Barbara J. Parker (SBN 69722)
City Attorney
Otis McGee, Jr. (SBN 71885)
Chief Assistant City Attorney
Colin Troy Bowen (SBN 152489)
Supervising Deputy City Attorney
OAKLAND CITY ATTORNEY
One Frank Ogawa Plaza, 6th Floor
Oakland, CA 94612
Tel: 510.238.3601 Fax: 510.238.6500

Kevin D. Siegel (SBN 194787)
E-mail: ksiegel@bwslaw.com
Gregory R. Aker (SBN 104171)
E-mail: gaker@bwslaw.com
Timothy A. Colvig (SBN 114723)
E-mail: tcolvig@bwslaw.com
Christopher M. Long (SBN 305674)
E-mail: clong@bwslaw.com
BURKE, WILLIAMS & SORENSEN, LLP
1901 Harrison Street, Suite 900
Oakland, CA 94612-3501
Tel: 510.273.8780 Fax: 510.839.9104

Attorneys for Defendant
CITY OF OAKLAND
(Defendant-Intervenors' Counsel listed on next page)

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

OAKLAND BULK & OVERSIZED TERMINAL, LLC,

Plaintiff,

v.

CITY OF OAKLAND,

Defendant.

SIERRA CLUB and SAN FRANCISCO BAYKEEPER,

Defendant-Intervenors.

Case No. 3:16-cv-07014-VC

DEFENDANT CITY OF OAKLAND AND DEFENDANT-INTERVENORS' PROPOSED FINDINGS OF FACT

Bench Trial
Date: January 16, 2018
Ctrm.: No. 2, 17th Floor
Judge: Honorable Vince Chhabria

Colin O'Brien, (SBN 309413)
E-mail: cobrien@earthjustice.org
Adrienne Bloch (SBN 215471)
E-Mail: abloch@earthjustice.org
Heather M. Lewis (SBN 291933)
E-mail: hlewis@earthjustice.org
Marie E. Logan (SBN 308228)
E-mail: mlogan@earthjustice.org
EARTHJUSTICE
50 California Street, Suite 500
San Francisco, CA 94111
Tel: 415.217.2000 Fax: 415.217.2040

Attorneys for Defendant-Intervenors
SIERRA CLUB AND SAN FRANCISCO BAYKEEPER

Jessica Yarnall Loarie (SBN252282)
E-mail: jessica.yarnall@sierraclub.org
Joanne Spalding (SBN169560)
E-mail: joanne.spalding@sierraclub.org
SIERRA CLUB
2101 Webster Street, Suite 1300
Oakland, CA 94612
Tel: 415.977.5636 Fax: 510.208.3140

Daniel P. Selmi (SBN 67481)
E-mail: dselmi@aol.com
919 Albany Street
Los Angeles, CA 92662
Tel. (213) 736-1098 Fax. (949) 675-9871

James M. Finberg (SBN 114850)
E-mail: jfinberg@altshulerberzon.com
Stacey M. Leyton (SBN 203827)
E-mail: sleyton@altshulerberzon.com
Andrew E. Kushner (SBN 316035)
E-mail: akushner@altshulerberzon.com
ALTSHULER BERZON LLP
177 Post Street, Suite 300
San Francisco, CA 94108
Tel. (415) 421-7151 Fax. (415) 362-8064

Attorneys for Defendant-Intervenor
SIERRA CLUB

TO THE HONORABLE COURT AND TO ALL PARTIES AND THEIR ATTORNEYS OF RECORD:

Defendant City of Oakland and Defendant-Intervenors Sierra Club and San Francisco Baykeeper submit the following proposed Findings of Fact.

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I. PREFATORY STATEMENT

The Court has reviewed the records before the City for substantial evidence and considered only such extra-record evidence as the parties offered to provide background and to assist the Court in understanding the record evidence (and not considered evidence offered as a substitute for record evidence).

The findings of fact set forth below affirm that substantial evidence supports the City Council's finding that the storage and handling of coal and coke (*e.g.,* petroleum coke) at Plaintiff Oakland Bulk & Oversized Terminal, LLC's ("OBOT") proposed bulk material facility would place existing or future occupants or users of the project, adjacent neighbors, or any portion thereof, or all of them, in a condition substantially dangerous to their health or safety.

II. INTRODUCTION

1. OBOT is a California limited liability company wholly owned by its sole member, California Capital and Investment Group, Inc. ("CCIG"). *See* Dkt. 199 [Joint Pretrial Conference Statement] at 3; 1/16/18 Tr. [Tagami] at 57:4–6.

2. Phil Tagami and Mark McClure manage and control CCIG and OBOT. *See* 1/16/18 Tr. [Tagami] at 57:1-6; 1/17/18 Tr. [McClure] at 274:14-15.

3. Defendant City of Oakland (the "City") is a California charter city. *See* https://library.municode.com/ca/oakland/codes/code_of_ordinances?nodeId=THCHOA (Oakland City Charter, last visited Feb. 4, 2018); *see also* Trial Ex. 4 [Ordinance] at 0013 [AR0001].

4. Defendant-Intervenors Sierra Club and San Francisco Baykeeper intervened as defendants to participate in the defense against OBOT's claims for relief. *See* Dkt. 28 [Intervention Motion]. Defendant-Intervenors are nonprofit environmental organizations headquartered in California. *Id*. at 1-2.

5. On July 16, 2013, the City and a third party, Prologis CCIG Oakland Global, LLC, ("Prologis CCIG"), entered into a Development Agreement Regarding the Property and Project Known as "Gateway Development/Oakland Global" ("DA"). Trial Ex. 584 [DA] at 0006

[AR0220 at OAK 36891];[1] *see also* Dkt. 199 [Joint Pretrial Conference Statement] at 3.

6. OBOT is successor-in-interest to the DA. Dkt. 199 [Joint Pretrial Conference Statement] at 3.

7. The language of the DA gave OBOT the right to pursue development of the private improvements described in the DA (defined in the DA as the "Project") pursuant to City regulations and approvals in effect as of the date of approval of the DA, July 16, 2013. However, section 3.4.2 of the DA provides an "exception to Developer's vested rights under this Agreement" that authorizes the City "to apply City Regulations adopted" after approval of the DA if the "City determines based on substantial evidence and after a public hearing that a failure to do so would place existing or future occupants or users of the Project, adjacent neighbors, or any portion thereof, or all of them, in a condition substantially dangerous to their health or safety." Trial Ex. 584 [DA] at 0023 [AR0220 at OAK 36908].

8. Pursuant to its third claim for relief, OBOT contends that the City breached the DA by applying an ordinance, adopted after approval of the Development Agreement, to prohibit the storage and handling of certain fossil fuels at a facility (the "Terminal") that OBOT seeks to develop at the former Oakland Army Base for the export of non-containerized bulk goods and import of oversized or overweight cargo. Dkt. 74 [First Amended Complaint] at 39–40; *see* Dkt. 199 [Joint Pretrial Conference Statement] at 2.

9. The ordinance at issue is City Council Ordinance No. 13385 C.M.S., entitled "AN ORDINANCE (1) AMENDING THE OAKLAND MUNICIPAL CODE TO PROHIBIT THE STORAGE AND HANDLING OF COAL AND COKE AT BULK MATERIAL FACILITIES

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[1] These proposed Findings of Fact refer to documents from the City proceedings at issue (*e.g.*, the Ordinance, Resolution, Development Agreement, City-commissioned health and safety reports, third party health and safety reports, public comments, etc.) by Trial Exhibit number if the document was introduced at trial through a witness.
In addition, the proposed Findings of Fact refer to "AR" documents, which are included in the Administrative/Legislative Record ("AR") submitted on a USB-drive as Trial Exhibit 640, and for which an Index is at Trial Exhibit 639. Declarations provided by City witnesses and the parties' stipulation establish the AR documents cited herein below were part of the City's proceedings that resulted in the adoption of City Council Ordinance No13385 and Resolution No. 86234 (*e.g.*, agenda reports, public comments) or are reflective thereof (*e.g.*, certified transcripts of public hearings). *See* Dkt. 222 [Stipulation and Exs. A–F].

OR TERMINALS THROUGHOUT THE CITY OF OAKLAND AND (2) ADOPTING CALIFORNIA ENVIRONMENTAL QUALITY ACT EXEMPTION FINDINGS" (the "Ordinance"). *See* Dkt. 199 [Joint Pretrial Conference Statement] at 4; *see also* Trial Ex. 4 [Ordinance] [AR0001].

10. The City Council determined that the Ordinance applied to OBOT pursuant to Resolution No. 86234 C.M.S., entitled "A RESOLUTION (A) APPLYING [THE ORDINANCE] TO THE PROPOSED OAKLAND BULK AND OVERSIZED TERMINAL LOCATED IN THE WEST GATEWAY DEVELOPMENT AREA OF THE FORMER OAKLAND ARMY BASE; AND (B) ADOPTING CEQA EXEMPTION FINDINGS AND RELYING ON THE PREVIOUSLY CERTIFIED 2002 ARMY BASE REDEVELOPMENT PLAN EIR AND 2012 ADDENDUM" (the "Resolution"). Trial Ex. 598 [Resolution] [AR0002].

11. The City Council adopted the Resolution based on two separate and independent grounds: (1) the Ordinance applied to OBOT, and the City did not need to apply DA section 3.4.2, because OBOT did not have a right under the DA or existing legislation to store or handle coal or coke, and (2) pursuant to section 3.4.2 of the DA based on its determination, after public hearings, that substantial evidence showed that the failure to do so would place existing or future occupants or users of the Terminal, adjacent neighbors, or any portion thereof, or all of them, in a condition substantially dangerous to their health or safety. Trial Ex. 598 [Resolution] at 0002-04 [AR0002 at OAK 39560-62].

III. BACKGROUND REGARDING REDEVELOPMENT OF THE FORMER ARMY BASE, THE LDDA, AND THE DA

12. The City has engaged in a decades-long, intensive planning process to redevelop the former Oakland Army Base, for productive, beneficial, and environmentally sound use on behalf of the City and its residents, businesses, and workers. *See, e.g.*, Trial Ex. 814 [5/30/12 Agenda Report] at 0004-006; Trial Ex. 128 [6/24/2013 Agenda Report] at 0002; Trial Ex. 630 [11/19/2014 Agenda Report] at 0001-0011; and Trial Ex. 65 [LDDA] at 0006-0010.

13. As part of the redevelopment process, in 2008, the City requested proposals to redevelop portions of the former Army Base—the West, Central, and East Gateway Areas—for

mixed or industrial uses, including "green" development. In 2012, the City selected a development group that included CCIG (OBOT's parent)—Prologis CCIG Oakland Global, LLC. Trial Ex. 65 [LDDA] at 0008-0010 (Recitals L, M, U, W, X); Trial Ex. 814 [5/30/12 Agenda Report] at 0010-0013; Trial Ex. 814 [5/30/12 Agenda Report]; *see also* Trial Ex. 213 [9/10/15 Agenda Report] at 0002-03.

14. In 2012, the City considered and approved (1) an amended Army Base Reuse Plan, and (2) an Initial Study/Addendum to the 2002 Army Base Environmental Impact Report, pursuant to the California Environmental Quality Act ("CEQA"). *See* Trial Ex. 976 [6/23/16 Agenda Report] at 0002;[2] *see also* Trial Ex. 972 [Initial Study/Addendum to Army Base EIR]; Trial Ex. 976 [6/23/16 Agenda Report] at 0002.

15. The amended Army Base Reuse Plan included a mix of industrial, warehousing, logistics and commercial uses. Trial Ex. 976 [6/23/16 Agenda Report] at 0002. Among the potential projects under consideration was a bulk goods terminal, on approximately 34 acres of the approximately 160-acre portion of the former Army base owned by the City. Trial Ex. 972 [Initial Study/Addendum to Army Base EIR] at 0043-44.

16. However, neither the original 2002 Environmental Impact Report nor the 2012 Initial Study/Addendum analyzed any particular commodities, *e.g.*, coal or coke, that might be stored or handled at, or shipped through, the Terminal. Trial Ex. 972 [Initial Study/Addendum to Army Base EIR] at 0043-44; *see also* Trial Ex. 440 [9/21/2015 Earthjustice letter] at 0002 [AR0115 at OAK 5209]; Trial Ex. 440 at 0038 [AR0115 at OAK 5245] [Environmental, Health and Safety Impacts of the Proposed Oakland Bulk and Oversized Terminal, dated 9/21/2015, by Dr. Phyllis Fox, Ph.D, PE ("Fox Report")]; Trial Ex. 440 at 0067-68 [AR0115 at OAK 5274-75] [Technical Memorandum: Air Quality, Climate Change, and Environmental Justice Issues from Oakland Trade and Global Logistics Center, dated 9/18/2015, by Sustainable Systems Research, LLC Report ("Sustainable Systems Research Report")]; *see also* 1/16/18 Tr. [Cashman] at 40:23-

[2] The 6/23/2016 Agenda Report for the proposed Ordinance and Resolution is at Trial Ex. 976 as well as Trial Ex. 135. These proposed findings of fact refer to Trial Ex. 976.

25, 41-2:21; 1/16/18 Tr. [Ranelletti] at 55:3-7.

17. In December 2012, the City and Prologis CCIG entered into a Lease Disposition and Development Agreement ("LDDA") for the West Gateway and other City-owned portions of the former Army Base. Trial Ex. 65 [LDDA] at 0001, 0006, 0008; Dkt. 199 [Joint Pretrial Conference Statement] at 3.[3]

18. On July 16, 2013, the City approved the DA with OBOT's predecessor-in-interest pursuant to California Government Code section 65864 *et seq.* Trial Ex. 584 [DA] at 0006; *see also* Dkt. 199 [Joint Pretrial Conference Statement] at 3.

19. The DA concerns the development of multiple private projects at the Gateway Development Areas. Trial Ex. 584 [DA] at 0016 (definitions of "Private Improvements" and the "Project;" reference to Exhibit D) and at 0106-08 [Ex. D-2].

20. The term of the DA is 66 years, pursuant to the 66-year term of the Ground Lease between the City and OBOT, dated February 16, 2016, for the Terminal site. Trial Ex. 584 [DA] at 0018-19 (section 2.2, providing for alternative terms, depending upon whether the parties entered into a Ground Lease); Trial Ex. 96 [Ground Lease] at 0013 (section 1.2, providing for a 66-year term); *see also* 1/19/18 Tr. [Cappio] at 485:6-9.

21. OBOT's development of the private projects at the Gateway Development Areas is dependent upon public infrastructure improvements, at a cost to the taxpayers of over $200,000,000. *See* Trial Ex. 65 [LDDA] at 0008-10, 0019-26 (Recitals O, Q, V and W, and sections 3.3.1.1.1, 3.3.1.1.3, 3.4, 3.5); *see also* Trial Ex. 213 [9/10/15 Agenda Report] at 0002-03.

IV. THE DEVELOPMENT AGREEMENT

22. Among the private projects generally described in the DA is the terminal, proposed for the West Gateway, "for the export of non-containerized bulk goods and import of overweight cargo." Trial Ex. 584 [DA] at 0107 [AR0220 at OAK 36922].

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[3] The LDDA provided that the City would ultimately lease the West Gateway to OBOT. Trial Ex. 65 [LDDA] at 0034. As noted above, the City and OBOT entered into the Ground Lease on February 16, 2016. Dkt. 199 [Joint Pretrial Conference Statement] at 3; *see also* Trial Ex. 96 [Ground Lease].

23. The DA does not define, list, or describe any bulk goods. *See* Trial Ex. 584 [DA] [AR0220].

24. Nor does the DA expressly state that OBOT has a vested right to store or handle any particular bulk goods. *See* Trial Ex. 584 [DA] [AR0220].

25. The DA addresses OBOT's rights to rely on such City regulations and approvals, in existence as of the date of the approval of the DA, that govern the development and use of the Terminal, subject to certain parameters, limitations, and exceptions as set forth in the DA.

26. Paragraph 3.2 states:

> This Agreement vests in Developer the right to develop the Project in accordance with the terms and conditions of this Agreement, the City Approvals and the Existing City Regulations; provided that City shall have the right to control development of the Project in accordance with the provisions of this Agreement, the LDDA and each Ground Lease. Notwithstanding any provision herein to the contrary, the permitted uses of each Phase of the Project, the density and intensity of use of each Phase, and the siting, height, envelope, and massing and size of proposed buildings in each Phase, shall consist only of those described in and expressly permitted by, and subject to all terms, conditions and requirements of, the City Approvals, the Subsequent Approvals, the LDDA, and the applicable Ground Lease for each Phase…. This Agreement, the City Approvals, the LDDA and the Ground Lease, and where such instruments are silent, the Applicable City Regulations, shall control the overall design, development and construction of the Project, and all on- and off-site improvements and appurtenances in connection therewith. In the event of any inconsistency between the Applicable City Regulations and this Agreement, this Agreement shall control, except that if the inconsistency cannot be reconciled by application of this rule of construction, the provision which, as determined by the City Council, best gives effect to the purposes of this Agreement shall control.

Trial Ex. 584 [DA] at 0020-21 [AR at OAK 36905].

27. The DA defines City Approvals as "[p]ermits or approvals required under Applicable City Regulations to develop, use, and operate the Project and granted on or before the Adoption Date of this Agreement as identified in Recital I of this Agreement and described in Exhibit B." Trial Ex. 584 [DA] at 0011 [AR0220 at OAK 36896].

28. The DA defines "Existing City Regulations" as "[t]he City Regulations and City Policies in effect as of the Adoption Date and to the extent such are consistent therewith, the City Approvals as such are adopted from time to time." Trial Ex. 584 at 0014.

29. The DA defines "City Regulations" as "[t]he General Plan of City, the Oakland Army Base Redevelopment Plan (as amended prior to the Adoption Date), Oakland Army Base Reuse Plan (as amended prior to the Adoption Date), and all other ordinances, resolutions, codes, rules, regulations and policies in effect as of the time in question." Trial Ex. 584 at 0012.

