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VIA ELECTRONIC FILING

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Redondo Beach Energy Project
AFC Committee, California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Subject: Redondo Beach Energy Project, Comments on the Preliminary Staff Assessment, Air Quality and Public Health Issues

Dear Commissioners:

On behalf of the City of Redondo Beach, BlueScape Environmental hereby submits the following comments on the Preliminary Staff Assessment (PSA) for the proposed Redondo Beach Energy Project (RBEP). The comments address issues in the PSA Air Quality and Public Health Sections 4.1-1 and 4.8-1.

1. The Air Quality Modeling Significance Analysis performed by the Applicant does not adequately address the localized impacts in Redondo Beach from fine particulate matter and air toxic emissions.

The California Energy Commission's (CEC) licensing process is a certified regulatory program under the California Environmental Quality Act (CEQA). The Commission must determine whether impacts from the proposed RBEP emissions will be significant, and if so, it must require mitigation measures to reduce the impacts to less than significant. The Applicant must provide the necessary data and analyses to enable the Commission to make this determination.

The PSA describes the Applicant's air quality modeling analyses (pp. 4.1-24 to 4.1-34) for demolition and construction, power plant commissioning and operational impacts. The dispersion modeling and health risk assessment completed for RBEP air toxic emissions is described at pp. 4.8-7 to 4.8-15.

Fine particulate matter (PM) and air toxic emissions from RBEP will have an impact on the public health of Redondo Beach citizens. Therefore, these emissions are the primary concern of the City of Redondo Beach. Long-term health effects from exposure to fine PM, such as is emitted from power plants, especially PM2.5, or PM less than 2.5 microns, is known to cause a range of chronic respiratory diseases

including asthma, reduced lung function, bronchitis and emphysema.[1] In the PSA Workshop on May 20, 2015, several residents reported that black particulate soot has deposited on their properties, that may be from the current power plant. This potential link must be reviewed.

In the PSA, Staff acknowledge that the impacts from RBEP PM emissions will be significant:

> *Staff believes that directly-emitted particulate matter emissions from demolition and construction [operation] would cause a significant impact because they would cause new violations or contribute to existing violations of PM10 and PM2.5 ambient air quality standards, and additionally that those emissions can and should be mitigated to a level of insignificance."*[2]

For the CEC and South Coast Air Quality Management District (SCAQMD) to properly identify appropriate local mitigation measures under CEQA, the agencies must rely upon a technically representative and conservative analysis. The Applicant has either ignored or inadequately characterized fine particulate formation and several unique meteorological and geographical aspects of siting RBEP near the ocean shore and the Palos Verdes peninsula. Special situations unique to the site such as land-sea breeze circulations, nighttime and daytime plume fumigation effects, local pollutant accumulation, and localized terrain influences have not been adequately addressed.

According to Jim Weisenberger, a former senior employee of Southern California Edison, the utility considered whether to repower the facility at Redondo Beach in the 1970s and 1980s, but decided against it due to the unique aspects of the site that would cause unacceptable and unavoidable air quality impacts.[3]

The City of Redondo Beach requests that Staff fully consider these issues in developing the Final Staff Assessment. Staff should consider whether a new power plant can be built at all without significantly damaging the public health in Redondo Beach, and if so, whether proposed mitigation measures go far enough to sufficiently mitigate health impacts in the heavily populated areas within a few miles of the proposed facility.

The following specific comments and recommendations regarding the Air Quality Modeling Significance Analyses are provided:

a. The Applicant's PM modeling analyses for the RBEP have ignored the localized impacts from NOx and ammonia emissions, precursors to secondary PM2.5 formation.

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1 Preliminary Staff Assessment, Redondo Beach Energy Project, CEC-700-2014-003-PSA, Docket No. 12-AFC-03, July 2014, p. 4.1-6.

2 PSA, pp. 4.1-27 and 4.1-30.

3 Interview with Jim Weisenberger, August 13, 2014.

Ammonia and NOx emission increases from the RBEP will be precursors to secondary fine particulate formation. The City of Redondo Beach does not agree with the statement in the PSA on p. 4.1-30, that the secondary formation of PM cannot be addressed through modeling. In fact, to properly address localized PM impacts, secondary PM formation processes can and should be quantified and modeled by the Applicant following current regulatory guidance.

