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13 **SUPERIOR COURT OF THE STATE OF CALIFORNIA**

14 **COUNTY OF SAN FRANCISCO**

15 **UNLIMITED JURISDICTION**

16 THE PEOPLE OF THE STATE OF  
CALIFORNIA, acting by and through the San  
17 Francisco City Attorney DENNIS J.  
HERRERA,

18 Plaintiff and Real Party in Interest,

19 vs.

20 BP P.L.C., a public limited company of  
England and Wales, CHEVRON  
21 CORPORATION, a Delaware corporation,  
CONOCOPHILLIPS COMPANY, a Delaware  
22 corporation, EXXON MOBIL  
CORPORATION, a New Jersey corporation,  
23 ROYAL DUTCH SHELL PLC, a public limited  
company of England and Wales, and DOES 1  
24 through 10,

25 Defendants.

ENDORSED  
FILED  
Superior Court of California  
County of San Francisco

SEP 19 2017

CLERK OF THE COURT  
BY: MEREDITH GRIER  
Deputy Clerk

CGC = 17-561370

Case No.:

**COMPLAINT FOR PUBLIC NUISANCE**

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1 Plaintiff, the People of the State of California (“the People”), by and through San Francisco  
2 City Attorney Dennis J. Herrera, brings this action against Defendants BP p.l.c. (“BP”), Chevron  
3 Corporation (“Chevron”), ConocoPhillips Company (“ConocoPhillips”), Exxon Mobil Corporation  
4 (“Exxon”), and Royal Dutch Shell plc (“Shell”) (collectively, “Defendants”), and alleges as  
5 follows:

## 6 I. INTRODUCTION

7 1. Global warming is here and it is harming San Francisco now. Global warming  
8 causes accelerated sea level rise through thermal expansion of ocean water and melting of land-  
9 based ice. Sea levels are rising at rates unprecedented in the history of human civilization due to  
10 global warming.<sup>1</sup> Global warming-induced sea level rise is already causing flooding of low-lying  
11 areas of San Francisco, increased shoreline erosion, and salt water impacts to San Francisco’s  
12 water treatment system.<sup>2</sup> The rapidly rising sea level along the Pacific coast and in San Francisco  
13 Bay, moreover, poses an imminent threat of catastrophic storm surge flooding because any storm  
14 would be superimposed on a higher sea level.<sup>3</sup> This threat to human safety and to public and  
15 private property is becoming more dire every day as global warming reaches ever more dangerous  
16 levels and sea level rise accelerates. The City and County of San Francisco (“San Francisco” or  
17 “City”) must take abatement action now to protect public and private property from this looming  
18 threat by building sea walls and other sea level rise adaptation infrastructure. Exhibits 1 and 2<sup>4</sup> to  
19

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21 <sup>1</sup> Griggs et al., *Rising Seas in California: an update on sea-level rise science*, California Ocean  
22 Science Trust, at 8 (Apr. 2017) (“*Rising Seas in California*”), *available at*  
[http://www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-  
rise-science.pdf](http://www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-rise-science.pdf).

23 <sup>2</sup> San Francisco Sea Level Rise Action Plan at 6 (Mar. 2016), *available at*  
24 [http://default.sfplanning.org/plans-and-programs/planning-for-the-city/sea-level-  
rise/160309\\_SLRAP\\_Executive\\_Summary\\_EDreduced.pdf](http://default.sfplanning.org/plans-and-programs/planning-for-the-city/sea-level-rise/160309_SLRAP_Executive_Summary_EDreduced.pdf).

25 <sup>3</sup> *Rising Seas in California* at 16-17 (Apr. 2017); *Climate Change Impacts in the United States:*  
26 *The Third National Climate Assessment*, southwest chapter at 469-70 (2014), *available at*  
[http://nca2014.globalchange.gov/system/files\\_force/downloads/low/NCA3\\_Full\\_Report\\_20\\_South  
west\\_LowRes.pdf?download=1](http://nca2014.globalchange.gov/system/files_force/downloads/low/NCA3_Full_Report_20_Southwest_LowRes.pdf?download=1).

27 <sup>4</sup> San Francisco Sea Level Action Plan, at 2-7 & 2-9 (March 2016), *available at*  
28 [http://default.sfplanning.org/plans-and-programs/planning-for-the-city/sea-level-  
rise/160309\\_SLRAP\\_Final\\_ED.pdf](http://default.sfplanning.org/plans-and-programs/planning-for-the-city/sea-level-rise/160309_SLRAP_Final_ED.pdf).

1 this Complaint, showing flood events' projected intrusion into San Francisco as a result of global  
2 warming, demonstrate just how stark the threat is.

3         2. This egregious state of affairs is no accident. Rather, it is an unlawful public  
4 nuisance of the first order. Defendants are the five largest investor-owned fossil fuel corporations  
5 in the world as measured by their historic production of fossil fuels. The use of fossil fuels – oil,  
6 natural gas and coal – is the primary source of the greenhouse gas pollution that causes global  
7 warming, a point that scientists settled years ago.<sup>5</sup> Defendants have produced massive amounts of  
8 fossil fuels for many years. And recent disclosures of internal industry documents demonstrate that  
9 they have done so despite knowing – since at least the late 1970s and early 1980s if not earlier –  
10 that massive fossil fuel usage would cause dangerous global warming. It was at that time that  
11 scientists on their staffs or with whom they consulted through their trade association, the American  
12 Petroleum Institute (“API”), investigated the science and warned them in stark terms that fossil fuel  
13 usage would cause global warming at a rate unprecedented in the history of human civilization and  
14 present risks of “catastrophic” harm in coming decades.

15         3. Defendants took these stark warnings and proceeded to double-down on fossil fuels.  
16 Most of the carbon dioxide now in the atmosphere as a result of combustion of Defendants' fossil  
17 fuels is likely attributable to their recent production – *i.e.*, to fossil fuels produced by Defendants  
18 since 1980. Even today, with the global warming danger level at a critical phase, Defendants  
19 continue to engage in massive fossil fuel production and execute long-term business plans to  
20 continue and even expand their fossil fuel production for decades into the future.

21         4. The global warming-induced sea level rise from past fossil fuel usage is an  
22 irreversible condition on any relevant time scale: it will last hundreds or even thousands of years.  
23 Defendants' planned production of fossil fuels into the future will exacerbate global warming,  
24  
25

26  
27 <sup>5</sup> See, e.g., Carbon Dioxide and Climate: A Scientific Assessment, Report of an Ad Hoc Study  
28 Group on Carbon Dioxide and Climate to the Climate Research Board, Assembly of Mathematical  
and Physical Sciences, National Research Council (1979), at vii, 4-6, *available at*  
<https://www.nap.edu/catalog/12181/carbon-dioxide-and-climate-a-scientific-assessment>.

1 accelerate sea level rise even further, and require greater and more costly abatement actions to  
2 protect San Francisco.

3 5. Defendants, notably, did not simply produce fossil fuels. They engaged in large-  
4 scale, sophisticated advertising and public relations campaigns to promote pervasive fossil fuel  
5 usage and to portray fossil fuels as environmentally responsible and essential to human well-being  
6 – even as they knew that their fossil fuels would contribute, and subsequently were contributing, to  
7 dangerous global warming and associated accelerated sea level rise. These promotional efforts  
8 continue through today even in the face of overwhelming scientific evidence that fossil fuels are  
9 altering the climate and global warming has become an existential threat to modern life.

10 6. Defendants' promotion of fossil fuels has also entailed denying mainstream climate  
11 science or downplaying the risks of global warming. During the 1990s and early 2000s,  
12 Defendants stole a page from the Big Tobacco playbook and sponsored public relations campaigns,  
13 either directly or through the API or other groups, to deny and discredit the mainstream scientific  
14 consensus on global warming, downplay the risks of global warming, and even to launch  
15 unfounded attacks on the integrity of leading climate scientists. "Uncertainty" of the science  
16 became the constantly repeated mantra of this Big Oil PR campaign just as "Doubt is our product"  
17 was the Big Tobacco PR theme. Emphasizing "uncertainty" in climate science, directly or through  
18 the API, is still a focus of Defendants' efforts to promote their products even though Defendants  
19 are well aware that the fundamental scientific facts of global warming are not in dispute and are a  
20 cause of grave danger through sea level rise.

21 7. The purpose of all this promotion of fossil fuels and efforts to undermine  
22 mainstream climate science was, like all marketing, to increase sales and protect market share. It  
23 succeeded.

24 8. And now it will cost billions of dollars to build sea walls and other infrastructure to  
25 protect human safety and public and private property in San Francisco from global warming-  
26 induced sea level rise. A recent report by the California government has rung the alarm bell as  
27 loudly as possible: "Previously underappreciated glaciological processes, examined in the research  
28 of the last five years, have the potential to greatly increase the probability of extreme global sea-

1 level rise (6 feet or more) within this century” under business-as usual fossil fuel production and  
2 usage.<sup>6</sup> Translation: the planet’s enormous ice caps on Greenland and Antarctica are beginning to  
3 melt, like their much smaller but more numerous cousins, the mountain glaciers, have been doing  
4 for many years, and slide into the ocean. This new dynamic is fundamentally increasing the risk of  
5 catastrophic sea level rise. The report projects a risk of as much as ten feet of additional sea level  
6 rise along San Francisco’s coastline by 2100, which would be catastrophic.<sup>7</sup> Nearer-term risks  
7 include 0.3 to as much as 0.8 feet of additional sea level rise by 2030,<sup>8</sup> which itself will require the  
8 building of sea walls and other costly infrastructure given the dynamics of storm surge and regular  
9 high tide flooding.

10 9. This new information shows that the costs of dealing with global warming-induced  
11 sea level—already immense—will be staggering for the public entities that must protect their  
12 people and their coastlines. Even before the latest projections of accelerating sea-level rise, San  
13 Francisco has already taken action to adapt. In 2016, San Francisco adopted an action plan  
14 establishing a framework for assessing San Francisco’s exposure to sea level rise and identifying  
15 actions the City must take to prevent sea level rise damage. The plan’s vision is to make San  
16 Francisco a “more resilient city in the face of immediate and long-term threats of sea level rise, by  
17 taking measures to protect and enhance public and private assets, natural resources, and quality of  
18 life for all.” The plan recommends that San Francisco conduct assessments to identify properties  
19 and infrastructure vulnerable to sea level rise, and develop and implement adaptation plans to  
20 protect them by raising infrastructure, building flood barriers and other infrastructure, and taking  
21 other measures. San Francisco is in the process of doing so for identified vulnerable areas such as  
22 Ocean Beach and the San Francisco Port. As set forth in the action plan, continuing Bayside sea  
23 level rise from global warming places at risk at least \$10 billion dollars of public property within  
24 San Francisco and as much as \$39 billion of private property. The magnitude of the actions needed  
25

26 <sup>6</sup> Rising Seas in California at 16.

27 <sup>7</sup> *Id.* at 26.

28 <sup>8</sup> *Id.*

1 to abate harms from sea level rise, and the amount of property at risk, will increase in light of the  
2 rapidly accelerating sea level rise and the increased scientific understanding of sea level rise  
3 processes as set forth in the 2017 report.

4 10. Defendants are substantial contributors to the public nuisance of global warming  
5 that is causing injury to the People and thus are jointly and severally liable. Defendants'  
6 cumulative production of fossil fuels over many years places each of them among the top sources  
7 of global warming pollution in the world. Upon information and belief, Defendants are,  
8 respectively, the first (Chevron), second (Exxon), fourth (BP), sixth (Shell) and ninth  
9 (ConocoPhillips) largest cumulative producers of fossil fuels worldwide from the mid Nineteenth  
10 Century to present; most of Defendants' global warming pollution from the usage of their fuels has  
11 accumulated in the atmosphere since 1980. Defendants, moreover, are qualitatively different from  
12 other contributors to the harm given their in-house scientific resources, early knowledge of global  
13 warming, commercial promotions of fossil fuels as beneficent even in light of their knowledge to  
14 the contrary, and efforts to protect their fossil fuel market by downplaying the risks of global  
15 warming.

16 11. The People seek an order requiring Defendants to abate the global warming-induced  
17 sea level rise nuisance to which they have contributed by funding an abatement program to build  
18 sea walls and other infrastructure that is urgently needed to protect human safety and public and  
19 private property in San Francisco. The People do not seek to impose liability on Defendants for  
20 their direct emissions of greenhouse gases and do not seek to restrain Defendants from engaging in  
21 their business operations. This case is, fundamentally, about shifting the costs of abating sea level  
22 rise harm – one of global warming's gravest harms – back onto the companies. After all, it is  
23 Defendants who have profited and will continue to profit by knowingly contributing to global  
24 warming, thereby doing all they can to help create and maintain a profound public nuisance.