30. The DA defines "Applicable City Regulations" as "[t]he Existing City Regulations, as defined below, and such other City Regulations, as defined below, otherwise applicable to development of the Project pursuant to the provisions of Section 3.4." Trial Ex. 584 at 0011.

31. DA paragraphs 3.4 and 3.4.1 further describe (a) the scope of OBOT's rights to rely on City regulations governing development and use of the Terminal that were in effect as of July 16, 2013, and (b) the City's corollary rights to apply City regulations adopted after July 16, 2013, including without limitation by creating an exception to OBOT's right to rely on pre-DA regulations pursuant to DA section 3.4.2. Trial Ex. 584 at 0021-23.

32. The DA reserves for the City the right to create an exception to any vested right OBOT had obtained pursuant to any other provision of the DA:

> Regulation for Health and Safety. Notwithstanding any other provision of this Agreement to the contrary, City shall have the right to apply City Regulations adopted by City after the Adoption Date, if such application (a) is otherwise permissible pursuant to Laws (other than the Development Agreement Legislation), and (b) City determines based on substantial evidence and after a public hearing that a failure to do so would place existing or future occupants or users of the Project, adjacent neighbors, or any portion thereof, or all of them, in a condition substantially dangerous to their health or safety. The Parties agree that the foregoing exception to Developer's vested rights under this Agreement [does not apply to] City Fees ….

Trial Ex. 584 at 0023.

33. The parties did not negotiate or discuss the meaning of section 3.4.2 prior to entering into the DA. 1/16/18 Tr. [Ranelletti] at 43:22-44:8.

34. The DA provides that it "shall not be construed for or against either Party by reason of the authorship or alleged authorship of any provisions hereof, or by reason of the status of either Party." Trial Ex. 584 [DA] at 0051 (section 14.7).

35. OBOT has not identified any City Approval, Existing City Regulation, or City Regulation (as each is defined in the DA) that afforded OBOT the right to store and handle coal or coke at the Terminal.

36. In addition, OBOT has not identified any term or condition in the DA that describes any right to store or handle coal or coke at the Terminal (and the DA does not define, list or describe any bulk goods, as discussed above).

37. DA section 3.4.2 does not include any provision requiring, expressly or impliedly, that analysis pursuant to or consistent with the California Environmental Quality Act ("CEQA") shall apply to the City's consideration of whether to apply post-DA legislation pursuant to section 3.4.2. *See* Trial Ex. 584 [DA] at 0023.

38. Section 3.4.2 does not include any provision requiring, expressly or impliedly, that analysis of whether the failure to apply post-DA legislation adopted by the City will result in substantially dangerous conditions shall include comparisons to conditions at other facilities or locations. *See* Trial Ex. 584 [DA] at 0023.

39. Section 3.4.2 does not include any provision requiring, expressly or impliedly, that analysis of whether the failure to apply post-DA legislation shall include comparison of the conditions caused by the storage and handling of any particular bulk good to the conditions caused by the storage and handling of a different bulk good. *See* Trial Ex. 584 [DA] at 0023.

40. There are thousands of bulk goods, as many as 15,000. 1/16/18 Tr. [Tagami] at 58:6-11 (referring to 15,000); *see also* 1/16/18 Tr. [Cashman] at 41:5 (referring to 10,000); 1/17/18 Tr. [McClure] at 282:22-23 (referring to "[t]housands").

41. Given the large number of bulk goods, it would be impracticable and/or infeasible to conduct any comparative analysis of the conditions caused by the storage and handling of any particular bulk good compared to the conditions caused by the storage and handling of a different bulk good.

V. DENIAL AND REVELATION OF PLANS REGARDING COAL

42. Prior to entering the DA, the City did not consider coal or coke as bulk goods that might be stored and handled at the Terminal. 1/16/18 Tr. [Cashman] at 40:23–41:4, 44:19-21;

1/16/18 Tr. [Ranelletti] at 55:3-7. In fact, prior to and after entry to the DA, OBOT communicated to the City that it was pursuing plans to ship bulk goods other than coal or coke through the Terminal. 1/16/18 Tr. [Cashman] at 41:2-21.

43. In December 2013, Mr. Tagami publicly declared that CCIG, the owner of OBOT, was not pursuing and would not pursue plans to ship coal through the Terminal. Mr. Tagami stated: "CCIG is publicly on record as having no interest or involvement in the pursuit of coal-related operations at the former Oakland Army Base." Trial Ex. 388 [Oakland Global News] at 0004; *see also* 1/16/18 Tr. [Tagami] at 87:5-24.

44. Despite public assurances that it would not pursue plans to ship coal through the Terminal, OBOT pursued such plans. Specifically, OBOT granted a third party, Terminal Logistic Solutions ("TLS"), an option to sublease the Terminal, pursuant to an Exclusive Negotiating Agreement, even though OBOT had yet to lease the site from the City. Trial Ex. 96 [Ground Lease]; Trial Ex. 213 [9/10/2015 Agenda Report] at 0003; Dkt. 199 [Joint Pretrial Statement] at 3-4.[4]

45. TLS is a wholly-owned subsidiary of Bowie Resource Partners ("Bowie"), an entity that extracts and produces Western bituminous coal. Dkt. 135 [OBOT's Opening MSJ Brief at 2]. 1/16/18 Tr. [Tagami] at 67:7-68:3; Wolff Tr. at 16:12-17; 1/16/18 Tr. [Tagami] at 67:7 – 68:3.

46. Members of the community and City officials became concerned that OBOT and/or its potential sublessee, TLS, were pursuing plans to ship coal through the Terminal. Trial Ex. 976 [6/23/16 Agenda Report] at 003. Accordingly, the City commenced a public hearing process to receive and evaluate evidence regarding whether the storage and handling of coal and coke creates or would create substantially dangerous health and safety conditions. *See* Trial Ex. 213 [9/10/2015 Agenda Report] at 0001-03.

47. On July 15, 2015, TLS acknowledged to the City that it intended to ship coal

[4] OBOT does not intend to operate the Terminal. Rather, OBOT intends to be the sub-landlord with Terminal operations to be managed by TLS. 1/16/18 Tr. [Tagami] at 58:18-20.

through the Terminal. Trial Ex. 213 [9/10/2015 Agenda Report] at 0003, 0017.

48. Absent the Ordinance and Resolution at issue herein, there are no restrictions on the origins or types of coal at the Terminal, and OBOT could ship any Western coal, including Powder River Basin sub-bituminous coal or Utah bituminous coal. Wolff Tr. 154:5-6, 154: 9-13. The Terminal is proposed to have coal blending capabilities, and Bowie currently blends coal now. Wolff Tr. 156:9, 156:12-15, 156:18.

49. Bowie potentially could ship coal up to the full OBOT Terminal capacity, between 5-10 million tons of coal annually. Wolff Tr. 153:5-6, 153:11-19.

50. Bowie currently ships a combined total of roughly 5 million tons of coal annually through the ports of Levin-Richmond, Stockton, and Long Beach. Wolff Tr. 148:5-18.

VI. PUBLIC HEARINGS

A. The September 21, 2015 Public Hearing and Follow-Up Questions and Responses

51. On September 21, 2015, the City held an initial public hearing to solicit public comment regarding the public health and safety impacts related to the transport, storage, and handling of coal. Trial Ex. 213 [9/10/15 Agenda Report] at 0001; Trial Ex. 214 [9/17/15 Agenda Report] at 0001.

52. TLS and OBOT, as well as members of the public, submitted reports and public comments to the City. *See, e.g.,* Trial Ex. 213 [9/11/15 Agenda Report] at 0006; Trial Ex. 214 [9/17/15 Agenda Report] at 0001-02.

53. Among the reports submitted by project proponents were: (1) the Basis of Design ("BoD"), dated 7/21/2015, and (2) a report from HDR Engineering ("HDR"). Trial Ex. 214 [9/17/2015 Agenda Report] at 0001-02.

54. TLS submitted the BoD. Trial Ex. 1238 [BoD] [AR0136]. The BoD represents not more than a 10% design. Trial Ex. 1238 [BoD] at 0005 [AR0136 at OAK 4712]; *see also* 1/16/18 Tr. [Tagami] at 61:15-21. The BoD identifies "Commodity A" as exhibiting "spontaneous combustion behavior, potentially explosive." Trial Ex. 1238 [BoD] at 010 [Table 5-1] [AR0136 at OAK 4717]; *see also* Trial Ex. 976 [6/23/16 Agenda Report] at 0009. "Commodity A," as described in the BoD, is presumed to be coal and/or coke (which OBOT does

not contest). Trial Ex. 281 [ESA Report] at 0024 (¶ 3);[5] *see also* Trial Ex. 976 [6/23/16 Agenda Report] at 0009; *accord* 1/16/18 Tr. [Evans] at 204:22-24.

55. CCIG (OBOT's parent) submitted the HDR Report. AR0113 [HDR Report]. The HDR Report provided aspirational assurances and conclusory "analysis" purportedly supporting a finding that "coal dust emissions … will be negligible, and that impacts from coal dust emissions and deposition will not harm health." AR0113 [HDR Report] at OAK 6755.[6]

56. Members of the public submitted comments, including expert reports, as further discussed below. *See, e.g.,* Trial Ex. 440 [9/21/2015 Earthjustice letter] [AR0115] at 0036 *et seq*. (attaching Fox Report) and at 0059 *et seq*. (attaching Sustainable Systems Research Report).

57. On September 21, 2015, the City Council held a public hearing, for which it received approximately 215 written submissions and heard from hundreds of speakers. *See* Trial Ex. 281 [ESA Report] at 0019 and 0108-0111; Trial Ex. 976 [6/23/16 Agenda Report] at 0003.

58. After the September 21, 2015 public hearing, the City issued a set of 18 follow-up questions, to which OBOT, CCIG and TLS responded on October 6, 2015. Trial Ex. 149 [10/6/2015 Response]; *see also* 1/16/18 Tr. [Tagami] at 64:25-65:5.

59. OBOT's October 6, 2015 response included various reports and analyses. Trial Ex. 149 [10/6/2015 Response]. The October 6, 2015 response did not include a material analysis regarding the quantities of fugitive coal dust that would be emitted as a result of the storage and handling of coal and coke at the Terminal or associated activities (*e.g.*, staging at the Port railyard or transport by rail to the Terminal). Trial Ex. 149 [10/6/2015 Response].

60. Indeed, OBOT never provided the City any meaningful emissions analysis regarding the quantities of fugitive coal dust that would be emitted as a result of the storage and handling of coal and coke at the Terminal or associated activities.

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[5] The Trial Exhibits include multiple copies of the ESA Report, *e.g.,* Trial Exs. 14 and 281, and as an attachment to Trial Ex. 976. These proposed findings of fact refer to Trial Ex. 281, a color copy of the ESA Report.

[6] Multiple sources in the record indicate that HDR significantly underestimated emissions. *See*, *e.g.*, Trial Ex. 657 [Dr. Ostro critique] at 0021-26 [AR0128 at OAK4305-10]; Trial Ex. 440 [Fox Report] at 0049 [AR0115 at OAK5256]; AR0123 [10/6/15 Earthjustice letter] at OAK5433-41; Trial Ex. 960 [PHAP Report] at 0045.

61. Members of the public also responded to the City's follow-up questions. *See generally* Trial Ex. 657 [Response to Follow-up Questions from Residents and Non-Residents]; *see also* 1/19/18 Tr. [Cappio] at 488:21-489:18. The responses included analysis and other evidence offered by credentialed professionals. *See, e.g.*, Trial Ex. 657 at 0021-26.

B. The City Commissioned Health and Safety Reports, and Sought Additional Information from OBOT, but Was Rebuffed

62. In the ensuing months, the City retained consultants to assist in the evaluation of the public record and to perform additional analyses.

63. The City retained Environmental Science Associates ("ESA") to review the public record and prepare a report analyzing the health and safety impacts that would be caused by OBOT's proposal to ship coal and coke through the Terminal, including associated activities. Trial Ex. 62 [ESA Contract] at 0001, 0027-28.

64. The City hired ESA to conduct a review "to assist the City in determining whether the information in its public record constitutes 'substantial evidence' that would support a finding of substantial endangerment." Trial Ex. 62 [ESA Contract] at 0027 (footnote omitted); *see also* 1/16/18 Tr. [Evans] at 147:5-15.

65. ESA analyzed public comments received from individuals, organizations, and technical professionals, including peer-reviewed literature, articles, journals, and additional substantiated scientific information related to the effects of transporting and handling coal relevant to the consideration by the City Council, including technical reports, journal articles, and other scientific information. Trial Ex. 281 [ESA Report] at 0008-09, 0020; *see also* 1/16/18 Tr. [Brown] at 104:8–105:1; *see also* 1/16/18 Tr. [Evans] at 148:16–150:21.

66. Councilmember Dan Kalb commissioned Dr. Zoë Chafe, MPH, PhD to prepare a health and safety report regarding coal. Trial Ex. 961 [Chafe Report]; *see also* 1/19/18 Tr. [Chafe] at 609:21-610:6. Dr. Chafe prepared an extensive report analyzing the health and safety impacts from fugitive coal dust, including health impacts to members of the adjacent community and Terminal workers caused by particulate matter pollution from toxic coal dust, and safety impacts caused by the combustibility of coal. Trial Ex. 961 [Chafe Report]; *see also* 1/19/18 Tr.

[Chafe] at 610:11-611:24. Dr. Chafe served as a City employee while preparing the report. *See* 1/19/18 Tr. [Chafe] at 609:25-610:6; *see also* Trial Ex. 108 [Chafe Scope of Work] at 0002.

67. While ESA and Dr. Chafe were preparing their reports, the City sought additional information from OBOT, *e.g.,* beyond that provided by the BoD, so that the City could ensure the most accurate and up-to-date information was included. By email dated May 11, 2016, the City solicited from OBOT information regarding the types of commodities likely to be stored and handled at the Terminal as well as additional information regarding the Terminal operations. Trial Ex. 264 [5/11/16 email from C. Cappio to P. Tagami and M. McClure]; *see also* 1/19/18 Tr. [Cappio] at 486:13-487:7, 487:22-488:3.

68. OBOT declined to provide the City any information. Trial Ex. 166 [5/16/16 letter from P. Tagami to C. Cappio]. In a letter to the City dated May 16, 2016, Mr. Tagami stated that "the entire effort" related to ESA's investigation and review of the OBOT facility was "premature and, consequently, will produce nothing but speculative analyses." Trial Ex. 166 [5/16/16 Tagami letter] at 0001; *see also* 1/16/18 Tr. [Tagami] at 88:1-20.

69. Instead, OBOT sought to introduce emissions evidence in this litigation through an expert witness, Lyle Chinkin, who testified that he informed OBOT that he could have prepared emissions estimates for the City's consideration based on documents and information in OBOT's possession prior to adoption of the Ordinance and Resolution. 1/17/18 Tr. [Chinkin] at 382:4-7.

70. Meanwhile, on May 9, 2016, the City Council held a public hearing to receive written and oral testimony and obtain more information regarding the health and/or safety effects of transporting and handling these materials as well as crude oil. Trial Ex. 976 [6/23/16 Agenda Report] at 0003. The City heard from approximately 30 speakers and received approximately 24,500 pages of written comments and material submitted after the City Council extended the deadline to receive comments at the meeting. AR0032 [5/9/16 Tr.]; AR0033 [5/9/16 Meeting Minutes]; *see also* AR0068-AR0096 (public comments).

C. The June 27, 2016 Public Hearing

71. On June 17, 2016, the City published notice in the Oakland Tribune, mailed notice to the interested parties, and posted notices on the Army Base Gateway Redevelopment Project

website, public notice kiosks, and at the City Clerk's office that it would hold a public hearing on June 27, 2016, regarding whether the to adopt an ordinance to prohibit the storage and handling of coal and coke at bulk material facilities or terminals, and whether to adopt a resolution applying the ordinance to OBOT. Trial Ex. 976 [6/23/16 Agenda Report] at 0022.

72. OBOT does not claim it did not receive timely or adequate notice.

73. Members of the public, including credentialed professionals, submitted evidence in advance of the June 27, 2016 Public Hearing. For example, on June 14, 2016, a Public Health Advisory Panel ("PHAP" or the "Panel") submitted an Assessment of the Health and Safety Implications of Coal Transport Through Oakland (the "PHAP Report"), as further discussed below. Trial Ex. 960 [PHAP Report].[7]

74. On June 24, 2016, the City published the Agenda Report, dated June 23, 2016, for the June 27, 2016 public hearing. Trial Ex. 976 [6/23/16 Agenda Report]. The Agenda Report attached the ESA Report, among other materials. *See* Trial Ex. 976 [6/23/16 Agenda Report] at 0025 *et seq.* The ESA Report addresses the impacts to health from coal dust emissions as well as the safety impacts from fire. *See* Trial Ex. 281 [ESA Report].

75. Councilmember Dan Kalb also submitted the Chafe Report to the City Council for the June 27, 2016 hearing. *See* Trial Ex. 961 [Chafe Report].

76. Neither Mr. Tagami nor Mr. McClure attended the June 27, 2016 public hearing, or even requested an extension of time so that OBOT could evaluate and respond to the ESA Report, the Chafe Report, or any other report. *See* 1/19/19 Tr. [Cappio] at 488:15-20.[8]

77. The City Council regularly grants developers an extension of time when the Council has materials regarding a development project before it that includes an extensive amount

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[7] Trial Ex. 1069 is a Bates-stamped, black & white copy of the PHAP Report from the Administrative Record; Trial Ex. 960 is a color copy of the PHAP Report. These proposed findings of fact refer to the color copy.

[8] Mr. McClure testified that he did not attend because, he expected, the Council would only have provided OBOT two minutes to testify. 1/17/18 Tr. [McClure] at 284:8-19. But the Assistant City Administrator confirmed that the Council typically provides developers 10-20 minutes to testify when they have a project before the Council, whereas members of the public are often limited to two minutes. 1/19/18 Tr. [Cappio] at 488:5-14.

of technical information. *See* 1/19/19 Tr. [Cappio] at 488:5-11.

