



March 29, 2018

PDEQ

Air Program Manager, Rupesh Patel

33 N. Stone Avenue, Suite 700

Tucson, Arizona 85701

Submitted via e-mail at [air.permits@pima.gov](mailto:air.permits@pima.gov).

Re: Intent to Approve: Proposed Revision to the existing Air Quality Permit No. 1052 to Tucson Electric Power (TEP) Irvington/H.Wilson Sundt Generating Station (IGS)

Dear Mr. Patel,

Thank you for the opportunity to comment the proposed revision to the existing Air Quality Permit No. 1052 to Tucson Electric Power (TEP) Irvington/H.Wilson Sundt Generating Station (IGS). We submit these comments on behalf of Sierra Club and its 3 million members and supporters, including over 16,000 members in Arizona.

PDEQ is proposing to approve a permit for a major modification that will allow construction of ten Reciprocating Internal Combustion Engines (RICE), each with a capacity of 19 MW. IGS is a major source of emissions for particulate matter less than 10 microns in diameter (PM10), fine particulate matter (PM2.5), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), carbon dioxide equivalent (CO<sub>2</sub>e), volatile organic compounds (VOCs), and hazardous air pollutants (HAPs). The new RICE units alone have the potential to emit 256.9 tons per year (tpy) of CO, 215.4 tpy of VOCs, 170.0 tpy of NO<sub>x</sub>, and 326.1 tpy of HAPS.<sup>1</sup>

As detailed below and in the attached report of Pless Environmental, Inc., PDEQ should deny the RICE Project because it does not comply with federal and state law.<sup>2</sup> Most significantly,

- TEP has avoided best available control technology (BACT) and air quality review of NO<sub>x</sub> by wrongfully taking credit for NO<sub>x</sub> emissions from shutdown of the 2 existing units and subtracting these emissions from the new units' expected emissions. The permit does not require both existing units to shut down unless 6 RICE units are constructed, so the facility

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<sup>1</sup> Proposed TSD at PDF p. 156.

<sup>2</sup> ARS 49-481(A).

could continue to run an existing unit with the 5 RICE units, while still getting credit for shutting down both existing units. Also, TEP plans to run the existing units simultaneously with the new units for 180 days, but the emissions from the existing units can only be subtracted from the new units if they are shut down before the new units begin operations.

- Based on this erroneous netting analysis, neither TEP nor PDEQ performed a BACT analysis for NOx emissions. Pless' expert comments demonstrate that NOx emissions from the RICE units are significantly higher than what could be achieved with the best available control technology. Likewise, Pless' comments show that the proposed permit's emission limits for PM10 and PM2.5 does not reflect the maximum degree of reduction required under BACT.
- PDEQ underestimated the visibility impacts at Saguaro National Park because the modeling rate it employed does not reflect the maximum emissions – the potential to emit. The NOx rate PDEQ accepted for the modeling demonstration is not an enforceable condition in the permit so there is no assurance that the units will not emit NOx at a much higher rate. TEP should redo the modeling at the higher rate to show the true potential visibility impacts at Saguaro and/or the lower modeled emission rate should be enforceable in the permit.
- Many of the proposed permit conditions are not practically enforceable. Specifically, using stack tests once every two years to determine whether the RICE units are in compliance with the permit is woefully inadequate; the permit does not contain an unambiguous methodology for demonstrating compliance with the annual NOx emission cap, and there is no support for the applicant's "vendor-guaranteed" NOx rate that is used to demonstrate compliance.
- The agency did not adequately consider impacts to the surrounding community, which contains a 85% minority population. The agency's environmental justice report wrongly relies on the applicant's erroneous "netting" of pollutants that does not comply with the law and does not reflect the reality of the toxic air pollution that people in the community will breathe. The environmental justice analysis should consider the total amount of air pollution that the facility will emit and not subtract the emissions from the shutdown of the 2 existing gas units. A proper analysis of environmental justice impacts should include air quality modeling of the NOx impacts.

For all the reasons detailed in these comments and exhibits, PDEQ cannot issue the permit for this project.

## I. Legal Background

### A. The Clean Air Act and the National Ambient Air Quality Standards (NAAQS)

The Clean Air Act's central purpose is to protect public health and welfare.<sup>3</sup> Severe air pollution events in the 1940s to 60s sickened thousands, and even killed people, raising public awareness of the health hazards of air pollution.<sup>4</sup> Congress adopted the Clean Air Act Amendments of 1970 in response to growing public concern over those hazards.<sup>5</sup>

A key component for achieving the Act's public health goal is compliance with the NAAQS.<sup>6</sup> NAAQS are the maximum permissible levels of common pollutants in the ambient air. NAAQS are set at levels to protect public health with an "adequate margin of safety."

EPA has set NAAQS for six common air pollutants known as "criteria pollutants." They are particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead.<sup>7</sup> PDEQ cannot issue a permit unless the proposal meets the requirements of the NAAQS.<sup>8</sup>

Exposure to particulate matter less than 10 microns in diameter (PM10) and fine particulate matter (PM2.5) leads to a variety of adverse health effects including premature death, heart attacks, strokes, birth defects, and asthma attacks. Fine particles are especially dangerous; they evade the body's filtering mechanisms, lodge deep inside our lungs and are able to cross over into our bloodstream.<sup>9</sup>

Sulfur dioxide (SO<sub>2</sub>) emissions are both harmful to human health on their own, and contribute to the formation of fine particulate. Exposure to SO<sub>2</sub> for even very short time periods—such as five minutes—has significant health impacts including impaired lung function, aggravation of asthma, and respiratory and cardiovascular morbidity.<sup>10</sup> EPA has determined that SO<sub>2</sub> exposure

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<sup>3</sup> 42 U.S.C. § 7401(b)(1).

<sup>4</sup> See Arnold W. Reitze, Jr., *The Legislative History of U.S. Air Pollution Control*, 36 *Hous. L. Rev.* 679, 696, 698 (1999).

<sup>5</sup> *Id.* at 700-704; see also *Lloyd A. Fry Roofing Co. v. EPA*, 415 F. Supp. 799, 805 (W.D. Mo. 1976) ("[T]he Clean Air Act was enacted and amended for the purpose of protecting public health.").

<sup>6</sup> 42 U.S.C. §§ 7401, 7409.

<sup>7</sup> See 40 C.F.R. Part 50.

<sup>8</sup> PCC § 17.16.590(5); 17.12.020 (A).

<sup>9</sup> National Ambient Air Quality Standards for Particulate Matter, 78 Fed. Reg. 3,086 (Jan. 15, 2013); National Ambient Air Quality Standards for Particulate Matter, 71 Fed. Reg. 2,620, 2,626-7 (proposed Jan. 17, 2006) (EPA unable to find evidence supporting the selection of a threshold level of PM<sub>2.5</sub> under which the death and disease associated with PM<sub>2.5</sub> would not occur at the population level); Clean Air Fine Particle Implementation Rule, 72 Fed. Reg. 20,586, 20,586-87 (Apr. 25, 2007); 70 Fed. Reg. 65,983, 65,988 (Nov. 1, 2005) ("emissions reductions resulting in reduced concentrations below the level of the standards may continue to provide additional health benefits to the local population."); National Ambient Air Quality Standards for Particulate Matter, 62 Fed. Reg. 38,652, 38,656 (July 18, 1997) (EPA rulemakings detailing harmful impacts of particulate matter).

<sup>10</sup> See EPA, EPA/600/R-08/047F, *Integrated Science Assessment for Sulfur Oxides—Health Criteria* ch. 5 tbls. 5-1, 5-2 (2008); Primary National Ambient Air Quality Standard for Sulfur Dioxide, 75 Fed. Reg. 35,520, 35,525 (June 22, 2010); see also EPA, *Our Nation's Air: Status and Trends Through 2008*, 4

can also aggravate existing heart disease, leading to increased hospitalizations and premature deaths.<sup>11</sup> Short-term SO<sub>2</sub> exposure is especially dangerous for children with asthma.<sup>12</sup>

Nitrogen oxides (“NOx”), in combination with other pollutants like volatile organic compounds (“VOCs”) and sunlight, create ground-level ozone – better known as smog – which contributes to asthma, bronchitis, and other respiratory and cardiovascular illnesses.<sup>13</sup>

NAAQS must be reviewed and updated every five years to reflect current scientific understanding on the health impacts of pollutants.<sup>14</sup> Over time, ambient air quality standards have become increasingly stringent as scientific understanding of health impacts has increased. Evidence has mounted linking short bursts of air pollution with severe health impacts, leading EPA to set updated standards for some pollutants on an hourly basis. The first sulfur dioxide standard was a 24-hour primary standard at 140 parts per billion (ppb) and an annual average standard at 30 ppb in 1971; in 2010, citing evidence linking short-term exposure to bronchoconstriction and increased asthma symptoms, as well as increased visits to emergency departments and hospital admissions for respiratory illnesses, EPA established a new 1-hour standard at a level of 75 ppb.<sup>15</sup>

Similarly, EPA established an additional one-hour primary standard for nitrogen oxides at 100 ppb in January 2010 after many studies established connections between short-term exposure to nitrogen oxides and adverse respiratory effects, increased visits to emergency departments, and hospital admissions for respiratory issues, especially asthma.<sup>16</sup> These recent 1-hour standards prove more than ever that ensuring compliance with emission limits at all times is critical to delivering on the Clean Air Act’s promise of healthful air.

## **B. New Sources of Air Pollution Must Obtain Permits to Ensure Protection of the NAAQS.**

The core goals of the Clean Air Act’s preconstruction permitting program are to ensure that new sources of air pollution incorporate state-of-the-art pollution controls and do not contribute to air pollution in excess of air quality standards.<sup>17</sup> Congress targeted “major emitting facilities,”<sup>18</sup> such

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(2010) (noting that the health effects of sulfur dioxide exposure include aggravation of asthma and chest tightness), *available at* <https://goo.gl/Wemzpd>.

<sup>11</sup> Fact Sheet, Revisions to the Primary National Ambient Air Quality Standard, Monitoring Network, and Data Reporting Requirements for Sulfur Dioxide, *available at* [https://www.epa.gov/sites/production/files/2016-05/documents/final\\_primary\\_naaqs\\_factsheet.pdf](https://www.epa.gov/sites/production/files/2016-05/documents/final_primary_naaqs_factsheet.pdf)

<sup>12</sup> See 75 Fed. Reg. at 35,525.

<sup>13</sup> See Revision to the Rate of Progress Plan for the Beaumont/Port Arthur Ozone Nonattainment Area, 71 Fed. Reg. 8,962, 8,963 (Feb. 22, 2006).

<sup>14</sup> 42 U.S.C. § 7409.

<sup>15</sup> See EPA, Table of Historical Sulfur Dioxide National Ambient Air Quality Standards (NAAQS), *available at* <https://www.epa.gov/so2-pollution/table-historical-sulfur-dioxide-national-ambient-air-quality-standards-naaqs>

<sup>16</sup> See EPA, Nitrogen Oxides Effects, *available at* <https://www.epa.gov/no2-pollution/basic-information-about-no2#Effects>

<sup>17</sup> See *Nat’l Parks Conservation Ass’n v. Tenn. Valley Auth.*, 480 F.3d 410, 412 (6th Cir. 2007); 42 U.S.C. §§ 7470-7492.

as the IGS plant, for stringent permitting because Congress' intent was to "identify facilities which, due to their size, are financially able to bear the substantial regulatory costs imposed by the [Prevention of Significant Deterioration] PSD provisions and which, as a group, are primarily responsible for emission of the deleterious pollutants that befoul our nation's air."<sup>19</sup> The preconstruction PSD process is critical for these massive sources of air pollution that operate for decades because there is little opportunity under the Clean Air Act to revisit the allowed emissions levels.

The preconstruction permit for a major source, referred to as a "PSD permit," has two central purposes, each critical to the Act's overall scheme: First, the permit sets the limits that will govern the plant's emissions of air pollutants to a rate consistent with the use of the best available methods, systems, and techniques of pollution control (in Clean Air Act jargon, this emission limit is called the "Best Available Control Technology" (BACT)). BACT is considered "[o]ne of the most critical elements of the PSD permitting process."<sup>20</sup> Second, the application must provide a comprehensive public assessment of the plant's impact on air quality, ensuring that air quality remains consistent with the Act's National Ambient Air Quality Standards as well as various site-specific ambient air quality standards, some of which are referred to as "increments."

The Act also contains special preconstruction permitting provisions to protect the public from hazardous air pollutants (HAPs). HAPs threaten human health and include substances that are "carcinogenic, mutagenic, teratogenic, neurotoxic, which cause reproductive dysfunction, or which are acutely or chronically toxic."<sup>21</sup> The purpose of the Act's HAP program is to require the stringent control of these dangerous pollutants because they could "cause, or contribute to, an increase in mortality or an increase in serious irreversible[] or incapacitating reversible[] illness."<sup>22</sup>

## II. PDEQ Failed to Apply the Best Available Control Technology (BACT) to the RICE Units

BACT is "one of the most critical elements of the PSD permitting process."<sup>23</sup> BACT is defined as:

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<sup>18</sup> 42 U.S.C. § 7475.

<sup>19</sup> *Alabama Power Co. v. Costle*, 636 F.2d 323, 353 (D.C. Cir. 1979).