## 25 II. JURISDICTION AND VENUE

26 12. Jurisdiction is proper in this Court because Defendants have contributed to the  
27 creation of a public nuisance in San Francisco, and the San Francisco City Attorney has the right  
28 and authority to seek abatement of that nuisance on behalf of the People of the State of California.





1           17.     As a result of its management, direction, conduct and/or control of operations  
2 relating to company-wide climate change policies and fossil fuel production, Defendant BP is  
3 responsible for its subsidiaries' past and current production and promotion of fossil fuel products.

4           18.     Defendant Chevron is a Delaware Corporation with its principal place of business  
5 located in San Ramon, California. Chevron and its predecessors had their headquarters in San  
6 Francisco from 1879 to 2001. Chevron is a multinational, integrated oil and gas company that  
7 explores for, produces, refines, markets, and sells oil, natural gas and fossil fuel products.

8           19.     Chevron controls company-wide climate change policies and fossil fuel  
9 production.<sup>10</sup> Chevron, through its employees and/or agents, manages, directs, conducts and/or  
10 controls operations relating to its subsidiaries' participation in the process by which fossil fuels,  
11 including raw crude oil, are produced, transported, refined, stored, distributed, marketed, and/or  
12 sold to consumers. Chevron also exercises control over company-wide decisions on production  
13 and use of fossil fuel reserves considering climate change impacts. Chevron's management,  
14 direction, conduct and/or control is exercised through a variety of means, including through its  
15 employees' and/or agents' implementation of policies, procedures, and programs relating to  
16 climate change generally and to production of fossil fuels specifically.

17           20.     As a result of its management, direction, conduct and/or control of operations  
18 relating to company-wide climate change policies and fossil fuel production, Defendant Chevron is  
19 responsible for its subsidiaries' past and current production and promotion of fossil fuel products.

20           21.     Defendant ConocoPhillips is a Delaware Corporation with its principal place of  
21 business located in Houston, Texas, doing business in California. ConocoPhillips is a  
22 multinational oil and gas company that produces, markets, and sells oil and natural gas and for  
23 many years also refined and sold finished oil products.

24     ///

25     ///

26  
27  
28     <sup>10</sup> Chevron Responses to Climate Change 2016 Information Request from Carbon Disclosure  
Project at 2, *available at* <https://www.cdp.net/en/companies>.

1           22.     ConocoPhillips controls company-wide climate change policies and fossil fuel  
2 production.<sup>11</sup> ConocoPhillips, through its employees and/or agents, manages, directs, conducts  
3 and/or controls operations relating to its subsidiaries' participation in the process by which fossil  
4 fuels, including raw crude oil, are produced, transported, refined, stored, distributed, marketed,  
5 and/or sold to consumers. ConocoPhillips also exercises control over company-wide decisions on  
6 production and use of fossil fuel reserves considering climate change impacts. ConocoPhillips's  
7 management, direction, conduct and/or control is exercised through a variety of means, including  
8 through its employees' and/or agents' implementation of policies, procedures, and programs  
9 relating to climate change generally and to production of fossil fuels specifically.

10           23.     As a result of its management, direction, conduct and/or control of operations  
11 relating to company-wide climate change policies and fossil fuel production, Defendant  
12 ConocoPhillips is responsible for its subsidiaries' past and current production and promotion of  
13 fossil fuel products.

14           24.     Defendant Exxon is a New Jersey corporation with its principal place of business  
15 located in Irving, Texas, doing business in the State of California. Exxon is a multinational,  
16 integrated oil and gas company that explores for, produces, refines, markets, and sells oil, natural  
17 gas and fossil fuel products and, as recently as 2009 produced, marketed and sold coal.

18           25.     Exxon controls company-wide climate change policies and fossil fuel production.<sup>12</sup>  
19 Exxon, through its employees and/or agents, manages, directs, conducts and/or controls operations  
20 relating to its subsidiaries' participation in the process by which fossil fuels, including raw crude  
21 oil, are produced, transported, refined, stored, distributed, marketed, and/or sold to consumers.  
22 Exxon also exercises control over company-wide decisions on production and use of fossil fuel  
23 reserves considering climate change impacts. Exxon's management, direction, conduct and/or  
24 control is exercised through a variety of means, including through its employees and/or agents'

26           <sup>11</sup> ConocoPhillips Responses to Climate Change 2016 Information Request from Carbon  
27 Disclosure Project at 2, *available at* <https://www.cdp.net/en/companies>.

28           <sup>12</sup> Exxon Responses to Climate Change 2016 Information Request from Carbon Disclosure  
Project at 1, *available at* <https://www.cdp.net/en/companies>.

1 implementation of policies, procedures, and programs relating to climate change generally and to  
2 production of fossil fuels specifically.

3 26. As a result of its management, direction, conduct and/or control of operations  
4 relating to company-wide climate change policies and fossil fuel production, Defendant Exxon is  
5 responsible for its subsidiaries' past and current production and promotion of fossil fuel products.

6 27. Defendant Shell is a public limited company registered in England and Wales with  
7 its headquarters in The Hague, Netherlands, doing business in California. Shell is a multinational,  
8 integrated oil and gas company that explores for, produces, refines, markets, and sells oil, natural  
9 gas and fossil fuel products.

10 28. Shell controls company-wide climate change policies and fossil fuel production.<sup>13</sup>  
11 Shell, through its employees and/or agents, manages, directs, conducts and/or controls operations  
12 relating to its subsidiaries' participation in the process by which fossil fuels, including raw crude  
13 oil, are produced, transported, refined, stored, distributed, marketed, and/or sold to consumers.  
14 Shell also exercises control over company-wide decisions on production and use of fossil fuel  
15 reserves considering climate change impacts. Shell's management, direction, conduct and/or  
16 control is exercised through a variety of means, including through its employees' and/or agents'  
17 implementation of policies, procedures, and programs relating to climate change generally and to  
18 production of fossil fuels specifically.

19 29. As a result of its management, direction, conduct and/or control of operations  
20 relating to company-wide climate change policies and fossil fuel production, Defendant Shell is  
21 responsible for its subsidiaries' past and current production and promotion of fossil fuel products.

22 30. Defendants DOES ONE through TEN are sued herein under fictitious names.  
23 Plaintiff does not at this time know the true names or capacities of said defendants, but prays that  
24 the same may be alleged when ascertained.

25 ///

26  
27  
28 <sup>13</sup> Shell Responses to Climate Change 2016 Information Request from Carbon Disclosure  
Project at 2, available at <https://www.cdp.net/en/companies>.

1           **C. Defendants' Connections To California.**

2           31. Defendants have contributed to the creation of a public nuisance – global warming-  
3 induced sea level rise – causing severe harms and threatening catastrophic harms in San Francisco.

4           32. Each Defendant, directly and through its subsidiaries, substantially participates in  
5 the process by which raw crude oil is extracted from the ground, refined into fossil fuel products  
6 and delivered, marketed, and sold to California residents for use.

7           33. BP, through its subsidiaries, owns and/or operates port facilities in California for  
8 receipt of crude oil. BP, through its subsidiaries, also produces oil in Alaska, and upon information  
9 and belief, BP, through its subsidiaries, transports some of this crude oil to California. In addition,  
10 BP operates 275 ARCO-licensed and-branded gasoline stations in California, including stations  
11 located in San Francisco. BP offers credit cards to consumers on its interactive website to promote  
12 sales of gasoline and other products at its branded gasoline stations. BP's web site maintains a  
13 page of "BP Amoco Stations Near Me" for California listing virtually every municipality in  
14 California and hundreds of such gas stations. BP promotes gasoline sales by offering, consumers,  
15 through its interactive web site, twenty-five cents off every gallon of BP-branded gasoline for  
16 every \$100 spent on a BP Visa<sup>®</sup> Credit Card or BP Credit Card for the first ninety days a  
17 consumer's account is open.

18           34. Chevron, through its subsidiaries, produces oil in California, owns and/or operates  
19 port facilities in California for receipt of crude oil, owns and operates two refineries where crude  
20 oil is refined into finished fossil fuel products including gasoline, and owns and operates  
21 approximately nine gasoline terminals in California. A gasoline terminal consists of enormous  
22 aboveground storage tanks that hold gasoline for distribution to retail gasoline stations and  
23 consumers. Chevron owns and operates the Richmond gasoline refinery and related terminals in  
24 the San Francisco Bay Area. Chevron, through its subsidiaries, also produces oil in Alaska, and  
25 upon information and belief, some of this crude oil is supplied to California. There also are  
26 numerous Chevron-branded gasoline stations in California, including in San Francisco. Chevron  
27 offers credit cards to consumers through its interactive website, to promote sales of gasoline and  
28 other products at its branded gasoline stations. Chevron promotes gasoline sales by offering

1 consumers three cents per gallon in fuel credits “every fill-up, every time at Chevron and Texaco  
2 stations.”

3 35. ConocoPhillips, through its subsidiaries, owns and/or operates port facilities in  
4 California for receipt of crude oil, and previously owned and operated a refinery based in both  
5 Rodeo and Arroyo Grande, California, from 2001 to 2012, where crude oil was refined into  
6 finished fossil fuel products including gasoline. ConocoPhillips, through its subsidiaries, also  
7 produces oil in Alaska, and transports some of this crude oil to California, including San Francisco.

8 36. Exxon, through its subsidiaries, produces oil in California, owns and/or operates  
9 port facilities in California for receipt of crude oil, and previously owned and operated a refinery in  
10 California until July 1, 2016, where crude oil was refined into finished fossil fuel products  
11 including gasoline. Exxon owned the Benicia gasoline refinery for 30 years until 2000. Exxon,  
12 through its subsidiaries, also produces oil in Alaska, and upon information and belief, Exxon,  
13 through its subsidiaries, transports some of this crude oil to California. There also are numerous  
14 Exxon-branded gasoline stations in California, including in San Francisco and the greater Bay  
15 Area. Exxon offers credit cards to consumers, through its interactive website, to promote sales of  
16 gasoline and other products at its branded gasoline stations. Exxon promotes gasolines sales by  
17 offering consumers twenty-five cents off every gallon of Synergy™ gasoline at Exxon™ or  
18 Mobil™ stations for the first two months and then six cents off every gallon of Synergy gasoline at  
19 Exxon- and Mobil-branded stations.

20 37. Shell, through its subsidiaries, owns and/or operates port facilities in California for  
21 receipt of crude oil, owns and operates a refinery in California where crude oil is refined into  
22 finished fossil fuel products including gasoline, transports crude oil through a pipeline within  
23 California, and owns and operates approximately six gasoline terminals in California. Since 1915,  
24 Shell has owned a gasoline refinery in Martinez, California, thirty miles northeast of San  
25 Francisco. There are numerous Shell-branded gasoline stations in California, including in San  
26 Francisco. Shell offers credit cards to consumers on its interactive website to promote sales of  
27 gasoline and other products at its branded gasoline stations. Shell promotes gasolines sales by  
28

1 offering consumers, through its interactive web site, twenty-five cents off every gallon of Shell  
2 Fuel for the first two months after they open an account.

3 **IV. FOSSIL FUELS ARE THE PRIMARY CAUSE OF GLOBAL WARMING.**

4 38. Production of fossil fuels for combustion causes global warming. When used as  
5 intended, fossil fuels release greenhouse gases, including carbon dioxide (CO<sub>2</sub>) and methane,  
6 which trap atmospheric heat and increase global temperatures. Carbon dioxide is by far the most  
7 important greenhouse gas because of the combustion of massive amounts of fossil fuels.

8 39. Scientists have known for many years that the use of fossil fuels emits carbon  
9 dioxide and that carbon dioxide is a greenhouse gas. In 1896, Svante Arrhenius, a Nobel-prize  
10 winning scientist, published calculations projecting temperature increases that would be caused by  
11 increased carbon dioxide concentrations in the atmosphere due to the burning of fossil fuels.<sup>14</sup>

12 40. By 1957, scientists at the Scripps Institute published a warning in the peer-reviewed  
13 literature that global warming "may become significant during future decades if industrial fuel  
14 combustion continues to rise exponentially" and that "[h]uman beings are now carrying out a large  
15 scale geophysical experiment" on the entire planet.<sup>15</sup>

16 41. In 1960, scientist Charles D. Keeling published results establishing that atmospheric  
17 carbon dioxide concentrations were in fact rising.<sup>16</sup>

18 42. By 1979, the National Academy of Sciences, which is charged with providing  
19 independent, objective scientific advice to the United States government, concluded that there was  
20 "incontrovertible evidence" that carbon dioxide levels were increasing in the atmosphere as a result  
21 of fossil fuel use, and predicted that a doubling of atmospheric carbon dioxide would cause an  
22

23 <sup>14</sup> Arrhenius, Svante (1896). "On the Influence of Carbonic Acid in the Air Upon the  
24 Temperature of the Ground." *Philosophical Magazine and Journal of Science* 41: 237-76, available  
at [http://www.rsc.org/images/Arrhenius1896\\_tcm18-173546.pdf](http://www.rsc.org/images/Arrhenius1896_tcm18-173546.pdf).