78. At the conclusion of the public hearing, the City introduced the Ordinance and adopted the Resolution. *See* Dkt. 199 [Joint Pretrial Conference Statement] at 3 (describing the introduction and first reading as "voted to pass"); *see also* Trial Ex. 4.

79. On July 19, 2016 the Oakland City Council, in a second vote, adopted the Ordinance by a vote of 8 to 0, which became immediately effective. Trial Ex. 4 at 0013-14 (section 6 and vote count); *see also* Dkt. 199 [Joint Pretrial Conference Statement] at 3.

80. The Resolution became effective upon the adoption of the Ordinance. Trial Ex. 598 [Resolution] at 0008-9 [AR0002 at OAK 0039566] (section 9 and vote count).

D. Summary of the Ordinance and Resolution

81. The Ordinance prohibits the "storage and handling" of "coal" and "coke" at "coal or coke bulk material facilities" in the City of Oakland, as those terms are defined in the Ordinance. Trial Ex. 4 [Ordinance] at 0008-09 (amending Oakland Municipal Code § 8.60.030(A)(2), (A)(3), (A)(4), (A)(9), (A)(12) (definitions), § 8.60.040(A), (B) (applicability, prohibitions)).

82. The Terminal, as OBOT proposed to develop it subsequent to the effective date of the DA, is a coal or coke bulk materials facility as defined in the Ordinance.

83. The Ordinance includes extensive findings regarding the substantially dangerous conditions caused by the storage and handling of coal and coke, including without limitation substantially dangerous health conditions caused by the respiration of fugitive coal dust and substantially dangerous safety impacts caused by the combustibility of coal. Trial Ex. 4 [Ordinance] at 0005-08 (amending Oakland Municipal Code § 8.60.020).

84. The Resolution includes extensive findings pursuant to DA section 3.4.2, including that failure to apply the Ordinance to the Terminal would place existing and/or future occupants or users of the Terminal, adjacent neighbors, or any portion thereof, or all of them, in a condition substantially dangerous to their health and/or safety if the Ordinance were not applied. Trial Ex. 598 [Resolution] at 0005-07 [AR0002 at OAK 39563-65].

VII. THE RECORD

85. The scope of evidence supporting the City Council's determination to apply the Ordinance to OBOT includes all the evidence received by the City prior to the close of the June 27, 2016 public hearing, whether or not it was posted on the City's website or directly provided to the City Council (*e.g.*, as an attachment to an agenda report), including oral testimony presented at the public hearings.

A. The Ordinance and Resolution Describe the Record Before the City Council

86. Section 4 of the Ordinance describes the record before the City Council relating to the Ordinance as follows:

> The record before this Council relating to this Ordinance and supporting the findings made herein includes, without limitation, the following:
>
> 1. All final staff reports, and other final documentation and information produced by or on behalf of the City, including without limitation supporting technical studies and all related/supporting final materials, and all final notices relating to aforementioned public hearings and meetings;
>
> 2. All oral and written evidence received by the City regarding the subject matter of this Ordinance through the close of the public hearing on June 27, 2016, and other such evidence and other information regarding the subject matter of this Ordinance which is in the public domain, no matter when or where such evidence or other information became public; and
>
> 3. All matters of common knowledge and all official enactments and acts of the City, such as (a) the City's General Plan; (b) the Oakland Municipal Code and Planning Code; (c) other applicable City policies and regulations; and (d) all applicable state and federal laws, rules and regulations.
>
> The custodians and locations of the documents or other materials which constitute the record of proceedings upon which the City Council's decision is based are respectively: (a) Planning and Building Department -Bureau of Planning, 250 Frank H. Ogawa Plaza, Suite 3315, Oakland, California; and (b) Office of the City Clerk, One Frank H. Ogawa Plaza, 1st Floor, Oakland California.

Trial Ex. 4 [Ordinance] at 0013 [AR 0001 at OAK39580].

87. Section 8 of the Resolution describes the record before the City Council relating to the Resolution as follows:

> The record before this Council relating to this Resolution and

> supporting the findings made herein includes, without limitation, the following:
>
> 1. All final staff reports, and other final documentation and information produced by or on behalf of the City, including without limitation supporting technical studies and all related/supporting final materials, and all final notices relating to aforementioned public hearings and meetings;
>
> 2. All oral and written evidence received by the City regarding the subject matter of this Ordinance through the close of the public hearing on June 27, 2016; and
>
> 3. All matters of common knowledge and all official enactments and acts of the City, such as (a) the City's General Plan; (b) the Oakland Municipal Code and Planning Code; (c) other applicable City policies and regulations; and (d) all applicable state and federal laws, rules and regulations.
>
> The custodians and locations of the documents or other materials which constitute the record of proceedings upon which the City Council's decision is based are respectively: (a) Planning and Building Department -Bureau of Planning, 250 Frank H. Ogawa Plaza, Suite 3315, Oakland, California; and (b) Office of the City Clerk, One Frank H. Ogawa Plaza, 1st Floor, Oakland California.

Trial Ex. 598 [Resolution] at 0008 [AR0002 at OAK 39566].

B. Trial Exhibit 640—a Flash Drive—Contains the Record Before the City Council

88. The record before the City Council for the Ordinance and Resolution[9] is contained in Trial Exhibit 640—a flash drive that was submitted to the Court. OBOT has stipulated that the documents contained in Exhibit 640 "were submitted to the City." Dkt. 222 [Stipulation and [Proposed] Order] at ¶ 3.

89. The Stipulation attached the declarations of Heather Klein (Dkt. 222, Ex. A ("Klein Decl.")), John Monetta (Dkt. 222, Ex. B ("Monetta Decl.")), Sharon Hagle (Dkt. 222, Ex. C ("Hagle Decl.")); Christopher Long (Dkt. 222, Ex. D("Long Decl.")), and Sean O'Brien [Dkt. 222, Ex. E ("O'Brien Decl.")). These declarations establish the following facts:

a. Ms. Klein and Mr. Monetta, employees of the City's Planning Department and City Administrator's Office, respectively, were tasked with collecting the records related to the Ordinance and Resolution as they were received by the City. Klein Decl.,

[9] The record has been referred to as the "Administrative Record" and the "Legislative Record" at various times.

¶¶ 2-10; Monetta Decl., ¶¶ 2-10.

b. Each were then responsible for seeing that the records were uploaded or posted to, or linked in, the City's dedicated website for the Terminal Project. Klein Decl., ¶¶ 5, 6, 8; Monetta Decl., ¶¶ 5, 6, 8. The website still exists and can be accessed at: http://www2.oaklandnet.com/government/o/CityAdministration/d/project-implementation/OAK038485. Klein Decl., ¶ 11.

c. The June 23, 2016 Agenda Report for the June 27, 2016 City Council hearing notes, at pages 3 and 4 thereof, states the following regarding the administrative record and the website:

> [T]he City Council held an informational public hearing on September 21, 2015 to receive written and oral testimony regarding the health and/or safety effects of coal and types of coal, including coke (which includes petroleum coke (petcoke), to help inform potential future City Council actions. The written public hearing comment period ended on or about October 6, 2015, but comments submitted and received after that date are considered part of the administrative record and are posted on the City's website at the following location:
>
> (http://www2.oaklandnet.com/government/o/CityAdministration/d/NeighborhoodInvestment/OAK038485)[10]
>
> In addition to coal, other potential fossil fuel commodities, which are listed in the BoD for the OBOT, include fuel oils and gasoline, which are fossil fuels and have characteristics similar to crude oil per the 2014 Resolution. On May 9, 2016, the City Council held an informational public hearing to receive written and oral testimony and obtain more information regarding the health and/or safety effects of transporting and handling these materials as well as crude oil. The written public hearing comment period ended on May 16, 2016. Several comments received related to coal rather than fuel oil, gasoline and crude oil. All comments received are also part of the administrative record and posted on the City's website cited above.
>
> Additional evidence was submitted before, during and after the above public hearings and is also part of the administrative record and posted on the City's website cited above.

[10] The location of this website is presently http://www2.oaklandnet.com/government/o/CityAdministration/d/project-implementation/OAK038485 (last accessed Feb. 4, 2018), however the content is the same. Klein Decl., ¶ 11.

Trial Ex. 976 [6/23/16 Agenda Report] at 0003-04; Klein Decl., ¶ 7.

d. The records posted on or linked within the City's dedicated website were downloaded by Burke Williams and Sorenson, LLP staff, then organized and indexed by them in a fashion typical of administrative record cases. The index is Trial Exhibit 639; the records are contained on Trial Exhibit 640 (a flash drive). *See* Hagle Decl. (downloaded records from website); Long Decl. (supervised process, produced records and index to OBOT's counsel); O'Brien Decl. (organized records, caused records to be Bates numbered, created index (Trial Exhibit 639), and caused organized records to be placed on flash drive that became Trial Exhibit 640).

e. Videos of relevant hearings and meetings were transcribed by a certified court reporter, which were included in the index and flash drive. Long Decl., ¶ 8.

f. Some inconsequential errata was identified as described in the O'Brien Declaration, at paragraph 7.

90. OBOT's counsel appears to have made an issue of when certain records were received by the City, based upon when certain records were uploaded to or linked within the City's website.[11] For this reason, the City filed the Supplemental Declaration of Heather Klein (Dkt. 226) ("Supp. Klein Decl."), which describes the few records which were either received after the June 27, 2016 City Council hearing (Dkt. 226, Exs. 4, 6), or for which direct evidence of the date of receipt was not clear (Exhibit 5). All others were received on or before June 27, 2016. Dkt. 226 at ¶ 16 (Supp. Klein Decl.).

91. Of the records received after June 27, 2016, a letter from the Sierra Club was received on July 19, 2016 (AR0040 at OAK 33194), which was the date of the second reading of the Ordinance, and thus properly part of the record with respect to the Ordinance itself. Other records received after June 27, 2016, but which are nevertheless properly part of the record are the video of the July 19, 2016 public hearing (for which a certified transcript is provided as part

[11] Notwithstanding OBOT's apparent reliance on when a record might have been posted to the City's website, the fact that a document was *received* makes it part of the record—not when or whether it was posted to the City's website.

of Trial Exhibit 640, *see* AR0028), the Ordinance (AR0001), the Resolution (AR0002), minutes, and the certified hearing transcripts (AR0030, AR0032, AR0034, AR0036, AR0038).

92. Of the three documents listed as not having direct evidence of a date of receipt (Supp. Klein Decl., Ex. 5) two have April 2016 dates on the documents, creating an inference that they were received on or around such dates—well before the June 27, 2016 hearing. These include an April 19, 2016 letter from Stice & Block to State Senator Bob Wiekowski (AR0227 at OAK 39519) and an April 14, 2016 letter from Mayors of Berkeley, Emeryville, El Cerrito, Albany and Richmond. (AR0066 at OAK8603).

93. A set of binders submitted by the project proponents relating to the May 9, 2016 public hearing on fuel oil, gasoline, and crude oil was apparently inadvertently not posted to the website and thus not included in Trial Exhibit 640. Dkt. 222, Ex. D [Long Decl.] ¶ 3 n.1. These were produced by the City to OBOT in this litigation. *Id.* Notably, OBOT did not seek to have them added to Exhibit 640 or otherwise admitted in evidence at the trial.

94. Although all of the records on Trial Exhibit 640 are properly part of the administrative record—regardless of when received or when posted to or linked in the City's website—to avoid any issue concerning whether a document was "before" the City Council as of the June 27, 2016 hearing on the Ordinance and Resolution (*i.e.*, whether received by the City by that time), the Defendants do not cite to any record that that was received after June 27, 2016, or for which there is a lack of direct evidence for the date of receipt, other than the following documents that were generated after June 27, 2016: the Ordinance (AR0001), the Resolution (AR0002), minutes of the June 27 and July 19, 2016 City Council meetings (AR0031, AR0029), and transcripts of those meetings (AR0030, AR0028), which are plainly part of the relevant record.

VIII. SUBSTANTIAL EVIDENCE SUPPORTS THE CITY'S FINDINGS PURSUANT TO DA SECTION 3.4.2

A. Summary

Existing Community

95. The West Oakland community is an adjacent neighbor to the Terminal that is

disproportionately burdened by multiple sources of air pollution, and West Oakland residents exhibit high rates of adverse health outcomes associated with such pollution, including increased asthma rates and incidents of cancer, as discussed at ¶¶ 115-16, below.

96. The California Environmental Protection Agency and the Bay Area Air Quality Management District have adopted regulatory programs identifying and seeking to address the air pollution impacts to the West Oakland community.

97. A number of sensitive receptors are located near the Terminal and the railyard that would serve it, including schools and parks, as discussed at ¶ 117, below.

98. The Bay Area Air Quality Management District was designated as a non-attainment area for several state and federal health-based standards when the City adopted the Ordinance and Resolution, as discussed at ¶¶ 118-20, below.

99. Local monitoring has demonstrated that and West Oakland has recently experienced exceedances of the state and federal ambient air quality standard levels, as discussed at ¶ 121, below.

Health

100. Coal is a substance that embodies a constellation of properties setting it apart from other commodities in its dangers to health (due to air quality impacts) and safety (due to fire and explosion impacts).

101. The transport, storage, and handling of coal generates dust that contains harmful particulate matter ("PM"), including PM_{10} and $PM_{2.5}$, as summarized immediately below and discussed in more detail at ¶¶ 122-23, below.

a. Exposure to $PM_{2.5}$ causes adverse health outcomes, including premature death and disease.

b. The populations at greatest risk to $PM_{2.5}$ include infants and children, asthmatics and older individuals with pre-existing cardiovascular or respiratory disease, and members of vulnerable populations like West Oakland that are disproportionately impacted by pollution.

102. There is no safe level of exposure to $PM_{2.5}$, as discussed at ¶¶ 125-26, below.

103. In addition, coal dust contains toxic constituents, *e.g.,* toxic metals and polycyclic aromatic hydrocarbons ("PAHs") that cause adverse health impacts, as discussed in more detail at ¶ 127, below.

a. Coal dust contains a number of toxic heavy metals and metalloids, including mercury, lead, cadmium, chromium, nickel, arsenic, and silica, that are linked to adverse health outcomes such as cancer, cognitive impairment, and genetic defects.

b. There are no known doses of any of these metals or metalloids that are risk-free, especially for the very young and for those in communities exposed to multiple toxins.

c. The heavy metals would become even more harmful if the coal were to catch fire or explode.

d. Coal dust also contains PAHs—well recognized carcinogens for which there is no safe level of exposure.

104. OBOT's proposal to store and handle coal and coke at the Terminal would cause the emission of significant quantities of harmful $PM_{2.5}$ pollution that will cause adverse health impacts in West Oakland, as summarized immediately below and discussed in more detail at ¶¶ 128-35, below.

a. The transport of coal by rail to the Terminal would generate 82 to 620 tons of fugitive coal dust per year, including *at least* six tons of $PM_{2.5}$ emissions annually, as discussed in ¶ 131, below.

b. The staging operations, from the operations at the Port railyard and to the Terminal, would generate 156 to 646 tons of fugitive coal dust per year, including at least 11.7 tons of $PM_{2.5}$ annually, as discussed in ¶¶ 131, 140, below.

c. OBOT operations at the Terminal itself will generate 37.5 tons of fugitive coal dust per year, including an estimated 2.7 tons of $PM_{2.5}$ annually, as discussed in ¶ 141, below.

105. Covers are neither used nor available to cover coal cars used for transportation by rail or staging, as discussed at ¶¶ 157-64, below.

106. Surfactants will not prevent health and safety impacts caused by the transport of coal, as discussed in more detail at ¶¶ 165-71, below.

107. Other regulatory measures will not prevent health impacts, as summarized immediately below and discussed in more detail at ¶¶ 172-77, below.

a. BAAQMD does not have a rule governing coal terminals, unlike the South Coast Air Quality District, which has Rule 1158 governing coal terminals.

b. Even if South Coast Air Quality District Rule 1158 applied, it would not require covered coal cars or otherwise prevent the emissions and health impacts discussed herein.

c. Installation of best available control technology ("BACT") at the Terminal will not prevent the prevent the emissions and health impacts discussed herein.

108. Multiple reports corroborate these findings, as summarized immediately below and discussed in more detail at ¶¶ 178-84, below.

Safety

109. Coal is a fuel that:

a. Is dusty, which in addition to impairing air quality in an already pollution-impacted neighborhood, creates dangers of fire and explosions. *See* ¶¶ 116 and 185-204, below.

b. Off gasses methane (enhancing the explosivity problem). *See* ¶¶ 186, 202, below.

c. Self heats and spontaneously combusts. *See* ¶¶ 191, 202, below.

d. Ignites easily. *See* ¶¶ 192, 202, below.

e. Burns hotter than other bulk goods. *See* ¶¶ 193, 202, below.

f. Has fires that are dangerous to human health and notoriously difficult to put out—requiring special equipment and training. Further, the location of the proposed Terminal creates access issues for emergency personnel, including the potential need to fight a fire from the sea side of the terminal. *See* ¶ 195, below.

110. OBOT's proposed mitigations to contain fugitive dust on the one hand, and to

contain fire and explosion dangers on the other, work against each other, requiring a delicate and difficult balance of conflicting measures in tension with one another, to be sustained over time. *See* ¶ 196, below.

111. Fires at coal storage, handling and shipping terminal facilities are not uncommon, including bituminous coal fires. *See* ¶¶ 191, 197-99, below.

112. Regulations, permit requirements, and best available control technologies are not sufficient to remove the danger coal poses to health and safety. *See* ¶¶ 200-03, below.

113. Over decades of operation, over millions of tons of throughput every year, over two hundred rail cars dumping coal onto conveyors every day, with conveyor belts carrying self-heating abrasive coal chunks and their pulverized residue rolling over bearings hour after hour, and the enclosed nature of the proposed operation, an accident leading to a fire or explosion is likely to happen. *See* ¶¶ 202-03, below.

114. OBOT's location would make a potential coal fire or explosion catastrophic and a completely unacceptable danger. *See* ¶ 204, below.