<sup>20</sup> *In re Knauf Fiber Glass*, 8 E.A.D. 121, 131 (E.A.B. 1999), 1999 WL 64235, at \*8; hereinafter ("*Knauf I*")

<sup>21</sup> 42 U.S.C § 7412(b)(2). State courts often look to decisions from the Environmental Appeals Board (EAB) for guidance, affording the EPA's highest decision making authority significant deference. See, e.g., *United States v. S. Indiana Gas & Elec. Co.*, 245 F. Supp. 2d 994, 1009-10 (S.D. Ind. 2003). The EAB is the final EPA decisionmaker on administrative appeals under all major federal environmental statutes. Arizona must interpret the Clean Air Act such that the state's program is no weaker than the federal program, as it has been interpreted by EPA. See 42 U.S.C. § 7416; *Alaska Dept. Env'tl. Conservation v. EPA*, 540 U.S. 461 (2004) (upholding EPA's interpretations of BACT over state objections).

<sup>22</sup> *New Jersey v. EPA*, 517 F.3d 574, 577 (D.C. Cir. 2008).

<sup>23</sup> *Knauf I*, 8 E.A.D. at 131.

an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

40 C.F.R. § 52.21(b)(12); PCC § 17.04.340 (A)(37). To ensure that the limits in the permit ensure “maximum degree of reduction,” the permit applicant is required to propose a permit limit that constitutes BACT and to supply sufficient information on the control option used to achieve that limit.<sup>24</sup> Specifically, the applicant must provide “[a] detailed description [of the] system of continuous emission[s] reduction [] planned for the source or modification, emission estimates,” and any other information necessary to ensure a detailed analysis leading to a limit ensuring maximum achievable pollution reduction.<sup>25</sup>

To ensure that the BACT determination is “reasonably moored” to the Clean Air Act’s statutory requirement that BACT represent the maximum achievable reduction through the use of various pollution control techniques, U.S. EPA established a top-down analysis process outlined in the 1990 New Source Review (NSR) Manual,<sup>26</sup> which PDEQ adopted in its review of the RICE unit. Each step of the BACT analysis, and especially a decision to reject an effective pollution reduction option in favor of a less effective option when establishing a BACT limit “must be adequately explained and justified.”<sup>27</sup>

A BACT analysis begins with the identification of all available control technology options for each regulated pollutant.<sup>28</sup> This step must include “inherently lower-polluting processes,” “technologies employed outside of the United States,” “controls applied to similar source categories and gas streams and innovative control technologies.”<sup>29</sup> BACT’s forward-looking emphasis is the “most important” mechanism promoting the Clean Air Act’s “philosophy of encouragement of technology development.” The BACT standard is intended to require the use

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<sup>24</sup> *In re* Genesee Power Station Ltd., 4 E.A.D. 832 (E.A.B. 1993) WL 484880, at \*3.

<sup>25</sup> 40 C.F.R. § 52.21(n); NSR Manual at B.24. EPA issued detailed guidance for permitting authorities on how to best perform a BACT analysis that comports with the statute’s mandate in its NSR Manual. EPA’s adjudicatory arm for Clean Air Act permitting, the Environmental Appeals Board (EAB), explained the import of the NSR Manual in evaluating BACT determinations *in In re N. Mich. Univ.*, slip op. at 54-55, PSD Appeal 08-02, 2009 WL 443976, at \*8 (EAB Feb. 18, 2009). PDEQ adopted the NSR manual’s BACT approach here. Proposed TSD Attach. C at PDF 191.

<sup>26</sup> *Alaska Dept. of Env’tl Conservation v. EPA*, 540 U.S. 461, 485 (2004).

<sup>27</sup> *Knauf I*, 8 E.A.D. at 131; NSR Manual at B.26-B.29; *In re General Motors, Inc.*, 10 E.A.D. 360, 379 (EAB 2002); *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 206-07 (EAB 20022000); *In re Masonite Corp.*, 5 E.A.D. 551, 546-69 (EAB 1994).

<sup>28</sup> NSR Workshop Manual B.5-9.

<sup>29</sup> *Id.*

of “the latest technological developments [in pollution control] as a requirement in granting the permit,” so as to “lead to rapid adoption of improvements in technology as new sources are built,” rather than “the stagnation that occurs when everyone works against a single national standard for new sources.”

Next, technical infeasible options are eliminated only if “clearly documented...based on physical, chemical and engineering principles.”<sup>30</sup> The control technologies are next ranked by “effectiveness” based on efficiency, emission rate, and emission reductions.<sup>31</sup>

In Step 4, starting with the most stringent technology, the economic, environmental, and energy impacts, “both beneficial and adverse,” are evaluated and quantified if possible.<sup>32</sup> Only if this analysis documents that the first ranked technology is inappropriate, that technology is eliminated and the next most effective alternative evaluated. Based on this process, the most effective, achievable technology is proposed as BACT.<sup>33</sup> As the Supreme Court has recognized, the definition of BACT contains the “strong, normative terms ‘maximum’ and ‘achievable.’” PDEQ must articulate a sound basis with supporting documentation to select anything other than the most stringent emissions limit achievable.<sup>34</sup>

As discussed in the attached technical comments by Pless Environmental, Inc., the proposed permit fails to establish BACT for NOx, PM10, and PM2.5.<sup>35</sup> Based on an erroneous netting analysis, neither the Applicant nor PDEQ performed a BACT analysis for NOx emissions. Pless’ comments demonstrate that NOx emissions from the RICE units are significantly higher than what could be achieved with the best available control technology. Likewise, Pless’ comments show that the proposed permit’s emission limit for PM10 and PM2.5 does not reflect the maximum degree of reduction required under BACT. Under PCC § 17.16.590, PDEQ cannot issue the permit without conducting a BACT analysis for NOx and redoing its BACT analysis for PM10 and PM2.5.

### **III. PDEQ’s Air Quality Impact Modeling Does Not Demonstrate That the RICE Project Will Not Cause Air Quality Deterioration and Underestimates Visibility Impacts**

One of the Clean Air Act’s most fundamental requirements is that a permit applicant must show that emissions from a new facility would not contribute to significant air quality deterioration.<sup>36</sup> A permit applicant must show that emissions from a new facility would not cause or contribute to a violation of ambient air quality standards or the increment.<sup>37</sup> “[W]orst case emissions should

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<sup>30</sup> *Id.*

<sup>31</sup> *Id.*

<sup>32</sup> *Id.*

<sup>33</sup> *Id.*

<sup>34</sup> *Id.* at 484-87, see also *In re Indeck-Elwood*, 2006 WL 3073109 at \*6.

<sup>35</sup> Pless Comments at 17-19.

<sup>36</sup> 42 U.S.C. § 7475(a)(3); 40 C.F.R. § 52.21(c) & (d); PCC §§ 17.16.590; 17.16.630.

<sup>37</sup> 42 U.S.C. §§ 7473, 7475(a)(3); 40 C.F.R. § 52.21(c) & (d); PCC §§ 17.16.590 (5).

be employed in the modeling analyses conducted to demonstrate a facility's compliance with the NAAQS and PSD increments."<sup>38</sup> As the NSR Manual explains:

For both NAAQS and PSD increment compliance demonstrations, the emissions rate for the proposed new source or modification must reflect the maximum allowable operating conditions as expressed by the federally enforceable emissions limit, operating level, and operating factor for each applicable pollutant and averaging time.<sup>39</sup>

As demonstrated in Pless' comments, the modeling in the permitting record does not support issuance of the proposed permit for the RICE units.<sup>40</sup> Most significantly, PDEQ underestimated the visibility impacts at Saguaro National Park because the modeling rate used does not reflect the maximum allowable operating conditions, which is the potential to emit. Moreover, the NOx rate used for the modeling is not an enforceable condition in the permit so there is no assurance that the units will not emit NOx at a much higher rate. TEP must redo the modeling at the legally mandated higher rate to show the potential visibility impacts at Saguaro and/or the lower modeled emission rate must be included as an enforceable limit in the permit.

Additionally, PDEQ's modeling for CO, PM10, and PM2.5 is not supported because the modeling was based on average emission rates instead of worst case emissions, PDEQ failed to model secondary PM2.5 emissions, and PDEQ did not model NO2 impacts. PDEQ must revise and perform these analyses in order to support issuance of the permit.<sup>41</sup>

#### **IV. The Proposed Permit Conditions Are Not Enforceable**

To be practically enforceable, a permit must contain adequate monitoring procedures to assure compliance with emissions limits.<sup>42</sup> Practical enforceability means the source must be able to show continuous compliance with each limitation requirement,<sup>43</sup> and the permit must include adequate testing, monitoring, and recordkeeping requirements.<sup>44</sup>

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<sup>38</sup> See *in re N. Mich. Univ.*, 14 E.A.D. 283, 319 (E.A.B. 2009), 2009 WL 443976 at \*30 (remanding permit for using modeling that could result in underestimated emissions); *Ober v. U.S. EPA*, 84 F.3d 304, 309 (9th Cir. 1996) (holding Clean Air Act requires attainment of all NAAQS, including a 24 hour standard for particulate matter).

<sup>39</sup> NSR Manual, at C.45 (emphasis in original).

<sup>40</sup> Pless Comments at 26-32.

<sup>41</sup> PCC § 17.16.590.

<sup>42</sup> *In re Peabody*, 12 E.A.D. 22 (E.A.B. 2005) WL 428833, at \*12; NSR Manual, at A.5, B.56; *United States v. Louisiana-Pac. Corp.*, 682 F. Supp. 1122, 1132-33 (D. Colo. 1987). EPA objected to the Title V permit for the Big Stone coal plant for this very reason. The permit "fail[ed] to indicate how the permittee must demonstrate that it is maintaining emissions at a level below the major source thresholds..." Letter from U.S. EPA to Steven M. Pirner, P.E. Sec'y, S.D. Dep't of Env't and Natural Res. (Jan. 22, 2009), at 11.

<sup>43</sup> Terrell E. Hunt & John S. Seitz, U.S. EPA, Guidance on Limiting Potential to Emit in New Source Permitting (June 13, 1989), at 3-5, hereinafter ("Guidance to Limiting PTE in NSR"); NSR Manual, at A.5.

<sup>44</sup> NSR Manual, at A.5.

*In re Peabody W. Coal Co.*,<sup>45</sup> demonstrates proper application of enforceability requirements. The Environmental Appeals Board (EAB) upheld EPA's refusal to accept the mine's proposed limits because Peabody "ha[d] not sufficiently demonstrated that it met the central criteria for establishing such limits – technical accuracy and a reliable method of determining compliance."<sup>46</sup> For example, Peabody had not "proposed monitoring sufficient to establish a practically enforceable PTE limit."<sup>47</sup>

Blanket limits alone, such as the proposed permit's ton per year NOx limit, are not practically enforceable because they are "virtually impossible to verify or enforce."<sup>48</sup> "Compliance with any limitation must be able to be established at any given time...restrictions [must be] written in such a manner that an inspector could verify instantly whether the source is or was complying with the permit condition."<sup>49</sup> To be enforceable, permits must "specify a reasonable averaging time consistent with established referenced methods..."<sup>50</sup> Additionally, emissions limits should be expressed in two ways, "with one value serving as an emissions cap (e.g., lb/hr) and the other ensuring continuous compliance at any operating capacity (e.g. lbs/MMBTU)."<sup>51</sup>

Pless' expert comments detail at length the enforceability issues with the proposed permit.<sup>52</sup> Specifically, using stack tests once every two years to determine whether the RICE units are in compliance with the permit is woefully inadequate. The permit does not contain an unambiguous methodology for demonstrating compliance with the annual NOx emission cap, and there is no support for the applicant's "vendor-guaranteed" NOx rate that is used to demonstrate compliance. Also, some of the permit conditions have *no* testing requirements whatsoever, and the permit does not contain a condition to ensure that fuel sulfur content in natural gas is below the 7,500 grains per million cubic feet assumed for the TEP's emission calculations.

## V. Conclusion

Thank you for your consideration of our comments and for all you do to protect Arizona's airsheds and environment and the health of our communities.

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<sup>45</sup> 12 E.A.D. 22 (E.A.B 2005) WL 428833.

<sup>46</sup> *Id.* at \*12.

<sup>47</sup> *Id.*

<sup>48</sup> *Louisiana-Pac. Corp.*, 682 F. Supp. at 1133; Guidance to Limiting PTE in NSR at 3-5; Memo from John S. Seitz, Office of Air Quality Planning and Standards to Air Management Division Directors et al. (Apr. 8, 1987); NSR Manual, at c.4.

<sup>49</sup> NSR Manual, at c.3.

<sup>50</sup> *Id.* at B.56.

<sup>51</sup> *Id.* at H.5; see also *Id.* at I.2.

<sup>52</sup> Pless Comments at 20 -26.

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*Re: Review of Pima County Department of Environmental Quality's Proposed Prevention of Significant Deterioration Air Quality Permit No. 1052 for Tucson Electric Power's Irvington Generating Station*

Dear Ms. Issod,

Per your request I reviewed the Proposed Prevention of Significant Deterioration ("PSD") air quality permit ("*Proposed Permit*") and associated Draft Technical Support Document ("*Proposed TSD*") prepared by Pima County Department of Environmental Quality ("PDEQ") for authorization and significant revision to the existing Class I, Title V air quality permit No. 1052 for the Irvington Generating Station ("IGS" or "Facility"), also known as the H. Wilson Sundt Generating Station, in the City of Tucson, Arizona, which is owned and operated by Tucson Electric Power ("TEP" or "Applicant").<sup>123</sup>

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<sup>1</sup> The Curriculum Vitae of Petra Pless is attached as Exhibit 1.

<sup>2</sup> PDEQ, Draft Prevention of Significant Deterioration Air Quality Permit, Issued to Tucson Electric Power Irvington Generating Station, 3950 East Irvington Road, Tucson, AZ 85714, February 2018; available at: [http://webcms.pima.gov/UserFiles/Servers/Server\\_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/1052-Proposed-Permit.pdf](http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/1052-Proposed-Permit.pdf), accessed March 18, 2018.