25 <sup>15</sup> Revelle, Roger, and Hans E. Suess (1957). "Carbon Dioxide Exchange between Atmosphere  
26 and Ocean and the Question of an Increase of Atmospheric CO<sub>2</sub> During the Past Decades." *Tellus*  
9: 18-27, available at <http://onlinelibrary.wiley.com/doi/10.1111/j.2153-3490.1957.tb01849.x/epdf>.

27 <sup>16</sup> Keeling, Charles D. (1960). "The Concentration and Isotopic Abundances of Carbon Dioxide  
28 in the Atmosphere." *Tellus* 12: 200-203, available at  
<http://onlinelibrary.wiley.com/doi/10.1111/j.2153-3490.1960.tb01300.x/epdf>.

1 increase in global surface temperatures of between 1.5 °C and 4.5 °C [2.7 °F and 8.1 °F], with a  
2 probable increase of 3 °C [5.4 °F].<sup>17</sup>

3 43. In 1988, NASA scientist Dr. James E. Hansen testified to the U.S. Senate's Energy  
4 and Natural Resources Committee that "[t]he greenhouse effect has been detected, and it is  
5 changing our climate now."<sup>18</sup>

6 44. More recent research has confirmed and expanded on these earlier findings. In  
7 1988, the United Nations established the Intergovernmental Panel on Climate Change ("IPCC") to  
8 assess the scientific and technical information relevant to global warming, and to provide advice to  
9 all parties to the U.N. Framework Convention on Climate Change, including the United States.  
10 The IPCC issues periodic assessment reports, which have become the standard scientific references  
11 on global warming. As Defendant Exxon has put it, the IPCC is "the leading international  
12 scientific authority on climate change."

13 45. In 1990, the IPCC issued its First Assessment Report ("FAR"). It stated that "we  
14 are certain" that "emissions resulting from human activities are substantially increasing the  
15 atmospheric concentrations of the greenhouse gases," including carbon dioxide and methane, and  
16 that "these increases will enhance the greenhouse effect, resulting on average in an additional  
17 warming of the Earth's surface."<sup>19</sup> The IPCC's FAR also predicted that a "Business-as-Usual"  
18 scenario (*i.e.*, a future in which fossil fuel production and associated emissions continue to  
19 increase) would cause global mean temperature during the next century to increase at a rate  
20 "greater than that seen over the past 10,000 years," and "will result in a likely increase in global  
21 mean temperature of about 1 °C [1.8 °F] above the present value by 2025 and 3 °C [5.4 °F] before  
22  
23  
24

25 <sup>17</sup> See Carbon Dioxide and Climate: A Scientific Assessment, Report of an Ad Hoc Study  
26 Group on Carbon Dioxide and Climate to the Climate Research Board, Assembly of Mathematical  
27 and Physical Sciences, National Research Council (1979), at vii, 16, *available at*  
28 <https://www.nap.edu/catalog/12181/carbon-dioxide-and-climate-a-scientific-assessment>.

<sup>18</sup> <https://www.scribd.com/doc/260149292/Transcript-of-pivotal-climate-change-hearing-1988>.

<sup>19</sup> [https://www.ipcc.ch/ipccreports/far/wg\\_I/ipcc\\_far\\_wg\\_I\\_spm.pdf](https://www.ipcc.ch/ipccreports/far/wg_I/ipcc_far_wg_I_spm.pdf), at Executive Summary xi.

1 the end of the next century” – higher than temperatures have been in the last 150,000 years.<sup>20</sup> The  
2 FAR also predicted that business-as-usual would result in substantial sea level rise by 2100.<sup>21</sup>

3 46. The FAR further stated “with confidence” that continued emissions of carbon  
4 dioxide “at present rates would commit us to increased concentrations for centuries ahead,” and  
5 that immediate reductions were required to stabilize carbon dioxide concentrations.

6 47. In 1995, in its Second Assessment Report (“SAR”), the IPCC concluded that the  
7 “balance of evidence suggests a discernible human influence on global climate.” This causal  
8 finding was profoundly important as confirmation that human-caused global warming had now  
9 been detected. By 2001, the IPCC strengthened its causal conclusion, stating that it was “likely”  
10 (an IPCC term of art meaning a 66% to 90% chance of being true) that temperature increases  
11 already observed were attributable to human activity.<sup>22</sup> The U.S. National Academy of Sciences  
12 reviewed this finding and concluded that it was accurate.<sup>23</sup>

13 48. The IPCC issued its most recent report, the Fifth Assessment, in 2013-14. It states  
14 that it is “extremely likely” (95 to 100 percent likely) that “human influence has been the dominant  
15 cause of the observed warming since the mid-20th century.”<sup>24</sup>

16 49. The increase in atmospheric carbon dioxide caused by the combustion of fossil fuels  
17 has been clearly documented – and measured. Carbon dioxide from fossil fuels has a chemical  
18 fingerprint and is the culprit; natural sources of carbon dioxide were in balance prior to the use of  
19 fossil fuels and are not a cause of the global warming problem. Today, due primarily to the  
20 combustion of fossil fuels produced by Defendants and others, the atmospheric level of carbon  
21 dioxide is 410 ppm, higher than at any time during human civilization and likely higher than any  
22

23 <sup>20</sup> *Id.* at Executive Summary xi and xxviii.

24 <sup>21</sup> *Id.* at Executive Summary xi.

25 <sup>22</sup> IPCC, Third Assessment Report, Working Group I, Summary for Policymakers at 10,  
26 available at [https://www.ipcc.ch/ipccreports/tar/wg1/pdf/WG1\\_TAR-FRONT.PDF](https://www.ipcc.ch/ipccreports/tar/wg1/pdf/WG1_TAR-FRONT.PDF).

27 <sup>23</sup> National Academy of Sciences, Commission on Geosciences, Environment and Resources,  
28 Climate Change Science: An Analysis of Some Key Questions, summary at 1 (2001), available at  
[https://download.nap.edu/cart/download.cgi?record\\_id=10139](https://download.nap.edu/cart/download.cgi?record_id=10139).

<sup>24</sup> IPCC, Climate Change 2013, The Physical Science Basis, Summary for Policymakers at 17,  
available at [https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5\\_SPM\\_FINAL.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf).



1 level in millions of years.<sup>25</sup> The result has been dramatic planetary warming: sixteen of earth's  
2 seventeen warmest years in the 136-year period of global temperature measurements have occurred  
3 since 2001, and 2016 was the warmest year on record.<sup>26</sup> As of July 2017, there were 391 months in  
4 a row that were warmer than the 20th century average.<sup>27</sup> The years 2014, 2015, and 2016 were the  
5 three hottest years ever recorded in California since modern temperature records were first taken in  
6 1895.<sup>28</sup> California has warmed over 2 °F since 1895.<sup>29</sup>

7 50. Scientists typically use "double CO<sub>2</sub>," or twice the pre-industrial level of  
8 atmospheric carbon dioxide concentration, as a standard reference for considering the warming  
9 impact of increased greenhouse gases. Double CO<sub>2</sub> is 550 ppm. According to the IPCC, double  
10 CO<sub>2</sub> will cause the global average surface air temperature to increase by 1.5 to 4.5 °C [2.7 to 8.1  
11 °F] over the pre-industrial level, a rate of warming that is unprecedented in the history of human  
12 civilization. By comparison, at the depths of the last ice age, 20,000 years ago, the global average  
13 temperature of the Earth was only seven to eleven degrees Fahrenheit cooler than today. Globally,  
14 approximately 1 °C [1.8 °F] of the temperature rise already has occurred, due primarily to carbon  
15 dioxide and methane emissions from the combustion and use of fossil fuels.

16 51. Ongoing and future warming caused by past and ongoing use of massive quantities  
17 of fossil fuels will cause increasingly severe harm to San Francisco through accelerating sea level  
18 rise. In 2013, the IPCC projected that between 2081 and 2100, the global average surface  
19 temperature will have increased by 4.7 °F to 8.6 °F under business-as-usual, *i.e.*, with continued  
20

21 \_\_\_\_\_  
22 <sup>25</sup> Brian Kahn, We Just Breached the 410 PPM Threshold for CO<sub>2</sub>, *Scientific American* (Apr.  
23 21, 2017), *available at* <https://www.scientificamerican.com/article/we-just-breached-the-410-ppm-threshold-for-co2/>.

24 <sup>26</sup> Rising Seas in California at 14.

25 <sup>27</sup> NOAA, Global Climate Report, July 2017, *available at* <https://www.ncdc.noaa.gov/sotc/global/201707>.

26 <sup>28</sup> NOAA, National Centers for Environmental Information, *available at*  
27 <https://www.ncdc.noaa.gov/temp-and-precip/climatological-rankings/index.php?periods%5B%5D=12&parameter=tavg&state=4&div=0&month=12&year=2016#ranks-form>.

28 <sup>29</sup> NOAA, National Climatic Data Center, *available at* <https://www.ncdc.noaa.gov/temp-and-precip/state-temps/>; *see also* <https://www.nytimes.com/2015/08/21/science/climate-change-intensifies-california-drought-scientists-say.html?mcubz=0>.

1 massive levels of fossil fuel production. Global warming causes sea level rise by melting glaciers  
2 and sea ice, and by causing seawater to expand.<sup>30</sup> This acceleration of sea level rise is  
3 unprecedented in the history of human civilization. Since 1990, the rate of sea level rise has more  
4 than doubled and it continues to accelerate. The rate of ice loss from the Greenland and Antarctic  
5 Ice Sheets is increasing, and these ice sheets soon will become the primary contributor to global  
6 sea level rise. With production of fossil fuels continuing on its business-as-usual trajectory, the  
7 resulting warming presents a risk of “rapidly accelerating and effectively irreversible ice loss.”  
8 The melting of even a portion of the West Antarctic Ice Sheet, the “most vulnerable major ice sheet  
9 in a warming global climate,” will cause especially severe impacts in California. Rapid ice sheet  
10 loss on Antarctica due to global warming risks a sea level rise in California of ten feet by 2100.<sup>31</sup>  
11 This would be catastrophic for San Francisco.

12 52. The Earth’s climate can undergo an abrupt and dramatic change when a radiative  
13 forcing agent, such as carbon dioxide, causes the climate system to reach a tipping point.  
14 Defendants’ massive production of fossil fuels increases the risk of reaching that tipping point,  
15 triggering a sudden and potentially catastrophic change in climate. The rapidity of an abrupt  
16 climate shift would magnify all the adverse effects of global warming. Crossing a tipping point  
17 threshold also could lead to rapid disintegration of ice sheets on Greenland and/or Antarctica,  
18 resulting in large and rapid increases in sea level rise.

19 **V. DEFENDANTS HAVE PRODUCED MASSIVE QUANTITIES OF FOSSIL FUELS**  
20 **AND HAVE CONTINUED TO DO SO EVEN AS GLOBAL WARMING HAS**  
21 **BECOME GRAVELY DANGEROUS.**

22 53. For many years, Defendants have produced massive quantities of fossil fuels that,  
23 when combusted, emit carbon dioxide, the most important greenhouse gas. Additionally, one of  
24 Defendants’ primary fossil fuel products, natural gas, is composed of methane, which is the second  
25 most important greenhouse gas and which, as Defendants know, routinely escapes into the  
26 atmosphere from facilities operated by Defendants’ customers and also consumers. The

27 <sup>30</sup> IPCC, Climate Change 2013, The Physical Science Basis, Summary for Policymakers at 11,  
28 available at [https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5\\_SPM\\_FINAL.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf).

<sup>31</sup> Rising Seas in California at 3-4, 13.

1 greenhouse gases from the usage of defendants' fossil fuels remain in the atmosphere for long  
2 periods of time: a substantial portion of carbon dioxide emissions remains in the atmosphere for  
3 over 1,000 years after they are emitted.<sup>32</sup> As noted above, Defendants have produced such vast  
4 quantities of fossil fuels that they are five of the ten largest producers in all of history, with most of  
5 the carbon dioxide that has built up in the atmosphere from the use of their products dating from  
6 1980 or later. The cumulative greenhouse gases in the atmosphere attributable to each Defendant  
7 has increased the global temperature and contributed to sea level rise, including in San Francisco.