B. The Impacted Community: Substantial Evidence Demonstrates that the Terminal Is Adjacent to a Community that Is Disproportionately Impacted by Pollution

115. The West Oakland community is an adjacent neighbor to the Terminal, a fact that OBOT does not contest and is supported by substantial evidence.

116. West Oakland is an area already disproportionately burdened by multiple sources of air pollution; the community exhibits high rates of emergency room visits and hospitalization for asthma and cancer risk from existing pollution. Trial Ex. 960 [PHAP Report] at 0019-20; *see also* 1/19/18 Tr. [Chafe] at 614:10-21.

a. The California Environmental Protection Agency ("CalEPA") has classified parts of West Oakland including the Terminal site as "disadvantaged communities," which means these are areas disproportionately burdened by and vulnerable to existing multiple sources of pollution. Trial Ex. 281 [ESA Report] at 0010, 0060; Trial Ex. 976 [6/23/16 Agenda Report] at 0005; *see also* 1/19/18 Tr. [Chafe] at 614:23 – 615:10. For example, some West Oakland "tracts are as high as the 78th

percentile for overall pollution burden and in the top percentile for clean-up sites compared to all other California census tracts." Trial Ex. 960 [PHAP Report] at 018.

b. The Bay Area Air Quality Management District ("BAAQMD")'s Community Air Risk Evaluation ("CARE") program has similarly identified West Oakland as an "impacted community"—*i.e.*, a community that suffers disproportionately from poor health outcomes due to air pollution, relative to other Bay Area communities. Trial Ex. 960 [PHAP Report] at 0021; Trial Ex. 281 [ESA Report] at 0010; 0062-066; *accord* 1/19/18 Tr. [Moore] at 591:11-592:25.

c. Areas of West Oakland have experienced some of the highest rates of emergency room visits for asthma for children in Alameda County, and West Oakland already has the highest cancer risk from air pollution anywhere in the County. Trial Ex. 960 [PHAP Report] at 0019-20.

117. A number of sensitive receptors are located nearby the Terminal, including two schools, a child care center, and multiple parks, such as the Alexander Zuckermann Bicycle and Pedestrian Path (immediately adjacent to the Terminal site) that will connect to the San Francisco-Oakland Bay Bridge Bay Trail, and Raimondi Park, where more than 27,000 annual person-visits are made by mostly youth and also adult athletes and their coaches to engage in soccer and football. These sensitive receptors are located within 1,000 feet of the Port railyard that would be used for staging rail cars prior to unloading at the Terminal; within half a mile of the rail spur between the Port railyard and the Terminal; and within 1.5 miles of the Terminal itself. Trial Ex. 281 [ESA Report] at 0010, 0058-59; Trial Ex. 960 [PHAP Report] at 0024, 0029.

118. At the time the City adopted the Ordinance and Resolution, ambient air quality within the Bay Area Air Quality Management District was then-designated as not attaining several state and federal health-based standards. With respect to the state ambient air quality standards, the Bay Area was designated as a non-attainment area for ozone, coarse particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$). With respect to the national ambient air quality standards ("NAAQS"), the Bay Area was designated as a non-attainment area for ozone and $PM_{2.5}$. Trial Ex. 281 [ESA Report] at 0010-11, 0060.

119. With respect to the 24-hour NAAQS for $PM_{2.5}$, which is set at 35 $\mu g/m^3$ (based on a 3-year average of the 98th percentile of 24-hour concentrations), EPA twice made findings that air quality in the Bay Area, overall, meets the standard. 78 Fed. Reg. 1760 (Jan. 9, 2013); 82 Fed. Reg. 21711, 21711-13 (May 10, 2017); *see id*. at 21713 (identifying a 24-hour $PM_{2.5}$ value of 30 $\mu g/m^3$, compared to the standard of 35 $\mu g/m^3$). But "[t]hese determinations of attainment do *not* constitute a *redesignation to attainment*." 82 Fed. Reg. at 21712 (emphasis added). EPA will not re-designate the Bay Area as attaining the 24-hour $PM_{2.5}$ standard unless or until BAAQMD satisfies "a number of additional statutory criteria in [the Clean Air Act]," including development of a plan that BAAQMD demonstrates to EPA is sufficient to maintain the air quality standard for the next 10 years. *Id*.[12]

120. As for the annual NAAQS for $PM_{2.5}$, set at 12 $\mu g/m^3$ (annual mean, three-year average), the Bay Area is designated as "unclassified/attainment." Trial Ex. 281 [ESA Report] at 0060. Recent data from West Oakland monitors indicate an annual average $PM_{2.5}$ concentration in the range of 10.2 to 11.5 $\mu g/m^3$. Trial Ex. 281 [ESA Report] at 0067-68; Trial Ex. 960 [PHAP Report] at 0026–27. Such annual $PM_{2.5}$ levels are just below the federal standard and above the World Health Organization standard, which is set at 10 $\mu g/m^3$. Trial Ex. 960 [PHAP Report] at 0026–27.

121. Local air quality monitoring has also demonstrated that Oakland and West Oakland both have recently experienced exceedances of the state and federal ambient air quality standard levels for the $PM_{2.5}$ 24-hour average of 35 $\mu g/m^3$ and the average annual ambient air quality standard of 12 $\mu g/m^3$—including three such exceedances in 2015. Trial Ex. 281 [ESA Report] at 0011, 0068-69; *see also* Trial Ex. 4 [Ordinance] at 0006.

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[12] OBOT's air quality expert Lyle Chinkin testified that the Bay Area was re-designated by EPA as an attainment area in 2017. 1/17/18 Tr. [Chinkin] at 330:7-17. That is incorrect. As noted above, EPA's 2017 action specified that it did "*not* constitute a redesignation to attainment." 82 Fed. Reg. at 21712. Indeed, BAAQMD's website still lists the Bay Area's status for the 24-hour $PM_{2.5}$ standard as "nonattainment." *See* http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status (last visited Feb. 2, 2018).

C. Health Conditions: Substantial Evidence Supports the City's Determination that the Failure to Apply the Ordinance to OBOT Would Create Substantially Dangerous Health Conditions to Existing or Future Occupants or Users of the Project, and/or Adjacent Neighbors

1. *There Is Substantial Evidence that Coal Dust Contains Harmful Fine Particles ($PM_{2.5}$)*

122. The transport, storage, and handling of coal generates coal dust. Trial Ex. 960 [PHAP Report] at 007, 0025; Trial Ex. 961 [Chafe Report] at 0006, 0008, 0013, 0016; *see also* Trial Ex. 1238 [BoD] at 0010 (describing Commodity A (coal) as "very dusty"); *see also* 1/19/18 Tr. [Moore] at 574:16-21; 1/19/18 Tr. [Sullivan] at 655:11-16, 657:23-24.

123. Coal dust includes particles of various sizes, including fine particles such as PM_{10} and $PM_{2.5}$. Trial Ex. 960 [PHAP Report] at 0046; Trial Ex. 961 [Chafe Report] at 0015; Trial Ex. 440 [Fox Report] at 0052 [AR0115 at OAK 5259]. $PM_{2.5}$ refers to very small particles that are 2.5 micrometers or less in diameter, which is about 1 ten-thousandth of an inch, about 20 times smaller in diameter than the thickness of a human hair, and less than 1/30th the size of a grain of fine beach sand. Trial Ex. 281 [ESA Report] at 0062; Trial Ex. 961 [Chafe Report] at 0015; *accord* 1/19/18 Tr. [Moore] at 573:11-574:15.

124. Exposure to $PM_{2.5}$ causes adverse health outcomes, particularly to vulnerable populations like the West Oakland community members already disproportionately impacted by pollution.

a. Because $PM_{2.5}$ particles are extremely small, once inhaled, the particles can affect lung tissue directly and can enter the bloodstream, spreading deep within the body and damaging other internal organs. Trial Ex. 961 [Chafe Report] at 0019, 0026; *see also* 1/19/18 Tr. [Chafe] at 613:20-614:4; 1/19/18 Tr. [Moore] at 574:2-15; 575:2-4.

b. Exposure to $PM_{2.5}$ has been linked with severe health outcomes including premature death, hospitalization for cardiovascular and respiratory disease, emergency room visits, asthma, adverse birth outcomes and school absenteeism, as demonstrated by substantial evidence submitted to the City and hundreds of peer-reviewed studies, including several conducted in California. Trial Ex. 466 [$PM_{2.5}$ NAAQS rule] at 0019-20 [78 Fed. Reg. 3086, 3113-14 (Jan. 15, 2013)]; Trial Ex. 960 [PHAP Report] at 007, 0025,

0029-32, 0119-0122; Trial Ex. 281 [ESA Report] at 0062, 0078-79; Trial Ex. 440 at 0052 [Fox Report] [AR0115 at OAK 5259]; Trial Ex. 440 at 0068 [Sustainable Systems Research Report] [AR0115 at OAK 5275]; AR0059 [letter from Drs. Balmes and Lipsett] at OAK 8550-52; *see also* 1/19/18 Tr. [Moore] at 575:13-19, 577:1-21, 579:16-582:9, 583:24-584:11, 589:12-590:22, 600:10-24, 606:10-607:2; 1/19/18 Tr. [Chafe] at 611:25-612:19, 613:5-614:4.

c. The populations at greatest risk to $PM_{2.5}$ include infants and children, asthmatics and older individuals with pre-existing cardiovascular or respiratory disease, and the elderly. There is also evidence that those with lower education, income, or employment status have higher risk of death from $PM_{2.5}$ exposure. Trial Ex. 960 [PHAP Report] at 0030; Trial Ex. 281 [ESA Report] at 0062; Trial Ex. 466 [$PM_{2.5}$ NAAQS Rule] at 0020 [78 Fed. Reg. at 3104]; *accord* 1/19/18 Tr. [Moore] at 575:20-576:14.

2. *There Is Substantial Evidence that There Is No Safe Level of $PM_{2.5}$*

125. Evidence in the record established that the U.S. EPA, CalEPA, the World Health Organization, and an expert panel convened by the National Academy of Sciences all concluded there is no safe level of exposure to $PM_{2.5}$. *See, e.g.*, Trial Ex. 960 [PHAP Report] at 0029-30; Trial Ex. 961 [Chafe Report] at 0021. In its 2013 rulemaking to set $PM_{2.5}$ air quality standards, the EPA stated that "no population threshold, below which it can be concluded with confidence that $PM_{2.5}$-related effects do not occur, can be discerned from the available evidence." Trial Ex. 466 [$PM_{2.5}$ NAAQS Rule] at 0014 [78 Fed. Reg. at 3098]; *see also* 1/19/18 Tr. [Moore] at 574:25–575:4, 579:11–580:6, 586:24–589:3, 589:12–590:22; *see also* 1/19/18 Tr. [Chafe] at 615:12–616:22.

126. The current NAAQS for $PM_{2.5}$ and the related state standard are based on 24-hour or annual average calculations of the pollutant, but substantial evidence in studies show that exposures as short as one or two hours are associated with significant cardiovascular health outcomes including heart attacks. Trial Ex. 960 [PHAP Report] at 0030 (collecting studies); *see also* Trial Ex. 961 [Chafe Report] at 0017 (discussing exceedances of 24-hour standards in West Oakland) and 0022 (noting short-term effects have been documented from exposure measured in

"hours").

3. *There Is Substantial Evidence that, in Addition to the Harmful Fine Particle Size, Coal Dust Contains Toxic Constituents that Cause Adverse Health Impacts*

127. Coal dust includes toxic and harmful constituents, including toxic metals and polycyclic aromatic hydrocarbons ("PAHs") that cause adverse health impacts.

a. Coal dust contains a number of toxic heavy metals, including mercury, lead, cadmium, chromium, and nickel. Trial Ex. 961 [Chafe Report] at 0028; Trial Ex. 960 [PHAP Report] at 0039-42. These toxins have been linked to cancer, cognitive impairment, genetic defects, endocrine disruption, and other severe health outcomes. Trial Ex. 961 [Chafe Report] at 0028; Trial Ex. 960 [PHAP Report] at 0040-42. Metals in coal are also understood to contribute to the development of coal workers' pneumoconiosis, or black lung disease. Trial Ex. 961 [Chafe Report] at 0028-29.

b. Coal dust contains the metalloid arsenic, a known carcinogen associated with skin cancer, bladder cancer, and lung cancer. Trial Ex. 960 [PHAP Report] at 0041. Arsenic can also cause adverse birth outcomes and irreversible neurological damage, including sensory loss, pain, and muscle weakness. Trial Ex. 960 [PHAP Report] at 0041. Arsenic is found in coal dust and is also believed to leach out of coal piles into nearby water. Trial Ex. 961 [Chafe Report] at 0028. Arsenic is carcinogenic both when it is inhaled and when it is ingested, often through contamination of drinking water or soils. Trial Ex. 960 [PHAP Report] at 0041.

c. Substantial evidence in the record supports the conclusion that the metal content of coal is significant compared to background soil levels and that metals from the dust may be bioavailable. Trial Ex. 440 [Fox Report] at 0052-53 [AR0115 at OAK 5259-60]; Trial Ex. 960 [PHAP Report] at 0048; Trial Ex. 961 [Chafe Report] at 0017-0018].[13]

d. Coal dust contains the metalloid crystalline silica, which is a known

[13] OBOT has asserted otherwise. AR0113 [HDR Report] at OAK6768; 1/17/18 Tr. [Maier] at 392:18-393:4. But under the substantial evidence standard of review, this Court defers to the City's findings that are supported by substantial evidence.

carcinogen, and has long been known to cause chronic lung disease such as silicosis and chronic obstructive pulmonary disease. Trial Ex. 961 [Chafe Report] at 0017, 0029-30. Utah coals have particularly high levels of silica. Trial Ex. 961 [Chafe Report] at 0029. Respirable-sized silica particles are created when coal is crushed, loaded, or dumped, and freshly fractured silica is more toxic than aged silica. Trial Ex. 961 [Chafe Report] at 0017. The California Office of Environmental Health Hazard Assessment determined that in order to avoid adverse effects from prolonged silica exposure in the general public, silica levels must remain below 3 micrograms per cubic meter. Trial Ex. 960 [PHAP Report] at 0042. Air monitoring conducted near a coal export facility in Seward, Alaska revealed crystalline silica levels that exceeded this level. Trial Ex. 960 [PHAP Report] at 0042; Trial Ex. 961 [Chafe Report] at 0029.

e. There are no known doses of any of these metals or metalloids that are risk-free, especially for the very young and for those in communities exposed to multiple toxins. Trial Ex. 960 [PHAP Report] at 0039-42.

f. Heavy metals can become even more harmful when coal burns, as it would in the event of a fire at the Terminal, as the metals are released as airborne vapors that could be inhaled by residents and workers. Trial Ex. 961 [Chafe Report] at 0018-19; *accord* 1/19/18 Tr. [Chafe] at 631:25–632:5.

g. Even before coal is burned, it contains high levels of PAHs, as confirmed by scientific articles in the record. AR0085 [Achten & Hofmann (2009), published in *Science of the Total Environment*] at OAK 27080-89. PAHs are well recognized carcinogens for which there is no safe level of exposure; in part because of the presence of PAHs, coal dust is cytotoxic, meaning it is toxic to living cells, as well as mutagenic, meaning it causes mutations to DNA. AR0071 [León et al (2007) in *Mutation Research*] at OAK 24645; AR0071 [Cabarcas-Montalvo et al. (2012) in *Science of the Total Environment*] at OAK 24336; AR0095 [2013 comments by Columbia Riverkeeper et al. on Coyote Island Terminals] at OAK 16296-97. Several kinds of PAHs are included on the State of California's Proposition 65 list of toxic chemicals that are harmful to human

health. Trial Ex. 960 [PHAP Report] at 0046.

h. Coal dust, and the PAHs contained therein, may remain in nearby air and water for days or weeks after it is released, thereby perpetuating exposure to nearby communities. AR0071 [Campbell & Devlin (1997)] at OAK 24363-64; AR0108 [Baykeeper 2015 Comments] at OAK 06547-48. Some studies have shown it can persist for much longer than that. For example, one set of public comments cited a study of a coal ship that sank in 1891 near British Columbia, and found that the coal from that ship is still a source of PAH contamination in the surrounding water today. AR0106 [No Coal in Oakland Comments (2015)] at OAK 5853. There is also evidence in the record that PAHs released by coal dust can bioaccumulate (*i.e.*, become concentrated) in fish that may be destined for human consumption like Pacific salmon, and consuming contaminated fish is harmful to human health. AR0071 [Campbell & Devlin (1997), published in *Aquatic Toxicology*] at OAK 24355; AR0071 [Burger et al., (2007) published in *Journal of Toxicology & Environmental Health*] at OAK 24320 (describing why contaminants in fish are of concern to human health).

4. *There Is Substantial Evidence that the Terminal Would Emit Significant Quantities of Harmful $PM_{2.5}$ Pollution that Will Cause Adverse Health Impacts in West Oakland*

(A) Overview of Substantial Evidence Regarding Quantity of Emissions from Multiple Reports with Complementary, Corroborating Analysis

128. The record contains substantial evidence from ESA and other environmental professionals concluding that the Terminal and associated activities will generate large quantities of coal dust, including $PM_{2.5}$ pollution.

129. Accounting for mainline rail emissions, emissions from staging at the Port railyard, and Terminal operations, ESA calculated that the sum total of emissions in West Oakland from Terminal activities would be 276 tons of fugitive coal dust annually, including approximately 21 tons per year of $PM_{2.5}$. Trial Ex. 281 [ESA Report] at 0086. Owing to difficulties in estimating emissions from all sources of $PM_{2.5}$ associated with the Terminal, ESA reasonably viewed its estimate as "conservative." Trial Ex. 281 [ESA Report] at 0011, 0074, 0081, 0085.