<sup>3</sup> PDEQ, Draft Technical Support Document (TSD), TEP Irvington Generating Station, Air Quality Permit # 1052, February 2018, 15 pages; available at: [http://webcms.pima.gov/UserFiles/Servers/Server\\_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/1052-Proposed-TSD.PDF](http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/1052-Proposed-TSD.PDF), accessed March 18, 2018.

Supporting documents for my review include TEP's application for the Facility modification dated July 2017<sup>4</sup> ("*7/17 Application*"), TEP's revised application dated December 2017<sup>5</sup> ("*12/17 Revised Application*"), and other relevant documents found in the docket for the *Proposed Permit*<sup>6</sup> and elsewhere.

As discussed in my comments below, the *Proposed TSD* is substantially flawed and the *Proposed Permit* is not consistent with the requirements of the federal Clean Air Act ("*CAA*" or "*the Act*").

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<sup>4</sup> Tucson Electric Power, Application for a Prevention of Significant Deterioration (PSD) Authorization and Significant Revision to Class I Air Quality Permit for Irvington Generating Station, submitted to Pima County Dept. of Environmental Quality, prepared by RTP Environmental Associates, Inc., July 2017; available at:

[http://webcms.pima.gov/UserFiles/Servers/Server\\_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/17-08-01-PSD-Air-Permit-Application.pdf](http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/17-08-01-PSD-Air-Permit-Application.pdf) , accessed February 20, 2018.

<sup>5</sup> Tucson Electric Power, Application for a Prevention of Significant Deterioration (PSD) Authorization and Significant Revision to Class I Air Quality Permit for Irvington Generating Station, submitted to Pima County Dept. of Environmental Quality, prepared by RTP Environmental Associates, Inc., July 2017 (Revised December 2017); available at:

[http://webcms.pima.gov/UserFiles/Servers/Server\\_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/17-12-19-Sundt-RICE-Project-Revised-Application.pdf](http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/17-12-19-Sundt-RICE-Project-Revised-Application.pdf), accessed March 18, 2018.

<sup>6</sup> PDEQ, TEP Application for PSD Authorization; available at:

<http://webcms.pima.gov/cms/One.aspx?portalId=169&pageId=363558>.

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## I. Facility and Project Description

The existing Facility is an electric utility power generating station with a combined, nominal, net generating capacity of 470 megawatts (“MW”) that generates electricity by fossil fuel (natural gas, liquid fuel) and landfill gas combustion. The Facility consists primarily of electric utility steam generating units (“EGUs”), stationary combustion turbines with starter engines, cooling towers, emergency generators, and other processes and equipment associated with power generation. There are four fossil fuel-fired EGUs (each consisting of a boiler, steam turbine, and generator), designated as Units I1 through I4, with a net generating capability of 81 MW, 81 MW, 104 MW, and 156 MW, respectively, and two simple-cycle peaking internal combustion turbines with black-start capability, designated as IGT1 and IGT2, with a combined net generating capability of 48 MW.<sup>7</sup>

TEP is proposing to install up to ten natural-gas fired reciprocating internal combustion engines (“RICE”) at the IGS Facility to provide flexible, fast-responding capacity and assist in mitigating power fluctuations associated with renewable resources.<sup>8</sup> Specifically, the proposed Facility expansion includes construction of up to ten 18-cylinder, four-stroke, lean-burn spark-ignited RICE units manufactured by Wartsila, which would be fueled exclusively by pipeline natural gas. Each RICE unit would have a mechanical output capacity of 26,820 horsepower (“hp”) and would be connected to an air-cooled electric generator with a nominal net generating capacity of 19 MW. Each RICE unit would be equipped with an oxidation catalyst to control emissions of VOC, CO, and HAPs and a selective catalytic reduction (“SCR”) system to control emissions of NOx.<sup>9</sup> Ancillary equipment includes natural gas piping and electrical circuit breakers. Collectively, the *Proposed TSD* and my comments refer to these modifications as “the RICE project.”

In conjunction with the RICE project, TEP proposes to permanently cease operation of the two 1950s-era steam-turbine cycle electric generating units Unit I1 and Unit I2 (81 MW each). The RICE project in conjunction with the shutdown of Units I1 and I2 would increase the combined nominal net generating capacity of the IGS Facility from 470 MW by 28 MW to 498 MW.<sup>10</sup>

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<sup>7</sup> *Proposed Permit*, p. 4, *Proposed TSD*, pp. 1-2, and Appx. C, Att. B, p. 1, and *12/17 Revised Application*, p. 1-1.

<sup>8</sup> *Proposed TSD*, p. 1, and *12/17 Revised Application*, pp. 2-1, 2-5, 3-5, 5-3, and 5-4.

<sup>9</sup> *12/17 Revised Application*, p. 2-6.

<sup>10</sup> *12/17 Revised Application*, p. 1-1.

## II. Current Facility Permit and Proposed Permit Revision

PDEQ issued the most recent version of the air quality permit for the existing Facility pursuant to the New Source Review (“NSR”) requirements of the federal Clean Air Act (“CAA” or “the Act”), No. 1052, on January 6, 2017.<sup>11</sup> According to the technical support document for this permit (“1/17 TSD”),<sup>12</sup> the existing Facility-wide potential to emit exceeds the applicable major source thresholds for emissions of criteria pollutants<sup>13</sup> of 100 tons per year (“tons/year” or “tpy”) for nitrogen oxides (“NO<sub>x</sub>”), carbon monoxide (“CO”), volatile organic compounds (“VOC”), sulfur dioxide (“SO<sub>2</sub>”), and particulate matter equal to or smaller than 10 micrometers (“PM<sub>10</sub>”) and equal to or smaller than 2.5 micrometers (“PM<sub>2.5</sub>”).<sup>14</sup> The Facility operates within an area that is currently classified as attainment for all criteria pollutants<sup>15</sup> and is, thus, an existing Class I major stationary source pursuant to the prevention of significant deterioration (“PSD”) review requirements of the Act. In addition, the existing Facility has a facility-wide potential to emit in excess of the major source thresholds of 25 tons/year for total hazardous air pollutants (“HAPs”) and 10 tons per year of a single HAP<sup>16</sup> and, thus, is an existing major stationary source pursuant to 42 USC §7412(a)(1). Further, the 1/17 TSD identified the existing Facility as a major source of carbon dioxide-equivalent (“CO<sub>2e</sub>”) greenhouse gas (“GHG”) emissions.<sup>17</sup>

The *Proposed Permit* constitutes a significant revision to the existing Class I, Title V air quality permit which would authorize the construction of the RICE project as

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<sup>11</sup> *Proposed TSD*, pp. 2 and 3.

<sup>12</sup> See *Proposed TSD*, Appx. A.

<sup>13</sup> Criteria air pollutants, or simply criteria pollutants, are six common air pollutants – particulate matter, photochemical oxidants (including ozone), carbon monoxide, sulfur oxides, nitrogen oxides, and lead – for which the U.S. Environmental Protection Agency establishes National Ambient Air Quality Standards (“NAAQS”) based on characterizations of the latest scientific information regarding their effects on health or welfare and the environment.

<sup>14</sup> 40 CFR §52.21(b)(1) defines the major source threshold for fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input as 100 tons/year or more for any regulated NSR pollutant.

<sup>15</sup> *Proposed TSD*, p. 3

<sup>16</sup> 1/17 TSD, p. 7. (“For Title V air permitting purposes, the threshold to trigger a major source status is 100 tpy of any criteria air pollutant, 10 tpy of any single hazardous air pollutant (HAP), 25 tpy of any HAPs combination, 100,000 tpy CO<sub>2</sub> equivalent emissions of greenhouse gases. As shown in the summary table, IGS is a major Title V source for the following air pollutants: PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, CO<sub>2e</sub>, VOC, and HAPs.”)

<sup>17</sup> *Id.*

a major modification of the existing major stationary source.<sup>18</sup> Specifically, the *Proposed TSD* finds that emissions increases from the RICE project exceed the respective PSD significance levels for six pollutants: NO<sub>x</sub>, VOC, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, and GHGs.<sup>19</sup> However, TEP is voluntarily accepting a permit cap for NO<sub>x</sub> emissions of 170.0 tons/year for all ten RICE units combined<sup>20</sup> to ensure that the net emissions increase for NO<sub>x</sub> associated with the RICE project, when accounting for the emission reductions resulting from the shutdown of Units I1 and I2, is not significant<sup>21</sup> and, thus, does not trigger PSD review. Accordingly, the *Proposed TSD* finds that, the net emissions increase of NO<sub>x</sub> from the RICE project is not significant and, thus, PSD review is not required with respect to NO<sub>x</sub>. For the other five pollutants (VOC, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, and GHGs), TEP claims no creditable decreases in actual emissions, and, consequently, the *Proposed TSD* finds that net emissions increases of these pollutants are equal to the emissions increases associated with the RICE project. Therefore, PDEQ finds that the RICE project constitutes a major modification of the current Class I, Title V air quality permit for the Facility triggering PSD air impact analyses for VOC, CO, PM<sub>10</sub>, and PM<sub>2.5</sub> and best available control technology (“BACT”) requirements for VOC, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, and GHGs.<sup>22</sup>

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<sup>18</sup> *Proposed TSD*, p. 3.

<sup>19</sup> *Proposed TSD*, p. 10.

<sup>20</sup> Conrad Spencer, TEP, Letter to to Rupesh Patel, PDEQ, February 23, 2018; available at: [http://webcms.pima.gov/UserFiles/Servers/Server\\_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/18-02-23-TEP-Voluntary-Proposed-NOx-Limit.pdf](http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/18-02-23-TEP-Voluntary-Proposed-NOx-Limit.pdf), accessed March 28, 2018. (“First, regarding the voluntarily proposed NO<sub>x</sub> emission cap: The limit requested in Section 4.5.3 of the permit application was 179.0 tons per year. Based on that proposed limit, the net NO<sub>x</sub> emissions increase as documented in Table 4-1 of the permit application, was 39.4 tons per year. Concerns were expressed by the governmental agencies regarding the small compliance margin relative to the PSD significant level of 40 tons per year. In order to alleviate these concerns, TEP informally requested that PDEQ reduce the NO<sub>x</sub> emission cap to a more restrictive level of 170.0 tons per year. This results in a net NO<sub>x</sub> emissions increase of 30.4 tons per year, which provides a 24 percent compliance margin relative to the PSD significant level of 40 tons per year. The more stringent NO<sub>x</sub> emission cap of 170.0 tons per year is already reflected in Condition II.A.1.a of the draft permit currently available for public notice and comment. With this letter, TEP formally requests the more stringent NO<sub>x</sub> emission cap of 170.0 tons per year.”)

<sup>21</sup> 12/17 Revised Application, p. 4-6. (“As provided by PCC §§ 17.12.190 and 17.12.195, TEP is voluntarily proposing three separate, substantive requirements that will ensure the net emissions increase for NO<sub>x</sub> as a result of the RICE project is not significant: A requirement to shut down permanently either Unit 1 or Unit 2 at the IGS within 180 days following initial startup of the first RICE; a requirement to have shut down permanently both Units 1 and 2 at the IGS within 180 days following initial startup of the sixth RICE; and a NO<sub>x</sub> emission cap of 179.0 tpy for the ten RICE to be installed at the IGS.”)

<sup>22</sup> *Proposed TSD*, pp. 10 and 11.

### **III. The Proposed TSD Is Deficient as a Support Document for the Proposed Permit**

The *Proposed TSD* fails to properly establish the potential to emit for the RICE units and fails to provide all information it relied upon to calculate potential to emit.

#### **A. The Proposed TSD Fails to Properly Establish Potential to Emit for the RICE Units**

Typically, the technical support document for a permit contains a discussion of how emission limits in the permit were determined and, in the case of a modification of an existing stationary source, a demonstration of the net emissions increase for each pollutant. The *Proposed TSD* provide no such explanations and instead simply presents a table allegedly containing the “potential to emit” for all new and existing sources at the Facility in a table entitled “*IGS Facility Wide Potential to Emit (tons/year) Summary.*” With respect to emission limits contained in the *Proposed Permit*, the *Proposed TSD* simply states that “[t]he detailed RICE Project emission calculations and calculation methodology are included in Attachment A of Appendix C.”<sup>23</sup> In order to track down the origin of the respective emission limits and verify that the RICE project would not constitute a major modification for NO<sub>x</sub> emissions, as claimed by the *Proposed TSD*, the reviewer must wade through the appendices to the *Proposed TSD* and other documents contained in the docket such as the *12/17 Revised Application* and a letter from the Applicant specifying the revised NO<sub>x</sub> emission cap.<sup>24</sup> Because the *Proposed TSD* will be a standalone document for further permit revisions, all information relied upon to determine the potential to emit for the RICE units and the proposed shutdown of Units I1 and I2 must be included as part of the document.

Further, the *Proposed TSD* explains with the “potential to emit” presented in the *IGS Facility Wide Potential to Emit (tons/year) Summary* table:

The following table summarizes IGS annual potential to emit of air pollutants by each emission unit and by facility-wide total. The emission estimate is to establish “major source” status of IGS pursuant to CAA Sec 501(2). Other use with the estimate may include comparing source potential-to-emit with emissions inventory and test data, or with emission rates allowable by relevant standards. This emission estimate is not meant to establish any baseline emission

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<sup>23</sup> *Proposed TSD*, p. 6.