8 54. Once Defendants produce fossil fuels by, for example, extracting oil from the  
9 ground, those fossil fuels are used exactly as intended and emit carbon dioxide.

10 55. Despite their internal warnings, an overwhelming scientific consensus on the  
11 unfolding imminent catastrophe, and actual gravely dangerous impacts from global warming,  
12 Defendants to this day maintain high levels of fossil fuel production. This production will intensify  
13 future warming and San Francisco's injuries from sea level rise.

14 56. Defendants' conduct will continue to cause ongoing and increasingly severe sea  
15 level rise harms to San Francisco because Defendants are committed to a business model of  
16 massive fossil fuel production that they know causes a gravely dangerous rate of global warming.  
17 The following graph from a 2015 study published in the peer-reviewed scientific literature  
18 demonstrates the grave indifference Defendants BP, Shell, and Exxon have for human safety and  
19 welfare.

20 ///

21 ///

22 ///

23 ///

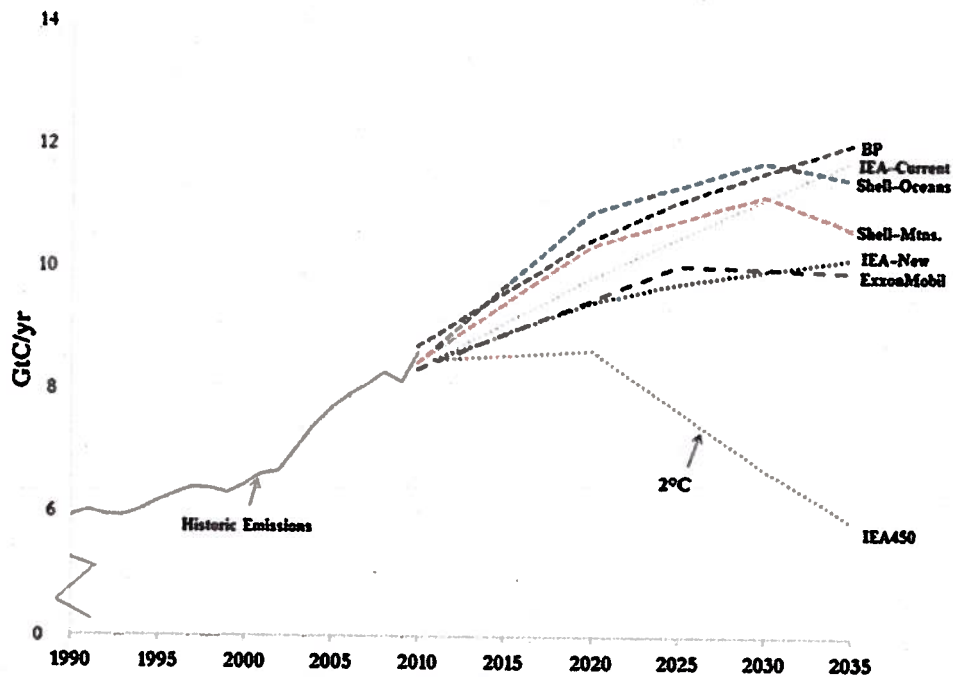
24 ///

25 ///

26

27

28 <sup>32</sup> IPCC, Climate Change 2013, The Physical Science Basis, Summary for Policymakers at 28,  
[https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5\\_SPM\\_FINAL.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf).



13 The graph compares BP, Exxon and Shell’s projections of worldwide total future emissions<sup>33</sup> –  
 14 projections upon which they make long-term business plans – to the IEA (“International Energy  
 15 Agency”) 450 emissions trajectory necessary to prevent global warming from exceeding a 2 °C  
 16 increase over the pre-industrial temperature.<sup>34</sup> The 2 °C level of global warming is widely  
 17 considered to be a red line of highly dangerous global warming. Upon information and belief, all  
 18 Defendants base their long-term business plans upon similar projections.

19 **VI. DEFENDANTS HAVE PRODUCED MASSIVE AMOUNTS OF FOSSIL FUELS**  
 20 **DESPITE HAVING FULL KNOWLEDGE FROM THEIR IN-HOUSE SCIENTIFIC**  
 21 **STAFF, OR FROM THE API, THAT FOSSIL FUELS WOULD CAUSE GLOBAL**  
 22 **WARMING.**

22 57. For decades, Defendants have known that their fossil fuel products pose risks of  
 23 “severe” and even “catastrophic” impacts on the global climate through the work and warnings of  
 24 their own scientists or through their trade association. Yet each Defendant decided to continue its  
 25 conduct and commit itself to massive fossil fuel production. This was a deliberate decision to  
 26

27 <sup>33</sup> In gigatons of carbon per year.

28 <sup>34</sup> Frumhoff, et al., The climate responsibilities of industrial carbon producers, *Climatic Change*, at 167 (2015), available at <https://link.springer.com/article/10.1007/s10584-015-1472-5>,

1 place company profits ahead of human safety and well-being and property, and to foist onto the  
2 public the costs of abating and adapting to the public nuisance of global warming.

3 58. The American Petroleum Institute (“API”) is a national trade association that  
4 represents the interests of America’s oil and natural gas industry. At all relevant times,  
5 Defendants, their corporate predecessors and/or their operating subsidiaries over which they  
6 exercise substantial control, have been members of the API. On information and belief, the API  
7 has acted as Defendants’ agent with respect to global warming, received funding from Defendants  
8 for the API’s global warming initiatives, and shared with Defendants the information on global  
9 warming described herein.

10 59. Beginning in the 1950s, the API repeatedly warned its members that fossil fuels  
11 posed a grave threat to the global climate. These warnings have included, for example, an  
12 admission in 1968 in an API report predicting that carbon dioxide emissions were “almost certain”  
13 to produce “significant” temperature increases by 2000, and that these emissions were almost  
14 certainly attributable to fossil fuels. The report warned of “major changes in the earth’s  
15 environment” and a “rise in sea levels,” and concluded: “there seems to be no doubt that the  
16 potential damage to our environment could be severe.”<sup>35</sup> Similar warnings followed in the ensuing  
17 decades, including reports commissioned by the API in the 1980s that there was “scientific  
18 consensus” that catastrophic climate change would ensue unless API members changed their  
19 business models, and predictions that sea levels would rise considerably, with grave consequences,  
20 if atmospheric concentrations of CO<sub>2</sub> continued to increase.

21 60. The API’s warnings to Defendants included:

22 a) In 1951, the API launched a project to research air pollution from petroleum  
23 products, and attributed atmospheric carbon to fossil fuel sources.<sup>36</sup> By 1968, the API’s scientific  
24

25 <sup>35</sup> E. Robinson & R.C. Robbins, Final Report, Sources, Abundance, and Fate of Gaseous  
26 Atmospheric Pollutants, SRI Project PR-6755, prepared for American Petroleum Institute, at 109-  
110, *available at* <https://www.smokeandfumes.org/#/documents/document16>.

27 <sup>36</sup> Charles A. Jones (1958) A Review of the Air Pollution Research Program of the Smoke and  
28 Fumes Committee of the American Petroleum Institute, *Journal of the Air Pollution Control*  
Association, 8:3, 268-272, DOI: 10.1080/00966665.1958.10467854, *available at*  
<https://www.smokeandfumes.org/#/documents/document9>.

1 consultant reported to the API that carbon dioxide emissions were “almost certain” to produce  
2 “significant” temperature increases by 2000, and that these emissions were almost certainly  
3 attributable to fossil fuels. The report warned of “major changes in the earth’s environment” and a  
4 “rise in sea levels,” and concluded: “there seems to be no doubt that the potential damage to our  
5 environment could be severe.”<sup>37</sup>

6           b)     In 1980, an API task force on climate change invited Dr. J.A. Laurman, a  
7 “recognized expert in the field of CO<sub>2</sub> and climate,” to make a presentation to the API CO<sub>2</sub> and  
8 Climate Task Force. Attendees to the presentation included scientists and executives from Texaco  
9 (a predecessor to Chevron), Exxon, and SOHIO (a predecessor to BP). Dr. Laurman informed the  
10 API task force that there was a “Scientific Consensus on the Potential for Large Future Climatic  
11 Response to Increased CO<sub>2</sub> Levels.” He further informed the API task force in his presentation  
12 that, though the exact temperature increases were difficult to predict, the “physical facts agree on  
13 the probability of large effects 50 years away.” His own temperature forecast was of a 2.5 °C [4.5  
14 °F] rise by 2038, which would likely have “MAJOR ECONOMIC CONSEQUENCES,” and a 5 °C  
15 [9 °F] rise by 2067, which would likely produce “GLOBALLY CATASTROPHIC EFFECTS.” He  
16 also suggested that, despite uncertainty, “THERE IS NO LEEWAY” in the time for acting. API  
17 minutes show that the task force discussed topics including “the technical implications of energy  
18 source changeover,” “ground rules for energy release of fuels and the cleanup of fuels as they relate  
19 to CO<sub>2</sub> creation,” and researching “the Market Penetration Requirements of Introducing a New  
20 Energy Source into World Wide Use.”<sup>38</sup>

21           (c)     In March 1982, an API-commissioned report showed the average increase in  
22 global temperature from a doubling of atmospheric concentrations of CO<sub>2</sub> and projected, based  
23 upon computer modeling, global warming of between 2 °C and 3.5 °C [3.6 °F to 6.3 °F]. The report  
24

25           <sup>37</sup> E. Robinson & R.C. Robbins, Final Report, Sources, Abundance, and Fate of Gaseous  
26 Atmospheric Pollutants, SRI Project PR-6755, prepared for American Petroleum Institute, at 109-  
110, available at <https://www.smokeandfumes.org/#/documents/document16>.

27           <sup>38</sup> CO<sub>2</sub> and Climate Task Force, Minutes of Meeting, at 1-2 & Attachment B, available at  
28 [http://insideclimatenews.org/sites/default/files/documents/AQ-  
9%20Task%20Force%20Meeting%20%281980%29.pdf](http://insideclimatenews.org/sites/default/files/documents/AQ-9%20Task%20Force%20Meeting%20%281980%29.pdf).

1 projected potentially “serious consequences for man’s comfort and survival,” and noted that “the  
2 height of the sea level can increase considerably.”<sup>39</sup>

3 61. In addition to the API information, some of the Defendants produced their own  
4 internal analyses of global warming. For example, newly disclosed documents demonstrate that  
5 Exxon internally acknowledged in the late 1970s and early 1980s that its products posed a  
6 “catastrophic” threat to the global climate, and that fossil fuel use would have to be strictly limited  
7 to avoid severe harm.

8 a) Exxon management was informed by its scientists in 1977 that there was an  
9 “overwhelming[]” consensus that fossil fuels were responsible for atmospheric carbon dioxide  
10 increases. The presentation summarized a warning from a recent international scientific conference  
11 that “IT IS PREMATURE TO LIMIT USE OF FOSSIL FUELS BUT THEY SHOULD NOT BE  
12 ENCOURAGED.” The scientist warned management in a summary of his talk: “Present thinking  
13 holds that man has a time window of five to ten years before the need for hard decisions regarding  
14 changes in energy strategies might become critical.”<sup>40</sup>

15 b) In a 1979 Exxon internal memo, an Exxon scientist calculated that 80% of  
16 fossil fuel reserves would need to remain in the ground and unburned to avoid greater than a  
17 doubling of atmospheric carbon dioxide.<sup>41</sup>

18 c) In a 1981 internal Exxon memo, a scientist and director at the Exxon  
19 Research and Engineering Company warned that “it is distinctly possible” that CO<sub>2</sub> emissions “will  
20 later produce effects which will indeed be catastrophic (at least for a substantial fraction of the  
21 earth’s population).”<sup>42</sup>

22  
23  
24 <sup>39</sup> <http://insideclimateneews.org/sites/default/files/documents/API%201982%20Climate%20models%20and%20CO2%20warming.pdf> at 5.

25 <sup>40</sup> [https://insideclimateneews.org/system/files\\_force/documents/James%20Black%201977%20Presentation.pdf?download=1](https://insideclimateneews.org/system/files_force/documents/James%20Black%201977%20Presentation.pdf?download=1) at 2.

26 <sup>41</sup> <http://insideclimateneews.org/sites/default/files/documents/CO2%20and%20Fuel%20Use%20Projections.pdf> at 5.

