Parties Provided Complete and Accurate Information

(1) CARB Had the Ability to Act in a Quasi-Judicial Fashion, but Did Not Do So for the Phase 2 Regulations

1867. Although CARB nearly always operated and acted in a quasi-legislative fashion, it had the ability to operate and act as a quasi-adjudicative body. (Kenny, Tr. 6658-59). CARB acted in a quasi-adjudicative capacity very rarely, however. (Kenny, Tr. 6659). CARB has exercised its authority under this provision on one occasion, at a May 22, 1998 Board hearing. (RX 70). At that time Mr. Kenny was the executive director of the Air Resources Board. (Kenny, Tr. 6658-59; RX 70 at 002). Kathleen Walsh was the general counsel or the chief counsel. (Kenny, Tr. 6658-59; RX 70).

1868. At that hearing, CARB acted in a quasi-adjudicative capacity in hearing an appeal by the City of Los Angeles from two orders of the Great Basin Unified Air Pollution Control District. (Kenny, Tr. 6659-60; RX 70 at 005). In the transcript, Mr. Kenny, as Executive Director, was introduced as follows: “Because of the special nature of this hearing, Mike Kenny will begin the proceedings by describing the process that will be followed. Mike Kenny is Executive Officer to our Board.” The “special nature” of this hearing was its character as a quasi-adjudicative proceeding. (Kenny, Tr. 6659-60; RX 70 at 005). After his introduction, Mr. Kenny stated: “The Item before is you unusual from both procedural and technical standpoints. In terms of procedure, the Board will exercise quasi judicial authority to decide on an appeal of . . . control measures and associated fees imposed upon the City of Los Angeles by the Great Basin Unified Air Pollution Control District.”

(RX 70 at 007). CARB was to decide the dispute between the City and the District. (Kenny, Tr. 6660-61; RX 70 at 007).

1869. At the hearing, in explaining the legal background of that adjudicative proceeding to the Board, Mr. Walsh, the CARB Chief Counsel (General Counsel), advised the Board as follows: “Typically the Board makes policy decisions in adopting regulations; this is called quasi-legislative process because it is similar to the process used by the Legislature in adopting laws.” (Kenny, Tr. 6664-65; RX 70 at 012). Mr. Kenny agreed with that statement at trial. (Kenny, Tr. 6665).

1870. At that quasi-adjudicative hearing, CARB’s counsel gave further instruction that, because of the quasi-judicial nature of the proceeding, “[CARB] staff has been very careful not to have any substantive communications with the Board, and as you know, that’s necessary to preserve your impartiality as decision makers today.” (RX 70 at 012).

(2) When Operating in its Quasi-Legislative Mode, CARB Did Not Have Procedures to Obtain Full Information From All Parties

1871. A quasi-adjudicative proceeding is different than a quasi-legislative proceeding. (Kenny, Tr. 6648). Mr. Kenny considered the activity that CARB was involved in as being quasi-legislative and further acknowledged that Phase 2 took place under the quasi-legislative section of the California Administrative Procedures Act. (Kenny, Tr. 6535, 6612-13; CX 767 at 010 (referred to in testimony as RX 66)).

1872. Although a central theme of the Complaint is that Unocal committed deception by failing to mention its patent application to CARB during the Phase 2 RFG rulemaking (Complaint, ¶¶ 38, 42, 45, 61, 62, 77, 78, 94), no “norm of conduct” existed that established an expectation that such a disclosure would be made. For example, CARB had no rules mandating disclosure of any

information to the agency, no rules mandating that all information submitted to it be complete and accurate, and no process for placing rulemaking participants under oath, cross-examining witnesses, or applying rules of evidence. (Kenny, Tr. 6652, 6654-55; Venturini, Tr. 395, 855-58). The Phase 2 proceedings were not adversarial or adjudicative, but were a rulemaking. (Venturini, Tr. 859).

1873. At the time of the Phase 2 rulemaking, California law placed minimal constraints on the conduct of notice-and-comment rulemakings, such as CARB's Phase 2 rulemaking. California Administrative Procedure Act required CARB to issue a notice of proposed adoption of the rule, CAL. GOV'T CODE § 11346.4 (1991), an initial statement of reasons, § 11346.5, a final statement of reasons for the rule, § 11346.7, and to maintain a public file of the rulemaking, § 11347.3. (CX 7029 at 048 (§ 11346.4), 051-053 (§ 11346.5), 059-061 (§ 11346.7), 068-069 (§ 11347.3)). The Act also provided for the "orderly review of adopted regulations" by an Office of Administrative Law, in which that Office may not "substitute its judgment for that of the rulemaking agency as expressed in the substantive content of the adopted regulations." (CX 7029 at 073-075 (CAL. GOV'T CODE § 11349.1)). The Act does not specify any type of evidentiary process for collecting information to inform CARB's judgment.

1874. CARB encouraged its staff to meet with as many third parties as possible. (Kenny, Tr. 6652). CARB staff held "extensive meetings with various affected stakeholders" throughout the regulation development process. (Fletcher, Tr. 6460; Kenny, Tr. 6652). This included "numerous meetings with both individual oil companies and also with organizations like the Western States Petroleum Association." (Courtis, Tr. 5733).

1875. None of the participants in the Phase 2 rulemaking was required to submit any information to CARB. CARB collected only that information that was voluntarily disclosed to the

agency. (Fletcher, Tr. 6959; Venturini, Tr. 1936; CX 7063 (Sharpless, Dep. at 166-67)). For example, although CARB sought cost information on a voluntary basis from refiners that participated in its Phase 2 RFG rulemaking, only six out of thirty California refineries purported to provide information, and only two provided both operating and capital costs. (RFF 710-17; CX 7040 (Aguila, Dep. at 54-55)).

1876. Private industry meetings with CARB during the Phase 2 process were not formal hearings, rather they were typically just private presentations to CARB staffers. (Kenny, Tr. 6653-54; Segal, Tr. 5691). Industry participants were not under oath. (Kenny, Tr. 6653; Segal, Tr. 5691). Various entities participated in these private meetings. (*E.g.*, Lamb, Tr. 1983-84 (Unocal); { [REDACTED] }, *in camera*; Clossey, Tr. 5347-49, 5695 (ARCO)). In the period of time leading up to the adoption of the Phase 2 regulations, CARB held many meetings with oil companies and auto companies. (Courtis, Tr. 5893-94). There were no procedures written down or rules that people were required to follow during the time period prior to rulemaking. (Venturini, Tr. 369-71). Instead, this period is one where people share their perspectives, concerns, or information. (Venturini, Tr. 369-71).