<sup>24</sup> Letter from Conrad Spencer, TEP, to Rupesh Patel, PDEQ, February 23, 2018. (“With this letter, TEP formally requests the more stringent NO<sub>x</sub> emission cap of 170.0 tons per year.”)

levels. These emission figures are not meant to be emission limitations of any form.<sup>25</sup>

The *Proposed TSD* does not explain why the “emission figures” do not reflect the true potential to emit for the Facility and its equipment based on the permit conditions.

The term “potential to emit” is a defined term for purposes of PSD review:

Potential to emit means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.

PCC §17.04.340(A)(175); 40 CFR 52.21(b)(4). The *Proposed TSD* should be revised to reflect the potential to emit for all emissions units consistent with this definition.

Further frustrating review, the *Proposed TSD* presents two different definitions for the term “potential to emit” (“PTE”) for the RICE units. Specifically, the emission calculations provided in Attachment A to Appendix C of the *Proposed TSD*, which purportedly support the potential to emit for these units presented in the summary table *IGS Facility Wide Potential to Emit (tons/year) Summary*,<sup>26</sup> refer to “Proposed Potential to Emit” and “Estimated Potential to Emit.” The former is consistent with the potential to emit presented in the summary table and the latter is based on vendor-supplied startup and controlled emission rates, which are lower and were used for modeling purposes. (Modeling must be based on the maximum emission rates incorporated into enforceable permit condition; see Comment VII.B.)

In sum, the *Proposed TSD* frustrates public review and should be revised to address the issues outlined above. In order to facilitate review, the *Proposed TSD* should include tables for BACT emission limits and net emissions increases for all pollutants.

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<sup>25</sup> *Proposed TSD*, p. 6.

<sup>26</sup> *Proposed TSD*, p. 6. (“The emissions from the new RICE units are calculated based on 8,760 hours of operation per year for each of the ten RICE. The summarized RICE potential to emit is included in Table 1 (below). Assumptions are presented in the Table 1 footnotes. The detailed RICE Project emission calculations and calculation methodology are included in Attachment A of Appendix C.”)

## **B. All Documents Relied Upon for Preparation of the Proposed TSD and Proposed Permit Must Be Provided**

The emission calculations provided in Appendix C, Attachment A, to the *Proposed TSD*, which purport to support the potential to emit provided in the *IGS Facility Wide Potential to Emit (tons/year) Summary* table, refer a number of times to vendor information provided by TEP in a letter entitled “*Vendor Emissions Performance Specifications, H. Wilson Sundt Generating Station Rice Project*,” dated September 21, 2017.<sup>27</sup> This document is neither attached to the *Proposed TSD* nor can it be found in the record.

Without the document in the permitting record, the assumed emission rates from this letter, specifically the cold startup emission factors and 60-minute average flue gas emission rates after control system startup for 25% to 100% engine loads, are not supported. Consequently, the emission calculations for potential to emit for the RICE units are not supported. This document must be provided with the *Proposed TSD*.

## **IV. The Facility May Not Net Out of PSD Review for NOx Emissions from the New RICE Units**

A facility may determine for a particular project that there will not be a significant emissions increase – and thereby avoid air impact analyses and pollution controls/emission rates consistent with BACT – only after adding and subtracting all “contemporaneous” emissions increases and decreases from the entire facility and determining there will be no significant “net” emission increases. This process is called “netting.” TEP desires to net out of the PSD review for NOx emissions from the new RICE units by accepting an emission cap of 170.0 tons/year and accounting for the emission decreases associated with the shutdown of Units I1 and I2.

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<sup>27</sup> See *Proposed TSD*, Appx. C, Att. A, footnote 2 to Table A-2 (“Proposed PTE Calculations for PM10, PM2.5, CO, and VOC assume 5 cold startup events per RICE per day. Per vendor information provided by TEP letter *Vendor Emissions Performance Specifications, H. Wilson Sundt Generating Station Rice Project*, date September 21, 2017, a cold start “...is when the temperature of the catalyst material inside the reactor is close to ambient temperature...” and that cold starts “... are expected after over haul periods or when the engine has not been operated during the last 2-3 days.”), footnote 8 to Table A-2 (“Vendor supplied cold startup emission factors provided in TEP letter *Vendor Emissions Performance Specifications, H. Wilson Sundt Generating Station Rice Project*. September 21, 2017.”), and footnote 9 to Table A-2 (“Vendor supplied 60 minute average flue gas emission rates after control system startup for 25% to 100% engine loads provided in TEP letter *Vendor Emissions Performance Specifications, H. Wilson Sundt Generating Station Rice Project*, September 21, 2017.”),

Pursuant to PCC §17.04.340(A)(127) and 40 CFR §52.21(a)(2)(iv) and (b)(2), a project is a “major modification” if it will cause a net emissions increase that is significant for any pollutant regulated by the PSD program. “Significant” is defined for each NSR pollutant at PCC §17.04.340(A)(212) and 40 CFR §§52.21(b)(23). For NO<sub>x</sub>, the significant emission rate is 40 tons/year.

As discussed below, the netting analysis for NO<sub>x</sub> emissions from the RICE project is not supported and the net emissions increase of NO<sub>x</sub> is significant, thus triggering PSD review including an air quality impact analysis and BACT review for this pollutant.

**A. The Emissions Decreases from Proposed Shutdown of Units I1 and I2 Are Not Contemporaneous with Emissions Increases from RICE Units**

The *Proposed TSD* and *Proposed Permit*, discuss the proposed NO<sub>x</sub> emission cap for the RICE project for PSD netting purposes as follows:

The Facility is voluntarily accepting a NO<sub>x</sub> emission cap to ensure that the RICE project net emissions increase for NO<sub>x</sub> is not significant. The permit requires the permanent shut down of either Unit I1 or Unit I2 (existing Units) within 180 days following initial startup of the first RICE and a requirement to permanently shut down both Units I1 and I2 within 180 days following initial startup of the sixth RICE. The NO<sub>x</sub> emission cap of 170.0 tpy applies to the ten RICE to be installed at the IGS.<sup>28</sup>

The Permittee has accepted the following three separate requirements to ensure that the net emissions increase in NO<sub>x</sub> as a result of the RICE project is not significant and therefore not subject to PSD requirements:

1. One of the existing fossil fuel fired units (Unit 1 or Unit 2) will be shut down permanently within 180 days following initial startup of the first RICE;
2. Two of the existing fossil fuel fired units (Unit 1 and Unit 2) will be shut down permanently within 180 days following initial startup of the sixth RICE; and
3. The NO<sub>x</sub> emissions from the ten RICE will be limited to 170.0 tpy.<sup>29</sup>

The requirement to shut down Units I1 and I2 is incorporated into the *Proposed Permit* in Conditions B.V.E.1 and B.V.E.2.<sup>30</sup> The emission cap for the RICE units of

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<sup>28</sup> *Proposed TSD*, p. 6.

<sup>29</sup> *Proposed Permit*, p. 4.

<sup>30</sup> *Proposed Permit* in Condition B.V.E. (“1. The permittee shall shutdown permanently either Unit I1 or Unit I2 within 180 days following initial startup of the first RICE unit. 2. The permittee shall have

170.0 tons/year is incorporated into the *Proposed Permit* in Condition B.II.A.1.a. Neither the *Proposed TSD* nor the *Proposed Permit* provide any reference to an applicable legal authority for the proposed two overlap periods of 180 days between startup of the first RICE unit and shutdown of either Unit I1 or I2 and the startup of the sixth RICE unit and shutdown of both Units I1 and I2. (See also Comment VI.B.) Such an overlap period is inconsistent with the requirements of the Act and its implementing regulations with respect to netting for purposes of triggering PSD review.

PCC §17.04.340(A)(148) and 40 CFR §52.21(b)(3)(i)(b) provide that any increases or decreases in actual emissions at the major stationary source that are used to calculate a net emissions increase with respect to any regulated NSR pollutant<sup>31</sup> (here the proposed decrease of actual emission from shutdown of Units I1 and I2) must be “contemporaneous with the particular change.” An increase or decrease in actual emissions is “contemporaneous” only for:

(a) The date five years before construction on the particular change commences;  
and

(b) The date that the increase from the particular change occurs.

PCC §17.04.340(A)(148)(b) and 40 CFR §52.21(b)(3)(ii). In sum, to be contemporaneous, shutdown of Units I1 and I2 must occur no later than the day startup of the first RICE unit occurs.

The proposed overlap period of 180 days between startup of the new RICE units and shutdown of the existing boilers may be relying on misinterpretation of PCC §17.04.340(A)(148)(g) and 40 CFR §52.21(b)(3)(viii), which allow for a “shakedown” period of 180 days for “replacement units:”

An increase that results from a physical change at a source occurs when the emissions unit on which construction occurred becomes operational and begins to emit a particular pollutant. Any replacement unit that requires shakedown becomes operational only after a reasonable shakedown period, not to exceed one hundred eighty days.

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shutdown permanently both Unit I1 and Unit I2 within 180 days following initial startup of the sixth RICE unit.”)

<sup>31</sup> NO<sub>x</sub> are a regulated NSR pollutant pursuant to 40 CFR § 52.21(b)(50)(i) for which a NAAQS has been promulgated (1-hour and annual NO<sub>2</sub>) and 40 CFR § 52.21(50)(i)(b)(1) as a precursor for ozone.

However, the RICE units are not replacement units for the steam electric generators Units I1 and I2. Since the Pima County Code does not include a definition for “replacement unit,” PDEQ should look to the federal definition, and also apply a common-sense definition to define replacement unit. Notably, nowhere does the Applicant claim that the RICE project is a replacement unit.

The meaning of a “replacement unit” is defined in 40 CFR §52.21(b)(33), which requires that all of the criteria listed in the following subsections are met:

- (i) The emissions unit is a reconstructed unit within the meaning of § 60.15(b)(1) of this chapter, or the emissions unit completely takes the place of an existing emissions unit.
- (ii) The emissions unit is identical to or functionally equivalent to the replaced emissions unit.
- (iii) The replacement does not alter the basic design parameters (as discussed in paragraph (cc)(2) of this section)<sup>32</sup> of the process unit.
- (iv) The replaced emissions unit is permanently removed from the major stationary source, otherwise permanently disabled, or permanently barred from operation by a permit that is enforceable as a practical matter. If the replaced emissions unit is brought back into operation, it shall constitute a new emissions unit.

Here, the RICE units do not comply with the requirements for “replacement units” specified in in sections (ii) and (iii):

*First*, the RICE units are not “identical or functionally equivalent” to the existing Units I1 and I2 pursuant to 40 CFR §52.21(b)(33)(ii) as they employ fundamentally different technologies to generate electricity, *i.e.*, internal combustion versus steam turbine cycle, respectively, as recognized by the *Proposed TSD*.<sup>33</sup>

*Second*, the RICE units alter the basic design parameters of the process unit pursuant to 40 CFR §52.21(b)(33)(iii). Here, the steam turbine cycle Units I1 and I2 are

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<sup>32</sup> Though 40 CFR §52.21(cc)(2) is stayed indefinitely, that does not impact the remainder of 40 CFR §52.21(b)(33)(iii).

<sup>33</sup> *Proposed TSD*, p. 3. (“TEP-IGS currently generates electricity using two fossil fuel fired processes: (1) Steam Turbine Cycle and (2) Combustion Turbine Cycle. This PSD modification approves the construction and operation of a third fossil fuel fired process: RICE.”)

permitted to fire different fuels than the RICE units and have substantially different maximum hourly heat input and maximum hourly electric output rates, as summarized in Table 1.

**Table 1: Design parameters for RICE units and Unit I1 and I2**

Design parameter	RICE unit	Unit I1	Unit I2
Permitted fuels	Natural gas <sup>a</sup>	Natural gas; fuel oil #2 through #6 or equivalent; co-firing natural gas with fuel oil #2 through #6; and co-firing any of the above fuels with landfill gas; and high sulfur oil (fuel sulfur content > 0.90% by weight) as a fuel if Permittee can demonstrate to the satisfaction of the Control Officer that sufficient quantities of low sulfur oil are not available for use by the source and that it has adequate facilities and contingency plans to ensure that the sulfur dioxide ambient air quality standards set forth in PCC 17.08.020 will not be violated <sup>b</sup>	Natural gas; fuel oil #2 through #6 or equivalent; co-firing natural gas with fuel oil #2 through #6; and co-firing any of the above fuels with landfill gas; and high sulfur oil (fuel sulfur content > 0.90% by weight) as a fuel if Permittee can demonstrate to the satisfaction of the Control Officer that sufficient quantities of low sulfur oil are not available for use by the source and that it has adequate facilities and contingency plans to ensure that the sulfur dioxide ambient air quality standards set forth in PCC 17.08.020 will not be violated <sup>b</sup>
Maximum hourly heat input	154.5 MMBtu/hr <sup>c</sup>	803 MMBtu/hr <sup>d</sup>	803 MMBtu/hr <sup>d</sup>
Maximum hourly electric output rate	19 MW <sup>c</sup>	81.02 MW <sup>d</sup>	81.53 MW <sup>d</sup>

a Proposed Permit, Condition B.II.A.1.a

b Proposed Permit, Condition B.V.A.3

c Proposed Permit, Attachment 2: Equipment List, VI. Reciprocating Internal Combustion Engines

d Proposed TSD, p. 3

Clearly, the RICE units are not “replacement units.” Therefore, any emissions decreases from shutdown of Units I1 and I2, if overlapping with construction of the new RICE units, may not be used as “contemporaneous” emissions decreases in the netting analysis for the RICE project. Consequently, the RICE project results in a significant net emission increase for NO<sub>x</sub> equal to the units’ combined potential to emit of 2,589.8 tons/year,<sup>34</sup> requiring a PSD analysis for this pollutant including an air impact analysis to determine compliance with the 1-hour and annual NO<sub>2</sub> national ambient air quality standards (“NAAQS”) and a BACT analysis. BACT for the RICE units is 3.10 pounds per hour (“lbs/hour”) of NO<sub>x</sub>, excluding startup. (See Comment V.A.) The Proposed TSD and Proposed Permit must be revised accordingly.