27 <sup>42</sup> <http://insideclimateneews.org/sites/default/files/documents/%2522Catastrophic%2522%20Effects%20Letter%20%281981%29.pdf>.

1           d)       A year later, the same scientist wrote another memo to Exxon headquarters,  
2 which reported on a “clear scientific consensus” that “a doubling of atmospheric CO<sub>2</sub> from its pre-  
3 industrial revolution value would result in an average global temperature rise of (3.0 ± 1.5) °C [2.7  
4 °F to 8.1 °F].”<sup>43</sup> The clear scientific consensus was based upon computer modeling, which Exxon  
5 would later attack as unreliable and uncertain in an effort to undermine public confidence in  
6 climate science.<sup>44</sup> The memo continued: “There is unanimous agreement in the scientific  
7 community that a temperature increase of this magnitude would bring about significant changes in  
8 the earth’s climate, including rainfall distribution and alterations in the biosphere.”

9           e)       In November 1982, an Exxon internal report to management warned that  
10 “substantial climatic changes” could occur if the average global temperature rose “at least 1 °C [1.8  
11 °F] above [1982] levels,” and that “[m]itigation of the ‘greenhouse effect’ would require major  
12 reductions in fossil fuel combustion.” The report then warns Exxon management that “there are  
13 some potentially catastrophic events that must be considered,” including the risk that “if the  
14 Antarctic ice sheet which is anchored on land should melt, then this could cause a rise in sea level  
15 on the order of 5 meters.” The report includes a graph demonstrating the expected future global  
16 warming from the “CO<sub>2</sub> effect” demonstrating a sharp departure from the “[r]ange of natural  
17 fluctuations.” This graph is attached hereto as Exhibit 3.<sup>45</sup>

18           f)       By 1983, Exxon had created its own climate models, which confirmed the  
19 main conclusions from the earlier memos. Starting by at least the mid-1980s, Exxon used its own  
20 climate models and governmental ones to gauge the impact that climate change would have on its  
21 own business operations and subsequently took actions to protect its own business assets based  
22 upon these modeling results.<sup>46</sup>

24           <sup>43</sup> Cohen memo to Natkin at 1 (Sept. 2, 1982), *available at* [http://insideclimatenews.org/  
25 documents/consensus-co2-impacts-1982](http://insideclimatenews.org/documents/consensus-co2-impacts-1982).

26           <sup>44</sup> *See infra* ¶ 76.

27           <sup>45</sup> M. B. Glaser, Memo to R.W. Cohen et al. on “CO<sub>2</sub> Greenhouse Effect,” Nov. 12, 1982, at 2,  
28 12-13, 28, *available at* [http://insideclimatenews.org/sites/default/files/documents/1982%20  
Exxon%20Primer%20on%20CO2%20Greenhouse%20Effect.pdf](http://insideclimatenews.org/sites/default/files/documents/1982%20Exxon%20Primer%20on%20CO2%20Greenhouse%20Effect.pdf).

<sup>46</sup> <http://graphics.latimes.com/exxon-arctic/>.



1           62. Exxon's early research and understanding of the global warming impacts of its  
2 business was not unique among Defendants. For example, at least as far back as 1970, Defendants  
3 Shell and BP began funding scientific research in England to examine the possible future climate  
4 changes from greenhouse gas emissions.<sup>47</sup> Shell produced a film on global warming in 1991, in  
5 which it admitted that there had been a "marked increase [in global temperatures] in the 1980s" and  
6 that the increase "does accord with computer models based on the known atmospheric processes  
7 and predicted buildup of greenhouse gases."<sup>48</sup> It acknowledged a "serious warning" that had been  
8 "endorsed by a uniquely broad consensus of scientists" in 1990. In the film, Shell further admits  
9 that by 2050 continued emissions of greenhouse gases at high levels would cause a global average  
10 temperature increase of 1.5 to 4 °C [2.7 to 7.2 °F]; that one meter of sea level rise was likely in the  
11 next century; that "this could be disastrous;" and that there is a "possibility of change faster than at  
12 any time since the end of the ice age, change too fast, perhaps, for life to adapt without severe  
13 dislocation."

14           **VII. DESPITE THEIR EARLY KNOWLEDGE THAT GLOBAL WARMING WAS**  
15           **REAL AND POSED GRAVE THREATS, DEFENDANTS PROMOTED FOSSIL**  
16           **FUELS FOR PERVASIVE USE WHILE DOWNPLAYING THE REALITY AND**  
17           **RISKS OF GLOBAL WARMING.**

18           63. Defendants have extensively promoted fossil fuel use in massive quantities through  
19 affirmative advertising for fossil fuels and downplaying global warming risks. First, Defendants  
20 promoted massive use of fossil fuels by misleading the public about global warming by  
21 emphasizing the uncertainties of climate science and through the use of paid denialist groups and  
22 individuals – a striking resemblance to Big Tobacco's propaganda campaign to deceive the public  
23 about the adverse health effects of smoking. Defendants' campaign inevitably encouraged fossil  
24 fuel consumption at levels that were (as Defendants knew) certain to severely harm the public.  
25 Second, Defendants' fossil fuel promotions through frequent advertising for their fossil fuel  
26 products, including promotions claiming that consumption at current and even expanded levels is

27 <sup>47</sup> Sir Solly Zuckerman, Chief Scientist, Letter to Vice Chancellor, University of Bath, 9th May  
28 1970, PRO ref CAB 163/272 #122885, "Long-term climate changes and their effects."

<sup>48</sup> <https://www.youtube.com/watch?v=0VOWi8oVXmo>.

1 “responsible” or even “respectful” of the environment, have encouraged continued fossil fuel  
2 consumption at massive levels that Defendants knew would harm the public.<sup>49</sup>

3 **A. Defendants Borrowed The Big Tobacco Playbook In Order To Promote Their**  
4 **Products.**

5 64. Notwithstanding Defendants’ early knowledge of climate change, Defendants have  
6 engaged in advertising and public relations campaigns intended to promote their fossil fuel  
7 products by downplaying the harms and risks of global warming. Initially, the campaign tried to  
8 show that global warming was not occurring. More recently, the campaign has sought to minimize  
9 the risks and harms from global warming. The campaign’s purpose and effect has been to help  
10 Defendants continue to produce fossil fuels and sell their products on a massive scale. This  
11 campaign was executed in large part by front groups funded by Defendants, either directly or  
12 through the API, and through statements made by Defendants directly.

13 65. One front group was the Global Climate Coalition (“GCC”). The GCC operated  
14 between 1989 and 2002. Its members included the API, and predecessors or subsidiaries of  
15 Defendants. William O’Keefe, former president of the GCC, was also a former executive of the  
16 API.<sup>50</sup>

17 66. The GCC spent millions of dollars on campaigns to discredit climate science,  
18 including \$13 million on one ad campaign alone. The GCC distributed a video to hundreds of  
19 journalists, which claimed that carbon dioxide emissions would increase crop production and feed  
20 the hungry people of the world.<sup>51</sup>

21 67. However, internal GCC documents admitted that their “contrarian” climate theories  
22 were unfounded. In December 1995, the GCC’s Science and Technology Advisory Committee  
23

24  
25 <sup>49</sup> ConocoPhillips, the changing energy landscape, *available at* <http://www.conocophillips.com/who-we-are/our-company/spirit-values/responsibility/Pages/the-changing-energy-landscape.aspx>;  
Chevron TV ad (2009), [https://www.youtube.com/watch?v=-KyjTGMVTkA\\_](https://www.youtube.com/watch?v=-KyjTGMVTkA_)

26 <sup>50</sup> Jeff Nesmith, *Industry Promotes Skeptical View of Global Warming*, Cox News Service, May  
27 28, 2003, *available at* <http://www.heatisonline.org/contentserver/objecthandlers/index.cfm?ID=4450&Method=Full>.

28 <sup>51</sup> [http://www.sourcewatch.org/index.php/Global\\_Climate\\_Coalition](http://www.sourcewatch.org/index.php/Global_Climate_Coalition).

1 (“GCC-STAC”), whose members included employees of Mobil Oil Corporation (an Exxon  
2 predecessor) and the API, drafted a primer on the science of global warming for GCC members.  
3 The primer concluded that the GCC’s contrarian theories “do not offer convincing arguments  
4 against the conventional model of greenhouse gas emission-induced climate change.” Due to this  
5 inconvenient conclusion, at its next meeting, in January 1996, the GCC-STAC decided simply to  
6 drop this seven-page section of the report. Nonetheless, for years afterward, the GCC and its  
7 members continued to tout their contrarian theories about global warming, even though the GCC  
8 had admitted internally these arguments were invalid.

9 68. In February 1996, an internal GCC presentation stated that a doubling of carbon  
10 dioxide levels over pre-industrial concentrations would occur by 2100 and cause “an average rate  
11 of warming [that] would probably be greater than any seen in the past 10,000 years.” The  
12 presentation noted “potentially irreversible” impacts that could include “significant loss of life.”

13 69. Certain Defendants also funded another front group in the 1990s, the Global  
14 Climate Science Communications Team (“GCSCT”). GCSCT members included Exxon, Chevron,  
15 and the API.<sup>52</sup> A 1998 GCSCT task force memo outlined an explicit strategy to invest millions of  
16 dollars to manufacture uncertainty on the issue of global warming, directly emulating a similar  
17 disinformation campaign by the tobacco industry. The memo stated: “*Victory Will Be Achieved*  
18 *When,*” among other things, “*Average citizens ‘understand’ (recognize) uncertainties in climate*  
19 *science,*” public “*recognition of uncertainty becomes part of the ‘conventional wisdom.’*” and the  
20 “*Media ‘understands’ (recognizes) uncertainties in climate science.*”<sup>53</sup> The plan stated that  
21 progress would be measured by the percentage of new articles that raise questions about climate  
22 change.

23 70. Over at least the last nineteen years, Exxon in particular has paid researchers and  
24 front groups to create uncertainties about basic climate change science and used denialist groups to  
25

26 <sup>52</sup> <https://assets.documentcloud.org/documents/784572/api-global-climate-science-communications-plan.pdf>.

27 <sup>53</sup> Global Climate Science Communications: Action Plan, Apr. 3, 1998, available at  
28 <https://assets.documentcloud.org/documents/784572/api-global-climate-science-communications-plan.pdf>.

1 attack well-respected scientists. These were calculated business decisions by Exxon to undermine  
2 climate change science and bolster production of fossil fuels.<sup>54</sup>

3 71. Between 1998 and 2014, Exxon paid millions of dollars to organizations to promote  
4 disinformation on global warming. During the early- to mid-1990s, Exxon directed some of this  
5 funding to Dr. Fred Seitz, Dr. Fred Singer, and/or Seitz and Singer's Science and Environmental  
6 Policy Project ("SEPP") in order to launch repeated attacks on mainstream climate science and  
7 IPCC conclusions, even as Exxon scientists participated in the IPCC.<sup>55</sup> Seitz, Singer, and SEPP had  
8 previously been paid by the tobacco industry to create doubt in the public mind about the hazards  
9 of smoking.<sup>56</sup> Seitz and Singer were not climate scientists.

10 72. Exxon's promotion of fossil fuels also entailed the funding of denialist groups that  
11 attacked well-respected scientists Dr. Benjamin Santer and Dr. Michael Mann, maligning their  
12 characters and seeking to discredit their scientific conclusions with media attacks and bogus studies  
13 in order to undermine the IPCC's 1995 and 2001 conclusion that human-driven global warming is  
14 now occurring.

15 73. One of Defendants' most frequently used denialists has been an aerospace engineer  
16 named Wei Hock Soon. Between 2001 and 2012, various fossil fuel interests, including Exxon and  
17 the API, paid Soon over \$1.2 million.<sup>57</sup> Soon was the lead author of a 2003 article, which argued  
18 that the climate had not changed significantly. The article was widely promoted by other denial  
19

20  
21 <sup>54</sup> [http://insideclimatenews.org/news/15092015/Exxons-own-research-confirmed-fossil-fuels-](http://insideclimatenews.org/news/15092015/Exxons-own-research-confirmed-fossil-fuels-role-in-global-warming)  
22 [role-in-global-warming](http://insideclimatenews.org/news/15092015/Exxons-own-research-confirmed-fossil-fuels-role-in-global-warming); Jeffrey Ball, Exxon Chief Makes A Cold Calculation on Global Warming,  
*The Wall Street Journal*, June 14, 2005, available at [https://www.wsj.com/articles/](https://www.wsj.com/articles/SB111870440192558569)  
[SB111870440192558569](https://www.wsj.com/articles/SB111870440192558569).