1877. At these private meetings, it was common for a company to present information that was confidential or proprietary. (Lamb, Tr. 1984). CARB could not rely on that information until the company released confidentiality. (Venturini, Tr. 411-13; Courtis, Tr. 5920-21).

1878. CARB also had no prohibitions against *ex parte* communications by either its staff or its Board members before a meeting to approve regulations. (Kenny, Tr. 6652-53). No restrictions existed on such contacts prior to the initiation of a rulemaking with a notice of proposed rulemaking. (Kenny, Tr. 6652).

1879. Board members could engage in ex parte contacts even after a rulemaking commenced, provided that the contacts were publicly disclosed by the end of the approval meeting. (Kenny, Tr. 6655-56). An example of this type of public disclosure of ex parte contacts by CARB Board members is found in the transcript of CARB's November 22, 1991 Board meeting (Kenny, Tr. 6655-56; CX 774 at 224).

1880. In the Board meeting on the Phase 2 regulations, held on November 21 and 22, 1991, participants had an opportunity to submit oral and written comments on the staff proposal after which the Board approved the Phase 2 regulations. (CX 10 at 007). CARB's Mr. Venturini testified that there were no objections, that the people making statements were not under oath, that there was no cross-examination, that the hearing was a "very open process," and that the process "was a rulemaking," and thus not adversarial or adjudicative. (Venturini Tr. 856-59). CARB's former General Counsel, Mr. Kenny, concurred:

Q. Now, the individuals who spoke at this hearing and whose comments are recorded in this document, they were not under oath when they spoke; correct?

A. Correct.

Q. And they were not subject to cross-examination; correct?

A. Correct.

Q. I'm sorry. I didn't hear your answer.

A. I'm sorry. Yes, that's correct.

Q. And there were not rules of evidence that were applicable to their statements; correct?

A. That's correct.

Q. And there were no objections that were made to the statements; correct, like we're having here in this proceeding?

A. Evidentiary objections?

Q. Correct.

A. That's correct, there were not.

- Q. And there were no rulings that were made by board members; right, on evidence?
- A. Correct.

(Kenny, Tr. 6654-55).

1881. Additionally, before the Board meeting, CARB had no procedures to ensure truthfulness, such as requiring testimony to be given under oath or subjecting parties to cross-examination or even maintaining a transcript of its workshops. (Kenny, Tr. 6651-57; Venturini, Tr. 856-58). Likewise, Mr. Kenny was unaware of any subpoena power CARB had to compel attendance of individuals at any sort of pre-hearing activity or rulemaking. (Kenny, Tr. 6653).

c. CARB Knew That Information It Received Was Likely to Be Biased

1882. CARB was on its guard in its dealings with private parties throughout the Phase 2 RFG rulemaking. (CX 7063 (Sharpless, Dep. at 167)). CARB Chairwoman Jananne Sharpless testified that companies that petition CARB “are not always forthcoming with all information.” (CX 7063 (Sharpless, Dep. at 167)).

1883. Mr. Boyd, Executive Director of CARB, understood at the time that various companies and constituents would advocate their differing positions about regulations to CARB from their own perceived best interests. (Boyd, Tr. 6801). Mr. Courtis testified that people approached one notable issue—MTBE—from, in his words, all sorts of angles. (Courtis, Tr. 5894-95). Some refiners favored the use of MTBE in the regulations. (Courtis, Tr. 5894-98). Other refiners were opposed to the use of MTBE; still others favored the use of ethanol. (Courtis, Tr. 5894-98). ARCO and others supported an oxygenate requirement, whereas Unocal and others opposed such a requirement. (Courtis, Tr. 5903-05).

1884. Ms. Sharpless testified that companies that lobbied CARB selectively chose the information that they disclosed to the agency and withheld information that they did not want CARB to have. (CX 7063 (Sharpless, Dep. at 167)). Ms. Sharpless was aware that companies that lobbied CARB “look[ed] very well after their own self interest” and disclosed information to CARB accordingly. (CX 7063 (Sharpless, Dep. at 167)).

1885. Thus, although CARB requested refiners to provide it with cost information to aid in its cost-effectiveness analysis of the proposed Phase 2 RFG regulations, only six refiners provided such information. (CX 7040 (Aguila, Dep. at 54-55); Fletcher, Tr. 6958-59; Venturini, Tr. 376). Further, only two of the six provided all of the information that CARB had requested. (CX 7040 (Aguila, Dep. at 165)). CARB staff recognized that each company had full discretion whether to provide the agency with cost information at all (Fletcher, Tr. 6959) or how much information to provide (Fletcher, Tr. 6961).

2. The Degree of CARB’s Discretion—CARB Had Substantial Policy Discretion with Respect to the Substantive Content of the Phase 2 RFG Regulations

1886. The California Air Resources Board (“CARB”) is an agency created by the State of California to regulate air quality in the state. (RFF 7).

1887. Section 43018 of the California Health and Safety Code required CARB to “achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of the state [air quality] standards at the earliest practicable date.” (CX 1665 at 190 (CAL. HEALTH & SAFETY CODE § 43018); Kenny, Tr. 6675-76).

1888. The statute, however, did not mandate what specific fuel properties should be controlled, how stringent those controls should be, what the compliance dates should be, to whom

the controls should apply, whether the limits should be statewide or limited to areas with substantial air pollution problems, whether the limits should apply year-round or only during seasons with bad air quality, whether all batches of fuel should be subject to the same limit or an averaging program of some sort should be instituted, how the controls should be enforced, and whether there should be provisions granting temporary variances based on unforeseen unique events. (Boyd, Tr. 6838-39; Kenny, Tr. 6676-77; Venturini, Tr. 855; CX 10 at 196). In short, the California legislature set the policy that broadly governed CARB's behavior but left CARB discretion to operate. (Kenny, Tr. 6777-78).

1889. The statute does not direct CARB specifically how to take any of these actions. (Venturini, Tr. 855-56). Instead, these actions all involved policy choices that were left to CARB's discretion. (Boyd, Tr. 6839).

