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Secretary for
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Department of Toxic Substances Control

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Edmund G. Brown Jr.
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Via Electronic Mail

November 17, 2017

Mr. Curt Russell
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DIRECTION ON REFINEMENT OF RISK ASSESSMENT EVALUATION, PACIFIC GAS AND ELECTRIC COMPANY (PG&E) TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA (EPA ID NO. CAT080011729)

Dear Mr. Russell,

The Department of Toxic Substances Control (DTSC) has worked with PG&E, Federal Agencies, Tribal representatives, and other project stakeholders in the development of the soil risk assessment approach since 2007. Throughout this period, DTSC Toxicologists remain apprehensive with the transparency and ease of review of the proposed alternative approach for estimating exposure point concentrations (EPCs) using area-weighted averaging (Thiessen polygons). Instead of reviewing only the alternative approach in the report, DTSC prefers that the outcome of a standard evaluation approach where EPCs are estimated as the 95% UCL of the mean using USEPA's ProUCL software, for each of the Areas of Concern (AOCs) identified be also provided for consideration. Recent presentations by PG&E appears to indicate that only EPCs estimated using the area-weighted averaging will be carried forward in the risk assessment when the 95% UCL of the mean for specific AOC(s) indicate that risks/hazards exceed screening criteria; in other words, this is no longer the "alternative" approach, but rather the primary approach.

DTSC reviewed the past agreements from the comment resolutions of the 2008 Human Health and Ecological Risk Assessment Work Plan (RAWP), 2009 RAWP Addendum and the 2015 RAWP Addendum 2 which addressed some of DTSC's concerns. DTSC would like to reiterate several of these below. These are grouped by their respective area of concerns:

Spatially-weighted exposure point concentrations:

1. Figure 1, General Approach for Ecological Risk Assessment – 2009 Revised RAWP Addendum

The decision flow chart communicated that a predictive Ecological Risk Assessment (ERA) will be completed to evaluate significance of risk and the use of spatially-weighted EPCs will be used to refine the calculated risk estimates if the predictive ERA shows significant risks. Furthermore, PG&E will hold Scientific Management Decision Point (SMDP) meetings after the predictive ERA prior to risk refinement. SMDP meetings will be held at other key decision points during the ERA.

2. Section 3.4 - 2015 RAWP Addendum 2

Consistent with the 2009 Addendum, PG&E states... *“As a first approach, EPCs will be calculated without the area-weighting, and the results will be evaluated for each exposure scenario. If EPCs calculated using a non-area weighted approach suggest that risks and/or non-cancer hazards may be significant for any given exposure scenario (i.e., cumulative cancer risks exceed a 10⁻⁶ cancer risk level, and/or the non-cancer HI exceeds 1), then EPCs may be calculated using an area-weighting approach. For transparency, and so the risk managers can fully understand the significance of area-weighting on the overall estimates of risk and hazard, area weighted EPCs, where calculated, will be presented in addition to the non-area weighted EPCs.”*

Exposure Units for Large Home Range Receptors:

3. Feb 4, 2009 responses to DTSC comments – 2009 Revised RAWP Addendum

In response to DTSC toxicologist suggestion to include evaluation for individual Areas of Concern (AOCs) as well as for multiple AOCs, PG&E agreed *“to provide information on the spatial distribution of significant risks if they are identified in the ERA. PG&E proposed that the minimum risk that could trigger spatial analysis would be the conservative estimate of the average daily dose (ADD) exceeding the no-observed adverse effect (NOAEL)-based toxicity reference value (TRV). That is, spatial analysis of risks would not be conducted unless the conservative estimate of the ADD for the exposure unit at least exceeds the TRV_{low}. The agencies concurred with this approach (Eichelberger, 2008). The spatial risk analysis step would occur after the Predictive ERA, which may include exposure point concentrations that are spatially-weighted as a refinement of the initial risk estimates. The spatial risk analysis may also be deferred until a validation study can be completed, if warranted. The spatial distribution of risks will be provided in the form of Thiessen polygon maps. These maps illustrate the distribution of risks for each area (i.e., polygon) representing a given sample*

point. This will provide relative risk information on an even smaller scale than AOC-by-AOC and can aid remedial decision-making. Areas driving risk can be easily visualized using the relative risk information on the maps.”