23 <sup>55</sup> Union of Concerned Scientists, *Smoke, Mirrors & Hot Air: How ExxonMobil Uses Big*  
24 *Tobacco's Tactics to Manufacture Uncertainty on Climate Science*, Jan. 2007, available at  
[http://www.ucsusa.org/assets/documents/global\\_warming/exxon\\_report.pdf](http://www.ucsusa.org/assets/documents/global_warming/exxon_report.pdf); <http://www.exxonsecrets.org/html/orgfactsheet.php?id=65>.

25 <sup>56</sup> [http://www.sourcewatch.org/index.php/S.\\_Fred\\_Singer](http://www.sourcewatch.org/index.php/S._Fred_Singer); [http://www.sourcewatch.org/](http://www.sourcewatch.org/index.php/Frederick_Seitz)  
26 [index.php/Frederick\\_Seitz](http://www.sourcewatch.org/index.php/Frederick_Seitz).

27 <sup>57</sup> Justin Gillis & John Schwartz, Deeper Ties to Corporate Cash for Doubtful Climate  
28 Researcher, *New York Times* (Feb. 21, 2015), available at  
[https://www.nytimes.com/2015/02/22/us/ties-to-corporate-cash-for-climate-change-researcher-](https://www.nytimes.com/2015/02/22/us/ties-to-corporate-cash-for-climate-change-researcher-Wei-Hock-Soon.html?mcubz=1)  
[Wei-Hock-Soon.html?mcubz=1](https://www.nytimes.com/2015/02/22/us/ties-to-corporate-cash-for-climate-change-researcher-Wei-Hock-Soon.html?mcubz=1).

1 groups funded by Exxon, including via “Tech Central Station,” a website supported by Exxon.<sup>58</sup>  
2 Soon published other bogus “research” in 2009, attributing global warming to solar activity, for  
3 which Exxon paid him \$76,106.<sup>59</sup> This 2009 grant was made several years after Exxon had  
4 publicly committed not to fund global warming deniers.<sup>60</sup>

5 74. Until recently, the API’s website referred to global warming as “possible man-made  
6 warming” and claimed that the human contribution is “uncertain.” The API removed this  
7 statement from its web site in 2016 when journalistic investigations called attention to the API’s  
8 misleading statements on global warming and its 1970s/1980s task force on global warming.

9 75. In 2000, Exxon took out an advertisement on the Op-Ed page of the *New York*  
10 *Times* entitled “Unsettled Science.” The advertisement claimed that “scientists remain unable to  
11 confirm” the proposition that “humans are causing global warming.”<sup>61</sup> This was six years after the  
12 IPCC had confirmed the causal link between planetary warming and anthropogenic greenhouse gas  
13 emissions – a historic moment in climate science – and some 18 years after Exxon itself had  
14 admitted in a 1982 internal memoranda to corporate headquarters that there was “a clear scientific  
15 consensus” that greenhouse gas emissions would cause temperatures to rise.

16 76. On May 27, 2015, at Exxon’s annual shareholder meeting, then-CEO Rex Tillerson  
17 misleadingly downplayed global warming’s risks by stating that climate models used to predict  
18 future impacts were unreliable: “What if everything we do it turns out our models were really lousy  
19 and we achieved all of our objectives and it turned out the planet behaved differently because the  
20 models just weren’t good enough to predict it?” But as noted above, in 1982 Exxon’s scientific  
21 staff stated, based upon the climate models, that there was a “clear scientific consensus” with  
22 respect to the level of projected future global warming and starting shortly thereafter Exxon relied  
23

24 <sup>58</sup> Smoke, Mirrors & Hot Air at 13-14.

25 <sup>59</sup> <https://www.documentcloud.org/documents/682765-willie-soon-foia-grants-chart-02-08-2011.html>.

26 <sup>60</sup> [http://www.socialfunds.com/shared/reports/1211896380\\_ExxonMobil\\_2007\\_Corporate\\_Citizenship\\_Report.pdf](http://www.socialfunds.com/shared/reports/1211896380_ExxonMobil_2007_Corporate_Citizenship_Report.pdf).

27 <sup>61</sup> <https://assets.documentcloud.org/documents/705605/xom-nyt-2000-3-23-unsettledscience.pdf>.

1 upon the projections of climate models, including its own climate models, in order to protect its  
2 own business assets.

3 77. Until recently, Exxon's website continued to emphasize the "uncertainty" of global  
4 warming science and impacts: "current scientific understanding provides limited guidance on the  
5 likelihood, magnitude, or time frame" of events like temperature extremes and sea level rise.<sup>62</sup>  
6 Exxon's insistence on crystal-ball certainty was clear misdirection, since Exxon knew that the  
7 fundamentals of climate science were well settled and showed global warming to present a clear  
8 and present danger.<sup>63</sup>

9 **B. Defendants' Direct Promotion Of Fossil Fuels.**

10 78. Defendants continue to promote massive fossil fuel use by the public  
11 notwithstanding that global warming is happening, that global warming is primarily caused by their  
12 fossil fuels, and that global warming is causing severe injuries. Defendants promote the massive  
13 use of fossil fuels through advertisements lauding fossil fuels as "responsible" and "respectful" to  
14 the environment, identifying fossil fuels as the only way to sustain modern standards of living, and  
15 promoting sales of their fossil fuels without qualification. Defendants and/or their U.S.  
16 subsidiaries are members of the API. The API also promotes the benefits of fossil fuel products on  
17 behalf of Defendants and its other members.<sup>64</sup> Defendants' message to consumers is that fossil  
18 fuels may continue to be burned in massive quantities without risking significant injuries.

19 79. Defendants bombard the public and consumers with the following advertisements,  
20 although these are a mere sliver of Defendants' extensive campaigns. Defendants' advertisements  
21 must be understood in their proper context – as following Defendants' substantial early knowledge  
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25 <sup>62</sup> Formerly found at <http://corporate.exxonmobil.com/en/current-issues/climate-policy/meeting-global-needs/managing-climate-change-business-risks>.

26 <sup>63</sup> See IPCC, Climate Change 2014, Impacts, Adaptation, and Vulnerability, Summary for  
27 Policymakers, available at [http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5\\_wgII\\_spm\\_en.pdf](http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgII_spm_en.pdf).

28 <sup>64</sup> API, Consumer Information, available at <http://www.api.org/oil-and-natural-gas/consumer-information>.

1 on global warming risks and impacts, and following a decades-long campaign of misleading  
2 statements on global warming that primed the pump for massive use of their fossil fuel products.

3 a) Exxon's "Lights Across America" website advertisement states that natural  
4 gas is "helping dramatically reduce America's emissions"<sup>65</sup> even though natural gas is a fossil fuel  
5 causing widespread planetary warming and harm to coastal cities like San Francisco and the use of  
6 natural gas competes with wind and solar, which have no greenhouse gas emissions.

7 b) In 2017, Shell's CEO promoted massive fossil fuel use by stating that the  
8 fossil fuel industry could play a "crucial role" in lifting people out of poverty.<sup>66</sup> A Shell website  
9 promotion states: "We are helping to meet the world's growing energy demand while limiting  
10 CO<sub>2</sub> emissions, by delivering more cleaner-burning natural gas."<sup>67</sup>

11 c) BP touts natural gas on its website as "a vital lower carbon energy source"  
12 and as playing a "crucial role" in a transition to a lower carbon future.<sup>68</sup> BP promotes continued  
13 massive fossil fuel use as enabling two billion people to be lifted out of poverty.<sup>69</sup>

14 d) Chevron's website implores the public that "we produce safe, reliable energy  
15 products for people around the world."<sup>70</sup> Chevron also promotes massive use of fossil fuels as the  
16 key to lifting people out of poverty: "Reliable and affordable energy is necessary for improving  
17 standards of living, expanding the middle class and lifting people out of poverty. Oil and natural  
18 gas will continue to fulfill a significant portion of global energy demand for decades to come –  
19

21 <sup>65</sup> [https://www.youtube.com/watch?v=tMu1CBjXfq4&list=PLlrXlIHj7zayYGaExfTp\\_](https://www.youtube.com/watch?v=tMu1CBjXfq4&list=PLlrXlIHj7zayYGaExfTp_B4t6gqTtkGf9A&index=6_(at 0:46))  
22 [B4t6gqTtkGf9A&index=6\\_\(at 0:46\)](https://www.youtube.com/watch?v=tMu1CBjXfq4&list=PLlrXlIHj7zayYGaExfTp_B4t6gqTtkGf9A&index=6_(at 0:46)).

23 <sup>66</sup> Shell CEO speech, Mar. 9, 2017, *available at* <http://www.shell.com/media/speeches-and-articles/2017/deliver-today-prepare-for-tomorrow.html>.

24 <sup>67</sup> Shell United States, Transforming Natural Gas, *available at* <http://www.shell.us/energy-and-innovation/transforming-natural-gas.html>.

25 <sup>68</sup> [https://www.bp.com/content/dam/bp/en/corporate/pdf/sustainability-report/group-reports/bp-](https://www.bp.com/content/dam/bp/en/corporate/pdf/sustainability-report/group-reports/bp-sustainability-report-2016.pdf)  
26 [sustainability-report-2016.pdf](https://www.bp.com/content/dam/bp/en/corporate/pdf/sustainability-report/group-reports/bp-sustainability-report-2016.pdf); <http://www.bp.com/energytransition/shifting-towards-gas.html>.

27 <sup>69</sup> BP energy outlook, *available at* [http://www.bp.com/en/global/corporate/energy-](http://www.bp.com/en/global/corporate/energy-economics/energy-outlook.html)  
28 [economics/energy-outlook.html](http://www.bp.com/en/global/corporate/energy-economics/energy-outlook.html).

<sup>70</sup> Chevron, Products and Services, *available at* [https://www.chevron.com/operations/products-](https://www.chevron.com/operations/products-services)  
services.

1 even in a carbon-constrained scenario.”<sup>71</sup> A prior Chevron advertisement still available on the web  
2 promotes Chevron fossil fuels on a massive scale by stating that “our lives demand oil.”<sup>72</sup>

3 e) ConocoPhillips promotes its fossil fuel products by stating that it  
4 “responsibly suppl[ies] the energy that powers modern life.”<sup>73</sup> Similarly, ConocoPhillips has the  
5 following advertising slogan on its website: “Providing energy to improve quality of life.”<sup>74</sup>

6 80. Contrary to Defendants’ claims that the use of massive amounts of fossil fuels is  
7 required to lift people out of poverty, the IPCC has concluded: “Climate change will exacerbate  
8 multidimensional poverty in most developing countries . . . . [and] will also create new poverty  
9 pockets in countries with increasing inequality, in both developed and developing countries.”<sup>75</sup>

10 81. Defendants BP and Exxon have also used long-term energy forecasts and similar  
11 reports to promote their products under the guise of expert, objective analysis. These forecasts  
12 have repeatedly sought to justify heavy reliance on fossil fuels by overstating the cost of renewable  
13 energy.

14 82. Defendants’ energy forecasts are aimed in substantial part at consumers and are  
15 promoted to the public through their respective websites and other direct media. Exxon continues  
16 to promote its annual “Outlook for Energy” reports in videos currently available on the internet.  
17 But Exxon’s energy “analyses” are self-serving means of promoting fossil fuels and undercutting  
18 non-dangerous renewable energy and clean technologies. For example, Exxon has claimed in a  
19 recent forecast that natural gas is a cheaper way to reduce carbon dioxide emissions than wind or  
20 solar power while BP has claimed that solar and wind power will be more expensive in 2050 than  
21

22  
23 <sup>71</sup> Chevron, managing climate change risks, *available at* <https://www.chevron.com/corporate-responsibility/climate-change/managing-climate-risk>.

24 <sup>72</sup> Chevron TV ad (2009), *available at* <https://www.youtube.com/watch?v=-KyjTGMVTkA>.

25 <sup>73</sup> ConocoPhillips, the changing energy landscape, *available at*  
<http://www.conocophillips.com/who-we-are/our-company/spirit-values/responsibility/Pages/the-changing-energy-landscape.aspx>.

26 <sup>74</sup> ConocoPhillips, Producing energy, *available at* <http://www.conocophillips.com/what-we-do/producing-energy/Pages/default.aspx>.

27 <sup>75</sup> IPCC, Climate Change 2014: Impacts, Adaptation, and Vulnerability, at 797, *available at*  
28 [https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap13\\_FINAL.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap13_FINAL.pdf).