1890. The statute established the required emissions reductions and left it up to CARB to determine how to actually achieve them. (Kenny, Tr. 6652, 6678; Venturini, Tr. 854-56 (CARB had broad discretion under its legislative mandate to determine the specific fuel characteristics that should be controlled)). CARB had broad policy discretion over air resources and regulations relating to clean air in California. (Kenny, Tr. 6674-75; CX 1665 at 190). While the California legislature put some constraints on CARB's discretion, such constraints were limited to the California Health and Safety Code impositions. (Kenny, Tr. 6674-75; CX 1665 at 190; CAL. HEALTH & SAFETY CODE § 43018(a)-(b)). The legislature left it to CARB to determine how to achieve the reductions in emissions. (Kenny, Tr. 6678).

1891. The Act provided no guidance as to the types of measures that CARB could take to reduce emissions, leaving it to CARB to determine what types of regulations to adopt. (RFF 220).

It also provided no guidance on how CARB was to reconcile the apparently contradictory goals of achieving “the maximum degree of emission reduction possible” while enacting cost-effective regulations. (CX 1665 at 190 (CAL. HEALTH & SAFETY CODE § 43018(a)-(b)); (RFF 671-73).

1892. CARB considered a variety of regulatory options that even included banning the use of gasoline. (See RFF 94-99; CX 5 at 163). As CARB explained, there were at least four ways to regulate:

1. Adopt tighter standards for vehicular emissions.
2. Require the use of fuels other than gasoline.
3. Adopt an emission standard for toxic air pollutants.
4. Adopt more control measures for stationary sources.

(CX 5 at 163).

1893. CARB’s Executive Officer at the time of the Phase 2 RFG rulemaking testified that CARB seriously considered replacing gasoline with methanol based on studies that showed that “methanol was a viable alternative fuel.” (Boyd, Tr. 6700-01). CARB ultimately rejected the option mandating the use of alternative fuels because it believed that mandating alternative fuels “could not be wisely done on the basis of only emissions.” (CX 5 at 164).

1894. The CARB Phase 2 Technical Support Document “discuss[ed] each of the above methods to reduce emissions and explain[ed] why staff believe[d] that the Phase 2 gasoline regulation would be preferable.” (CX 5 at 163).

1895. CARB ultimately decided to carry out its mandate by regulating, among other things, gasoline composition. (See RFF 221). In considering how to implement the statutory requirements, Ms. Jananne Sharpless, CARB’s Chairwoman at the time of the Phase 2 regulations, understood that

CARB would consider technical feasibility, emission reduction levels, cost, and other information on how to weigh those factors. (CX 7063 (Sharpless, Dep. at 54)).

3. The Extent of CARB's Reliance on Unocal's Factual Assertions and/or Nondisclosure of its Patent Application—CARB Did Not Seek or Consider Information about Patents or Patent Applications in Promulgating Phase 2 RFG Regulations

1896. As a governmental institution, CARB is required to give notice of its policies in writing, so that persons regulated by the agency have notice of the rules by which they are governed. (RFF 909).

1897. CARB had no written or formal policy requiring rulemaking participants to disclose patents or patent applications. (Kenny, Tr. 6518; Boyd, Tr. 6834; RFF 911).

1898. CARB never asked Unocal whether it possessed any patents related to its research. (Venturini, Tr. 395; Jessup, Tr. 1595; Lamb, Tr. 2260; RFF 918-21).

1899. In fact, CARB never inquired of any company whether it had any patent rights and never considered whether ARCO had any patents or pending patents related to MTBE. (Ingham, Tr. 2674, 2680-81; Eizember, Tr. 3397; Clossey, Tr. 5492; CX 7042 (Bea, Dep. at 36); Boyd, Tr. 6792; Curtis, Tr. 5901-02; RFF 922).

1900. CARB was aware of one patent relating to RFG that had been issued to Talbert Fuel Systems but never analyzed the patent before voting to issue the RFG regulations. (Curtis, Tr. 5884-86; RFF 999-1002).

1901. As discussed elsewhere in these findings, other participants in the Phase 2 rulemaking process did not disclose their patent applications related to reformulated gasoline. (RFF 965-68).

1902. Furthermore, Mr. Jim Boyd, CARB's Executive Officer at the time of the rulemaking, testified that he did not know whether he would have expected a patent application to be brought to

CARB's attention in 1991. (Boyd, Tr. 6821-22). He further testified that he did not even know whether he would have wanted to know about a patent application during the Phase 2 rulemaking. (Boyd, Tr. 6822-23).

4. The Ability to Determine the Effect of the Misrepresentation—There Is No Ability to Establish Causation Between Unocal's Alleged Misrepresentations and Promulgation of the Phase 2 RFG Regulations

1903. The rulemaking process officially begins with the release of the notice of proposed rulemaking. (CX 767; Kenny, Tr. 6611). At the time the notice was released, CARB staff also released its Staff Report and Technical Support Document. (CX 52 at 001; CX 5 at 001). Neither the Staff Report nor the Technical Support Document necessarily reflect the policies or views of the Board. (Venturini, Tr. 326-27).

1904. The rulemaking record concludes with the regulatory adoption document, signed by the Executive Officer, Mr. Boyd. (CX 816; Kenny, Tr. 6614). CX 816 is the Executive Order, signed by Mr. Boyd, adopting the Phase 2 regulations. (CX 816; Kenny, Tr. 6534). Between the notice of proposed rulemaking, issued on October 4, 1991, and the regulatory adoption document in 1992, a number of documents are included in the official rulemaking record. (CX 767; Kenny, Tr. 6614).

1905. Under California law, CARB was required to place in its rulemaking record anything that constitutes substantial evidence on which the agency relied in promulgating its rules. (Kenny, Tr. 6632; CX 7029 at 068). Among other things, CARB was required to maintain in the rulemaking record “[a]ll data and other factual information, technical, theoretical, and empirical studies or reports, if any, on which the agency is relying in the adoption, amendment, or repeal of a regulation, including any cost impact estimates as required by Section 11346.53.” (CX 7029 at 068).

1906. As discussed in RFF 647-49, none of the following was included in the rulemaking record for the Phase 2 RFG regulations: Unocal's July 1, 1991 letter providing its equations, Unocal's August 27, 1991 letter releasing confidentiality of its data, or Unocal's data base referred to in its August 27, 1991 letter.