In the case where a project's direct PM emission increases exceed 10 tons per/year (TPY), and NOx and/or SOx emission increases exceed 40 TPY, the Environmental Protection agency (EPA) recommends a "Case 3" approach to assessing secondary PM formation.[4] Given the RBEP's potential to cause or contribute to exceedances of the PM ambient standards, the appropriate approach would be either a hybrid qualitative / quantitative analysis or photochemical modeling, using a preferred model in the *Guideline on Air Quality Models.*[5] A hybrid qualitative / quantitative approach would use background nitrate, sulfate and total PM2.5 data with direct PM modeling results, to add in the secondarily formed PM to modeled results. A similar approach could also be used to estimate the conversion of ammonia slip emissions into ammonium sulfate.

Due to concerns regarding long-term health impacts in the community from fine particulate emissions, the City requests that the local impacts from secondarily formed PM due to, at a minimum, NOx and ammonia slip emissions from RBEP, be properly analyzed by the Applicant following EPA guidance.

b. The Applicant's modeling analyses have not accounted for nighttime offshore plume transport and fumigation, stagnant/calm conditions, and the accumulation of pollutants that may occur and locally impact Redondo Beach residents.

In completing the air quality modeling significance analyses, the Applicant has relied on a standard modeling approach using the AERMOD dispersion model, with readily available input data. However, this standard approach is not acceptable in light of the unique conditions at a site that drive pollutant impacts. A different and more sophisticated technical approach is required to adequately understand the potential impacts.

The City challenges the standard approach used, and in fact, opposes siting the power plant in Redondo Beach on the basis of the unique meteorological conditions and terrain features that are likely to cause pollution impacts to reach unacceptable levels in the neighboring community. The Applicant is proposing to increase new power plant PM emissions substantially above recent levels, while reducing stack heights by about 50 feet. The impacts may be significantly higher than represented

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[4] *Guidance for PM2.5 Modeling*, USEPA, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, May 20, 2014.

[5] *Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose Dispersion Model and Other Revisions; Final Rule*, EPA, 40 CFR Part 51 Appendix W, FR 68218, November 9, 2005.

in the Applicant's modeling analyses and described in the PSA. In the 1970s and 1980s, such special considerations led Southern California Edison to decide against repowering the plant in Redondo Beach.[6] At a minimum, these localized impacts must be fully understood before allowing power plant development to proceed.

EPA has provided guidance that special consideration should be taken for siting facilities at locations with complex atmospheric processes and terrain. This is discussed in the *Guideline on Air Quality Models*[7], and includes processes that commonly and frequently occur in Redondo Beach. These include inhomogeneous local winds, inversion breakup fumigation, shoreline fumigation, and stagnation. EPA's *Meteorological Monitoring Guidance for Regulatory Modeling Applications* Section 3.4 on Coastal Locations, states, *"the unique meteorological conditions associated with local scale land-sea breeze circulations necessitate special considerations."*[8] As discussed below, this EPA guidance has been ignored by the applicant, and the air quality modeling completed does not adequately address the impacts.

In Redondo Beach, the winds are inhomogeneous, characterized by onshore sea breezes during the day, with calm conditions or light winds at night. At night, an offshore land breeze is typical. The wind patterns may be impacted by terrain influences, including the Palos Verdes Peninsula rising to about 1,450 feet above sea level about 3 to 5 miles south of the RBEP site, and a nearly 200-foot high bluff within Redondo Beach. As a result the pollutant transport may be different than represented by the LAX meteorological data used by the Applicant.

At night, pollution can be transported offshore where convective processes can mix emissions downward toward the surface of the water. In addition, the pollution can accumulate and then be brought onshore at ground-level during the day. In the 1970s and 1980s, several studies addressed this phenomenon, including one study discussed in *Convective Mixing of Plumes in a Coastal Environment*.[9] The Applicant's modeling analysis currently assumes that any offshore winds take pollution away permanently, when in fact this pollution could return in the daytime to impact City residents. A review of the LAX data from the SCAQMD website[10] shows that winds in the area blow offshore away from Redondo Beach from north to east about 30% of the time. The Applicant should be required to assess how much of this pollution impacts Redondo Beach.

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6 Interview with Jim Weisenberger, August 13, 2014.

7 *Guideline on Air Quality Models*, Section 7.2.8.

8 *Meteorological Monitoring Guidance for Regulatory Applications*, EPA-454/R-99-005, OAQPS, RTP, NC, Feb 2000), Section 3.4, p. 3-12.

9 McRae, Gregory J., Shair, Fredrick H., and Seinfeld, John H., *Convective Downmixing of Plumes in a Coastal Environment*, Journal of Applied Meteorology, Vol. 20. No. 11, November 1981.