130. ESA's estimate of 21 tons of $PM_{2.5}$ pollution emitted annually is more than double the threshold quantity of pollution that the City of Oakland uses pursuant to CEQA to evaluate the "significance" of proposed projects. Under City guidance, a project's emissions are considered significant if they exceed 10 tons per year of $PM_{2.5}$. Trial Ex. 976 [6/23/16 Agenda Report] at 0012 n.9; Trial Ex. 4 [Ordinance] at 0006 (Section 8.60.020.B.1.c); *see also* 1/17/18 Tr. [Chinkin] at 322:6-14 (noting the same threshold of significance for $PM_{2.5}$).[14]

131. Other reports predicted the Terminal would cause even higher emissions than those estimated by ESA, without even accounting for all sources of emissions associated with the Terminal.

a. A report submitted by Sustainable Systems Research estimated 323 to 646 tons per year of fugitive coal dust—from Port railyard staging activities alone. Trial Ex. 440 [Sustainable Systems Research Report] at 0061, 0065, 0072-73.

b. The PHAP, analyzing mainline rail emissions only, estimated that the Terminal would cause 90 to 620 tons of coal dust emissions annually in West Oakland. Trial Ex. 960 [PHAP Report] at 0027.

132. In addition to assessing emissions, the PHAP—based on peer-reviewed studies—assessed the potential for mainline rail operations serving the Terminal to increase ambient $PM_{2.5}$ concentrations experienced in West Oakland. According to the Panel, rail operations alone could add between 0.25 and 0.625 µg/m3 to the annual average PM2.5 concentration in West Oakland. Trial Ex. 960 [PHAP Report] at 0028.

133. In light of the currently elevated background levels of $PM_{2.5}$ in West Oakland, and based on their calculations, ESA and the PHAP both concluded that emissions from the Terminal and associated activities (a) would be significant; (b) likely would cause levels to exceed the $PM_{2.5}$ NAAQS; and (c) would cause adverse health impacts in West Oakland. *See* ¶¶ 136-42, and

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[14] ESA also estimated the potential PM_{10} emissions expected from the Terminal and its associated operations. ESA estimated 134 tons of PM_{10} emissions annually, which exceeds the City's CEQA threshold of significance which is set at 15 tons per year of PM_{10}. Trial Ex. 976 [6/23/16 Agenda Report] at 0012 n.9.

(ESA); ¶¶ 143-51 (PHAP), below.[15]

134. The Chafe Report likewise concluded it is "very likely that coal dust in the form of fine particulate air pollution from this project would harm human health." Trial Ex. 961 [Chafe Report] at 0006.

135. Other public health and environmental professionals along with expert agencies and informed community members provided further evidence that the Terminal will increase air pollution and cause adverse health consequences in West Oakland. *See* ¶¶ 178-84, below.

(B) Summary of ESA's Emissions Calculations

136. ESA calculated expected fugitive dust emissions from OBOT's operations, included the expected volumes of PM_{10} and $PM_{2.5}$ pollution. ESA's analysis was premised upon the most recent facility design and operational details available at the time—*i.e.*, the BoD submitted by OBOT. Trial Ex. 281 [ESA Report] at 0022-25, 0082-83. For example, ESA assumed an annual facility throughput of 6.5 to 7.5 million metric tons total, including 5 million metric tons of coal annually. Trial Ex. 281 [ESA Report] at 0023-0025.

137. ESA calculated emissions for three categories of activity associated with the Terminal: (a) the mainline rail transport of coal in uncovered cars; (b) the staging of such coal cars at the Port railyard and transport along the rail spur to the Terminal; and (c) Terminal operations, including the unloading, storage, transfer, and transloading of coal. Trial Ex. 281 [ESA Report] at 0070.

138. ESA based its emissions calculations upon the estimation methodologies contained in AP-42, an EPA-issued compilation of air pollutant emissions factors, subject to appropriate assumptions about the degree of pollution control that might be achieved by the control measures proposed and described by OBOT in the BoD. Trial Ex. 281 [ESA Report] at 0070-71; *see also* 1/16/18 Tr. [Evans] at 172:8-24.

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[15] OBOT's expert, Mr. Chinkin, acknowledged that "it is so important not to fall into non-attainment" because "[i]t does cause society problems." 1/17/2018 Tr. [Chinkin] at 342:19-21. OBOT's expert Dr. Maier testified that "for protective purposes, it's appropriate to use that NAAQS level as the place where we want to make sure we stay below it." 1/17/2018 Tr. [Maier] at 401:10-12.

139. ESA estimated the expected fugitive dust emissions from mainline rail car transit of coal for the Terminal. Trial Ex. 281 [ESA Report] at 0071. ESA's primary estimate was adapted from a report submitted to the record by Sustainable Systems Research. Trial Ex. 281 [ESA Report] at 0071. Utilizing an industry emissions rate supplied by BNSF in testimony before the Surface Transportation Board, ESA calculated that 82 tons of coal dust—including six tons of $PM_{2.5}$—would be emitted annually in West Oakland by coal cars traveling along the three-mile stretch of mainline rail in West Oakland. Trial Ex. 281 [ESA Report] at 0071-73.

a. This estimate assumes that the rail cars would be uncovered, based on ESA's finding that covers are not available or feasible. *See* ¶ 160, below.

b. ESA also estimated that these mainline rail emissions potentially could be reduced to 12 tons of coal dust per year—and 1 ton of $PM_{2.5}$—if surfactants were used and proved to be effective, Trial Ex. 281 [ESA Report] at 0075-76, although ESA ultimately concluded that there was no evidence in the record indicating that surfactants would be used or effective. *See* ¶¶ 167-68, below.

c. ESA cautioned that its emission estimates for mainline rail were conservative because they did not account for the re-entrainment of coal dust. Trial Ex. 281 [ESA Report] at 0011, 0038, 0073-74. Once coal dust is emitted within the rail corridor, wind and/or the wake of subsequent passing trains can re-suspend the dust, adding to local concentrations of PM_{10} and $PM_{2.5}$. Trial Ex. 281 [ESA Report] at 0073; *see also* 1/16/18 Tr. [Evans] at 183:11-25. ESA made note of this qualitative concern but was unable to quantify this additional source of mainline rail emissions because there currently is no specific guidance available from EPA on how to quantify such emissions. Trial Ex. 281 [ESA Report] at 0073-74; *see also* 1/16/18 Tr. [Evans] at 184:1–185:13.

140. ESA also calculated emissions from the staging of coal-filled rail cars at the Port Railyard prior to transport to the Terminal for unloading. Trial Ex. 281 [ESA Report] at 0079. For its staging calculations, ESA relied on the description of the timing and sequence of rail car movement provided by OBOT in the BoD. Trial Ex. 281 [ESA Report] at 0079-80. ESA utilized AP-42 emission factors for its calculations, using the same emission factors as similar

calculations submitted to the record by Sustainable Systems Research. Trial Ex. 281 [ESA Report] at 00080. ESA made adjustments of its own, however, lowering the number of assumed rail car days and adjusting peak wind speeds downward—changes that lower the estimated quantity of emissions. Trial Ex. 281 [ESA Report] at 0080-81.

a. As with the estimate of mainline rail emissions, ESA provided two estimates of the expected fugitive dust emissions from staging. Trial Ex. 281 [ESA Report] at 0080-81. Assuming that the coal cars would not be covered or controlled with surfactant, ESA estimated calculated that 156 tons of coal dust—including 11.7 tons of $PM_{2.5}$—would be emitted annually in West Oakland by staging activities. Trial Ex. 281 [ESA Report] at 0080-81. ESA also estimated that these staging emissions potentially could be reduced to 23 tons of coal dust per year—and 2 tons of $PM_{2.5}$—if surfactants were used and proved to be effective, Trial Ex. 281 [ESA Report] at 0075-76, although ESA ultimately concluded that there was no evidence in the record indicating that surfactants would be used or effective. *See* ¶¶ 167-68, below.[16]

b. After the adoption of the Ordinance and Resolution, OBOT questioned whether it was appropriate for ESA to use section 13.2.5 of AP-42 to calculate fugitive coal dust emissions from rail car staging. 1/17/18 Tr. [Chinkin] at 352:13–354:7. But AP-42 does not directly address every emissions scenario, and engineering judgment often is required to apply AP-42. *See* 1/19/18 Tr. [Sahu] at 536:10–537:15.

c. The shipment of coal by trains is not specifically addressed in AP-42. AR0095 [Canadian Government Report] at OAK16473-74. But two reports in the record indicate that use of section 13.2.5 was appropriate for ESA's calculation. Trial Ex. 440 [Sustainable Systems Research Report] at 0072 [AR0115 at OAK 5279] (using AP-42 section 13.2.5 for rail staging calculations); AR0095 [Canadian Government Report] at

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[16] ESA's estimate of 11.7 tons per year of $PM_{2.5}$ from staging is stated correctly in Table 5-4 of the report. Trial Ex. 281 [ESA Report] at 0081. Owing to a transcription error, summary Table 5-7 erroneously identifies 18 tons per year of staging emissions. Trial Ex. 281 [ESA Report] at 0086. The correct value is 11.7 tons per year of $PM_{2.5}$ for staging (rounded up to 12 tons per year). 1/16/18 Tr. [Evans] at 193:1–19.

OAK 16475 ("In regard to PM lost from coal trains, … the wind erosion estimates in AP-42 section 13.2 would be as applicable as anything …."); *see also* 1/19/18 Tr. [Sahu] at 537:6-25. OBOT has not identified any approach other than section 13.2.5 that was in the record before the City. 1/17/18 Tr. [Chinkin] at 354:2-7.

d. After the adoption of the Ordinance and Resolution, OBOT also questioned the choice of a particular value—*i.e.*, the threshold friction velocity—that ESA used as an input for its calculation following AP-42's section 13.2.5 methodology. 1/17/18 Tr. [Chinkin] at 354:15–358:16. But section 13.2.5 does not supply a threshold friction velocity value for moving, vibrating rail cars; only values for stationary piles are provided. Trial Ex. 435 [AP-42 section 13.2.5] at 0005; *see also* 1/17/18 Tr. [Evans] at 260:15–261:11; *see also* 1/19/18 Tr. [Sahu] at 538:1–542:17. The value that ESA used was supported by a report in the record that used the same value, subject to the caveat that the value was "relatively conservative" and therefore "may underestimate the actual amount of fugitive emissions occurring. Trial Ex. 440 [Sustainable Systems Research Report] at 0065, 0072 [AR0115 at OAK 5272, OAK 5279].[17]

e. As with its calculation of mainline rail emissions, ESA cautioned that its estimate of staging emissions should be considered conservative because of the inability to quantify dust from staging activities that could be re-suspended and therefore make an additional, significant contribution to local ambient concentrations of PM_{10} and $PM_{2.5}$. Trial Ex. 281 [ESA Report] at 0081.

141. In addition to emissions from mainline rail and staging, ESA calculated the expected emissions for Terminal operations, including the unloading, storage, transfer, and transloading of coal.

a. For each element of Terminal operations, ESA accepted the facility and

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[17] After adoption of the Ordinance and Resolution, OBOT also criticized the coal moisture value ESA used in its calculations. 1/17/18 Tr. [Chinkin] at 354:15 – 355:9. However, OBOT's expert admitted that he merely accepted the coal moisture value supplied in the BoD and did not have information regarding the moisture content of Bowie's Utah mines. 1/17/18 Tr. [Chinkin] at 384:20–385:7.

operational descriptions provided by OBOT—including OBOT's proffered control measures—and concluded in each instance (*i.e.*, unloading, storage, transfer, and transloading) that the control measures proposed by OBOT would constitute the Best Available Control Technology (BACT) as defined by BAAQMD regulations. Trial Ex. 281 [ESA Report] at 0081–83; *see also* 1/17/18 Tr. [Evans] at 238:7–16 (for its estimates of Terminal emissions, ESA assumed controls that BAAQMD "would have required).[18]

b. Using standard AP-42 procedures, ESA calculated that Terminal operations would produce 37.5 tons of coal dust annually, including 2.7 tons of $PM_{2.5}$ per year. Trial Ex. 281 [ESA Report] at 0081–83.[19]

142. Accounting for mainline rail, staging, and Terminal operations, ESA calculated that the sum total of emissions in West Oakland from Terminal activities would be 276 tons of fugitive coal dust annually, including approximately 21 tons per year of $PM_{2.5}$. Trial Ex. 281 [ESA Report] at 0086.[20] Based upon these emissions calculations, ESA concluded that the Terminal and its associated activities are "expected to be significant in terms of providing additional contributions to local concentrations of PM_{10} and $PM_{2.5}$." Trial Ex. 281 [ESA Report] at 0085. According to ESA, expected emissions along with the expected, continual re-entrainment of fugitive coal dust would contribute to local levels of PM_{10} and $PM_{2.5}$ and "would likely add to the existing number of exceedances of the California and federal $PM_{2.5}$ air quality standards." Trial Ex. 281 [ESA Report] at 0084. ESA stated that the additional emissions could therefore contribute to additional health issues experienced by community members in West

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[18] Moreover, Dr. Sahu confirmed that ESA accounted for BACT, based on his review of ESA spreadsheets. 1/19/18 Tr. [Sahu] at 526:5-17; *see also* 1/17/18 Tr. [Chinkin] at 383:10-18 (noting ESA's calculations used reduced wind speeds to account for controls at the Terminal). OBOT suggests that a higher control efficiency should have been assumed, but BACT is subject to many variables and cannot be known with exactitude before permitting is completed. *See* ¶ 175, below.

[19] ESA's calculations for Terminal operations are summarized in Table 5-6. Trial Ex. 281 [ESA Report] at 0082.

[20] As discussed above, the annual tonnage of $PM_{2.5}$ emissions displayed in Table 5-7 is erroneous owing to a transcription error. However, the bottom-line total of 21 tons of $PM_{2.5}$ per year for all sources in West Oakland is correct.

Oakland. Trial Ex. 281 [ESA Report] at 0011, 0084.[21]

(C) Summary of the Public Health Advisory Panel's Ambient Concentration Estimate

143. The PHAP is comprised of physicians and scientists with doctorates and other advanced degrees and their report was endorsed by physicians and other scientists with advanced degrees. Trial Ex. 960 [PHAP Report] at 0002, 0004-05.

144. In compiling its report, not only did the PHAP review available evidence in the record submitted as of the date of the report's issuance, the Panel also identified additional scientific references and other sources and conducted further analyses and original calculations. Trial Ex. 960 [PHAP Report] at 0001, 0007.

145. The PHAP Report concluded that transporting coal by rail through the City of Oakland and transferring it through the OBOT facility will increase exposures to air pollutants with known adverse health effects including deaths. Trial Ex. 960 [PHAP Report] at 0007. The Panel found that an increase in air pollution exposure poses unique risks for West Oakland, a neighborhood already burdened by significant and inequitable environmental hazards in addition to a high prevalence of poverty, coexisting chronic diseases, and reduced access to health care. Trial Ex. 960 [PHAP Report] at 0009. According to the Panel, if coal is transported, stored, and handled in Oakland, it is "highly likely that there will be increases in adverse health outcomes." Trial Ex. 960 [PHAP Report] at 0009.

146. The Panel concluded that increased emissions of coal dust and diesel pollutants will likely push current outdoor air concentrations of $PM_{2.5}$ over state and federal air quality standards. Trial Ex. 960 [PHAP Report] at 0007, 0025-29. To reach this conclusion, the Panel relied on peer-reviewed studies to assess the existing background concentration of $PM_{2.5}$ in West Oakland and to calculate the potential increase in concentrations that can be expected from OBOT's operations. Trial Ex. 960 [PHAP Report] at 0007, 0025-29.

147. To assess the existing background level of $PM_{2.5}$ in West Oakland, the Panel

[21] ESA separately stated that the volume of PM_{10} and $PM_{2.5}$ emissions are expected to be similar, if not greater, for coke. Trial Ex. 281 [ESA Report] at 0011, 0087-88.

reviewed data from a special West Oakland air monitoring study; the study was conducted by BAAQMD and the results were published in a peer-reviewed journal. Trial Ex. 960 [PHAP Report] at 0025-26. Isolating the data from three air quality monitors in West Oakland closest to and downwind of the Terminal site, the Panel determined that the annual average concentration of $PM_{2.5}$ is approximately 11.5 $\mu g/m^3$ in the nearest residential areas. Trial Ex. 960 [PHAP Report] at 0026. This level is just below the NAAQS and corresponding state standard for annual average $PM_{2.5}$ concentrations, both of which are set at 12 $\mu g/m^3$. Trial Ex. 960 [PHAP Report] at 0026; Trial Ex. 281 [ESA Report] at 0060.

148. To estimate the expected incremental increase in $PM_{2.5}$ concentrations in West Oakland associated with the Terminal and associated rail activities, the Panel relied upon recent studies of 367 coal trains in Washington State which identified distinct $PM_{2.5}$ increases from coal trains above and beyond the pollution increases observed from trains carrying other freight. Trial Ex. 960 [PHAP Report] at 0028 (citing Jaffe et al. 2014, AR0043 at OAK 8622 [attached to 6/27/16 Earthjustice letter as attachment B] and Jaffe et al. 2015, AR0123 at OAK 5581 [attached to 10/6/15 Earthjustice letter as exhibit 7]); *see also* 1/17/18 Tr. [Evans] at 229:3-232:15 (summarizing Jaffe studies).[22] Based on data from the studies which linked the magnitude of the observed $PM_{2.5}$ concentration increases from coal trains with "effective wind speed" (*i.e.*, a combination of train speed and wind speed), the Panel utilized information on West Oakland train and wind speeds to estimate the short-term $PM_{2.5}$ concentration increases expected from coal trains delivering coal to the Terminal. The Panel estimated that coal trains making deliveries to the Terminal would regularly cause short-term $PM_{2.5}$ "enhancements" (*i.e.*, spikes) of approximately 20 $\mu g/m^3$ over background with some higher enhancements of 45 $\mu g/m^3$. Trial Ex. 960 [PHAP Report] at 0028.

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[22] The record before the City Council contained a manuscript of Jaffe et al. 2015. AR0123 at OAK 5581 [Ex. 7 to 10/6/15 Earthjustice letter]. At the time the manuscript was submitted, it had been accepted for publication, but not yet published in final form. *See* AR0107 at OAK 6290 [manuscript acceptance letter]. The citation for the published version is as follows: Jaffe, D. et al. 2015. Diesel particulate matter and coal dust from trains in the Columbia River Gorge, Washington State, USA. *Atmospheric Pollution Research* 6, 946-952, *available at* http://www.sciencedirect.com/science/article/pii/S1309104215000057 (last visited Feb. 8, 2018).