<sup>34</sup> Proposed TSD, Appx. C, Att. A, Table A-2.

**B. The Proposed Phased Shutdown of Units I1 and/or I2 Does Not Support the Proposed NOx Emissions Cap for the RICE Units**

Even assuming, *arguendo*, that a 180-day shakedown period applied, which it does not, the Applicant's netting analysis, upon which PDEQ relies, fails to identify that the RICE project would result in a significant net emissions increase of NO<sub>x</sub>, thus, triggering PSD review for this pollutant.

Specifically, the requirements to shut down Units I1 and I2 are incorporated into the *Proposed Permit*, Condition B.V.E, as follows:<sup>35</sup>

1. The permittee shall shutdown permanently either Unit I1 or Unit I2 within 180 days following initial startup of the first RICE unit.
2. The permittee shall have shutdown permanently both Unit I1 and Unit I2 within 180 days following initial startup of the sixth RICE unit.

Notably, there is no requirement that both steam turbine units be shut down should the Applicant decide to construct only five RICE units as permitted by the *Proposed Permit*, Condition B.I.N.1, which authorizes the installation of "up to ten" RICE units, and continue to operate one of the existing steam turbine cycle units, either Unit I1 or Unit I2. This scenario would permit simultaneous NO<sub>x</sub> emissions from the five RICE units and from one of the two existing steam turbine units, either Unit I1 or I2. Thus, the emission decrease assumed for shutdown of the second steam turbine cycle unit, either Unit I1 or I2, cannot be used for the RICE project to net out of PSD review. As a result, the net significant increase in NO<sub>x</sub> emissions from the five RICE units exceeds the 40 tons/year PSD significance threshold for this pollutant for the following reason:

NO<sub>x</sub> emissions from the RICE units are limited only by *Proposed Permit*, Condition B.II.A.1.a, which implements the proposed permit cap of 170.0 tons/year as a 12-month rolling total for all ten RICE units combined.<sup>36</sup> The *Proposed Permit* does not include any permit conditions limiting NO<sub>x</sub> emissions on an annual basis for individual

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<sup>35</sup> *Proposed Permit* in Condition B.V.E. ("1. The permittee shall shutdown permanently either Unit I1 or Unit I2 within 180 days following initial startup of the first RICE unit. 2. The permittee shall have shutdown permanently both Unit I1 and Unit I2 within 180 days following initial startup of the sixth RICE unit.")

<sup>36</sup> *Proposed Permit*, Condition B.II.A.1. ("The combined total NO<sub>x</sub> emissions from emissions units RICE01 through RICE10 shall not exceed 170.0 tons per year (tpy), based on a 12-month rolling total, calculated monthly.")

RICE units, which each have a potential to emit of 258.9 tons/year of NO<sub>x</sub>.<sup>37</sup> Based on the potential to emit of 258.9 tons/year, the PSD significance threshold for major modifications of 40 tons/year NO<sub>x</sub> would be exceeded when operating one RICE unit for more than 2,061.2 hours per year (23.5% of the year).<sup>38</sup> In fact, during a recent hearing before the Arizona Power Plant and Transmission Line Siting Committee, the Applicant indicated anticipated operation of one of the RICE units for 8,760 hours per year,<sup>39</sup> which would by itself result in an exceedance of the PSD significance threshold for major modifications of 40 tons/year NO<sub>x</sub> by 547 percent.<sup>40</sup> For all five RICE units, the PSD significance threshold for major modifications of 40 tons/year NO<sub>x</sub> would be exceeded when operating for a combined 270.7 hours per year (3.1% of the year).<sup>41</sup> Because the *Proposed Permit* only contains an annual emission cap for NO<sub>x</sub> emissions from all ten RICE units and no requirements to determine compliance with the major modification PSD significance threshold of 40 tons/year assumed for netting out of PSD review, this would not be detected.

Thus, unless the *Proposed Permit* is revised to include an enforceable condition to limit total combined NO<sub>x</sub> emissions from all ten RICE units to equal or less than 40 tons/year,<sup>42</sup> the RICE project constitutes a major modification of an existing major

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<sup>37</sup> See *Proposed TSD*, p. 7: potential to emit for NO<sub>x</sub> for each RICE unit is 59.1 lbs/hour; therefore, annual potential to emit for each RICE unit: (59.1 lbs/hour NO<sub>x</sub>/RICE unit) × (8,760 hours/year) / (2000 lbs/ton) = 258.9 tons/year NO<sub>x</sub>/RICE unit.

<sup>38</sup> (40 tons/year NO<sub>x</sub>) / (258.9 tons/year NO<sub>x</sub>/RICE unit) = 23.53%;  
23.53% × (8,760 hours/year) = 2,061.2 hours/year.

<sup>39</sup> Before the Arizona Power Plant and Transmission Line Siting Committee, In the Matter of the Application of Tucson Electric Power Company (“TEP”), in Conformance with the Requirements of Arizona Revised Statutes §§ 40-360, et seq., for Certificates of Environmental Compatibility Authorizing the Construction of the Reciprocating Internal Combustion Engine Generation Project and the Irvington 138 kV Transmission Line Relocation Project, Including the Installation of Ten (10) Modular Approximately 20 MW Reciprocating Internal Combustion Engine Generators and Construction of Approximately 2.2 Miles of New 138 kV Transmission Lines Located Within TEP’s Irvington Campus, Section 3, Township 15 South, Range 14 East, Pima County, Arizona, Docket No. L00000C-17-0365-00177, Case No. 177, January 18, 2018, p. 249; available at: [https://www.tep.com/wp-content/uploads/2018/02/TEP-RICE-Project-LS\\_II.pdf](https://www.tep.com/wp-content/uploads/2018/02/TEP-RICE-Project-LS_II.pdf), accessed March 28, 2018.

<sup>40</sup> (258.1 tons/year NO<sub>x</sub>/RICE unit) / (PSD significant modification threshold applicable to all ten RICE units: 40 tons/year NO<sub>x</sub>) = 0.647 or 647%; 647% - 100% = 547%.

<sup>41</sup> (258.9 tons/year NO<sub>x</sub>/RICE unit) × (5 RICE units) = 1,294.3 tons/year NO<sub>x</sub>/5 RICE units;  
(40 tons/year NO<sub>x</sub>) / (1,294.3 tons/year NO<sub>x</sub>/5 RICE units) = 3.1%;  
(3.1%) × (8,760 hours/year) = 270.7 hours/year.

<sup>42</sup> Such permit conditions to ensure compliance with a determination supporting a minor modification are included for Unit IGT3 in *Proposed Permit*, Attachments 6 and 7, Conditions III.B.1.b, respectively (“The Permittee shall not allow the total combined emissions of NO<sub>x</sub> from Unit IGT3 to equal or exceed

stationary source pursuant to PCC §17.04.340(A)(212) and 40 CFR §§52.21(b)(23), requiring PSD review including an air quality dispersion modeling analysis and a BACT analysis. A discussion of BACT for emissions of NO<sub>x</sub> from RICE units is provided in Comment V.A.

In the alternative, the *Proposed Permit* must be revised to either a) require the shutdown of both steam turbine units, Units I1 and I2, at the startup of the first RICE unit or b) include an enforceable permit condition limiting NO<sub>x</sub> emissions from each RICE unit to one tenth of the 40 tons/year significance threshold for this pollutant triggering PSD review (4 tons/year per RICE unit).

## V. The Proposed Permit Fails to Establish BACT for the RICE Units

I reviewed EPA's RACT/BACT/LAER Clearinghouse ("RBLC"), the BACT Clearinghouse maintained by the California Air Resources Board ("CARB"),<sup>43</sup> guidance published by air districts in California and other agencies, and permits recently issued for similar equipment. My review determines a BACT limit for NO<sub>x</sub> and finds that the BACT determination supporting the *Proposed Permit* is deficient for PM<sub>10</sub>.

### A. NO<sub>x</sub> BACT Normal Operations

As discussed in Comment IV, the RICE project is subject to PSD review for NO<sub>x</sub> emissions requiring BACT for this pollutant, *i.e.*, the "maximum degree of reduction" of pollution. PCC §17.04.340(A)(37); 40 CFR §52.21(b)(12). The *Proposed TSD* does not include a BACT analysis for NO<sub>x</sub>, nor does the permit include an emission rate that constitutes BACT. The most stringent emission limit for the RICE units specified in the *Proposed Permit* is the emission standard contained in Table 1 of the New Source Performance Standard ("NSPS"), Subpart JJJJ - Standards of Performance for Stationary

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40 tons per year, calculated as a 12-month rolling total. [PCC 17.12.190.B] [Material Permit Condition]"); Attachments 6 and 7, Conditions III.C.1.b, respectively ("The Permittee shall not allow the total combined emissions of SO<sub>2</sub> from Unit IGT3 to equal or exceed 40 tons per year, calculated as a 12-month rolling total. [PCC 17.12.190.B] [Material Permit Condition]"); and Attachments 6 and 7, Conditions III.D.1 respectively ("The Permittee shall not allow the total combined emissions of carbon monoxide (CO) from IGT3 to equal or exceed 100 tons per year, calculated as a 12-month rolling total. [PCC 17.12.190.B] [Material Permit Condition]"). (PCC §17.12.190.B requires: "The control officer shall provide public notice of receipt of complete applications for permits to construct or make a major modification to major sources by publishing a notice in a newspaper of general circulation in the county where the source will be located.")

<sup>43</sup> CARB, BACT Clearinghouse; available at: <https://www.arb.ca.gov/bact/bactnew/rptpara.htm>, accessed March 28, 2018.

Spark Ignition Internal Combustion Engines, which require compliance with a NO<sub>x</sub> emission factor of 1.0 grams per brake horsepower-hour (“g/bhp-hour”) for a natural gas-fueled, non-emergency, spark-ignited, lean-burn reciprocating internal combustion engine with a maximum engine power equal to or greater than 500 horsepower (“hp”). For each of the RICE units, this is equivalent to 59.1 lbs/hour at 100 percent load.<sup>44</sup>

Based upon my review, the maximum emission reduction that is technically feasible to control emissions from this type of engine is SCR with lean-burn combustion. The *Proposed Permit* requires SCR for the RICE units<sup>45</sup> and lean burn-combustion is inherent in the design of the proposed RICE units. The most stringent BACT emission limit for non-emergency lean-burn, 4-stroke RICE units fired on pipeline natural gas, 1.45 lbs/hour, was permitted four years ago by the Kansas Department of Health and Environment (“KDHE”) for a similar project, *i.e.*, the construction of ten 9-MW natural gas-fueled, non-emergency, spark-ignited, 4-stroke, lean-burn RICE units, designed to support the expansion of the wind energy resources and the oil/ gas exploration in western Kansas, at TradeWind Energy’s Lacey Randall facility, northeast of Colby, Kansas.<sup>46</sup> The supporting BACT analysis for this facility determined, based on information from EPA’s RBLC, that NO<sub>x</sub> BACT for steady-state (normal) operation is the use of SCR and an emission limit of 1.45 lbs/hour or less with an averaging period of 1 hour for each of the facility’s RICE units based on vendor guarantees.<sup>47</sup> This

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<sup>44</sup> See *12/17 Revised Application*, p. 3-3, which calculates the hourly emission rate for NO<sub>x</sub> based on an emission factor of 1.0 g/hp-hr and the nominal mechanical output capacity of each RICE unit of 26,820 hp at 59.1 lbs/hour.

<sup>45</sup> *Proposed Permit*, Condition II.A.1.c.

<sup>46</sup> See KDHE, Air Emission Source Construction Permit, Lacey Randall Generating Facility, LLC, Source ID 1930036, January 24, 2014 Condition VI.A. BACT Emission Limitations; available at [http://www.kdheks.gov/bar/tradewind/Lacey-Randall-Final-Permit-1\\_24\\_14.pdf](http://www.kdheks.gov/bar/tradewind/Lacey-Randall-Final-Permit-1_24_14.pdf), accessed March 27, 2018. (Attached as Exhibit 2) (“VI.A.1. The emission of pollutants from each EGU shall be no greater than the specified limitations listed below... For the purpose of demonstrating ongoing compliance with BACT-based emission limitations, startup ends 30 minutes after a start sequence is initiated.” and “VI.A.1.a. The emission of NO<sub>x</sub> shall not exceed 1.45 lbs/hour at all times except during startup (1-hour averaging period).”)

<sup>47</sup> TradeWind Energy, Inc., Prevention of Significant Deterioration – Air Construction Permit Application, Lacey Randall Station – TradeWind Energy, Inc., Source ID 1930036, Project No. 72125, Updated December 2013 (hereafter “*Lacey Randall RICE Application*”); available at: <http://www.kdheks.gov/bar/tradewind/tradewind-laceyrandall-psd-air-permit-application.pdf>, accessed March 27, 2018. (Excerpts attached as Exhibit 3.) (p. 6-15: “The BACT emission limitation for NO<sub>x</sub> is 1.45 lbs/hr for steady state loads of 50 percent and higher, based on vendor guarantees. This rate is equivalent to 0.053 g/hp-hr for loads of 50 percent and higher.”)

equates to an emission factor of 0.0525 g/hp-hr for each of the Lacey Randall facility's 12,526-hp RICE units.<sup>48</sup>

This BACT determination remains applicable to the RICE project and results in a BACT emission rate of 3.10 lbs/hour for each of the RICE units based on a NO<sub>x</sub> emission factor of 0.0525 g/bhp-hour and the nominal mechanical output capacity of 26,820 hp of each RICE unit.<sup>49,50</sup> The *Proposed Permit* must be revised to include a corresponding emission limit and testing, monitoring and reporting requirements.