10 South Coast Air Quality Management District, /www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/data-for-aermod

Stagnation is defined by the *Guideline on Air Quality Models* as a condition when calm or low wind conditions lead to minimal dispersion with local accumulation of pollution, and potentially high ground-level concentrations.[11] The potential for stagnation conditions and trapping of pollution by terrain features near the power plant has not been addressed by the Applicant.

To evaluate offshore pollutant transport and accumulation with onshore transport as well as stagnation conditions, the Applicant should use the CALPUFF dispersion model to complete the analysis. CALPUFF includes advanced formulas for "following" pollutant emissions in space and time, and can be used to address fumigation and other special situations.

The meteorological data processed for AERMOD from the LAX site located six miles away from the site, and the San Diego upper air data, will not be appropriate or sufficient to evaluate these special conditions using CALPUFF. Staff should also consider whether more advanced review such as a new tracer study may be needed. The Applicant should obtain one year of representative surface data from a network of on-site and neighborhood meteorological monitoring sites, as well as upper air data from the Redondo Beach area. From the EPA *Meteorological Monitoring Guidance*,[12] "*To provide representative measurements for the entire area of interest, multiple sites would be needed: one site at a shoreline location (to provide 10 m and stack height/plume height wind speed), and additional inland sites perpendicular to the orientation of the shoreline to provide wind speed within the TIBL, and estimates of the TIBL height. Where terrain in the vicinity of the shoreline is complex, measurements at additional locations, such as bluff tops, may also be necessary.*"

In the case of using the CALPUFF dispersion model or other advanced studies, surface data from other local sites and mesoscale data should also be input to improve model accuracy. The City recommends that these advanced plume studies consider current plant plumes, and the impact that they are currently having within the City. Such a study will be a good indicator or impacts from the future plant. In addition, as a condition for Certification, City of Redondo Beach requests that the Commission require a particulate monitoring network at several locations of maximum impact, to monitor and mitigate future soot and health impacts from the RBEP.

c. The fumigation analysis completed by the Applicant using the SCREEN3 model is inadequate to describe conditions in the Redondo Beach area.

The PSA p. 4.1-31 describes the plume fumigation analysis completed by the Applicant. As defined by Staff, "*Inversion breakup fumigation occurs when a plume*

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11 *Guideline on Air Quality Models*, Section 7.2.8.

12 *Meteorological Monitoring Guidance for Regulatory Applications*, p. 3-12.

is emitted into a stable layer of air and that layer is mixed to the ground in a short period of time through convective heating and microscale turbulence. Shoreline fumigation occurs when a plume is emitted into a stable layer and is then mixed to the surface as a result of advection of the air masses to less stable surroundings."

The Applicant used the SCREEN3 dispersion model to evaluate fumigation processes occurring when the RBEP plume is transported inland. However, the analysis was completed only for CO, NO2 and SO2, and not for PM impacts.

The SCREEN3 output file was obtained for review. The one-hour average shoreline fumigation calculation based upon a 1 g/sec emissions input was 7.0 ug/m3 at 1,467 meters from the stack. This value is 10 times higher than the maximum concentration calculated by SCREEN3 at 1,500 meters distance, 0.70 ug/m^3. What this means is that, for every day fumigation occurs, a short-term impact with 10 times higher 1-hour concentration is added to the 24-hour and long-term average concentrations. If this impact happens once every day over 12 hours when winds blow onshore, and assuming the same concentrations in the other 11 hours, then the 24-hour and long-term average PM concentrations would be higher by about 75%, from (11 x 1 + 1 x 10) / 12. This indicates a potential serious deficiency in how the Applicant has reviewed the fumigation effect and local PM impacts.

The Applicant's SCREEN3 fumigation analysis also ignored building downwash that can lower the plume height, as well as the potential for much higher impacts at elevated terrain location along the bluff within 0.5 to one mile east of the RBEP site location. With terrain at the bluff exceeding stack heights, this could mean that the fumigation analysis has underestimated concentrations considerably. Also, the bluff may actually act to trap and hold pollutants within the City; this potential effect needs to be understood.

The City of Redondo Beach requests that Staff require the Applicant to perform a comprehensive and adequate review of localized fumigation and terrain impacts for all pollutants, but especially for PM and air toxic emissions. As stated above, the Applicant should use the CALPUFF dispersion model with onsite meteorological data to complete the analysis.

2. The proposed Conditions for Certification do not require RBEP to provide local CEQA mitigation for PM emissions impacts.