149. The Panel subsequently converted these estimates of short-term $PM_{2.5}$ concentration spikes from expected coal train traffic into an estimate of the impact upon the annual average concentration in Oakland. According to the Panel, coal trains headed for the Terminal ultimately could add between 0.25 and 0.625 $\mu g/m^3$ to the annual average $PM_{2.5}$ concentration in West Oakland. Trial Ex. 960 [PHAP Report] at 0026, 0028. Because the estimated annual average $PM_{2.5}$ background level in West Oakland is already 11.5 $\mu g/m^3$, the upper range of the Panel's estimated increase from coal trains would exceed the annual NAAQS and state standard of 12 $\mu g/m^3$. Trial Ex. 960 [PHAP Report] at 0028. The panel cautioned that this calculation does not include potential additional increases from the re-entrainment of coal dust on the tracks or staging or Terminal operations, both of which are additional sources of $PM_{2.5}$. Trial Ex. 960 [PHAP Report] at 0029.

150. The Panel also noted that an increase in the annual average of 0.25 to 0.625 $\mu g/m^3$ would push West Oakland even further above the $PM_{2.5}$ standard set by the World Health Organization (WHO), which is an annual average of 10 $\mu g/m^3$. Trial Ex. 960 [PHAP Report] at 0028.

151. In comparing expected increased concentrations of $PM_{2.5}$ associated with the Terminal to existing state, federal, and WHO standards, the Panel cautioned that the standards do not represent thresholds or an absolutely safe level of exposure and stated that "$PM_{2.5}$-associated death and disease effects definitely occur below these levels." Trial Ex. 960 [PHAP Report] at 0026. According to the Panel, the data suggest that every incremental increase in $PM_{2.5}$ is related to negative health outcomes. Trial Ex. 960 [PHAP Report] at 0007, 0026, 0029.

(D) The Chafe Report Evidence on Adverse Health Impacts Due to Emissions

152. Consistent with the analyses performed by ESA and the Public Health Advisory Panel, Dr. Chafe concluded that there is "substantial evidence" that the coal handling, storage, and associated activities proposed for the Terminal "would endanger the health and safety" of community members, including workers. Trial Ex. 961 [Chafe Report] at 0006. Dr. Chafe found that there is no evidence that coal dust can or will be fully contained, meaning that community members' and workers' exposure "is inevitable." Trial Ex. 961 [Chafe Report] at 0008, *accord*

0032. She observed that $PM_{2.5}$ concentrations in West Oakland are already at a harmful level, Trial Ex. 961 [Chafe Report] at 0008, 0017, and there is no safe level of exposure. Trial Ex. 961 [Chafe Report] at 0008, 0021. Consequently, Dr. Chafe concluded "[i]t is very likely that coal dust in the form of fine particulate air pollution ($PM_{2.5}$) from this project would harm human health." Trial Ex. 961 [Chafe Report] at 0006; *accord* 0045-46; *see also* 1/19/18 Tr. [Chafe] at 620:5 – 623:11.

153. In support of her conclusions, Dr. Chafe highlighted a study of children living near a bulk handling port which found an increased prevalence of respiratory symptoms in those children that were exposed to coal dust. Trial Ex. 961 [Chafe Report] at 0009, 0046. The port addressed in the study handled less than 2 million tons of coal and coke at its peak, far less than the 5 to 10 million metric tons of coal and coke that is forecast for the Terminal. Trial Ex. 961 [Chafe Report] 0009, 0046.

154. Dr. Chafe also cited an air quality analysis performed for a proposed bulk terminal, similar in design to OBOT's facility; the study concluded that $PM_{2.5}$ emissions would increase to a level that would cause exceedances of the $PM_{2.5}$ NAAQS—even without including background concentrations. Trial Ex. 961 [Chafe Report] 0016-0017 (citing AR0131 [Alameda County Public Health Department Response to Questions] at OAK 6628).

155. Dr. Chafe also highlighted significant concerns for the health of workers at the Terminal. Workers at the Terminal will be in closest contact to the coal dust during unloading, transfer, and transloading activities, and if Terminal facilities are indeed enclosed—as OBOT has pledged—concentrations of coal dust in such enclosed spaces is expected to be high. Trial Ex. 961 [Chafe Report] at 0006, 0010, 0035-0041. According to Dr. Chafe, there is evidence that current workplace safety standards are inadequate, meaning workers will be at risk even if current occupational standards are met. Trial Ex. 961 [Chafe Report] at 0006, 0039-41.

156. In addition to the general harms of $PM_{2.5}$, Dr. Chafe noted that the smallest portion of $PM_{2.5}$ is classified as "ultrafine" particulate matter—characterized by an even smaller diameter than $PM_{2.5}$ (*i.e.*, less than 0.1 micrometer ("µm")). Trial Ex. 961 [Chafe Report] at 0009, 0027-0028. Dr. Chafe identified mounting evidence that such ultrafine particles in coal dust are even

more harmful than generalized $PM_{2.5}$, but nonetheless are typically underestimated in analyses that focus on $PM_{2.5}$. *Id.*

5. *Substantial Evidence Establishes that Covers for Coal Cars Are Unproven and Not Commercially Available*

157. Coal is typically shipped in open-top rail cars. 1/17/18 Tr. [Buccolo] at 312:16-18; 1/19/18 Tr. [Sullivan] at 657:17-22. Bowie currently ships coal in open-top rail cars to ports in California for export. Wolff Tr. 176:8-9, 176:13.

158. At trial, representatives from all sides acknowledged that they are not aware of the commercial use of railcar covers for coal anywhere in the United States. 1/16/18 Tr. [Tagami] at 77:22-25; Wolff. Tr. at 174:17-18, 21-22, 176:8-9, 13, 177:1-5; 1/19/18 Tr. [Sullivan] at 657:10-13, 662:19-663:2; 1/17/18 Tr. [Buccolo] at 312:12-21; *see also* Trial Ex. 149 [10/6/2015 Response] at 0045. OBOT was able to cite only one potential example of shipping covered lignite over short distances; lignite is a low quality coal-related product that is not intended to be transported , stored, or handled at the Terminal. 1/16/18 Tr. [Tagami] at 77:22-25; 1/19/18 Tr. [Sullivan] at 663:21-25; 1/17/18 Tr. [Buccolo] at 296:24 to 297:3; *see also* Trial Ex. 149 [10/6/2015 Response] at 0045.

159. Rail car covers have been used to transport other bulk goods. However, enclosing coal in a rail car is untested. There are also concerns about costs, logistics, and potential risk of self-combustion. Trial Ex. 440 [Fox Report] at 0048 [AR0115 at OAK 5255]; Trial Ex. 960 [PHAP Report] at 0034-35.

160. The record before the City Council includes ample evidence that rail covers are not available for coal cars. ESA contacted the rail car cover manufacturer identified by the Terminal's proponents (*i.e.*, EcoFab), and confirmed with an EcoFab representative that EcoFab covers have not been tested for covering rail cars filled with coal. Trial Ex. 281 [ESA Report] at 0032; 1/16/18 Tr. [Evans] at 188:5-21. ESA also contacted other potential manufacturers of covers, but ultimately was not able to confirm the historical use of rail car covers for coal nor could it confirm their effectiveness owing to the lack of any documentation in scientific field demonstrations or peer reviewed journal studies. Trial Ex. 281 [ESA report] at 0033-34.

161. Beyond ESA, several others independently researched and assessed the possibility of covered coal cars, and determined that they are not a possible control measure.

a. For example, the Public Health Advisory Panel conducted interviews with car cover manufacturers but could find no evidence that covers for coal train cars are currently in use or had even been sold commercially in the U.S., and concluded that their use has not been demonstrated in the field to be safe, reliable or effective. Trial Ex. 960 [PHAP Report] at 0008, 0033-35.

b. Based on a literature review, Sustainable Systems Research likewise found that covers for coal cars are not in production, have never been in production, and have never been field tested for their ability and effectiveness for reducing fugitive coal dust on extended train trips. Trial Ex. 440 [Sustainable Systems Research Report] at 0061, 0065, 0067 [AR0115 at OAK 5268, 5272, 5274].

c. Dr. Phyllis Fox also found no history of use of covered rail cars and could not identify a commercial source for covered coal rail cars. Trial Ex. 440 [Fox Report] at 0047-48 [AR0115 at OAK 5254-55].

d. Concerned community member Lora Jo Foo spoke with representatives of five companies that had purportedly designed rail car covers for coal and found that none of the companies had ever manufactured a coal cover for sale, and none of the covers had been field tested. Trial Ex. 960 [Letter from Foo to Cappio dated 6/2/2016] at 0124–27.

162. There is no regulatory requirement of any sort for coal cars to use covers. Trial Ex. 440 [Fox Report] at 0047; *accord* 1/17/18 Tr. [Buccolo] at 312:19-21. Further, neither the City nor the Air District can require covered rail cars due to federal control over railroad operations. Trial Ex. 960 [PHAP Report] at 0034; *accord* 1/17/18 Tr. [Evans] at 236:17 – 237:2; *see also* 1/17/18 Tr. [Chinkin] at 382:8-15 (agreeing BAAQMD's authority is limited to "inside the fence line of a facility"). Indeed, OBOT's counsel submitted a letter to the record asserting that federal law would preempt any efforts by the City that would burden rail transportation. AR0119 [OBOT letter 9/8/2015] at OAK 7664, 7750.

163. Although OBOT has argued that it or TLS might utilize covered cars voluntarily,

neither OBOT nor TLS possess the control necessary to impose this obligation: "The Terminal would have no control over whether the trains arrive covered or uncovered." Trial Ex. 440 [Fox Report] at 0053 [AR0115 at OAK 5260]; *see* Trial Ex. 960 [PHAP Report] at 0034.

164. The rail cars carrying coal will be owned or leased by Bowie from third parties or the rail carrier(s). Wolff Tr. at 175:8-11, 175:14-18. Railroads like Union Pacific or federal bodies play a role in determining what types of rail cars Bowie can use, and whether those rail cars could be covered. Wolff Tr. 175:22-23, 176:1-7, 178:8-9, 178:12-13.

6. *Substantial Evidence Shows that Surfactants Will Not Prevent Health and Safety Impacts that Would Be Caused by the Transport of Coal*

165. Currently, Bowie does not use surfactants on its coal shipped from Utah to California. Wolff Tr. at 164:14-21, 176:14-19.

166. OBOT's consultant HDR opined that the use of topping agents like surfactants could effectively limit rail emissions to a "negligible" amount. AR0113 [HDR Report] at OAK 6758-59. But nowhere has OBOT explained how or where surfactant would be applied.[23] The decision to use surfactant will not be made by OBOT or even TLS; it is Bowie that owns the coal for the duration of its transport, Dkt. 135 [OBOT's Opening Summary Judgment Br.] at 3.

167. There is no federal or state regulatory requirement to apply surfactant—*i.e.*, it is not required by the Department of Transportation, the Surface Transportation Board, the Federal Railroad Administration, or EPA. Trial Ex. 281 [ESA Report] at 0031-32, 0039. While two rail carriers have a tariff involving the use of topping agents like surfactants, one (BNSF) only requires it for coal shipments from Montana and Wyoming, and the other (CSX Transportation) only operates in the eastern United States. Trial Ex. 281 [ESA Report] at 0031; Trial Ex. 440 [Sustainable Systems Research Report] at 0066 [AR0115 at OAK 5273]. Further, companies have challenged BNSF's requirement before the Surface Transportation Board, and compliance appears to be low (estimated at 30%). Trial Ex. 281 [ESA Report] at 0037, Trial Ex. 960 [PHAP

[23] Pictures of car-spraying machinery are shown in the ESA Report. Trial Ex. 281 [ESA Report] at 0149-0150. No such equipment is proposed in the BoD for the Terminal or the rail route, and Bowie does not typically spray cars leaving its Utah mines. Wolff Tr. at 164:14-21, 176:14-16, 176:18-19.

Report] at 0035–36.

168. Even if surfactants or "topping agents" were used, the record lacks evidence that their use would effectively control coal dust generally and $PM_{2.5}$ specifically. ESA found that current plans for the Terminal contemplate that coal that will be shipped from Utah mines 700 miles away, and there is a lack of objective scientific data proving the continuous effectiveness of surfactants or topping agents to reduce emissions during a complete trip from Utah to Oakland. Trial Ex. 281 [ESA Report] at 0038. Other substantial evidence in the record—from the PHAP and Sustainable Systems Research—likewise found that topping agents degrade over time, meaning surfactants applied in Utah will not significantly reduce coal dust emissions locally. Trial Ex. 960 [PHAP Report] at 008, 0027-28; Trial Ex. 440 [Sustainable Systems Research Report] at 0061-65 [AR0115 at OAK 5268-72]; *see also* 1/19/18 Tr. [Sahu] at 554:8-12.

169. The only evidence presented by OBOT in the record regarding the alleged effectiveness of surfactants comes from a BNSF study known as the "Super Trial." Trial Ex. 281 [ESA Report] at 0036. This study suggested a 75 to 93 percent effectiveness at reducing dust from coal filled rail cars—though the results applied only at the time of rail car loading. Trial Ex. 281 [ESA Report] at 0036. ESA did not credit the study because it was not published in a peer-reviewed journal, the specific details of the BNSF testing were never even released publicly, ESA identified a host of other significant missing data issues, and evidence presented to the Surface Transportation Board suggests that, even in BNSF's Super Trial, the surfactants had failed by the end of the tests. Trial Ex. 281 [ESA Report] at 0036-38.

170. Effectiveness over distance is important because coal dust is created continuously. Substantial evidence establishes that dusty erodible materials are generated continuously throughout the train trip. Trial Ex. 440 [Fox Report] at 0048 [AR0115 at OAK 5255] ("The movement of cars during transit creates vibrations that break larger pieces of coal into smaller particles; creating a continuous sources of dust as the trains travel to their destinations"); Trial Ex. 440 [Sustainable Systems Research Report] at 0065 [AR0115 at OAK 5272] ("It is important to note that every time a train is moved, or jostled, the coal is disturbed"); 1/19/18 Tr. [Sullivan] at 661:22–662:18; 1/16/18 Tr. [Evans] at 190:20-23; *accord* 1/19/18 Tr. [Sahu] at 542:22 –

544:7.[24] Further, peer-reviewed studies have documented coal dust emissions emanating from trains well after departure, near their ultimate destination. Trial Ex. 960 [PHAP Report] at 0045 (citing Jaffe et al. 2014, AR0043 at OAK 8622 [attached to 6/27/16 Intervenors' letter as attachment B] and Jaffe et al. 2015, AR0123 at OAK 5581 [attached to 10/6/15 Intervenors letter as exhibit 7])); *accord* 1/16/18 Tr. [Evans] at 201:10-24 (discussing Jaffe studies).[25]

171. Substantial evidence shows that regardless of the use of covers and/or surfactants, neither address the loss of coal dust from the bottom of rail cars; coal dust still accumulates at the bottom of the car and can escape during transit, leaking out around the doors of bottom-dump cars. Trial Ex. 281 [ESA Report] at 0038, 0071; Trial Ex. 961 [Chafe Report] at 0070 n.244; Trial Ex. 440 [Fox Report] at 0048 [AR0115 at OAK 5255]; *accord* 1/16/18 Tr. [Evans] at 187:22 – 188:4; 1/19/18 Tr. [Sullivan] at 656:17 – 657:3; 657:25 – 658:5. Roughly 7 percent of the dust lost during transport by rail leaks from the bottom of bottom-unloading cars. Trial Ex. 440 [Fox Report] at 0053 [AR0115 at OAK 5260]; Trial Ex. 960 [PHAP Report] at 0034 (citing CCIG's BoD); *see also* 1/19/18 Tr. [Sullivan] at 660:2-13. This dust that escapes from the bottom of the cars can be stirred up by winds or later trains passing, potentially re-suspending air pollution repeatedly. Trial Ex. 281 [ESA Report] at 0038. OBOT purportedly intends to use bottom-unloading cars at the proposed Terminal. Trial Ex. 960 [PHAP Report] at 0034; Trial Ex. 281 [ESA Report] at 0025, 0030; *accord* 1/19/18 Tr. [Sullivan] at 656:23-657:3.

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[24] Although OBOT has argued that coal dust is predominantly lost at the beginning of a rail trip, when the cars are accelerating, AR0113 [HDR Report] at OAK6756, substantial evidence in the record indicates to the contrary, as discussed above.

[25] OBOT attempted to discredit the Jaffe studies by claiming that the measuring devices used in the study were not properly calibrated to detect coal dust, and that the authors had no way of determining whether the $PM_{2.5}$ measured was coal dust or diesel particulate matter. Trial Ex. 149 [CCIG Response to Questions] at 0050 [AR0122 at OAK 7512]; 1/17/18 Tr. [Chinkin] at 374:24-375:20. In fact, both the authors and peer reviewers of the study were aware that the equipment used was not designed specifically for coal dust, and they used a method approved by the US EPA to calibrate the equipment. AR0123 [Jaffe et al. 2015] at OAK 5592; *see also* Trial Ex. 961 [Chafe Report] at 0073; 1/19/18 Tr. [Chafe] at 618:22-619:8. Similarly, the authors were able to discern the fraction of the $PM_{2.5}$ that was from diesel emissions by looking for black carbon, which is a marker unique to diesel emissions, and by using the difference in weight between diesel PM and coal dust. AR0123 [Jaffe et al. 2015] at OAK 5596-98; 1/19/18 Tr. [Chafe] at 619:9-19.

7. *Substantial Evidence Shows other Regulatory Measures Will Not Prevent Health Impacts*

172. Because coal was not addressed in the CEQA review, none of the mitigation measures from that review specifically address coal dust impacts. Trial Ex. 440 [Fox Report] at 0038 [AR0115 at OAK 5245].