## B. PM10/PM2.5 BACT Normal Operations

The BACT analysis for PM10/PM2.5 in Attachment C to Appendix A of the *Proposed TSD* establishes BACT as good combustion practices and a non-startup PM10/PM2.5 emission limit of 2.5 lbs/hour per engine.<sup>51</sup> This corresponds to an emission factor of 0.04 g/hp-hr.<sup>52</sup> This is not BACT for a lean-burn, 4-stroke RICE unit.

A considerably lower BACT limit was permitted by the Tehama County Air Pollution Control District ("TCAPCD") and can be found in CARB's BACT Clearinghouse and the BACT determination for RICE units established by the South Coast Air Quality Management District ("SCAQMD"). Specifically, TCAPCD permitted a 44 MW peaking power plant for NEO California Power, LLC, with sixteen 3,870-hp Wartsila lean burn, 4-stroke RICE units (Model 18V220SG) fired on natural gas with a BACT emission limit of 0.02 g/hp-hr PM10, *i.e.*, half of the proposed BACT limit for the RICE project units. The engines started up in late fall of 2001, *i.e.*, more than a decade ago, and compliance with emission limits has been achieved in practiced as evidenced by source tests.<sup>53,54</sup> In fact, the SCAQMD's BACT determination for these units states

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<sup>48</sup> *Lacey Randall RICE Application*, Table 1-2, p. ES-4.

<sup>49</sup> See *Proposed Permit*, p. 26.

<sup>50</sup>  $(0.0525 \text{ g/hp-hr}) \times (26,820 \text{ hp}) \times (453.6 \text{ g/lb}) = 3.10 \text{ lbs/hour}$ .

<sup>51</sup> *Proposed TSD*, Appx. C, Att. C, pp. 6-9. ("The proposed non-startup limit of 2.5 pounds PM10/PM2.5 per hour based on three 120-minute test runs is acceptable as BACT for nonstartup operation.")

<sup>52</sup>  $(2.5 \text{ lbs/hour/RICE unit}) / (26,820 \text{ hp/RICE unit}) \times (453.6 \text{ g/lb}) = 0.04 \text{ g/hp-hr}$ .

<sup>53</sup> See CARB, BACT Clearinghouse for Neo California Power, LLC; available at: <https://www.arb.ca.gov/bact/bactnew/determination.php?var=694>, accessed March 28, 2018. (Attached as Exhibit 4.)

<sup>54</sup> SCAQMD, Section II: Other LAER/BACT Determinations Application No. 220, Equipment Category - I.C. Engine, Stationary, Non-Emergency, May 14, 2004; available at: <http://www.aqmd.gov/docs/default-source/bact/laer-bact-determinations/other-laer-bact/ice-neo-calif-power-3870-hp-an-220.pdf?sfvrsn=2>. (Attached as Exhibit 5.)

that the “operating company contact reports that there has been no problem meeting the emission limits.”<sup>55</sup>

A PM10/PM2.5 limit of 0.02 g/hp-hr is therefore equally feasible for the RICE project units. The corresponding hourly emission rate for one RICE unit is 1.18 lbs/hour.<sup>56</sup> The *Proposed TSD* and *Proposed Permit* must be revised to reflect this BACT emission limit for PM10/PM2.5 as an enforceable permit condition.

## **VI. The Proposed Permit Emission Limits Are Not Enforceable and/or Inadequate or Missing**

A unit’s or facility’s potential to emit must be practically enforceable.<sup>57</sup> Practical enforceability means the source and/or enforcement authority must be able to show continual compliance (or noncompliance) with each limitation or requirement. In other words, adequate testing, monitoring, and record-keeping procedures must be included in the PSD permit for the RICE units. This requirement is not satisfied by the conditions recommended in the *Proposed Permit*.

### **A. Infrequent Stack Tests Are Inadequate to Determine Compliance with Proposed PSD and BACT Permit Emission Limits and Air Quality Impact Modeling**

The *Proposed Permit*, Condition B.II.D.1, specifies the following testing requirements for the RICE units for compliance with PSD and BACT:

Performance tests to demonstrate compliance with the NO<sub>x</sub>, VOC, CO, and PM10/PM2.5 emission limitations shall be conducted annually, in accordance with the following schedule. Each RICE shall be subjected to a performance test within 60 days after achieving the maximum production rate, but not later than 180 days after initial startup. Thereafter, testing shall be conducted annually according to the following schedule: The Permittee shall conduct performance tests of at least five RICE in each calendar year, and each RICE shall be subjected to a performance test no less frequently than once in each period of two consecutive calendar years.

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<sup>55</sup> *Ibid.*

<sup>56</sup>  $(0.02 \text{ g/hp-hr PM10}) \times (26,820 \text{ hp/RICE unit}) \times (453.6 \text{ g/lb}) = 1.18 \text{ lbs/hour PM10/RICE unit.}$

<sup>57</sup> PCC §17.04.340 (A)(175); 40 CFR §52.21(b)(17).

The *Proposed Permit* contains no testing requirements other than these infrequent stack tests (biannual after initial source test for each RICE unit) to determine compliance with the *Proposed Permit* PSD and BACT emission limits for NO<sub>x</sub>, VOC, CO, and PM<sub>10</sub>/PM<sub>2.5</sub>. Infrequent stack tests are inadequate to determine whether permit limits are being met routinely, day in and day out.<sup>58</sup> EPA itself has stated that annual stack tests are not sufficient to assure compliance with emissions limits.<sup>59</sup> The reasons for this inadequacy include the shortness of the tests, the frequency of the proposed stack testing, and the ideal, prearranged conditions under which manual stack tests are conducted.

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<sup>58</sup> The General Accounting Office (“GAO”), for example, has noted that stack tests “are not considered a primary detection method because they are scheduled by the facility, employ contractors paid by the facility and are performed infrequently...” See GAO, Report to the Chairman, Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representative, *Air Pollution: Improvements Needed in Detecting and Preventing Violations*, GAO/RCES09155, September 1990, p. 12, footnote 3; <http://archive.gao.gov/d22t8/142597.pdf>, accessed March 27, 2018. (Attached as Exhibit 6.) (“EPA also uses stack tests to assess compliance; however, these tests are not considered a primary detection method because they are scheduled by the facility, employ contractors paid by the facility, and are performed infrequently, often only once every 6 years during permit application or renewal, according to EPA.”)

<sup>59</sup> See, for example, Deborah Jordan, EPA, Letter to Jack Broadbent, Bay Area Air Quality Management District, Re: EPA Review of Proposed Title V/ Major Facility Review Permits: Chevron Products Company (Richmond) #A0010, ConocoPhillips Company #A0016 (Rodeo), Shell Oil Products US #A0011 (Martinez), Tesoro Refining and Marketing Company (Martinez) #B2758 & B2759, Valero Refining Company #B2626 (Benicia), October 8, 2004; available at: <https://www3.epa.gov/region9/air/ca/sfrefineries/EPAletter-attchments.pdf>, accessed March 27, 2018. (Attached as Exhibit 7.) (Explaining that annual stack testing does not ensure compliance throughout the rest of the year: “Annual testing at the ESP outlet, however, is inadequate because there is no way to determine whether the control device is operating at a level that meets the applicable requirements during the rest of the year.”)

See also EPA, Letter to Howard Rhodes, Florida Department of Environmental Management, Re: EPA’s Review of Proposed Title V Permit No. 0170004-004-AV Florida Power Corporation Crystal River Plant, November 1, 1999; available at <https://www.epa.gov/sites/production/files/2015-07/documents/fpc.pdf>, accessed March 27, 2018. (Attached as Exhibit 8.) (Specifying that the use of add-on controls requires more than annual stack testing: “While EPA has in the past accepted this approach as adequate periodic monitoring for particulate matter, it has done so only for uncontrolled natural gas and fuel oil-fired units. The units addressed in Conditions A.14. and B.13., primarily burn coal and use add-on control equipment (i.e., electrostatic precipitators) to comply with the applicable particulate matter standards. In order to provide reasonable assurance of compliance, the results of annual stack testing will have to be supplemented with additional monitoring. Furthermore, the results of an annual test alone would not constitute an adequate basis for the annual compliance certification that the facility is required to submit for these units in order to certify continuous compliance with the pound/hour particular matter limit.”)

*First*, stack tests normally last only a few hours (two to six hours).<sup>60</sup> Annual testing therefore may not be representative for emissions during routine operations during the remaining hours of the year. Bi-annual testing, as proposed here is even less representative.

*Second*, it is well known that “[m]annual stack tests are generally performed under optimum operating conditions, and as such, do not reflect the full-time emission conditions from a source.”<sup>61</sup> A widely used handbook on Continuous Emissions Monitoring (“CEMs”) notes, with respect to manual source tests for PM10, that: “Due to the planning and preparations necessary for these manual methods, the source is usually notified prior to the actual testing. This lead time allows the source to optimize both operations and control equipment performance in order to pass the tests.”<sup>62</sup> In other words, maintenance is performed in advance of the test to ensure that the emission-generating process is finely tuned. Sometimes, a pre-test is conducted and additional maintenance and tuning performed to assure the source passes.

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<sup>60</sup> See, for example, NSPS Subpart JJJJ, Table 2, for NOx: Results of this test consist of the average of the three 1-hour or longer runs.

<sup>61</sup> See, for example, 40 Fed. Reg. 46,241, October 6, 1975.

<sup>62</sup> James A. Jahnke, *Continuous Emission Monitoring*, 2<sup>nd</sup> Ed., John Wiley & Sons, Inc., New York, 2000, p. 241. (Attached as Exhibit 9.)

Therefore, to assure that sources comply with emission limits, it is essential that monitoring be performed more frequently than specified by the biannual source test requirements in the *Proposed Permit*. Stack emissions can be accurately monitored with Continuous Emissions Monitors (“CEMs”). CEMS are electro-mechanical instruments, usually installed in the facility’s exhaust or smoke stacks, which sample, analyze, measure, and record the amount of pollutants passing through the stack. CEMS have been developed to measure various types of pollutants emitted by stationary sources,<sup>63</sup> including NO<sub>x</sub>, CO, and opacity. NO<sub>x</sub> and CO CEMS are routinely required for natural gas-fired combustion units, including RICE units,<sup>64</sup> and can detect violations that inspectors cannot:

According to EPA compliance officials, inspectors have difficulty judging visible emissions at night and in adverse weather, whereas CEMS are not affected by these conditions. More importantly, gaseous emissions, such as SO<sub>2</sub> and NO<sub>x</sub>, are generally not visible, whereas CEMS consistently measure these gases directly and reliably. For some gaseous pollutants, inspectors often can only infer compliance by comparing existing process and control system operating conditions with those recorded during stack testing. However, according to EPA, stack test data are collected under finely tuned process and control system operating conditions, and thus may be atypical of tests conducted under normal operations, further adding to the difficulty of detecting violations of permit conditions for gaseous pollutants.<sup>65</sup>

Unless supplemental monitoring such as CEMS is added to the *Proposed Permit*, community members will not be able to protect themselves against harmful emissions and local, state, and federal regulatory agencies cannot detect and cure violations of permit conditions. Indeed, even when locals observe conditions that strongly suggest that the plant is violating its permit limits (*e.g.*, plumes are visible at the stacks, odors are present, solids settle in their yards or homes, or they experience adverse health

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<sup>63</sup> GAO Report, *op. cit.*, p. 17.

<sup>64</sup> For example, NESHAP Subpart ZZZZ, includes CO CEMS as a feasible option to determine compliance with emission limitations.

See also North Coast Unified Air Quality Management District, Title V Federal Operating Permit, NCUAQMD, Permit to Operate and Final Determination of Compliance, ATC Permit No: 443-1, April 14, 2008; available at: <http://docketpublic.energy.ca.gov/PublicDocuments/Regulatory/Non%20Active%20AFC%27s/06-AFC-7%20Humboldt%20Repower/2008/April/TN%2045997%2004-14-08%20Title%20V%20Fed%20Operating%20Permit%20NCUAQMD%20Permit%20to%20Operate%20-%20FDOC.pdf>, accessed March 28, 2018. (Attached as Exhibit 10.)

<sup>65</sup> GAO Report, *op. cit.*, pp. 19 and 20.

effects), they are often powerless to prove such violations or to stop unlawful pollution because there are no monitoring data to support their claims.

## **B. NOx Emissions Cap Is Not Enforceable**

NOx emissions from the RICE units are limited by the *Proposed Permit*, Condition B.II.A.1.a, which implements the proposed permit emissions cap of 170.0 tons/year NOx for all ten RICE units combined based on a 12-month rolling total, calculated monthly. The *Proposed Permit* does not include any permit conditions limiting NOx emissions on a short-term basis for individual RICE units, other than the NSPS, Subpart JJJJ, emission limit of 1.0 g/bhp-hr, which results in a potential to emit of 258.9 tons/year of NOx per RICE unit.<sup>66</sup> The *Proposed Permit*, Condition B.II.D.2, establishes testing requirements for NOx emissions as follows:

- a. The permittee shall perform NOx emissions testing of each RICE using the methods and procedures in 40 CFR § 60.4244 and Table 2 of 40 CFR part 60, subpart JJJJ.
- b. Tests shall be performed at 25, 40, 70, and 100 percent of peak load or at a minimum and peak load capacity in the normal operating range of the engine, based upon the past twelve months of operation.
- c. The Permittee shall establish a NOx emission factor for non-startup periods expressed in lb/MMBtu heat input using the results of the most recent NOx emissions test approved by PDEQ. The emission factor for each RICE shall be set as the maximum lb/MMBtu emission factor observed during testing of such RICE under any load conditions.