1907. CARB adopted the Phase 2 RFG regulations pursuant to a vote of its nine Board members after a public hearing. (CX 774 at 264-265). The transcript of the hearing does not include an explanation by any member of the reason for his or her vote, nor is there a written record explaining why the Board members voted the way they did. (CX 774 at 264-265). The final decision is captured in Board Resolution 91-54. (CX 817 at 002; CX 7063 (Sharpless, Dep. at 140)). Complaint Counsel only called one Board member as a witness in this case, Ms. Jananne Sharpless, who testified by designated deposition. (CX 7063 (Sharpless, Dep.)).

1908. Nearly a year after the November 1991 hearing, CARB published its Final Statement of Reasons for the Phase 2 RFG rulemaking. (CX 10; Venturini, Tr. 764). The Final Statement of Reasons is a document put together by CARB staff to satisfy the requirements of the Office of Administrative Law. (CX 7063 (Sharpless, Dep. at 139)). The staff does not submit this Final Statement of Reasons to the Board. (CX 7063 (Sharpless, Dep. at 139); Venturini, Tr. 327).

B. Nature of the Communication—Unocal's Alleged Misrepresentations Do Not Meet the Criteria for a Non-Protected Communication

1. Unocal Made No False or Misleading Statements or Omissions to CARB or Members of Auto/Oil and WSPA

1909. Unocal made a presentation on its research to CARB on June 20, 1991, designed to focus on the feasibility of a predictive model as an option for compliance. (RFF 361-380).

1910. At the June 20, 1991 meeting, Unocal said that a predictive model could be practical, cost-effective, and enforceable. (Lamb, Tr. 2221-22). It did not want CARB to implement caps and did not suggest that CARB do so. (RFF 378; Lamb, Tr. 2223-24; Jessup, Tr. 1504; Croudace, Tr. 656-57; Kulakowski, Tr. 4608, 4599-600). Even so, when CARB eventually developed a predictive model it included caps. (CX 54 at 008). Unocal's representations continue to be true, as demonstrated by CARB's decision to enact a predictive model in 1994 and then update it in 1999, as well as other refiners' support for, and clear preference for, the predictive model to comply with CARB regulations. (RFF 782, 804-805, 813-14).

1911. On July 1, 1991, Unocal provided CARB with actual 5/14 emissions equations developed from the ten-car study. (CX 25; Kulakowski, Tr. 4612; Croudace, Tr. 497; Venturini, Tr. 336-37). On or subsequent to July 25, 1991, Dr. Peter Jessup of Unocal provided a data disk to CARB containing Unocal's raw emissions data base from its ten-car tests to develop the predictive model. (Jessup, Tr. 1537-38; CX 1247; Miller, Tr. 1439-40; Venturini, Tr. 718 (explaining in prior testimony that "[CARB] needed this for the predictive model")). Finally, on August 27, 1991, Unocal gave notice to CARB waiving its rights to the confidentiality of the 5/14 project data. (CX 29).

1912. As described above, the August 27, 1991 letter is truthful in its description of the meeting between Unocal and CARB; truthful in its description of the Unocal presentation; and truthful in stating that Unocal was releasing the data for use in the development of a predictive model. (RFF 431-48 (discussing the meaning and intent of the term "data" in the letter); CX 29; Lamb, Tr. 2233-36). Every statement in this letter is true (Lamb, Tr. 2233-36), and Complaint Counsel did not dispute this at trial. (E.g., Venturini, Tr. 723-24).

1913. Moreover, the letter releases confidentiality over the Unocal “data” by using the term “non-proprietary.” (CX 29; Lamb, Tr. 2236-38). First, this “data” which Unocal is making publicly available in the third paragraph of the letter is the “data base” specifically referred to in the second paragraph as having previously been made available to CARB staff. (RFF 434; Lamb, Tr. 2236).

1914. Second, Unocal’s data was, and still is, non-proprietary—the use of the word was accurate and truthful. (RFF 462). Additionally, contemporaneous Unocal documents and trial testimony establish that Unocal used the term “non-proprietary” in order to release the confidentiality of the data. (CX 266 at 004; CX 1755; Lamb, Tr. 2238, 2262-63; RFF 450-51; Venturini, Tr. 821-22). The statement that the data was non-proprietary was a truthful statement of Unocal’s intent to make the data base available to the public. (Lamb, Tr. 2236-38; 2262-63). There is no evidence that Unocal intended that the letter had to do anything with patent rights, and CARB staff members did not interpret it that way. (RFF 454-57, 464-67).

1915. Complaint Counsel have also stated that Unocal’s alleged statement to Auto/Oil on September 26, 1991 that its data was “in the public domain” was also misleading. (Complaint ¶¶ 2(a), 54). As reflected in the Auto/Oil minutes from that date: “Mr. Jessup explained that the data from Unocal’s research has been provided to CARB and is in the public domain.” (CX 4027 at 010 (referred to in Dr. Jessup’s testimony as CX 291 at 010)). Dr. Jessup does not believe he used the phrase “public domain” (Jessup, Tr. 1546); however, there is nothing false about this statement.

1916. Unocal did not patent either its data or its equations, nor could it have, since neither data nor equations can be patented. (Linck Tr., 7752; RX 1163 at 004). Unocal has never charged CARB or any one else for the use of its data. (Lamb, Tr. 2238-39). ARCO’s Mr. Clossey admitted that his company had received a data disk from Unocal, that ARCO used the data to do its own

evaluation, and that Unocal did not charge ARCO for their use of this data. (Clossey, Tr. 5380-81, 5450, 5458).

1917. Even if Mr. Lamb's reference to "data" in the August 27, 1991 letter were read to mean something other than the raw data which Unocal had provided to CARB on a diskette in late July 1991, it could not possibly be read so broadly as to include patent claims. Both the August 27, 1991 letter (CX 29) and the Auto/Oil September 1991 minutes (CX 4027), make it clear that the data, which is being referred to as "non-proprietary" and "in the public domain," is data that has previously been shared with CARB. (See CX 29 ("We subsequently made the data base available to the staff and agreed to make the data public if necessary in the development of a predictive model for use in the certification of reformulated gasoline"); CX 4027 at 010 ("Mr. Jessup explained that the data from Unocal's research has been provided to CARB and is in the public domain.")). Unocal never shared with CARB (or Auto/Oil or WSPA) any of the combinations of ranges of motor gasoline that are claimed in Unocal's patents. (Jessup, Tr. 1576).