1 natural gas or coal even though wind and solar are already cheaper than natural gas or coal in some  
2 circumstances.<sup>76</sup> Exxon and BP also have understated in recent “forecasts” the expected market  
3 share of electric vehicles even as electric vehicle technology has taken off, prices have dropped and  
4 GM announced (in 2015) that it was investing billions in electric cars because the “future is  
5 electric.”<sup>77</sup>

6 83. Defendants’ reports also promote their fossil fuel products by warning consumers of  
7 supposed downsides to reducing fossil fuel use and carbon dioxide emissions. For example,  
8 Exxon’s most recent report claims that the costs of carbon dioxide reductions are “ultimately borne  
9 by consumers and taxpayers.”

10 84. These reports by BP and Exxon, and a similar one by Shell, predict massive  
11 increases in fossil fuel use over roughly the next 15 years.<sup>78</sup> This is part of a larger strategy of  
12 “mak[ing] the case for the necessary role of fossil fuels,” as BP’s chief executive stated in a  
13 moment of candor in 2015.<sup>79</sup>

14 **VIII. SAN FRANCISCO WILL INCUR SERIOUS CLIMATE CHANGE INJURIES**  
15 **THAT WILL REQUIRE BILLIONS IN EXPENDITURES TO ABATE THE**  
16 **GLOBAL WARMING NUISANCE.**

17 85. According to a 2012 California governmental report, by 2050, California is  
18 projected to warm by approximately 2.7° F above the average temperature in 2000, regardless of  
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20

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21 <sup>76</sup> <http://cdn.exxonmobil.com/~media/global/files/outlook-for-energy/2017/2017-outlook-for-energy.pdf>, at 31; <http://www.bp.com/content/dam/bp/pdf/technology/bp-technology-outlook.pdf>,  
22 at 18.

23 <sup>77</sup> <http://cdn.exxonmobil.com/~media/global/files/outlook-for-energy/2017/2017-outlook-for-energy.pdf>, at 18; <https://www.bp.com/content/dam/bp/pdf/energy-economics/energy-outlook-2017/bp-energy-outlook-2017.pdf>, at 47; General Motors, Press Release, *GM Employees on Mission to Transform Transportation* (May 7, 2015), available at [http://media.gm.com/media/us/en/gm/company\\_info/facilities/assembly/orion.detail.html/content/Pages/news/us/en/2015/may/0507-sustainability-report.html](http://media.gm.com/media/us/en/gm/company_info/facilities/assembly/orion.detail.html/content/Pages/news/us/en/2015/may/0507-sustainability-report.html).

26 <sup>78</sup> [http://www.shell.com/energy-and-innovation/the-energy-future/scenarios/new-lenses-on-the-future/\\_jcr\\_content/par/relatedtopics.stream/1448477051486/08032d761ef7d81a4d3b1b6df8620c1e9a64e564a9548e1f2db02e575b00b765/scenarios-newdoc-english.pdf](http://www.shell.com/energy-and-innovation/the-energy-future/scenarios/new-lenses-on-the-future/_jcr_content/par/relatedtopics.stream/1448477051486/08032d761ef7d81a4d3b1b6df8620c1e9a64e564a9548e1f2db02e575b00b765/scenarios-newdoc-english.pdf).

28 <sup>79</sup> <http://www.bp.com/en/global/corporate/media/speeches/2015-annual-general-meeting-group-chief-executive.html>.

1 the level of future emissions, a rate of warming three times greater than over the last century.<sup>80</sup> By  
2 2100, California's average temperatures could increase by 8.6 °F, if not more.<sup>81</sup> San Francisco's  
3 average annual temperatures are currently projected to increase by up to 5.5 °F by 2100.<sup>82</sup> San  
4 Francisco's average summertime high temperature (based upon 1986-2005 data) is projected to  
5 increase from 68.61 °F to 76.17 °F by 2100, making San Francisco's summers similar to those now  
6 experienced in Rancho Palos Verdes, California, approximately 400 miles south of San  
7 Francisco.<sup>83</sup> Continued production of massive amounts of fossil fuels will exacerbate global  
8 warming, increase sea level rise and result in grave harm to San Francisco.

9       86. Global warming has caused and continues to cause accelerated sea level rise in San  
10 Francisco Bay and the adjacent ocean with severe, and potentially catastrophic, consequences for  
11 San Francisco. Scientists recently concluded that coastal California is already experiencing  
12 impacts from accelerated sea level rise, including "more extensive coastal flooding during storms,  
13 periodic tidal flooding, and increased coastal erosion."<sup>84</sup> In the last 100 years, the California coast  
14 has experienced sea level rise of 6.7 to 7.9 inches.<sup>85</sup>

15       87. Storms with their attendant surges and flooding occur on top of and superimposed  
16 on sea level rise, causing storm surges to be greater, extend farther inland, and cause more  
17 extensive damage – including greater inundation and flooding of public and private property in San  
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21 <sup>80</sup> Our Changing Climate 2012, Vulnerability & Adaptation to the Increasing Risks from  
22 Climate Change in California, at 2, available at <http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>.

23 <sup>81</sup> *Id.*

24 <sup>82</sup> S.F. Dept. of Public Health, San Francisco's Climate and Health Adaptation Framework at 8  
(2017), available at [https://extxfer.sfdph.org/gis/ClimateHealth/Reports%20and%20Research/SFDPH\\_ClimateHealthAdaptFramework2017a.pdf](https://extxfer.sfdph.org/gis/ClimateHealth/Reports%20and%20Research/SFDPH_ClimateHealthAdaptFramework2017a.pdf).

25 <sup>83</sup> Climate Central, available at <http://www.climatecentral.org/news/summer-temperatures-co2-emissions-1001-cities-16583> (Aug. 1, 2014).

26 <sup>84</sup> Rising Seas in California at 3.

27 <sup>85</sup> Climate Change Impacts in the United States: The Third National Climate Assessment,  
28 southwest chapter at 469 (2014), available at [http://nca2014.globalchange.gov/system/files\\_force/downloads/low/NCA3\\_Full\\_Report\\_20\\_Southwest\\_LowRes.pdf?download=1](http://nca2014.globalchange.gov/system/files_force/downloads/low/NCA3_Full_Report_20_Southwest_LowRes.pdf?download=1).

1 Francisco.<sup>86</sup> By 2050, for example, a “100-year flood” in San Francisco is expected to occur on  
2 average once every year and by 2100 to occur 92 times per year – or almost twice per *week*.<sup>87</sup> A  
3 100-year flood event normally – that is, without global warming – has a 1% chance of happening  
4 every year. Under this same scenario, the 500-year storm surge flood would occur, by 2050, once  
5 every four years and, by 2100, 42 times per year – or almost once per week.<sup>88</sup> Even with lower  
6 levels of future fossil fuel production, there will be substantial increases in flood frequencies in San  
7 Francisco due to past and ongoing fossil fuel combustion.<sup>89</sup>

8 88. Accelerated sea level rise in California is causing and will continue to cause  
9 inundation of both public and private property located within San Francisco. San Francisco is  
10 extremely vulnerable to accelerated sea level rise, storm surges, and inundation because it is  
11 surrounded by water on three sides – the Pacific Ocean to the west and San Francisco Bay to the  
12 north and east.<sup>90</sup> Rising bay and coastal water levels are already affecting San Francisco through  
13 coastal flooding of low-lying shorelines, increased shoreline erosion, and salt water impacts on its  
14 wastewater treatment systems.<sup>91</sup> Sea levels in and around San Francisco rose approximately eight  
15 inches during the past century and accelerated due to global warming.<sup>92</sup> But with accelerated sea  
16 level rise, they are currently projected to increase by up to 24 inches by 2050 and 66 inches by  
17 2100, if not higher.<sup>93</sup> Storm surge added on top of these greatly elevated sea levels could produce a  
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19 <sup>86</sup> San Francisco Sea Level Rise Action Plan, Executive Summary at 4 (2016) (“SLR Plan  
20 Executive Summary”), *available at* [http://default.sfplanning.org/plans-and-programs/planning-for-the-city/sea-level-rise/160309\\_SLRAP\\_Executive\\_Summary\\_EDreduced.pdf](http://default.sfplanning.org/plans-and-programs/planning-for-the-city/sea-level-rise/160309_SLRAP_Executive_Summary_EDreduced.pdf).

21 <sup>87</sup> Buchanan, et al., Amplification of flood frequencies with local sea level rise and emerging  
22 flood regimes, *Environmental Research Letters* (2017), supplementary material table 6.

23 <sup>88</sup> *Id.*

24 <sup>89</sup> *Id.* at supplementary material table 5.

25 <sup>90</sup> See S.F. Dept. of Public Health, San Francisco’s Climate and Health Adaptation Framework  
26 at 8 (2017), *available at* [https://extxfer.sfdph.org/gis/ClimateHealth/Reports%20and%20Research/SFDPH\\_ClimateHealthAdaptFramework2017a.pdf](https://extxfer.sfdph.org/gis/ClimateHealth/Reports%20and%20Research/SFDPH_ClimateHealthAdaptFramework2017a.pdf).

27 <sup>91</sup> SLR Plan Executive Summary at 9.

28 <sup>92</sup> S.F. Dept. of Public Health, San Francisco’s Climate and Health Adaptation Framework at 8  
(2017), *available at* [https://extxfer.sfdph.org/gis/ClimateHealth/Reports%20and%20Research/SFDPH\\_ClimateHealthAdaptFramework2017a.pdf](https://extxfer.sfdph.org/gis/ClimateHealth/Reports%20and%20Research/SFDPH_ClimateHealthAdaptFramework2017a.pdf).

<sup>93</sup> *Id.* at 9.

1 combined rise of up to 66 inches by 2050 and 108 inches by 2100.<sup>94</sup> As sea level rises, average  
2 daily high tides will extend further inland and cause more extensive flooding.<sup>95</sup> Without adaptation  
3 measures, daily tides could permanently inundate six percent of San Francisco's land by 2100.<sup>96</sup>  
4 And all of these projections are an understatement in light of a new, 2017 report that sea level is  
5 likely to rise faster than projected and could reach as much as a catastrophic ten feet by the end of  
6 the century.<sup>97</sup>

7 89. San Francisco must adapt now to ongoing sea level rise to abate ongoing damage to  
8 property, facilities, and equipment, with risks of increasingly severe damage in the future. In  
9 particular, San Francisco must improve, protect, move, and build infrastructure to adapt now to  
10 past and ongoing sea level rise. For example:

11 a) San Francisco is planning to fortify its Seawall to protect itself from sea  
12 level rise. The Seawall is the foundation of over three miles of San Francisco waterfront stretching  
13 from Fisherman's Wharf to Mission Creek. In 2016, San Francisco Mayor Edwin M. Lee  
14 announced an initial investment of \$8 million over the next two years to initiate City efforts to  
15 fortify the Seawall.<sup>98</sup> Short-term seawall upgrades are expected to cost more than \$500 million.  
16 Long-term upgrades to the seawall are projected to cost \$5 billion.<sup>99</sup>

17 b) A significant portion of the combined sewer and storm water infrastructure  
18 on the west side of San Francisco is at severe risk of shoreline erosion caused by sea level rise.  
19 This infrastructure, including the Westside Transport Box, Westside Pump Station, Lake Merced  
20 Tunnel, and the Oceanside Water Pollution Control Plant, is located along Ocean Beach on San  
21 Francisco's western shore. Most of this infrastructure, including much of the Oceanside plant, is

22 \_\_\_\_\_  
23 <sup>94</sup> *Id.*

24 <sup>95</sup> San Francisco Sea Level Rise Action Plan, at 2-3 (2016), [http://default.sfplanning.org/plans-and-programs/planning-for-the-city/sea-level-rise/160309\\_SLRAP\\_Final\\_ED.pdf](http://default.sfplanning.org/plans-and-programs/planning-for-the-city/sea-level-rise/160309_SLRAP_Final_ED.pdf).

25 <sup>96</sup> *Id.*

26 <sup>97</sup> Rising Seas in California.

27 <sup>98</sup> <http://sfmayor.org/article/mayor-lee-invests-seawall-protect-city>.

28 <sup>99</sup> <https://sfseawall.files.wordpress.com/2017/01/seawall-fact-sheet.pdf>;  
<http://onesanfrancisco.org/sites/default/files/2017-06/Agenda%20Item%206%20-%20Seawall%20Presentation.pdf>.

1 located underground. Because San Francisco has a city-wide combined sewer system – designed  
2 to handle both storm water and sewer water – this infrastructure is large in size and scale. Sea level  
3 rise and corresponding shoreline erosion threatens to damage this infrastructure. As a result, San  
4 Francisco has helped to develop plans to protect this infrastructure at an estimated cost of  
5 approximately \$350 million.<sup>100</sup> The costs and logistics of relocating this infrastructure would be  
6 far greater.