The PSA states that RBEP operational PM emissions will be fully offset by SCAQMD internal bank ERCs at a ratio of one-to-one, under Rule 1304(a)(2). The City of Redondo Beach understands that this is a District permitting requirement to maintain attainment with regional air quality standards. However, with regard to CEQA analysis, there is no assurance that significant local direct and secondary PM impacts within the City of Redondo Beach will be mitigated. The Applicant should be required to provide separate mitigation fees directly to City of Redondo Beach to offset local PM emission impacts to zero, in the amount of 54 TPY direct PM plus any secondarily formed PM.

Rule 1304(a)(2) partially exempts RBEP from the requirement to obtain emission offsets from the District's internal bank in order to obtain an air permit. The District is compensated for NOx, VOC, and PM10 offsets under Rule 1304.1. RBEP will be required to pay fees for net PM10 emissions increases. The fee is only for direct PM10 emissions, and does not include secondarily formed PM2.5 from emissions of the precursors ammonia, NOx and SOx. While the District Governing Board has directed SCAQMD staff to work with stakeholders to use funds from repower projects to improve air quality in the impacted communities,[13] there is no guarantee or other assurance this will be the case. The City of Redondo Beach does not anticipate that the SCAQMD will be willing and able to utilize these funds to reduce impacts within the City of Redondo Beach.

Rule 1325 implements federal New Source Review requirements for PM2.5. For purposes of this rule, SCAQMD has excluded ammonia emissions despite their role in secondary PM formation. Accordingly, SCAQMD will not be providing any PM2.5 emission offsets from their Rule 1309.1 priority reserve despite the facility being a major source for ammonia emissions in excess of 100 TPY. The CEC should ensure that all secondary PM2.5 emissions are mitigated by local offsets.

The SCAQMD requirement to offset emissions for an air permit should not be confused with local mitigation under CEQA. If the CEC can compel the SCAQMD to utilize Rule 1304.1 funds in Redondo Beach to reduce PM emissions in amounts equal to those proposed and along a foreseeable schedule, then these funds may be able to satisfy the CEQA mitigation requirement. Otherwise, Staff should direct the Applicant to develop a separate local PM mitigation fund equal to the projected payments to the SCAQMD, to include direct and secondarily formed emissions. The City of Redondo Beach is committed to working with Staff to identify offset projects such as diesel emissions reduction from trucks and marine craft, traffic flow improvements, wood stove replacement programs, alternative energy, and other projects.

3. Updated air quality studies should be completed to reflect current information and regulatory guidance.

Due to the nearly one year lapse in RBEP proceedings, the City of Redondo Beach requests that Staff require the Applicant to update air quality analyses to include more recently available data and regulatory guidance. Staff should provide justification where updates are not required.

In particular, the air toxics health risk assessment in the PSA Public Health section should be updated to follow the *Draft Risk Assessment Procedures for Rules 1401, 1401.1 and 212*.[14] It is expected that this guidance will become final by June 5th,

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[13] Nazemi, Mohsen, of SCAQMD, Air Credits in the South Coast Basin, Southern CA Reliability CEC IEPR lead Commissioner Workshop, UCLA, Aug 20, 2014.

[14] Draft Risk Assessment Procedures for Rules 1401, 1401.1 and 212, South Coast Air Quality Management District, Version 8.0, March 31, 2015.

2015. The SCAQMD has said that changes to state guidance will increase residential cancer risks from 3-6 times.[15] While Staff did perform manual calculations in anticipation of the new state risk assessment standards,[16] the air toxics health risk assessment should be updated to meet the revised SCAQMD risk assessment guidelines. If the updated calculations show significant risk impacts, then Conditions for Certification should be added to provide mitigation.

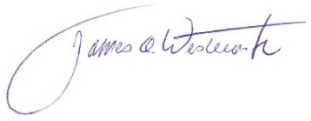
Other updates would include new review of the cleanest turbine technologies and emission controls, following EPA guidance to model secondary PM formation, and update the background data and model inputs. The City of Redondo Beach requests that, in light of higher cancer risks to residents and children, that the Applicant calculate the population cancer burden within the City of Redondo Beach, or within about two miles from the RBEP site. A cancer burden value greater than 0.5 would be considered significant and would require mitigation.[17]

In closing, the City of Redondo Beach is committed to protecting the health of its citizens. We appreciate the opportunity to provide these comments on air quality issues, and request that Staff take them into consideration in the RBEP proceedings.

Sincerely,

BLUESCAPE ENVIRONMENTAL

a California Corporation



James A. Westbrook
President & CEO

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15 Public Workshop, Proposed Amended Rules to Implement Revised OEHHA Guidelines, April 1, 2015, South Coast AQMD.

16 PSA, p. 4.8-21.

17 SCAQMD Air Quality Significance Thresholds, aqmf.gov/doc/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf, March 2015.