2. There Is No Evidence That Unocal's Statements and Omissions Were a Willful and Deliberate Attempt to Mislead CARB or Members of Auto/Oil and WSPA

1918. As described in detail above in Section IV.A.3-5, Unocal's advocacy was not motivated by an intent to deceive, but rather by a desire to avoid regulations that would harm its business. (E.g., RFF 247-72). For example, Unocal refineries produced products with unique properties, so it wanted to get credit for its ability to produce some gasoline with relatively beneficial attributes. (Beach, Tr. 1742-43; 1761-62). Moreover, there was a possibility that oxygenates would become part of the regulatory requirements, which would be detrimental to Unocal's business.

(Lamb, Tr. 2176). Unocal also wanted a regulation with flexibility and alternatives instead of a specific formula. (Lamb, Tr. 2181-83).

a. In the August 1991 Letter, Unocal Intended to Waive the Confidentiality of its Data Base for the Development of the Predictive Model

1919. Mr. Lamb testified that when he wrote the August 27, 1991 letter, he had no intent to mislead anyone at CARB. (Lamb, Tr. 2262). As discussed in Section VI.A.16., *supra*, Unocal intended to waive the confidentiality of its 5/14 data. (*E.g.*, RFF 450). This is supported by the existence of two contemporaneous Unocal memorandum, which confirm Unocal's intentions. (RFF 444-45). The testimony of other Unocal witnesses is consistent with these two internal memoranda. (*See, e.g.*, Beach, Tr. 1768-69; Kulakowski, Tr. 4425; Miller, Tr. 1439-40).

b. Unocal Did Not Intend for CARB to Adopt Regulations That Overlapped with its Patent Claims

1920. The Complaint alleges that Unocal's alleged misrepresentations "caused CARB to adopt Phase 2 RFG regulations that substantially overlapped with Unocal's concealed patent claims." (Complaint ¶ 45; *see also* ¶ 76).

1921. Unocal, however, never advocated to CARB any specific set of formulations, much less formulations that fell within any of its patent claims. (Kulakowski, Tr. 4608; Lamb, Tr. 2223-24).

1922. As discussed in Sections IV.A.20, *supra*, Unocal opposed the Phase 2 regulations as a whole, both in its written comments to CARB and its oral comments at the November 1991 Board meeting. (RFF 537-52; *see also* CX 10 at 023-024 (list of commenters supporting regulation does not include Unocal); RX 437 at 001 (WSPA and other refiners were "offset by ARCO backing the 10/4/91 proposal"); RX 434 at 007).

1923. Unocal specifically told CARB that the Phase 2 specifications were not necessary, and were not cost-effective. (RFF 538-39, 549, 551; CX 33 at 002, 019-020; Lamb, Tr. 2308-10, 2274; Boyd, Tr. 6786; CX 7065 (Stegemeier, Dep. at 136-37); CX 7063 (Sharpless, Dep. at 93, 99)).

1924. Unocal also advocated for elimination or relaxation of many of the specifications that refiners have now claimed would help them get around the Unocal patents. For example, several of the refiners argued to CARB that the cap on olefins should be raised so that they could avoid Unocal's patent claims. (*E.g.*, RX 553 at 001-002; {REDACTED}, *in camera*). But Unocal had told CARB in November 1991 that olefins were a costly parameter to control and that neither the Staff Report nor the Technical Support Document supported the necessity of controlling or reducing olefins. (CX 33 at 011). Several refiners argued that the cap on T50 should be raised. (*E.g.*, CX 7045 (Cleary, Dep. at 195); CX 7049 (Hochhauser, Dep. at 91-92, 99-100); RX 552 at 006). But in November 1991, Unocal had told CARB that it agreed with WSPA that T50 should be eliminated: (Lamb, Tr. 2304-06; CX 774 at 045 ("There's very limited things you can do to change T50. . . . [w]e don't see the spec for T50 as necessary."); *see also* CX 33 at 016; Lamb, Tr. 2298). Others argued in favor of relaxing aromatics limits. (*E.g.*, RX 552 at 006; {REDACTED}, *in camera*). In November 1991, Unocal had criticized CARB staff for not looking at Unocal's study, which showed that aromatic content of gasoline does not affect tailpipe emissions. (CX 33 at 012-013).

1925. Subsequently, with respect to the predictive model, at least three refiners asked CARB to "flatten" the T50 response curve to more closely resemble the EPA complex model. (Eizember, Tr. 3280-81; {REDACTED}, *in camera*). Unocal had argued unsuccessfully to WSPA in favor of the EPA model. (Kulakowski, Tr. 4642).

1926. Although Unocal was strongly in favor of a predictive model, Unocal opposed a model with caps on fuel parameters in November of 1991. (RFF 544; CX 33 at 006). After the November meeting, Unocal continued to oppose the inclusion of caps in a predictive model. (RFF 800; CX 42 at 006). And even after the '393 patent issued, Unocal argued in favor of an unbounded predictive model. (RFF 801-03; RX 159). Furthermore, Unocal also advocated repeatedly to CARB that the regulations should not go into effect until at least four years from the date on which a predictive model was adopted. (RFF 791, 794-96, 798-99).

c. Because There Was No Duty to Disclose its Patent Application, Unocal's Omission Cannot Be a Knowing, Willful and Deliberate Intent to Mislead

1927. As discussed in RFF 909-23, CARB never asked about pending patent applications and had no rules requiring such disclosure.

1928. Unocal itself had internal policies that prohibited it from discussing competitively sensitive information (such as patent applications). (RFF 1789-98).

1929. Auto/Oil and WSPA had similar policies regarding the discussion of competitively sensitive material among their members, and these policies were well understood and vigorously enforced. (RFF 1065-67; 1105-14).

3. The Alleged Misrepresentations Do Not Involve "Sharply Defined Facts" and Are Not "Clear and Apparent"

1930. The Complaint alleges that by representing that certain data was "non-proprietary," Unocal implied that it did not have, or did not intend to assert, any patent rights. (Complaint ¶¶ 2, 41, 48, 58, 78, 84).

1931. The August 27, 1991 letter, which Complaint Counsel claims gives rise to the alleged misrepresentation, refers only to a specific, tangible item: a computer disk containing data from one of Unocal's emissions projects that Unocal had previously given to CARB. (CX 29).