Condition B.II.C.9 and B.II.C.10 lay out the reporting requirements for NOx emissions as follows:

9. On a monthly basis, for each RICE, the permittee shall calculate and record NOx emissions using the monthly records of heat input during periods other than startup, the NOx emission factor for non-startup periods as determined during the most recent emission test for that RICE, the number of startup events during the month, and the vendor-guaranteed NOx emission rate for each startup event. [PCC 17.12.050]
10. On a monthly basis, the permittee shall calculate and record total NOx emissions for the ten RICE, both for the most recent month and as a 12-month

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<sup>66</sup>  $(59.1 \text{ lbs/hour NOx/RICE unit}) \times (8,760 \text{ hours/year}) / (2000 \text{ lbs/ton}) = 258.9 \text{ tons/year NOx/RICE unit.}$

rolling total calculated using data from the most recent month and the eleven immediately preceding months. [PCC 17.12.050]

These permit conditions are inadequate to ensure compliance with the emission cap for NO<sub>x</sub> emissions of 170.0 tons/year established in Condition B.II.A.1.a, which is therefore not enforceable.

*First*, the *Proposed Permit* fails to establish an unambiguous methodology for calculating NO<sub>x</sub> emissions from the emission test. Simply referring to the parameters that are part of the calculation is inadequate to ensure that the Applicant correctly calculates NO<sub>x</sub> emissions. Thus, the NO<sub>x</sub> emission cap is not enforceable. The *Proposed Permit* should be revised to include an equation that lays out the emission calculation in detail. Preferably, the *Proposed Permit* should be revised to require installation of NO<sub>x</sub> CEMS which would eliminate the need for manual calculations.

*Second*, one of the parameters that are part of the proposed NO<sub>x</sub> emission calculation is the “vendor-guaranteed NO<sub>x</sub> emission rate for each startup event.” This emission rate is nowhere to be found in the *Proposed Permit*. Presumably, the *Proposed Permit* refers to the vendor-supplied (not vendor-guaranteed) startup emission rate of 11.1 lbs/hour of NO<sub>x</sub> per RICE unit presented in Attachment A to Appendix of the *Proposed TSD*, Table A-2. A vendor guarantee for this emission rate is nowhere to be found in the docket. Further, PDEQ recognizes that the emission rates provided by the vendor are not guaranteed. Specifically, Footnote 10 to Table A-2 clearly states “PTE emissions using vendor supplied controlled emission rates for comparative purposes only. Emissions presented are not enforceable by permit limits.” Thus, the startup emission rate for NO<sub>x</sub> is not supported and, consequently, the emission cap for NO<sub>x</sub> emission from all ten RICE units is not enforceable.

### **C. VOC, CO, and PM10/PM2.5 Emission Limits Are Not Enforceable**

The *Proposed Permit* contains testing requirements for VOC in Condition B.II.D.3, for CO in Condition B.II.D.4, and for PM10/PM2.5 in Condition B.II.D.5. Yet, the *Proposed Permit* contains no reporting requirements whatsoever for these pollutants. Thus, the emission limits for these pollutants are not enforceable.

### **D. Lack of Emission Limits for Potential to Emit of SO<sub>2</sub> and Sulfuric Acid Mist**

Based on a sulfur content in pipeline natural gas of 7,500 grains per million cubic feet, the *12/17 Revised Application* determines the potential to emit of SO<sub>2</sub> and sulfuric acid mist (“SAM”) as sulfur trioxide SO<sub>3</sub> for each of the RICE units at 0.32 lbs/hour and

1.4 tons/year SO<sub>2</sub> and 0.050 lbs/hour and 0.22 tons/year SO<sub>3</sub>, respectively.<sup>67</sup> The *Proposed TSD* provides the respective potential to emit for SO<sub>2</sub> and SAM in Attachment A to Appendix C, Table A-1, but the *Proposed Permit* contains no corresponding emission limits for either SO<sub>2</sub> or SO<sub>3</sub> or the sulfur content in natural gas. The only related permit condition is contained in Condition B.L. Fuel Sulfur Limitations:

Except as otherwise specified in the Specific Conditions of this permit, the Permittee shall be considered in compliance with the fuel sulfur limitations in this permit by demonstrating that only the specified fuel allowed was fired in the applicable equipment. Such a demonstration may be made by making available to the Control Officer for his inspection, documentation, such as invoices or statements from the fuel supplier, or sample analysis which verify the sulfur content of the fuel being piped and/or delivered. [PCC 17.12.180.A.3.c] [Locally Enforceable Condition]

This condition is inadequate to ensure that fuel sulfur content in natural gas is below the 7,500 grains per million cubic feet assumed for the Applicant's emission calculations upon which PDEQ relies for its potential to emit presented in summary table "IGS Facility Wide Potential to Emit ... Summary." Instead, the *Proposed Permit* should be revised to contain a condition specifying the maximum sulfur content in the pipeline natural gas is 7,500 grains per million cubic feet (0.75 grains/100 scf) or less demonstrated by TEP maintaining a copy of the tariff agreement approved by the Federal Energy Regulatory Commission with the same specification or less. Absent such a requirement, the visibility impact analysis for the RICE project is not supported. (See Comment VII.A.)

## **VII. PDEQ's Air Impact Analysis for the RICE Project Is Not Supported**

The *Proposed TSD*, Appendix C, Attachment B, presents an *Air Impact Analysis* for the RICE project, which includes a Class II Significant Impact Modeling Analysis (Section 3.4), a PSD Class I Significant Impact Level Modeling Analysis (Section 3.5), Modeling of Ozone Precursors (Section 3.6), and a Visibility Analysis (Section 3.7.1). These analyses are flawed, and the modeled results are not supported.

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<sup>67</sup> See 12/17 Revised Application, pp. 3-1 and 3-2.

**A. PDEQ's Visibility Impact Analysis for Saguaro National Park Is Not Supported and Underestimates Visibility Impacts**

Pursuant to 40 CFR §52.21(o)<sup>68</sup> and PCC § 17.16.630, the *Proposed TSD*, Appendix C, Attachment B, Chapter 3.7.1, presents an analysis of the anticipated impacts on visibility due to emissions from the proposed RICE project at nearby federal Class I areas, specifically, at Saguaro National Park (East and West).<sup>69</sup> Both PDEQ and the National Park Service ("NPS") determined that the RICE project would have a negative impact on visibility at Saguaro National Park as modeled. However, as discussed below, the modeling runs by far underestimate visibility impacts because the modeled NOx emission rates are not consistent with the potential to emit for the RICE units.

*Modeling Approach*

PDEQ modeled potential impacts with PLUVUE II, a refined visibility model designed to predict the transport, atmospheric diffusion, chemical conversion, optical effects, and surface deposition of point and area sources. The objective of the PLUVUE II model is to calculate visual range reduction and atmospheric discoloration caused by plumes consisting of primary particles, NOx, and sulfur dioxides ("SOx"), emitted by a single emission source.<sup>70</sup>

PDEQ modeled visibility impacts at Saguaro National Park with PLUVUE II for the following two cases:

*Case 1:* maximum 1-hour average emissions accounting for simultaneous start-up of all 10 RICE units within 30 minutes, plus 30 minutes running at 100% load in the same hour; and

*Case 2:* emissions from all 10 RICE units at 100% load.<sup>71</sup>

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<sup>68</sup> 40 CFR §52.21(o)(1). ("The owner or operator shall provide an analysis of the impairment to visibility, soils and vegetation that would occur as a result of the source or modification and general commercial, residential, industrial and other growth associated with the source or modification. The owner or operator need not provide an analysis of the impact on vegetation having no significant commercial or recreational value.")

<sup>69</sup> *Proposed TSD*, Appx. C, Att. B, Chapter 3.7.1, pp. 17-20.

<sup>70</sup> *Proposed TSD*, Appx. C, Att. B, Chapter 3.7.1, p. 17.

<sup>71</sup> *Proposed TSD*, Appx. C, Att. B, Chapter 3.7.1, p. 18.

The *Proposed TSD* fails to provide information on the modeled emission rates. Presumably, PDEQ modeled the same emission rates as those presented by the Applicant in the December 22, 2017 *Final Air Quality Dispersion Modeling Protocol*,<sup>72</sup> Chapter 5.1 Visibility Analysis (within 50 kilometers). The corresponding combined short-term emission rates for all ten RICE units are shown in the excerpted table from the December 22, 2017 *Final Air Quality Dispersion Modeling Protocol*.<sup>73</sup>

**Table 2-1 Emissions Summary for All Ten RICE Units (pounds per hour)**

Pollutant	Case 1	Case 2
PM	29.85	23.70
NOx	110.50	15.00
SO <sub>2</sub>	3.20	3.20

### *Modeling Results*

Based on the PLUVUE II modeling as discussed above, the *Proposed TSD* finds adverse impacts on visibility at Saguaro National Park for *Case I* (0.59% of daytime hours assuming grey as background color and 0.82% assuming black as background color) and for *Case II* (0.52% of daytime hours assuming grey as background color and 0.70% assuming black as background color).<sup>74</sup> The NPS reran the PLUVUE II modeling with the same emission rates for *Case I*<sup>75</sup> and found “visibility impacts at Saguaro east and west.”<sup>76</sup> Specifically, the NPS determined:

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<sup>72</sup> See TEP, Air Quality Dispersion Modeling Report in Support of the Application for a Prevention of Significant Deterioration (PSD) Authorization and Significant Revision to Class I Air Quality Permit for Irvington Generating Station, prepared by AECOM, Revision 2, December 22, 2017 (hereafter “12/17 TEP Air Quality Modeling Report”), Section 4.8, pp. 4-9 and 4-10; available at: [http://webcms.pima.gov/UserFiles/Servers/Server\\_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/17-12-22-TEP-IGS-Modeling-Report.pdf](http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/17-12-22-TEP-IGS-Modeling-Report.pdf), accessed March 27, 2018.

<sup>73</sup> *Ibid*, Appx. C, p. 8.

<sup>74</sup> *Proposed TSD*, Appx. C, Att. B, Chapter 3.7.1, p. 20.

<sup>75</sup> The NPS indicates modeled emission rates of 0.04 tons/day SO<sub>2</sub>, 1.33 tons/day NOx, and 0.36 tons/day PM, which is equivalent to 3.3 lbs/hour SO<sub>2</sub>, 110.5 lbs/hour NOx, and 30.0 lbs/hour PM. See Email from Kirsten King, NPS, to Rupesh Patel, PDEQ, Re: Tucson Electric Power, February 8, 2018, 1:37 pm.

<sup>76</sup> Email from Kirsten King, NPS, to Rupesh Patel, PDEQ, Re: Tucson Electric Power, February 8, 2018, 1:37 pm; available at [http://webcms.pima.gov/UserFiles/Servers/Server\\_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/NPS-Review-and-Response-to-Visibility-Modelling-and-Proposed-Permit.pdf](http://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Environmental%20Quality/Air/TEP%20PSD%20Webpage/NPS-Review-and-Response-to-Visibility-Modelling-and-Proposed-Permit.pdf), accessed March 28, 2018.

Saguaro east would see 13 hours per year with the highest Delta E of 4.658 and a Cp of 0.184. Saguaro west will see 48 hours per year with the highest Delta E of 9.612 and a Cp of 0.413.

Based on the PLUVUE model, out of a total of 4,380 daylight hours per year, there will be, on average, 61 hours per year when a plume might be perceptible within the park.<sup>77</sup>

The guidance that FLMs rely on to determine significance for visibility impacts, FLAG 2010, notes that for PLUVUE II analyses, the FLM would likely not object if Delta E is lower than 1.0 and Cp is lower than  $< 0.02$ .<sup>78</sup>

In other words, both PDEQ and the NPS determine that the RICE project would have an adverse impact on visibility at Saguaro National Park as modeled. However, these modeled adverse impacts, as discussed below, by far underestimate visibility impacts due to emissions from the RICE units.

#### *Modeled NOx Emission Rates Are Not Supported*

The *Proposed Permit* does not contain any permit conditions for the RICE units limiting short-term NOx emission rates to the modeled short-term emission rates and the modeled NOx rates are much lower than the combined potential to emit. Specifically, as shown in the excerpted table from the December 22, 2017 *Final Air Quality Dispersion Modeling Protocol* above, the modeled worst-case emission rates are 110.50 lbs/hour NOx for *Case 1* (30 minutes startup + 30 minutes normal operation) for all ten RICE Units or 11.05 lbs/hour NOx per RICE unit, and 15.00 lbs/hour NOx for *Case 2* (60 minutes normal operation) for all ten RICE units, or 1.50 lbs/hour NOx per RICE unit. These emission rates are considerably lower than those indicated as potential to emit in the Proposed TSD of 59.1 lbs/hour NOx for one RICE unit, *i.e.*, 590.1 lbs/hour NOx combined for all ten RICE units.