7 c) Shoreline erosion along Ocean Beach also threatens roads, pathways, private  
8 properties, and buildings along the shore – all of which San Francisco’s citizens have long used  
9 and enjoyed. Protecting these properties through construction of a seawall and/or other shoreline  
10 armoring infrastructure will be extremely expensive. San Francisco’s plan for protecting its  
11 combined sewer infrastructure along Ocean Beach calls for closing a portion of the Great Highway  
12 south of Sloat Boulevard.<sup>101</sup>

13 d) Sea level rise also interferes with San Francisco’s stormwater infrastructure  
14 through inundation of the City’s stormwater outfalls along the ocean and San Francisco Bay.<sup>102</sup> As  
15 a result of sea level rise, 27 of San Francisco’s 29 stormwater discharge locations between the  
16 Golden Gate Bridge and the City’s southern border on San Francisco Bay will be underwater daily  
17 by 2050 or before.<sup>103</sup> As those outfalls are more frequently submerged by sea water, they cannot  
18 be used to discharge stormwater as intended, causing backups in the system and flooding elsewhere  
19 in San Francisco. Saltwater intrusion into San Francisco’s water treatment facilities also interferes  
20 with effective treatment function at those facilities, reducing their capacity and causing further  
21 backups. Stormwater system outfalls cannot simply be elevated because that would interfere with  
22 the hydraulic gradient of the entire system. As a result, San Francisco is developing costly plans to  
23 protect its stormwater outfalls and water treatment facilities with backflow preventers and pumping  
24

25 <sup>100</sup> Office of the Mayor (2012), Mayor Lee Celebrates SPUR Ocean Beach Master Plan,  
26 *available at* <http://sfmayor.org/article/mayor-lee-celebrates-spur-ocean-beach-master-plan>.

27 <sup>101</sup> See Ocean Beach Master Plan, at III-19 and executive summary at 6.

28 <sup>102</sup> SLR Plan at 2-5.

<sup>103</sup> CSD Backflow Prevention and Monitoring, 263.

1 equipment. To address current and short-term impacts of sea level rise on its Bayside stormwater  
2 system outfalls, for example, San Francisco has developed an interim backflow prevention plan  
3 projected to cost a minimum of \$10 million. Long-term backflow prevention at these outfalls, and  
4 at others, will cost more.

5 90. San Francisco faces other ongoing and likely injuries as a result of sea level rise,  
6 including threats to Port infrastructure and operations, a risk of saltwater intrusion into the City's  
7 groundwater wells used for drinking water, and both direct and indirect impacts to public health,  
8 housing and city services.<sup>104</sup> Sea level rise, storm surges, and flood inundation induced by global  
9 warming will disproportionately impact some of San Francisco's most vulnerable residents,  
10 including those in the Bayview/Hunters Point neighborhood.<sup>105</sup> The same sea level rise also  
11 threatens some of San Francisco's most iconic and valuable buildings. For example, the Ferry  
12 Building would be temporarily flooded during a 100-year extreme tide today, but could be flooded  
13 every day after 36 inches of sea level rise.<sup>106</sup> Each of these ongoing and likely injuries, and others,  
14 requires San Francisco to plan for and implement costly protections.

15 91. San Francisco is already experiencing, and working to abate, current harms caused  
16 by sea level rise. But while harms to San Francisco and its residents have commenced, additional  
17 far more severe injuries will occur in the future if prompt action is not taken to protect San  
18 Francisco and its residents from rising sea levels. Indeed, the sea level rise harms inflicted on San  
19 Francisco by global warming are insidious partly because they are projected to continue, and to  
20 worsen, far into the future. Pervasive fossil fuel combustion and greenhouse gas emissions to date  
21 will cause ongoing and future harms regardless of future fossil fuel combustion or future  
22 greenhouse gas emissions. Future production and use of fossil fuels will exacerbate sea level rise  
23 and require even greater expenditures to abate the injuries. San Francisco must plan for and adapt  
24

25 \_\_\_\_\_  
26 <sup>104</sup> S.F. Dept. of Public Health, San Francisco's Climate and Health Adaptation Framework at  
27 12 (2017), available at [https://extxfer.sfdph.org/gis/ClimateHealth/Reports%20and%20Research/  
28 SFDPH\\_ClimateHealthAdaptFramework2017a.pdf](https://extxfer.sfdph.org/gis/ClimateHealth/Reports%20and%20Research/SFDPH_ClimateHealthAdaptFramework2017a.pdf).

<sup>105</sup> *Id.* at 14.

<sup>106</sup> SLR Plan Executive Summary at 2-5.

1 to sea level rise future harms now to ensure that abatement of ongoing and future sea level rise  
2 harms is done most efficiently and effectively and in order to protect human well-being and public  
3 and private property before it is too late. Additionally, the significant infrastructure needed to  
4 abate global warming requires long lead times for planning, financing, and implementation.  
5 Planning to abate the known and projected adverse effects of global warming on San Francisco and  
6 its citizens remains underway, and will continue. Sea level rise impacts in the future are imminent  
7 in the context of planning for and carrying out large-scale, complex infrastructure projects to  
8 protect San Francisco from sea level rise.

9 92. Sea level rise, storm surges, and flooding caused by global warming threaten not  
10 only the physical infrastructure and property of San Francisco and its citizens, but also the safety,  
11 lives, daily way of life, sense of community, and security of San Francisco residents.<sup>107</sup> A severe  
12 storm surge coupled with higher sea levels caused by global warming could occur at any time,  
13 potentially resulting in the loss of life and extensive damage to public and private property. The  
14 risk of catastrophic sea level rise harm to San Francisco and its citizens will increase, just as rising  
15 sea levels will continue to cause regular damage, the longer concrete action is not taken to abate the  
16 harms and effects of sea level rise.

17 93. Building infrastructure to protect San Francisco and its residents, will, upon  
18 information and belief, cost billions of dollars.

19 **IX. CAUSE OF ACTION: PUBLIC NUISANCE ON BEHALF OF THE PEOPLE**

20 94. The People incorporate by reference the preceding paragraphs.

21 95. The People of the State of California, acting by and through the San Francisco City  
22 Attorney, bring this claim seeking abatement pursuant to California public nuisance law, including  
23 section 731 of the Code of Civil Procedure, and sections 3479, 3480, 3491, and 3494 of the Civil  
24 Code.

25 96. Defendants' production and promotion of massive quantities of fossil fuels, and  
26 their promotion of those fossil fuels' pervasive use, has caused, created, assisted in the creation of,  
27

28 <sup>107</sup> Rising Seas in California at 6.

1 contributed to, and/or maintained and continues to cause, create, assist in the creation of, contribute  
2 and/or maintain to global warming-induced sea level rise, a public nuisance in San Francisco.  
3 Defendants, both individually and collectively, are substantial contributors to the global warming-  
4 induced sea level rise and the People's attendant injuries and threatened injuries. The People's  
5 injuries and threatened injuries from each Defendant's contributions to global warming are  
6 indivisible injuries. Each Defendant's past and ongoing conduct is a direct and proximate cause of  
7 the People's injuries and threatened injuries. Defendants each should have known that this  
8 dangerous global warming with its attendant harms on coastal cities like San Francisco would  
9 occur before it even did occur, and each Defendant in fact did have such knowledge. Each  
10 Defendant has at all relevant times been aware, and continues to be aware, that the inevitable  
11 emissions of greenhouse gases from the fossil fuels it produces combines with the greenhouse gas  
12 emissions from fossil fuels produced by the other Defendants, among others, to result in dangerous  
13 levels of global warming with grave harms for coastal cities like San Francisco. Defendants were  
14 aware of this dangerous global warming, and of its attendant harms on coastal cities like San  
15 Francisco, even before those harms began to occur. Defendants' conduct constitutes a substantial  
16 and unreasonable interference with and obstruction of public rights and property, including, *inter*  
17 *alia*, the public rights to health, safety and welfare of San Francisco residents and other citizens  
18 whose safety and lives are at risk from increased storm surge flooding and whose public and  
19 private property, is threatened with widespread damage from global warming-induced sea level  
20 rise, greater storm surges, and flooding.

21 97. Defendants, individually and collectively, are substantial contributors to global  
22 warming and to the injuries and threatened injuries suffered by the People. Defendants have  
23 caused or contributed to accelerated sea level rise from global warming, which has and will  
24 continue to injure public property and land located in the City of San Francisco, through increased  
25 inundation, storm surges, and flooding, and which threatens the safety and lives of San Francisco  
26 residents. Defendants have inflicted and continue to inflict injuries upon the People that require the  
27 People to incur extensive costs to protect public and private property, against increased sea level  
28 rise, inundation, storm surges, and flooding.

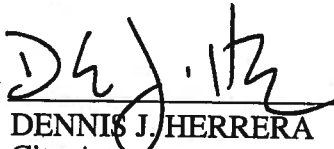




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**Exhibit 1: Map showing San Francisco sea level rise vulnerability zone**

**Source: San Francisco Sea Level Rise Action Plan, p. 2-7 (March 2016)**



**Legend**

— Sea Level Rise Vulnerability Zone



*NOTE: Zone represents upper range (unlikely, but possible), end-of-century projections for permanent SLR inundation (up to 66 inches) plus temporary flooding due to a 100-year extreme storm (up to 42 inches) for a total of 108 inches above today's average high tide.*

**Map Disclaimer:** The inundation maps and the associated analyses are intended as planning level tools to illustrate the potential for inundation and coastal flooding under a variety of future sea level rise and storm surge scenarios. The maps depict possible future inundation that could occur if nothing is done to adapt or prepare for sea level rise over the next century. The maps do not represent the exact location of flooding. The maps relied on a 1-m digital elevation model created from LiDAR data collected in 2010 and 2011. Although care was taken to capture all relevant topographic features and coastal structures that may impact coastal inundation, it is possible that structures narrower than the 1-m horizontal map scale may not be fully represented. The maps are based on model outputs and do not account for all of the complex and dynamic San Francisco Bay processes or future conditions such as erosion, subsidence, future construction or shoreline protection upgrades, or other changes to San Francisco Bay or Open Coast. For more context about the maps and analyses, including a description of the data and methods used, please see the Climate Stressors and Impacts Report: Bayside Sea Level Rise Inundation Mapping Technical Memorandum, March 2014 and FEMA Open California Coast Sea Level Rise Pilot Study, San Francisco County, 2015.

**Exhibit 2: Map showing sea level rise vulnerability zone  
– Downtown to Central Bayshore detail**

**Source: San Francisco Sea Level Rise Action Plan, p. 2-7 (March 2016)**

**SLR VULNERABILITY ZONE—DOWNTOWN TO CENTRAL BAYSHORE DETAIL THROUGH END-OF-CENTURY WITHOUT ANY ADAPTATION MEASURES OR ACTIONS**



Data Source: Bayside—SFPUC SSIP Inundation Mapping, 2015. Westside—FEMA Sea Level Rise Pilot Study, 2015.

**NOTE:** Zone represents upper range (unlikely, but possible), end-of-century projections for permanent SLR inundation (up to 66 inches) plus temporary flooding due to a 100-year extreme storm (up to 42 inches) for a total of 108 inches above today's MHHW. See Appendix for complete set of San Francisco SLR Vulnerability Zone maps and public land ownership information.

**Exhibit 3: "Range of Global Mean Temperature From 1850 to the Present with the Projected Instantaneous Climatic Response to Increasing CO2 Concentrations"**

**Source: M.B. Glaser, Memo for Exxon management (Nov. 12, 1982), pp. 1, 28**



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Cable: ENGREXXON, N.Y.

November 12, 1982

CO<sub>2</sub> "Greenhouse" Effect

82EAP 266

TO: See Distribution List Attached

Attached for your information and guidance is briefing material on the CO<sub>2</sub> "Greenhouse" Effect which is receiving increased attention in both the scientific and popular press as an emerging environmental issue. A brief summary is provided along with a more detailed technical review prepared by CPPD.

The material has been given wide circulation to Exxon management and is intended to familiarize Exxon personnel with the subject. It may be used as a basis for discussing the issue with outsiders as may be appropriate. However, it should be restricted to Exxon personnel and not distributed externally.

Very truly yours,



M. B. GLASER

MBG:rva

Attachments

H. N. WEINBERG

NOV 15 1982

Figure 9

Range of Global Mean Temperature From 1850 to the Present  
with the Projected Instantaneous Climatic Response to  
Increasing CO<sub>2</sub> Concentrations.