1932. Similarly, when Dr. Jessup gave a presentation to Auto/Oil and told members that he would send them a copy of the data if they wanted one, he was referring to a tangible diskette containing a data base. (See CX 7055 (Mallett, Dep. at 34-35); CX 293 at 001) ("Peter will send data disk to those who gave him business cards."). The references to "data" or "data disk" refers to a specific item that had previously been shared with CARB and that would be sent to Auto/Oil members upon request. (CX 4027 at 010).

1933. The Complaint also asserts that Unocal's contention that a "predictive model" is "cost-effective" and "flexible" is false because of the failure to disclose that Unocal would charge a royalty if a patent issued. (Complaint ¶¶ 2(b), 2(c), 37, 46, 48, 57, 79). Unocal's statements about the comparative cost-effectiveness and flexibility of a pure predictive model were Unocal's opinions, with which other refiners also agreed and CARB accepted. (RFF 803 (Texaco argued that the predictive model would save money); RFF 804-05).

4. The Alleged Unocal Misrepresentation Was Not Central to the Legitimacy of the Phase 2 Regulations

1934. Upon learning of the issuance of Unocal's '393 patent, CARB executive officer Mr. Boyd did not protest that Unocal had duped CARB. (Boyd, Tr. 6818). Instead, he asked Unocal for assurances that it would "not raise patent infringement issues" as to a reformulated gasoline test program that was then being conducted by CARB. (CX 50; Boyd, Tr. 6818; *see generally* RFF 828-30).

1935. Mr. Boyd furthermore testified that the word “dismayed” would be too strong a term to describe the reaction of CARB members upon learning of that patent. (Boyd, Tr. 6821). A misrepresentation that is not severe enough to even cause dismay by the party to which it was made is not central to the process in which it was made.

a. Cost-Effectiveness Was Not a Critical Determinant of CARB’s Phase 2 Regulations

1936. The Complaint alleges that Unocal’s purported misrepresentation affected CARB’s assessment of “cost-effectiveness.” (Complaint ¶¶ 2, 3, 27, 79). As discussed in Section VI.A.24, cost-effectiveness is only one, and not an outcome-determinative, factor that CARB was required to consider in promulgating Phase 2 regulations. (RFF 671-82).

1937. CARB’s primary mandate was to achieve the state air quality standards by the earliest practicable date. (RX 195 at 004).

1938. The relative lack of importance assigned to cost-effectiveness in the Phase 2 rulemaking process is demonstrated by CARB’s actions. As discussed in Section VI.A.24, CARB assigned the cost-effectiveness analysis to a junior engineer (RFF 684-87), represented that it planned linear programming model to determine cost (RFF 688-91), requested that refiners voluntarily provide cost information very late in the process (RFF 699-702), and then was forced to rely on limited investment and operating cost data from only two out of the 30 refineries in California. (RFF 703-17). Nevertheless, CARB proclaimed in its Final Statement of Reasons that “[b]ecause the cost data were received from a diverse group of refiners, staff had the ability to assess the impacts of the regulation on all segments of the industry.” (CX 10 at 095).

1939. CARB rejected proposals by various refiners to conduct an incremental analysis of the cost-effectiveness of individual parameter of its fuel regulation, such as an analysis focused on the incremental cost and benefit of a T50 specification. (RFF 749-56).

b. CARB Would Not Have Changed its Analysis of Cost-Effectiveness Had it Known of Unocal's Pending Patent Application

1940. During the relevant period, CARB staff believed gasoline formulations could not be patented. CARB's Executive Officer, Jim Boyd, greeted the issuance of the '393 with "disbelief" in view of his lack of understanding of patent law. (Boyd, Tr. 6730). Similarly, CARB's Mr. Peter Venturini "couldn't understand how a patent like this could be issued to start with." (CX 7042 (Bea, Dep. 133-34). Even after Unocal won a judgment for infringement of that patent, CARB continued to believe that the patent was invalid and that it was, in any event, too much "in a state of flux" to be taken into account in its regulatory process. (Venturini, Tr. 815).

1941. In developing the Phase 3 RFG regulations, which it adopted in December 1999, CARB did not alter the existing regulations to ease patent avoidance despite of its awareness of the Unocal patent and repeated refiner requests to modify the Phase 2 regulations to make it easier to avoid the Unocal patents. (See RFF 836-49, 862-69, 889-91).

1942. Even after the adoption of the Phase 3 regulations, refiners continued to ask CARB to make changes in the new Phase 3 regulations or assist in changing the octane law to make it easier for refiners to avoid the numerical claim limitations in the Unocal patents. (See RFF 898-908).

1943. Furthermore, even if it had considered Unocal's pending patent application in determining cost-effectiveness, CARB would have still considered the proposed Phase 2 regulations cost-effective. (See RFF 766-78).

c. CARB Would Have Regulated T50 Regardless of Unocal's Submissions Because Doing So Was Critical to Attaining Necessary Emission Reductions

1944. CARB developed an interest in T50 months before Unocal ever met with CARB. (*See* RFF 317-38). Other companies (but not Unocal) lobbied in support of a T50 specification. (*See, e.g.*, RFF 516). Furthermore, CARB based its regulations largely upon ARCO's EC-X fuel, and not upon information provided by Unocal. (*See, e.g.*, RFF 414-16, 565-85, 593-625). It is not likely that disclosure of Unocal's patent application would have led CARB to alter its view that a Phase 2 regulation containing a T50 specification was needed. (RFF 1423-38, *infra*).

d. CARB Had No Viable Alternative to the Phase 2 Gasoline Regulations That Would Have Resulted in Lower Infringement Rates

1945. The Technical Support Document prepared by CARB staff for the Phase 2 RFG rulemaking set out the following alternatives that CARB had the legal authority to implement and explained the basis for their rejection. First, CARB rejected the concept of tighter regulations on vehicles because of the time it would take to develop such technology and the fact that it would take approximately ten years to replace enough older vehicles before such regulations would attain their full impact. (CX 5 at 163-164). Second, CARB rejected the concept of requiring fuels other than gasoline because existing vehicles use gasoline because "such a specification could not be wisely done on the basis of only emissions." (CX 5 at 164). Further, because existing cars use gasoline, such a regulation would not produce any significant effect until well after 2000. (CX 5 at 164). Third, CARB rejected the concept of adopting an emission standard based on toxics because such a regulation would take at least ten years to reach full effect. (CX 5 at 164).