173. BAAQMD does not have a rule governing coal terminals, unlike the South Coast Air Quality District, which has Rule 1158 governing coal terminals. Trial Ex. 960 [PHAP Report] at 0060; *see also* 1/19/18 Tr. [Cappio] at 484:13-16.

174. South Coast Air Quality Management District Rule 1158 only applies to rail cars within the strict boundary of the permitted facility. Trial Ex. 453 [Rule 1158] at 0005, 0010-0011 (subdivision (d)(2), (e)(10)). The rule does not require that such cars be covered physically. While the rule does state that a rail car may not transport material within facility boundaries unless it is "covered," Trial Ex. 453 [Rule 1158] at 0010-11 (subdivision (e)(10)), physical covers are not required; instead, any method "proven effective in preventing visible fugitive PM emissions escaping from the railcar and approved by the [Air District]" is allowed. Trial Ex. 453 [Rule 1158] at 0011 (subdivision (e)(10)(D)). However, it is unclear what coal-carrying rail cars, if any, are controlled by even this requirement, which is subject to a significant exception: it "shall not apply to coal inside railcars that originated from outside of California, provided the coal is moistened upon arrival." Trial Ex. 453 [Rule 1158] at 0015 (subdivision (k)(9)). Since coal is not mined in and therefore does not originate in California (*see* Dkt. 74 [First Amended Complaint] ¶ 127; Trial Ex. 281 [ESA Report] at 0046-48), Rule 1158 merely requires that coal cars, upon arrival at the permitted facility, be moistened.[26]

175. BAAQMD's regulations do generally require the installation of "best available control technology" (BACT) at stationary sources like the Terminal, but the measure(s) to be implemented as BACT at a given facility are not determined until BAAQMD issues an operating permit. *See generally* Dkt. 166-3 [BAAQMD Reg. 2, Rule 2]. Further, use of BACT does not

[26] OBOT's air quality expert admitted that he is not familiar with the entirety of Rule 1158. 1/17/18 Tr. [Chinkin] at 382:16-20.

eliminate all emissions; it only reduces emissions to the extent feasible—subject to a variety of factors including an explicit consideration of cost and energy requirements. Dkt. 166-3 [BAAQMD Reg. 2, Rule 2] at § 202 (defining BACT); *see also* ¶ 180, below (testimony by BAAQMD's director of planning encouraging the City's efforts to minimize air pollution emissions).

176. The PHAP also noted that it is possible to apply BACT and yet still have emissions that are detrimental to health in cases where sufficient technological controls have not been developed. Trial Ex. 960 [PHAP Report] at 0060-61.

177. Neither BACT specifically nor BAAQMD oversight generally prevent accidents, upsets, or violations at regulated facilities, like the major fire that occurred at the Chevron refinery in 2012. That fire sent an estimated 15,000 people to the emergency room, and the long-term health consequences for community members are still unknown. AR0068 [5/16/16 Letter from Dr. Davis of Alameda County Public Health Dep't to City of Oakland] at OAK 0020985.

8. *Other Substantial Evidence in the Record Confirms that Storing and Handling Coal at the Terminal Would Pose a Substantial Danger from Increased Air Pollution*

178. Dr. Phyllis Fox, a licensed professional environmental engineer, prepared a report on the environmental, health, and safety impacts of the proposed terminal, which was submitted to the City Council on September 21, 2015, as an attachment to a letter submitted on behalf of Sierra Club, West Oakland Environmental Indicators Project, San Francisco Baykeeper, and Communities for a Better Environment. Trial Ex. 440 [9/21/15 Earthjustice Letter] at 0001, 0036 [Fox Report] [AR0115 at OAK 5208, OAK 5243]. Dr. Fox's report came to the following conclusions: (1) the design documents and drawings provided by OBOT were not specific enough to demonstrate enforceable emissions controls; (2) up to 79 millions of gallons of water per year could be required to control coal dust at the terminal; (3) rail cars are expected to emit significant amounts of coal dust in California; (4) locomotives for trains transporting coal in Oakland to the Terminal would emit carcinogenic diesel particulate matter at amounts that are higher than locomotives for trains transporting other bulk goods because coal cars are heavier than cars carrying other bulk goods; (5) trains at the terminal would result in significant traffic, noise, and

vibration impacts; and (6) none of the impacts discussed in Dr. Fox's report were analyzed in the CEQA review of the project. Trial Ex. 440 at 0037-38 [Fox Report]] [AR0115 at OAK 5244-45].

179. The September 21, 2015 letter from Sierra Club et al. also attached a technical memorandum on air quality, climate change, and environmental justice issues, authored by Sustainable Systems Research, LLC, and more specifically by Dr. Deb Niemeier and two of her colleagues. Trial Ex. 440 [9/21/15 Earthjustice Letter] at 0059, 0075–83 [Sustainable Systems Research Report] [AR0115 at OAK 5266, OAK 5282-90]. Dr. Niemeier and her colleagues estimated that based on the project information available at that time, the project could generate 323 tons per year of fugitive coal dust, and that there are no proven topping agents that effectively reduce coal dust over long trips, nor was there any evidence of rail car covers for coal being produced or tested. Trial Ex. 440 at 0061, 0065, 0072-73 [Sustainable Systems Research Report] [AR0115 at OAK 5268, OAK 5272, OAK 5279-80]. Finally, Dr. Niemeier noted that the Terminal project's emissions would exacerbate health problems in a neighborhood already overburdened by air pollution and vulnerable to asthma and other respiratory ailments. Trial Ex. 440 at 0068-69 [Sustainable Systems Research Report] [AR0115 at OAK 5275-76].

180. The record included comments from government agencies, including the Alameda County Public Health Department, the U.S. Environmental Protection Agency, and the Bay Area Air Quality Management District. Trial Ex. 281 [ESA Report] at 0009, 0018-19.

a. The Alameda County Public Health Department offered written and oral evidence regarding adverse health impacts. AR0038 [9/21/15 Hearing Tr., Dr. Muntu Davis] at 42:12-43:2; AR0030 [6/26/16 Hearing Tr., Dr. Erica Pan] at 83:24-87:2; Trial Ex. 660 [ACPHD letter] [AR0105]; AR0131 [ACPHD response to questions]. The Health Department emphasized that the health impacts of coal storage and handing would be severe, particularly in West Oakland, where the rate of asthma emergency department visits is nearly two times the county rate, and an African-American child in West Oakland can expect to die 12 years earlier than a white child in the Oakland hills. AR0131 [ACPHD response to questions] at OAK 6628.

b. A representative of the U.S. EPA, Richard Grow, testified that the

Terminal developers' undisclosed plans to bring coal to the Terminal were inconsistent with efforts to address pollution in the local community. AR0038 [9/21/15 Hearing Tr.] at 58:22-60:6, 61:18-62:5, 62:8-19.

c. The director of planning at BAAQMD, Henry Hilken, also provided testimony at the September 21, 2015 public hearing. AR0038 [9/21/15 Hearing Tr.] at 167:3-6. Mr. Hilken stated, "I'm here to ask you as strongly as I can that as you deliberate on this, you do consider the air quality impacts and the maximum possibility air quality mitigations that are feasible." AR0038 [BAAQMD Response to Questions] at 167:11-14. Mr. Hilken submitted additional testimony to the City on October 5, 2015, via e-mail. He discussed the coal terminal in Richmond, stating that while BAAQMD did not "does not have readily available data on specific health impacts to Richmond residents of coal shipments in Richmond," "we do know that Richmond [like West Oakland] is exposed to relatively high levels of air pollution and residents suffer the health effects of these elevated emissions due to multiple sources of air pollution in close proximity." AR0130 [BAAQMD Response to Questions] at OAK 4956. While additional research could provide a precise quantification of the amount of particulate matter that would be attributable to coal products, "Air District staff believes, however, that previous air quality modeling and measurements amply demonstrate that the West Oakland community experiences higher exposure to air pollution, and associated health effects, compared to other parts of the region, and that continued efforts to minimize air pollution emissions are needed." AR0130 [BAAQMD Response to Questions] at OAK 4956.

181. Dr. Bart Ostro, the former Chief of the Air Pollution Epidemiology Section of the California EPA, and the author of more than 100 peer-reviewed publications, including many articles on the health effects of air pollution, *see* Trial Ex. 961 [Chafe Report] at 0021, n.42, offered extensive substantial evidence, including (1) "California EPA, USEPA and WHO have specified there is no clear cut safe level for" $PM_{2.5}$ exposure; (2) "[s]tudies from epidemiologists and cardiologists have demonstrated in peer reviewed journals that there is a clear causal relationship between both very short (a day or multiple days) and longer-term (several months to

years) exposure to $PM_{2.5}$ and a wide range of adverse health outcomes (Brook et al 2010);" (3) "$PM_{2.5}$ is associated with respiratory symptoms, school and work loss, asthma exacerbation, emergency room visits, non-fatal heart attacks, adverse birth outcomes (premature births, low birth weight), hospital admissions, and death from cardiovascular disease;" (4) BAAQMD analysis shows that the wind in West Oakland blows from the west 70% of the time in the winter and 100% of the time in the summer, all of which demonstrated that "it is very likely that there will be adverse health effects associated with blowing coal dust in West Oakland and Oakland in general." Trial Ex. 657 [Response to Follow-Up to Questions from Residents and Non-Residents] at 0021-0026.

182. A local community group, No Coal in Oakland ("NCIO"), submitted a lengthy comment letter to the City Council on September 18, 2015, on behalf of itself and four other community organizations. AR0106 [9/18/15 NCIO Letter] at OAK 5837. NCIO's comments addressed health and safety concerns arising from coal handling and storage, including particulate matter and other toxic elements in coal, the infeasibility of coal covers on rail cars, the fire and explosion risks of enclosed storage and handling facilities, and the potential for water contamination. AR0106 [9/18/15 NCIO Letter] at OAK 5842-53.

183. The record also contains first-hand testimony describing conditions working at a coal terminal, from Katrina Booker, a member of the International Longshore and Warehouse Union who used to work at the Port of Stockton (a former emergency room nurse, too). AR0038 [9/21/15 Hearing Tr.] at 98:3-15. Ms. Booker testified that when she worked with coal at the Port of Stockton, the coal conveyor belts would rattle and shake, and coal and coal dust would spill along the conveyer. AR0038 [9/21/15 Hearing Tr.] at 99:19-100:2. "I have to wear my mask, which that doesn't keep the coal out. So at the end of the day my eyes are burning and red, I get nose bleeds, when I go home I have headaches. It's hard for me to breathe because whatever has gotten past that mask while I'm working, I have already inhaled that in my lungs. So now my chest feels heavy like weights are on them." AR0038 [9/21/15 Hearing Tr.] at 100:3-11. As a result of this experience, "I choose not to work the coal when I go work in Stockton. That is one job that I will not do. And it's not about the money, it's that I'm a mother of children, and if I'm

not healthy, who's going to take care of my kids?" AR0038 [9/21/15 Hearing Tr.] at 100:10-15.

184. Defendant-Intervenors Sierra Club and San Francisco Baykeeper submitted a total of seven comment letters to the City Council on the proposed terminal project, most of which were submitted jointly with other local environmental organizations. *See* AR0120 [9/2/15 letter] at OAK 6728; AR0123 [9/14/15 letter] at OAK 5451; Trial Ex. 440 [9/21/15 Earthjustice Letter] at 0001 [AR0115 at OAK 5208]; AR0118 [9/21/15 Baykeeper letter] at OAK 4988; AR0123 [10/6/15 letter] at OAK 5431; AR0043 [6/27/16 letter] at OAK 8608. These letters included substantial technical and scientific materials that addressed the health and safety dangers of a coal terminal. For example, Intervenors' September 21, 2015 letter attached three expert reports, including those of Dr. Phyllis Fox and Dr. Deb Niemeier. Trial Ex. 440 [9/21/15 Earthjustice Letter] at 0001, 0036 [Fox Report], 0059 [Sustainable Systems Research Report] [AR0115 at OAK 5208, OAK 5243, OAK 5266]. One week earlier, Intervenors submitted four DVDs that contained information, reports, and analyses completed for three comparable coal export terminals in the Pacific Northwest. *See* AR0123 at OAK 5451-52 [9/14/15 letter]. The materials on those four DVDs are contained in the record at AR0070 through AR0096.

D. Safety Conditions: Substantial Evidence Supports the City's Determination that the Failure to Apply the Ordinance to OBOT Would Create Substantially Dangerous Safety Conditions Due to the Combustibility of Coal

1. *Danger from Coal Dust—Substantial Evidence:*

185. Coal is well known for generating coal dust. Trial Ex. 281 [ESA Report] at 0024; Trial Ex. 1238 [BoD] at 0010 (describing Commodity A (coal) as "very dusty, exhibits spontaneous combustion behavior, potentially explosive").

186. Apart from the danger to human health such dust poses by breathing it, coal dust is well known for its danger of exploding. Trial Ex. 281 [ESA Report] at 0012, 0093-94; AR0095 [Power Magazine Article] at OAK17178; Trial Ex. 961 [Chafe Report] at 0010, 0065-66; Trial Ex. 960 [PHAP Report] at 0054-55. This risk is enhanced for bituminous coal (which is the coal Bowie seeks to ship to the Terminal), because bituminous coal off-gasses methane. Trial Ex. 961 [Chafe Report] at 0006 ("Coal and coal dust from Utah are considered highly volatile;" "bituminous coal is highly volatile"), 0008, 0010, 0062 ("Utah coals are considered highly

volatile, which means that they give off gases such as methane"), and 0062 n.199 (citing AR0150 [TLS Preliminary Operating Plan] at OAK 6966 (admitting that "[t]he toxic and explosive gases that may be generated during storage are carbon monoxide from COMMODITY, due to spontaneous combustion, and methane")); *see also* 1/19/18 Tr. [Pello] at 636:12-14.

187. The risk of a dust/methane explosion is further enhanced at the proposed Terminal, because OBOT proposes to enclose the conveyor and storage areas. 1/17/18 Tr. [McClure] at 275:20-276:10; Trial Ex. 960 [PHAP Report] at 0055-57; Trial Ex. 961 [Chafe Report] at 0006. Such enclosure creates the necessary conditions to allow the dust and methane to reach a concentration sufficient to create a flammable mixture, because of the absence of wind to dilute the dust and methane. Trial Ex. 961 [Chafe Report] at 0062 ("When the gases collect in an enclosed area, such as in a covered rail car or an enclosed storage space, concentrations may become high enough to cause threat of a major fire or explosion…Suspended coal dust (dust that is present in the air) has the potential to cause very large, damaging, and potentially fatal explosions. This situation also can occur when large amounts of very fine dust are generated in an enclosed space...," and noting that the Minimum Explosive Concentration of a coal dust cloud is influenced by "whether or not a potentially combustible gas such as methane is present."); AR0030 [6/27/16 Hearing Tr., Chafe] at 105:13-14, 106:5-10 [at OAK 0033738-739] ("the potential for explosion increases in enclosed and confined spaces… So my opinion is that the enclosure of coal exacerbates issues not only with explosion and combustibility, combustibility of dust, which is very harmful to workers, but it does also expose workers in the facilities to fighter levels of occupational hazards and industrial hygiene problems"); Trial Ex. 960 [PHAP Report] at 0036-37 (noting that enclosed spaces in covered storage facilities promote coal dust explosions due to high concentrations of ambient combustible material); *see also* 1/19/18 Tr. [Pello] at 638:7-19.

188. The absence of wind in the enclosure also allows dust to accumulate on surfaces, which when disturbed can create a suspended cloud with sufficient mass to be flammable and explosive. AR0106 [NCIO Letter] at OAK 5852 ("Dust clouds may generate wherever loose coal dust accumulates, such as on structural ledges of domes if there is a nearby impact or vibration…

”); *see also* 1/19/18 Tr. [Pello] at 638:20-639:2. All that is needed to trigger a coal dust/methane cloud is a spark, which could be caused by something as simple as a metal object striking concrete. Trial Ex. 961 [Chafe Report] at 0062-63; *see also* 1/19/18 Tr. [Pello] at 637:10-25.

189. Enclosing rail cars with top covers may also create conditions allowing for dust to collect and for dust clouds (in combination with off-gassed methane) to reach sufficient mass to cause an explosion in the event of a spark. AR0062 [Foo Letter] at OAK 0008590 (noting potential for untested covered coal rail cars to allow explosive concentrations of coal dust to form inside the containment).

2. *Danger from Methane—Substantial Evidence:*

190. Bituminous coal contains substantial amounts of volatile methane gas. Trial Ex. 961 [Chafe Report] at 0006, 0008, 0010, 0062; *see also* 1/19/18 Tr. [Pello] at 636:12-14. Methane off-gassed from such coal enhances the danger of an explosion. Trial Ex. 961 [Chafe Report] at 0062; *see also* 1/19/18 Tr. [Pello] at 637:7-9. Such methane also creates a danger in the event of a fire. Trial Ex. 960 [PHAP Report] at 0054 (quoting National Institute for Occupational Safety and Health report: “*bituminous* coal in either the smoldering or flaming stage may produce copies amounts of methane and carbon monoxide gases…In addition to their toxicity, these gases are highly explosive in certain concentrations, and can further complicate efforts to fight this type of coal fire” [emphasis added]); AR0090 [Dept. of Energy report] at OAK 0030879 (same); *accord* 1/19/18 Tr. [Pello] at 640:15-641:21. As noted, OBOT’s plan to enclose the conveyor and storage operations would shelter the coal from wind dilution, which may allow dangerous amounts of methane to collect, potentially in combination with suspended coal dust (*e.g.*, Trial Ex. 961 [Chafe Report] at 0062).