Use of Thiessen Polygon for hotspot analysis:

4. Feb 4, 2009 responses to DTSC comments – 2009 Revised RAWP Addendum

In response to DTSC’s statement that identification of hotspots by using Thiessen polygons will need to be approved prior to implementation, PG&E responded by stating, *“PG&E understands that changes to the exposure areas in order to refine risk estimate would best be accomplished through coordination with the regulatory agencies. Further, PG&E understands that identification of hotspots by using Thiessen polygons needs to be approved by the regulatory agencies prior to implementation.”*

5. Section 3.4 Hot Spot and Spatial Evaluation – 2015 RAWP Addendum 2

A general discussion on hot spot identification was provided. *“Hot spot analysis may be necessary to calculate a representative exposure point concentration with a dataset resulting from biased sampling. If a hot spot evaluation is warranted (e.g., concentrations and/or non-spatial EPCs exceed a risk-based screening level, or preliminary risk estimates indicate a potentially unacceptable risk influenced by potential outliers), the project team may use boxplots, probability plots, or geo-statistical tools to identify outliers (i.e., hot spots). If hot spots are identified, then spatial-weighting may be applied to sample concentrations when calculating EPCs. Not all instances of a non-spatial EPC exceeding a risk-based screening level will warrant hot spot evaluation. In some case, the exceedance may be small and may not result in a potentially unacceptable risk, and in those circumstances, hot spot evaluation and spatially-weighted EPCs would not be necessary to appropriately recommend areas for further evaluation in the feasibility study. Alternatively, spatially weighted EPCs may not be necessary if they are based on a relatively evenly distributed dataset containing many sample concentrations in excess of risk-based screening levels.”*

“The data will first be analyzed to determine if calculating a spatially weighted UCL is warranted. Data will be evaluated to determine if a hotspot is likely present and if sampling locations are biased toward the hot spot. Hot spots may be detected using [a] one or more means, including spatial mapping, exploratory graphical methods, or analytical outlier tests, as noted above. Spatially explicit (geostatistical) methods may also be used to identify hot spots.”

6. Appendix D Statistical Methods – 2015 RAWP Addendum 2

Aside from the non-spatial methods identified in Section 2.1, Appendix D provided discussion on various spatial weighting methods beyond Thiessen polygons as well as processing steps and decision framework to determine the best spatial weighting technique for a particular data set. In Section 4 of Appendix D, four steps were identified to determine the recommended spatial weighting method.

Observations

As agreed by regulatory agencies with Tribes and project stakeholders, PG&E held a meeting on August 16, 2017 to demonstrate and discuss the methodology to be used for EPC calculations. Subsequently, DTSC and the U.S. Department of Interior further discussed with PG&E the process for identifying hotspots, spatial-weighting and the use of “custom utilities” (or software coding) developed for automating EPC calculations. Based on these meetings, PG&E’s representatives maintained that the best course of action is to allow PG&E to fully develop the risk assessment report so that the information can be reviewed in totality.

This approach, however, appears to deviate from some of the agreements made in the RAWP and its addenda. As an example, DTSC’s understanding was that a predictive ERA would be conducted without spatial-weighting and that the RAWP’s concept of SMPD meetings after key evaluations would be followed. After the August and subsequent meetings, DTSC is now left with the impression that in cases where EPCs estimated using the standard approach (for both the human health and ecological receptors) are above screening levels, the area weighted averaging will be adopted as the primary method for estimating EPCs and that these are the only values that will be carried forward in the risk assessment. This approach is also a deviation from the agreement that spatially-weighted EPCs will be calculated only as a refinement when significant risks have been identified, and will be presented in addition to the standard approach. Furthermore, DTSC notes that PG&E has not provided supporting information for the selection of the Thiessen polygon method as outlined in Section 4 of Appendix D of the 2015 RAWP Addendum 2.