1946. Complaint Counsel did not introduce any evidence suggesting that any of the foregoing could have been adopted in place of the Phase 2 regulations to avoid Unocal's patents. Complaint Counsel also did not introduce any evidence suggesting that CARB had the alternative of adopting a rule that regulated gasoline properties with a substantially different T50 specification.

1947. As discussed in Section VII, *supra*, Professor Shapiro correctly agreed with the definition of lock-in as "just a little more graphic word for switching costs, significant switching costs, and it has inherent in it the notion that one had choices *ex ante* and that one made a choice and now you're stuck with it in the sense that it is hard to switch, in the sense that your options are reduced in comparison to what they were earlier. That is, your options are reduced or less attractive." (Shapiro, Tr. 7345-46). Yet Professor Shapiro was unable to identify a single less costly regulatory alternative that was available at the time of the Phase 2 RFG rulemaking but that ceased to be available by the time CARB learned of Unocal's patents, for reasons of stranded costs or otherwise. (*See* RFF 1632, *supra*).

1948. The one alternative proffered by Complaint Counsel and sponsored by CARB's Rule 3.33(c) witness, Mr. Peter Venturini, would have been for CARB to not promulgate any Phase 2 regulations and rely instead on EPA regulations. (Venturini, Tr. 787-88). As discussed in Section VI, *supra*, and as supported by the unrebutted testimony of Unocal's expert Pedersen, this was not a realistic or likely alternative. (RFF 1375-1402).

1949. Failure to adopt the Phase 2 regulations would have resulted in the imposition of a Federal Implementation Plan that would have been needed to bring the state into compliance with the Federal Clean Air Act. (RFF 1394, 1518). A study performed by the California Governor's office found that the imposition of a FIP would have cost the state at least \$8.4 billion in direct costs and

\$17.2 billion in lost output, and would have resulted in the loss of 165,000 jobs. (RX 334 at 001). After CARB learned of Unocal's patents in 1996, CARB reaffirmed the view that reliance on the EPA's regulations would have been insufficient to meet California's Clean Air Act requirements. (RX 202 at 004).

XI. COMPLAINT COUNSEL'S CLAIMS ARE BARRED BY THE STATUTE OF LIMITATIONS

1950. In 1995, Atlantic Richfield Co., Chevron U.S.A., Inc., Exxon Corp., Mobil Oil Corp., Shell Oil Products Co., and Texaco Refining and Marketing, Inc. filed a complaint ("the 1995 Complaint") asserting claims for, *inter alia*, equitable estoppel, unclean hands, and implied license in an attempt to stop Unocal from asserting and enforcing its U.S. Patent No. 5,288,393 ("393 patent"). (RX 783 (1995 Complaint ¶¶ 10-20, 61-77); Strathman, Tr. 3651). The plaintiffs based their claims on Unocal's alleged concealment of the '393 patent application and conduct before and during the CARB proceedings leading to the development and adoption of the Phase 2 RFG specifications. (RX 783 (1995 Complaint ¶¶ 10-20, 61-77)). The plaintiffs alleged that Unocal's supposed concealment was part of a larger plot to gain a competitive edge over and extract royalties from the plaintiffs. (RX 783 (1995 Complaint ¶¶ 10-20, 61-77)).

1951. In 1996, representatives from several of these same refiners asked the FTC to investigate Unocal's alleged concealment of the '393 patent application before and during the Phase 2 CARB proceedings. (JX 7 at 001). Moreover, in 1996, the FTC staff was informed that there was pending litigation between Unocal and certain oil refiners regarding enforcement of Unocal's '393 patent. (JX 7 at 001).

1952. The FTC chose to not file this action until after Unocal's competitors spent eight years litigating against one of Unocal's RFG patents. (*See* JX 7 at 001; Complaint (issued March 4, 2003);

RX 783 (1995 Complaint); *Union Oil Co. of Cal. v. Atlantic Richfield Co.*, 208 F.3d 989 (Fed. Cir. 2000)).

1953. Under paragraph 2 of the Complaint, it is alleged that Unocal made materially false and misleading statements from 1990-1994. (Complaint ¶ 2).

1954. In January 1995, Unocal announced its plan to license its RFG technology (CX 375) (Unocal's press release regarding the '393 patent), and thus no longer could "perpetuate the [allegedly] false and misleading impression that it did not possess, or would not enforce, any proprietary interests relating to RFG." (Complaint ¶ 4).

1955. One year later, Unocal's competitors requested that the FTC investigate the enforcement of Unocal's '393 patent based on allegedly fraudulent conduct in connection with CARB consideration of Phase 2 regulations. (JX 7 at 001).

1956. Seven years later, on March 4, 2003, the FTC initiated administrative proceedings against Unocal. (Complaint).

XII. THE FACTS CANNOT JUSTIFY COMPLAINT COUNSEL'S PROPOSED REMEDY

1957. Complaint Counsel's proposed remedy aims to strip Unocal of its property right to claim infringement in California of any of Unocal's five patents. (Complaint ¶¶ 17-18). Specifically, the first paragraph of the requested relief asks this Court to end all of Unocal's current efforts to assert infringement by any means (for any present or future patents that claim priority back to the '393 patent application) based on the manufacture, sale, distribution, or other use of gasoline to be sold in California. (Complaint ¶ 17). The second paragraph asks this Court to prohibit any new or future efforts by Unocal to assert infringement by any means (for any present or future patents that claim priority back to the '393 patent application) based on the manufacture, sale, distribution, or other use

of gasoline to be sold in California. (Complaint ¶ 17). The third portion of the requested relief is identical to the first, except that it relates to the import or export of gasoline, asking this Court to end all of Unocal's current efforts to assert infringement by any means (for any present or future patents that claim priority back to the '393 patent application) based on the manufacture, sale, distribution, or other use of gasoline for import or export to or from California. (Complaint ¶¶ 17-18). The Complaint additionally asserts that Unocal should be forced to use, at its own cost, a Commission-approved compliance officer as its sole representative for the purpose of communicating Unocal's patent rights relating to any standard or regulations under consideration by any standard-setting organization of which Unocal is a member, or any state or federal governmental entity that conducts rulemaking proceedings in which Unocal participates. (Complaint ¶ 18).

1958. The requested relief covers, without distinction, all five of Unocal's patents, without regard for the judiciary's decisions with respect to the '393 patent, and notwithstanding the minuscule market share represented by the '393 patent technology. (Teece, Tr. 7513, 7552).