Thus, the results of the PLUVUE II modeling are not supported and the *Proposed Permit* does not ensure compliance with the modeled impacts. (In contrast, to ensure compliance with the air quality dispersion modeling analysis for PM10 and

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<sup>77</sup> *Ibid.*

<sup>78</sup> U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service, Federal Land Managers' Air Quality Related Values Work Group (FLAG), Phase I Report – Revised (2010), Natural Resource Report NPS/NRPC/NRR–2010/232, October 2010, p. 21; available at [https://www.nature.nps.gov/air/Pubs/pdf/flag/FLAG\\_2010.pdf](https://www.nature.nps.gov/air/Pubs/pdf/flag/FLAG_2010.pdf), accessed March 26, 2018. (Attached as Exhibit 11.) (“For PLUVUE II analyses, the FLM would likely not object if  $\Delta E < 1.0$  and  $|C| < 0.02$ .”)

PM2.5, which determines compliance with the respective short-term (24-hour) NAAQS for these pollutants, the *Proposed TSD* requires, and the *Proposed Permit* incorporates, the modeled emission rate as a permit condition.<sup>79,80)</sup>

#### *Permit Revision Required*

The *Proposed Permit* must be revised to include a permit condition limiting short-term emission rates to the modeled emission rates described above. Alternatively, the PLUVUE II modelling must be rerun with the potential to emit for all 10 RICE units of 591.0 lbs/hour of NOx. This would more accurately reflect visibility impacts from the RICE project absent any permit conditions limiting short-term NOx emissions from the RICE units, which would be considerably more severe than determined by PDEQ and NPS. The Federal Land Manager must have an opportunity to review the updated modeling and consider whether the project will adversely impact visibility.

#### **B. PDEQ's Class II Significant Impact Modeling Analysis for CO, PM10, and PM2.5 Is Not Supported**

The *Proposed TSD* determines compliance with short-term NAAQS for CO, PM10 and PM2.5 based on "average emission rates." These average emission rates are summarized in Tables 3-5 and 3-6 of Attachment B to Appendix C of the *Proposed TSD*. PDEQ modeled the 1-hour and 8-hour CO concentrations based on the startup emission rate for this pollutant of 18.2 lbs/hour provided by the vendor.<sup>81</sup> PDEQ modeled the 24-hour PM10 and PM2.5 concentrations based on 24-hour average emission rates calculated based on 21.5 hours of operation at the vendor-supplied emission rate including a buffer five startups per day.<sup>82</sup> As discussed in Comment VI.B, the vendor-supplied emission rates are not guaranteed and are not required as enforceable permit

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<sup>79</sup> *Proposed TSD*, p. 12. ("PM10/PM2.5 BACT for the RICE is determined to be 2.5 pounds PM10/PM2.5 per hour for non-startup operation. PM10/PM2.5 BACT for startup is: 1) minimize time spent at idle, 2) 30-minute startup duration limit, and 3) operation according to manufacturer specifications for minimizing emissions. Although 2.5 lbs/hr is deemed BACT for non-startup operation, the PM10/PM2.5 emission limit in the permit (2.37 lbs/hr) is based on the BACT determination and the dispersion modeling analysis. The dispersion modeling analysis includes startup emissions and requires an emission limit of 2.37 lbs/hr to demonstrate compliance (see Attachment B of Appendix C for details.)" Emphasis retained.)

<sup>80</sup> *Proposed Permit*, Condition B.II.A.4.a: PM10/PM2.5 emissions from each emissions unit (RICE01 through RICE10) shall not exceed 2.37 lbs/hr, excluding periods of startup.

<sup>81</sup> *Proposed TSD*, Appx. C, Att. B, Table 3-5, p. 9, Footnote 1.

<sup>82</sup> *Proposed TSD*, Appx. C, Att. B, Table 3-5, p. 9, Footnote 2.

conditions. Thus, the results of PDEQ’s Class II significant impact modeling analysis is not supported. Instead, modeling must be based on the maximum emission rates incorporated into an enforceable permit condition.

**C. Modeling of Secondary PM2.5 Emissions Is Required to Determine Compliance with the PM2.5 NAAQS**

The *Proposed TSD* fails to address the requirement for modeling of secondary PM2.5 emissions, presumably based on the Applicant’s erroneous finding that such modeling is not required.<sup>83</sup> Modeling of secondary PM2.5 emissions is required based on EPA guidance, and PDEQ must model the secondary PM2.5 emissions to properly demonstrate compliance with the PM2.5 NAAQS.

Specifically, the Applicant discusses the May 20, 2014 guidance from EPA regarding PM2.5 modeling for permitting purposes,<sup>84</sup> which defines four cases for what type of air quality modeling analysis is needed for consideration of direct and secondary PM2.5 emissions, as shown in the following excerpted table.

**Table ES-1. EPA Recommended Approaches for Assessing Primary and Secondary PM<sub>2.5</sub> Impacts by Assessment Case**

Assessment Case	Description of Assessment Case	Primary Impacts Approach	Secondary Impacts Approach
Case 1: No Air Quality Analysis	Direct PM2.5 emissions < 10 tpy SER NOx and SO2 emissions < 40 tpy SER	N/A	N/A
Case 2: Primary Air Quality Impacts Only	Direct PM2.5 emissions ≥ 10 tpy SER NOx and SO2 emissions < 40 tpy SER	Appendix W preferred or approved alternative dispersion model	N/A
Case 3: Primary and Secondary Air Quality Impacts	Direct PM2.5 emissions ≥ 10 tpy SER NOx and/or SO2 emissions ≥ 40 tpy SER	Appendix W preferred or approved alternative dispersion model	<ul style="list-style-type: none"> <li>• Qualitative</li> <li>• Hybrid qualitative / quantitative</li> <li>• Full quantitative photochemical grid modeling</li> </ul>
Case 4: Secondary Air Quality Impacts Only	Direct PM2.5 emissions < 10 tpy SER NOx and/or SO2 emissions ≥ 40 tpy SER	N/A	<ul style="list-style-type: none"> <li>• Qualitative</li> <li>• Hybrid qualitative / quantitative</li> <li>• Full quantitative photochemical grid modeling</li> </ul>

<sup>83</sup> See *TEP Air Quality Dispersion Modeling Report*, p. 4-10.

<sup>84</sup> Stephen Page, EPA, Memorandum to Regional Air Division Directors, Regions 1-10, Re: Guidance for PM2.5 Permit Modeling, May 20, 2014 (hereafter “EPA PM2.5 Modeling Guidance”); available at: [https://www3.epa.gov/scram001/guidance/guide/Guidance\\_for\\_PM25\\_Permit\\_Modeling.pdf](https://www3.epa.gov/scram001/guidance/guide/Guidance_for_PM25_Permit_Modeling.pdf), accessed March 27, 2018. (Attached as Exhibit 12.)

The Applicant finds that PM<sub>2.5</sub> modeling for the RICE project falls into Case 2, *i.e.*, direct PM<sub>2.5</sub> emissions are equal to or greater than the 10 tons/year significant emission rate (“SER”) for this pollutant and NO<sub>x</sub> and/or SO<sub>2</sub> emission rates are less than the respective 40 tons/year SER for these pollutants, thus, concludes that an analysis to address secondary PM<sub>2.5</sub> impacts is not required.<sup>85</sup>

However, as demonstrated in Comment IV, the RICE project in the *Proposed Permit* would exceed the 40 tons/year SER for NO<sub>x</sub> emissions; thus, Case 3 applies, *i.e.*, direct PM<sub>2.5</sub> emissions are equal to or greater than the 10 tons/year SER for this pollutant and NO<sub>x</sub> and/or SO<sub>2</sub> emission rates are less than the respective 40 tons/year SER for these pollutants. For Case 3, EPA guidance recommends an analysis to address secondary PM<sub>2.5</sub> impacts. The *Proposed Permit* and *Proposed TSD* should be revised to include such an analysis.

#### **D. The Proposed TSD Fails to Provide Modeling for Compliance with National Ambient Air Quality Standards for NO<sub>2</sub>**

As discussed in Comment IV, the RICE project would result in a significant net emission increase for NO<sub>x</sub>, which requires dispersion modeling for demonstrating compliance with the short-term and annual NAAQS for NO<sub>2</sub>. The *Proposed TSD* must be revised to include such an analysis.

### **VIII. Typographical and Other Errors in the Proposed TSD**

The *Proposed TSD* and *Proposed Permit* contain a number of typographical and other errors, as discussed below.

#### **A. The Facility-wide Potential to Emit Presented in the Proposed TSD Is Incorrect**

The *Proposed TSD*, p. 7, presents a summary table, *IGS Facility Wide Potential to Emit ... Summary*, which totals emissions unit-specific and Facility-wide hourly and annual PTE:

- The Facility-wide annual PTE for NO<sub>x</sub>, presented in the *IGS Facility Wide Potential to Emit ... Summary* table, **4,886.1 tons/year**, is incorrectly totaled; instead the correct Facility-wide annual PTE for NO<sub>x</sub> is **4,877.1 tons/year**.

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<sup>85</sup> 12/17 TEP Air Quality Modeling Report, pp. 4-9 - 4-10.

It appears that the Facility-wide annual PTE in the summary table was not updated to account for the proposed lower permit limit cap for NO<sub>x</sub> emissions from all ten RICE Units of 170.0 tons/year, a decrease of 8.96 tons/year compared to the previously proposed 178.96 tons/year.<sup>86</sup>

- The hourly and annual PTE for CO<sub>2</sub>e for each of the 10 RICE units presented in the *IGS Facility Wide Potential to Emit ... Summary* table, **1.85E05 lbs/hr** and **7.9E05 tpy**, are an order of magnitude too high. Instead, according to the *12/17 Revised Application*, the correct hourly and annual PTE for CO<sub>2</sub>e for each of the ten RICE units are **1.85E+04 lbs/hr** and **7.92E+04 tpy**.<sup>87</sup>
- The Facility-wide annual PTE for CO<sub>2</sub>e, presented in the *IGS Facility Wide Potential to Emit ... Summary* table, **3,822,500 tons/year**, is incorrectly totaled. Instead, the correct Facility-wide annual PTE for CO<sub>2</sub>e is calculated at **3,833,682 tons/year** when accounting for the revised hourly and annual PTE for CO<sub>2</sub>e for each of the ten RICE units, as discussed above.

## **B. The Proposed TSD Fails to Correctly Identify National Ambient Air Quality Standards and Class II Significant Impact Levels**

The Proposed TSD contains several errors regarding the applicable NAAQS and Class II SILs:

- The *Proposed TSD*, Appendix C, Attachment B: *Air Quality Impact Analysis*, Table 3-2, incorrectly provides the 1-hour NAAQS for CO as 358 parts per million (“ppm”) instead of 35 ppm.<sup>88</sup>
- The *Proposed TSD*, Appendix C, Attachment B: *Air Quality Impact Analysis*, Table 3-1, incorrectly identifies the annual NAAQS for PM<sub>2.5</sub> as 15 µg/m<sup>3</sup> instead of 12 µg/m<sup>3</sup>.<sup>89</sup>
- The *Proposed TSD*, Appendix C, Attachment B: *Air Quality Impact Analysis*, Table 3-1, incorrectly identifies the Class II SIL for 24-hour PM<sub>2.5</sub> as 0.3 µg/m<sup>3</sup> instead of 0.2 µg/m<sup>3</sup>.<sup>90</sup>

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<sup>86</sup> See, *12/17 Revised Application*, pp. 3-3, 3-7, 4-6, 4-10, and 4-11, and Appx. B, pp. B-2 and B-4 (179.0 tons/year); and Conrad Spencer, TEP, Letter to Rupesh Patel, PDEQ, February 23, 2018, *op. cit.*

<sup>87</sup> *12/17 Revised Application*, p. 3-5, Table 3-1: GHG PTE for Each RICE.

<sup>88</sup> See U.S. EPA, NAAQS Table; available at: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>, accessed March 18, 2018. (Attached as Exhibit 13).

<sup>89</sup> *Id.*

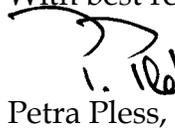
**C. The Proposed TSD Must be Revised to Reflect the Proposed Emission Cap for NO<sub>x</sub> Emissions for the RICE Units**

The *Proposed TSD*, Appendix C, Attachment A, provides emission calculations for the RICE project. Table A-1: Proposed RICE Project Potential to Emit (PTE) provides the potential to emit for the RICE project, *i.e.*, the ten RICE units and auxiliary equipment, at 170.0 tons/year for NO<sub>x</sub>. Note 1 to Table A-1 and Note 11 to Table A-2 provide that this proposed NO<sub>x</sub> emission limit is included in TEP's 12/17 Revised Application.<sup>91</sup> This is incorrect, the 12/17 Revised Application provides the potential to emit for the RICE project at 179.0 tons/year.<sup>92</sup> The proposed 170.0 tons/year emission cap for NO<sub>x</sub> emissions from the RICE project is contained in the Applicant's February 23, 2018 letter to PDEQ.<sup>93</sup> The *Proposed TSD* must be revised accordingly.

**IX. Conclusion and Recommendation**

As discussed in my comments above, the *Proposed TSD* is substantially flawed and the *Proposed Permit* is not consistent with the requirements of the Act and its implementing regulations and should be revised to address the above discussed issues.

With best regards,

  
Petra Pless, D.Env.

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<sup>90</sup> *Id.*

<sup>91</sup> *Proposed TSD*, Appx. C, Att. A, Table A-1, Note 1. ("Proposed NO<sub>x</sub> emission limit for all 10 RICE included in TEP Application for a Prevention of Significant Deterioration (PSD) Authorization and Significant Revision to Class I Air Quality Permit for Irvington Generating Station, Revised December 2017.")

<sup>92</sup> See 12/17 Revised Application, pp. 3-3, 3-7, 4-6, 4-10, and 4-11 and Appx B, pp. B-2 and B-4.

<sup>93</sup> Conrad Spencer, TEP, Letter to to Rupesh Patel, PDEQ, February 23, 2018, *op. cit.*