Directives

DTSC understands that PG&E’s risk assessors are already fully engaged in the EPC evaluations and proceeding with the risk assessment. To maintain an expedited risk evaluation and to document verbal discussions with stakeholders and the agencies, DTSC, hereby, directs PG&E to incorporate the following components to the currently planned risk assessment.

1. PG&E will continue to use depth-weighting approach for EPC calculations. However, PG&E shall calculate the EPCs with and without the use of spatial-

weighting as agreed to in the RAWP and provide discussion in an uncertainty analysis. EPC calculations without spatial-weighting should be conducted using USEPA's ProUCL software. The non-spatially weighted EPCs shall be carried forward in the risk assessment. If PG&E refines the risk evaluation using spatially weighted EPCs, PG&E shall provide adequate justification for its use and provide discussion in the uncertainty section of the report.

2. PG&E shall calculate cancer risks and non-cancer hazards for potential human receptors for each individually identified AOC outside the Topock Compressor Station (TCS). Risk assessments for exposure areas with combined AOCs for human receptors may be included. However, the rationale for this evaluation should be clearly stated. In some situations, simply combining multiple AOCs together may not be appropriate, as there may be physical barriers or other features that may prevent easy access or movement of receptors from one AOC to another. The calculated risk/hazard differences, if any, between a combined and individual AOC evaluation approach, should be discussed in the uncertainty section of the risk assessment. The AOC by AOC evaluations for human and small home range receptors will provide further understanding to assist agencies in risk management decisions.
3. DTSC agrees with the proposed ERA exposure areas except for the large home range receptors (e.g. Red-tailed Hawk, desert Kit Fox, and Big Horn Sheep). In addition to the risk evaluation as proposed in the RAWP and its addenda which separates "BCW and AOC4" from area "Outside the TCS," PG&E shall evaluate risk to the large home range receptors for the entire site (except the TCS) as one exposure area.
4. PG&E shall continue to evaluate the Bat Cave Wash (AOC-1) as indicated in the RAWP and its addenda. However, PG&E shall also carve out SWMU-1/TCS-4 from the rest of the Bat Cave Wash (BCW) as a separate exposure unit. PG&E will evaluate the Bat Cave Wash and the SWMU-1/TCS-4 exposure units for worker, recreational, and tribal use scenarios. Bat Cave Wash area north of the railroad will also be evaluated for residential use scenario, except for land owned by FMIT. In addition, PG&E shall also evaluate the mouth of Bat Cave Wash tamarisk thicket area for the small home range ecological receptors in the ecological risk assessment.
5. PG&E shall first screen each AOCs for hotspots using non-spatial-weighting and statistical outlier approaches as outlined in Section 2.1 of the 2015 Addendum 2. PG&E can further evaluate data to confirm hotspots by spatial-weighting techniques if necessary.

DTSC believes that the additional risk evaluation steps as directed above will ultimately provide transparency to the risk assessors to fully review the risk assessment report and provide useful information to the risk managers on the final disposition of the land

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based on the various future use scenarios. Since these refinements to the current risk assessment work plan are considered industry standard practices, it is not necessary for PG&E to revise the existing and approved risk assessment work plan or its addenda.

DTSC acknowledges that the incorporation of these calculations will necessitate additional time to prepare the draft risk assessment report; however, DTSC does not support PG&E's proposal to submit the Report on June 29, 2018. DTSC requests PG&E to explore possible solutions and submit a draft risk assessment to the agencies by April 30, 2018.

If you have any questions regarding DTSC's directives identified above, please feel free to contact me or Ms. Karen Baker, Branch Chief of Office Geology.

Sincerely,



Aaron Yue
Project Manager
Office of Geology
Department of Toxic Substances Control

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cc: PG&E Topock Consultative Workgroup Members
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