1959. The '393 patent was the only one at issue in the 1997 jury trial, and the only one subsequently upheld as valid and infringed by the Federal Circuit. The jury in the 1997 trial found that on average approximately 29 percent of the CARB summertime gasoline infringed, based upon the refiners' production from March through July 1996 (the only time period for which the refiners had supplied production records). (Strathman, Tr. 3656; RX 1165A at 014). The damages award for these five months totaled \$69 million. (See RX 814 at 004-005; RX 816 at 002). Following the Federal Circuit's decision, the defendant refiners paid this amount to Unocal, together with \$27 million in prejudgment interest. (See RX 814 at 004-005; RX 816 at 002).

1960. In addition to ordering the defendants to pay damages for the five months of infringement in 1996, the District Court ordered on September 28, 1998, that a further accounting would take place against these refiners:

With respect to infringement from August 1, 1996 to the date of final judgment this Court orders that an accounting for defendants' oil production take place in order to determine the number of gallons of infringing motor gasoline, to be then multiplied by the royalty rate of 5.75¢ per gallon, prejudgment interest at the rate of 8.24%, compounded quarterly, such accounting to be stayed during the pendency of an appeal in this matter.

(RX 814 at 005; *see also* RX 816 at 002).

1961. At the refiners' request, the court stayed this accounting of additional damages pending appeal. (Strathman, Tr. 3658). Once Unocal had prevailed on appeal, Unocal moved forward with the accounting earlier ordered by the court. (Strathman, Tr. 3658-59). After receiving updated information on refiners' motor gasoline production, Unocal moved for an additional award of damages totaling \$209 million for infringement of the '393 patent for the period from August 1, 1996 through September 30, 2000 (the date through which refiners had provided production records). (Strathman, Tr. 3658-59; CX 1579). Unocal also sought prejudgment interest bringing the outstanding total to around \$280 million. (Strathman, Tr. 3659). The accounting is currently not proceeding, however, because the case is "on hold" pending reexamination of the '393 patent. (Strathman, Tr. 3660-64).

1962. Moreover, once the refiners decided to implement steps to avoid infringement of the '393 patent, representatives of each refiner testified that they were able to do so for little to no cost (or even a cost savings)—and that the technology to do so has been in existence since 1995. (RX 1162A at 050; RX 85; RX 91; RX 92; RX 207A; RX 215A; RX 224). In recent years, less than

one percent of the summertime CARB gasoline falls within the claims of Unocal's '393 patent. (Sarna, Tr. 6367-68; Teece, Tr. 7513).

1963. In recent years, less than one percent of the summertime CARB gasoline falls within the claims of Unocal's '393 patent. (Sarna, Tr. 6367-68; Teece, Tr. 7513). Professor Teece cited this as "real-world evidence" in support of his conclusion that Unocal has no monopoly power in connection with the '393 patent. (Teece, Tr. 7551-53).

1964. Since the time of the alleged misrepresentation, CARB engaged in the Phase 3 rulemaking well after it learned of the '393 patent. (Venturini, Tr. 129). The Phase 3 regulations were passed with knowledge by CARB and the industry that Unocal had received patents, that a jury upheld one of Unocal's patents, and that the jury had awarded damages for infringement. (Eskew, Tr. 3010; Eizember, Tr. 3280 (testifying that Exxon and Mobil approached CARB to discuss Unocal's patents during the Phase 3 process)). CARB's Mr. Kenny agreed CARB certainly could have raised the issue of Unocal's patents with Senator Sher, in the California legislature, but to his knowledge, CARB did not do so. (Kenny, Tr. 6605-07). Nor did CARB ever have a written policy during Mr. Kenny's tenure, which lasted until January 2003 (Kenny, Tr. 6496), requiring participants in the CARB regulatory process to disclose all pending patents. (Kenny, Tr. 6518).

1965. Complaint Counsel's remedy proposal for a zero royalty "goes beyond what would be appropriate to restore the world to a situation where it would have been had Unocal not engaged in the alleged misconduct." (Teece, Tr. 7537). Professor Teece reaches this conclusion "even if it is proved that Unocal engaged in misconduct that led CARB to enact regulations that overlapped its regulations to which CARB was now locked in." (Teece, Tr. 7538).

1966. It is clear that Unocal's patents have been licensed to refiners outside California in arms length transactions untainted by any allegations of wrongdoing. (Teece, Tr. 7541-46). "The competitive price is set by or at least is benchmarked by the price that's actually being paid, the price that's been negotiated and paid in license agreements entered into by Unocal and other refiners outside of the state of California." (Teece, Tr. 7540-41). This competitive price is not zero. (Teece, Tr. 7541).

1967. Any remedy that would bear a reasonable relationship to the alleged conduct Unocal is accused of should be established with reference to the amount refiners outside of California who licensed Unocal's RFG patents were willing to pay. (Teece, Tr. 7440-41, 7446).

Dated: March 14, 2005.

Respectfully submitted,

ROBINS, KAPLAN, MILLER & CIRESI L.L.P.

By Signature on File with Commission

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ATTORNEYS FOR UNION OIL COMPANY OF
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CERTIFICATE OF SERVICE

I hereby certify that on March 15, 2005, I caused the original and two paper copies of the public version of Union Oil Company of California's Post-Trial Proposed Findings of Fact, together with an electronic copy on CD, to be delivered for filing via Federal Express and also caused an electronic copy to be delivered for filing via e-mail to:

Donald S. Clark, Secretary
Federal Trade Commission
600 Pennsylvania Ave. NW, Rm. H-159
Washington, DC 20580
secretary@ftc.gov

I hereby certify that on March 15, 2005, I also caused two paper copies of the public version of Union Oil Company of California's Post-Trial Proposed Findings of Fact, together with an electronic copy on CD, to be delivered via Federal Express to:

Office of Administrative Law Judges
Federal Trade Commission
600 Pennsylvania Ave. NW
Washington, DC 20580
Attention: The Honorable D. Michael Chappell

I hereby certify that on March 15, 2005, I also caused an electronic copy of the public version of Union Oil Company of California's Post-Trial Proposed Findings of Fact to be delivered via e-mail to:

dgross@ftc.gov

I hereby certify that on March 15, 2005, I also caused two paper copies of the public version of Union Oil Company of California's Post-Trial Proposed Findings of Fact, together with an electronic copy on CD, to be served upon the persons listed below via overnight delivery (Federal Express):

Geoffrey Oliver, Esq.
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