3. *Danger from Coal Self Heating and Spontaneous Combustion—Substantial Evidence:*

191. Coal self-heats and spontaneously combusts. Trial Ex. 281 [ESA Report] at 0012, 0092-93; Trial Ex. 961 [Chafe Report] at 0061-65; Trial Ex. 960 [PHAP Report] at 0053-54; Trial Ex. 440 [Fox Report] at 0054 [AR0115 at OAK 5261]. This is a serious danger because coal will catch on fire if left alone over time, and as discussed below, such fires are dangerous and difficult to put out.

a. Spontaneous combustion is a danger *for bituminous coal*. AR0095 [Hossfeld and Hatt article] at OAK 17309 (describing dust explosion event within coal bunker, while noting that "fires prior to this were not uncommon with *bituminous coal* in the bunker..." [Emphasis added]); Trial Ex. 961 [Chafe Report] at 0063 & n.207; Trial Ex. 960 [PHAP Report] at 0054; AR0106 [NCIO Letter] at OAK 5850-51 (noting multiple spontaneous combustion fires within a dome at a Reno, Nevada Department of Energy project, which involved bituminous coal from Bowie's SUFCO mine—eventually the Bowie bituminous coal was moved outside of the dome because of the spontaneous combustion problem).

b. Dr. Rangwala testified that spontaneous combustion dangers might be mitigated through compacting. 1/17/18 Tr. [Rangwala] at 422:13-24. There was no evidence presented before the City Council or at trial as to whether or how stored coal could or would be compacted within a storage dome or otherwise enclosed structure, or whether such compacting would be feasible in such an operation.

i. Notably, compacting would create coal dust within the enclosure (1/17/18 Tr. [Rangwala] at 433:5-14 (compacting generates dust), 434:8-10 (would be done in a closed environment)), and would necessarily involve equipment and physical forces that could create a spark, thus creating a risk of explosion. *See* ¶¶ 187-89, above.

ii. Further, even if it were to be attempted, such compacting must be done to an exacting level of density or it will not be effective. AR0090 [Dept. of Energy Report] at OAK 0030881 ("excessive compaction caused by fines [finely crushed coal] contributed to the rate of ignition").

c. One of the concerns about potentially enclosing the stored coal at the Terminal, and also covering rail cars, to control dust emissions is that such enclosures may heat up on hot days, warming the already self-heating substance to enhance the danger of spontaneous combustion. Trial Ex. 961 [Chafe Report] at 0063, 0070-71 ("completely enclosing coal increases the retention of heat released during self-heating

and also increases the accompanying risk of combustion or explosion"), 0072 ("The use of covered cars would increase risk of fire, since the coal is prone to spontaneous combustion and, when enclosed, heat from the coal cannot dissipate effectively," and reports cited in n.249); AR0106 [NCIO Letter] at OAK 5847 ("The fact that covered train cars will not allow heat to escape exacerbates the risk of fire during transport"); Trial Ex. 440 [Fox Report] at 0054 [AR0115 at OAK 5261].

4. *Danger from Coal Being Easily Ignited—Substantial Evidence:*

192. Apart from self-heating and spontaneous combustion, coal (including bituminous coal) ignites easily. Trial Ex. 961 [Chafe Report] at 0061 ("Coal has an ignition temperature of 260-265 degrees F"); *see also* 1/19/18 Tr. [Pello] at 636:14-17. This property adds to the danger of a coal fire, because coal is easily ignited, which ignition can, in addition to spontaneous combustion, be caused by any number of mechanical factors, including an overheated conveyor belt bearing, such as happened twice at the Los Angeles Export Terminal, discussed further below.

5. *Danger from Coal Burning Hotly—Substantial Evidence:*

193. Coal burns very hot—that is why it is used as a preferred fuel in power plants. 1/19/18 Tr. [Pello] at 636:21-25. Bituminous coal burns hotter than sub-bituminous coal, and twice as hot as grain. *Id.* This property adds to the danger from a coal fire because, once started, a coal fire can ignite other proximate materials with its high heat output.

6. *Smoke from Coal Fires is Dangerous to Human Health—Substantial Evidence:*

194. Smoke from coal fires is dangerous to human health:

a. Coal fires result in combustible products that are dangerous to human health. Trial Ex. 281 [ESA Report] at 0012, 0095; AR00105 [9/21/2015 County Dept. of Public Health Letter] at OAK 0004021; Trial Ex. 961 [Chafe Report] at 0018, 0031-32. Such products include hydrogen cyanide (HCN), sulfur nitrate (SN03) and other toxic substances. Trial Ex. 281 [ESA Report] at 0095. "Emissions from coal fires also would include fine particulate matter, a wide variety of metals, especially mercury, toxic hydrocarbon/volatile organic compound species and small amounts of uranium. These

would become bio-available during combustion." *Id.*

b. Coal fires—and in particular bituminous coal fires—off-gas carbon monoxide and methane, which are both toxic and highly explosive. Trial Ex. 960 [PHAP Report] at 0054 ("bituminous coal in either the smoldering or flaming stage may produce copies amounts of methane and carbon monoxide gases…In addition to their toxicity, these gases are highly explosive in certain concentrations, and can further complicate efforts to fight this type of coal fire" (quoting NIOSH Report); AR0090 [Dept. of Energy Report] at OAK 30879 (same); *accord* 1/19/18 Tr. [Pello] at 640:15-641:21.

7. *Danger from Difficulty of Fighting Coal Fires—Substantial Evidence:*

195. Coal fires are difficult to put out, require specialized equipment and training, and create danger to emergency responders:

a. Coal fires are notorious for the difficulty in putting them out. Trial Ex. 281 [ESA Report] at 0012; AR0090 [Dept. of Energy Report] at OAK 0030879 ("such fires can be very stubborn to extinguish," noting that "copious amounts of methane and carbon monoxide gases" may be produced, which gases are both toxic and "highly explosive in certain concentrations, and can further complicate efforts to fight this type of coal fire").

b. Such fires require firefighters to have specialized equipment and training. Trial Ex. 281 [ESA Report] at 0094; Trial Ex. 961 [Chafe Report] at 0069; *see also* 1/17/18 Tr. [Rangwala] at 441:11-442:17; 1/19/18 Tr. [Pello] at 636:18-20. In many cases, water cannot be used to fight a coal fire. Trial Ex. 281 [ESA Report] at 0012, 0094; Trial Ex. 961 [Chafe Report] at 0069; AR0090 [Dept. of Energy Report] at OAK 0030879-80. The Department of Energy notes that "certain chemicals such as carbon dioxide or nitrogen may mitigate fire effects, but their use has had mixed success from a DOE perspective." AR0090 [Dept. of Energy Report] at OAK 30880. Firefighters have been killed attempting to fight a fire at a coal storage facility. Trial Ex. 961 [Chafe Report] at 0065-66, 0069; Trial Ex. 960 [PHAP Report] at 0054.

c. OBOT's location makes fighting a coal fire even more dangerous, because such a fire may require it to approached from the sea side of the facility—particularly if

the fire is in the shiploading conveyor system, such as happened at the Los Angeles Export Terminal ("LAXT") two different times in the 2000s. *See* Trial Ex. 915 [LAXT Report] at 0007 (photograph of LAXT fire). Fighting such a fire within an enclosure such as an enclosed conveyor or storage dome would also add to the complexity and danger. The proximity to the Bay Bridge presents even further safety and emergency response logistical concerns. Trial Ex. 281 [ESA Report] at 0094.

d. Mr. Tagami was aware that spontaneous combustion would be an issue if trains sat for a while, such as if operations had to cease due to an air quality standard exceedance. 1/16/18 Tr. [Tagami] at 84:12-85:2.

8. *OBOT's Proposed Mitigations to Contain Fugitive Dust Enhance Fire and Explosion Dangers—Substantial Evidence:*

196. OBOT's proposed mitigations to contain fugitive dust on the one hand, and to contain fire and explosion dangers on the other, work against each other, requiring a delicate and difficult balance of conflicting measures in tension with one another, to be sustained over time.

a. As noted, OBOT proposes to enclose the Terminal's conveyors and storage operations, in order to mitigate against fugitive dust emissions into the adjoining neighborhood. OBOT also proposes to enclose rail cars with top covers, also to mitigate against fugitive dust emissions. Both proposed enclosures enhance fire and explosion dangers, however. *See* evidence cited in ¶¶ 187-89, above. Perhaps for this reason, there do not appear to be many fully enclosed coal terminals, as noted in the Public Health Advisory Panel Report. Trial Ex. 960 [PHAP Report] at 0057 ("The proposal to wholly encapsulate the terminal seems to represent a departure from practice at any other coal terminal that we can identify and so seems to be an unproven technology.").

b. To the extent that OBOT might seek to mitigate fugitive dust emissions through the use of air filtering technologies, such filtering can contribute to explosive ignition of coal dust. Trial Ex. 960 [PHAP Report] at 0057-58.

c. OBOT also proposes to spray or fog the coal at various points in the Terminal operation in order to quell the dust to control fugitive dust emissions into the

neighborhood. Trial Ex. 1238 [Basis of Design] at 0013 [AR0136 at OAK 4720]. However, applying water to coal creates an exothermic reaction that can promote self-heating and spontaneous combustion. AR0095 [Hossfeld and Hatt article] at OAK 17310; AR0090 [Dept. of Energy Report] at OAK 30881-82. "Moisture in coal contributes to spontaneous heating because it assists the oxidation process…Efforts should be made to keep stored coal from being exposed to moisture."). Combining wet and dry coal is a "dangerous scenario." AR0095 [Hossfeld and Hatt article] at OAK 17310.

9. *Fires at Coal Storage, Handling and Shipping Terminal Facilities Are Not Uncommon—Substantial Evidence:*

197. Fires at coal storage, handling and shipping terminal facilities have regularly occurred through the years and are not uncommon. Just as examples, in 1993, the Department of Energy noted "[a]t least a dozen coal fires occurred within the Department of Energy (DOE) over the last decade." AR0090 [Dept. of Energy Report] at OAK 30879. There have been coal fires at terminals located in Los Angeles, Scotland, and Australia (Trial Ex. 281 [ESA Report] at 0093), and also coal fires on conveyor systems in Norfolk, Virginia in 2009, and in Scotland in 2015 (1/17/18 Tr. [Rangwala] at 440:16-441:1). There were also multiple coal fires in a bunker at a Green Bay, Wisconsin power plant. Trial Ex. 961 [Chafe Report] at 0066; AR0095 [Hossfeld and Hatt article] at OAK 17309. Notably, there were spontaneous combustion coal fires at a Reno, Nevada Department of Energy demonstration project in or around 2001—and the coal involved in the Reno incidents came from Bowie's Utah "SUFCO" mine and was stored in a dome. Trial Ex. 961 [Chafe Report] at 0063 &. n.207; Trial Ex. 960 [PHAP Report] at 0037; AR0106 [NCIO Letter] at OAK 5851. The solution to the Department of Energy's Reno coal fires in the dome was to *store the coal outside*. AR0106 [NCIO Letter] at OAK 5850–51; Trial Ex. 961 [Chafe Report] at 0063 & n.207; Trial Ex. 960 [PHAP Report] at 0037.

198. Although Dr. Rangwala suggested at trial that such fires may not involve bituminous coal (1/17/18 Tr. [Rangwala] at 427:8-12), in fact fires at coal storage facilities have included *bituminous coal* fires, including the Green Bay, Wisconsin fires (AR0095 [Hossfeld & Hatt Report] at OAK 0017309 ("fires prior to this were not uncommon with bituminous coal in

the bunker")), and the multiple spontaneous combustion fires within a dome at the Reno, Nevada Department of Energy project, which involved bituminous coal from Bowie's SUFCO mine. Trial Ex. 961 [Chafe Report] at 0063 & n.207. Reports on other fires did not always indicate the type of coal involved, which is not evidence that they did *not* involve bituminous coal. 1/17/18 Tr. [Rangwala] at 441:2-10.

199. The fires at LAXT are particularly instructive because they occurred:

a. At a modern, state-of-the-art coal terminal, that had infrared temperature sensors, demonstrating that regulation, permits, best practices and mitigation measures are not enough to prevent coal fires. AR0107 [Ansar Letter] at OAK 6256 ("world-class coal expert facility"); *see also* Trial Ex. 915 [LAXT Report] at 0002 ("commissioned in 1997 and designed as a state-of-the-art coal and petroleum coke facility" with "infrared temperature monitoring devices"); 1/19/18 Tr. [Pello] at 642:14-643:23;

b. As a result of accumulated coal and coke debris being exposed to an overheated bearing, demonstrating that all it takes to start a coal fire is for the coal to be exposed to an overheated piece of equipment. Trial Ex. 915 [LAXT Report] at 0007; Trial Ex. 281 [ESA Report] at 0041;

c. Twice within six months, demonstrating that even the experience of one fire will not necessarily prevent a second fire at the same facility, and that even the best of intentions will not prevent coal-related fires. Trial Ex. 961 [Chafe Report] at 0064-65; *see also* 1/19/18 Tr. [Pello] at 642:17-23, 643:16-23; and

d. At least one of the fires had to be fought from the sea side, because it occurred in the shiploading conveyor, demonstrating the potential difficulty in fighting a coal fire at a rail to ship terminal. Trial Ex. 915 [LAXT Report] at 0007 (photograph of LAXT fire).

10. *Regulations, Permit Requirements, and Best Available Control Technologies Are Not Sufficient to Remove the Danger Coal Poses to Health and Safety—Substantial Evidence:*

200. LAXT was a regulated, permitted "state of the art" coal terminal, with infrared heat sensors, and still experienced two fires in six months in 2000 and 2001 (*see* ¶¶ 195, 199,

above).

201. Fires frequently occur at regulated facilities. As noted in ¶¶ 191, 195, 197-98 above, even the Department of Energy has experienced multiple coal storage fires, including spontaneous combustion of Bowie's Utah bituminous coal in a dome in recent times (*see* ¶ 197). Recent local examples of highly regulated facilities experiencing fires are the refinery fires in Richmond and Benicia that required residents to shelter in place and occasioned emergency room visits. AR0068 [Letter from Dr. Davis, Alameda County Dept. of Public Health] at OAK 0020985 (2012 Richmond Chevron fire sent 15,000 people to the emergency room); AR0030 [6/27/16 Hearing Tr.] at 129:23-130:4 (same); *see also* 1/19/18 Tr. [Pello] at 644:4-17.

11. *An Accident Causing a Fire or Explosion at the Proposed Terminal Is Likely—Substantial Evidence:*

202. With over decades of operation, over millions of tons of throughput every year, over two hundred rail cars dumping coal onto conveyors every day, and with conveyor belts carrying self-heating abrasive coal chunks and their pulverized residue rolling over bearings hour after hour, an accident leading to a fire or explosion is likely to happen. *See* 1/19/19 Tr. [Pello] at 645:22-646:16. To avoid a fire or explosion over years of operations, would require close to perfection in handling a substance that (1) ignites easily, (2) burns hot, (3) self-heats, (3) spontaneously combusts, (4) generates explosive dust, (5) off-gasses methane, and (6) generates further energy if moistened—the danger of which is enhanced by OBOT's proposal to enclose the operation. This, in turn, would require near perfection in design, fabrication of materials, parts and equipment, construction, maintenance, and housekeeping. *Id.*

203. Such perfection would also require no mechanical failures or human errors. *Id.* However, "[s]everal scientific studies have found that many (perhaps even the majority of) explosions in coal processing and storage facilities occur as a result of 'human error' and 'technical failure/malfunction of component or equipment' in areas such as silos and hoppers." Trial Ex. 961 [Chafe Report] at 0064. Human experience tells us that accidents leading to fires often result from unforeseen circumstances, and an unpredictable sequence of events. The LAXT fires are a good example of two different coal fires that resulted from the coincidence of design

and housekeeping deficiencies at a modern "state of the art" coal terminal with heat sensors on the conveyor system (*see* ¶ 199, above).

12. *Given OBOT's Location, a Coal Fire or Explosion Would Be Catastrophic—Substantial Evidence:*

204. Given the location of the Terminal, a coal fire or explosion would be catastrophic and a completely unacceptable danger.

a. The location is proximate to a densely populated neighborhood, adjacent to a key Bay Area infrastructure chokepoint—the Bay Bridge—and the Bay Bridge Toll Plaza, as well as a bike/pedestrian path. Trial Ex. 281 [ESA Report] at 0010.

b. Such a fire could be difficult to put out, requiring special equipment and training—*see* ¶ 195, above.

c. Such a fire or portions of it may require the need to fight the fire from the sea side like at LAXT, particularly if a shiploading conveyor is on fire—*see* ¶¶ 195, 199, above.

d. The health effects of a fire are very serious—*see* ¶ 194, above.

e. Such a fire could place workers, nearby occupants of businesses, residents in the adjoining neighborhood, commuters and emergency responders at significant risk of injury.

f. As described by Dr. Pello, who consults for NASA, fires at some locations—like in a space station or space craft—are so dangerous that "you just can't have a fire." 1/19/18 Tr. [Pello] at 644:18-645:2.

g. By comparison, the Public Health Advisory Panel noted that "[w]e did not identify many coal terminals in such close proximity to dense urban environments as downtown Oakland or critical infrastructure as the Bay Bridge. The Long Beach coal terminal is located at the far southern end of the Port of Long Beach away from freeways and critical infrastructure and areas of dense housing. The prevailing winds would tend to push dust out over the water rather than into downtown Long Beach." Trial Ex. 960 [PHAP Report] at 0058.

IX. CONCLUSION

The foregoing findings of fact establish that the City Council's decision to apply the Ordinance to OBOT is supported by substantial evidence.

Dated: February 9, 2018

BURKE, WILLIAMS & SORENSEN, LLP

By: */s/ Kevin D. Siegel*
Kevin D. Siegel
Gregory R. Aker
Timothy A. Colvig
Christopher M. Long
Attorneys for Defendant
CITY OF OAKLAND

Dated: February 9, 2018

EARTHJUSTICE

By: */s/ Colin O'Brien*
Colin O'Brien
Attorneys for Defendant-Intervenors
SIERRA CLUB and SAN FRANCISCO BAYKEEPER

ATTESTATION

I, Kevin D. Siegel, am the ECF user whose ID and password are being used to file this "Defendant City of Oakland and Defendant-Intervenors' Proposed Findings of Fact." Pursuant to Civil Local Rule 5-1(i)(3), I hereby attest that Colin O'Brien has concurred in the filing of this document.

DATED: February 9, 2018

/s/ Kevin D. Siegel
Kevin D. Siegel