**Question from party:** Could staff provide a detailed explanation of the proposed methodology elaborating on the section 4 of Attachment B? For example, how would EPA emissions data be used to generate plant specific emissions curve and how would those curves be applied to hourly dispatch data from PCM?

**Response:**

In the next cycle of IRP, staff proposes to perform the following steps to quantify criteria pollutants emissions.

**Step 1: Gather data.**

Staff will gather data from these two sources.

1. Hourly dispatch by generating unit. This is an output of the SERVM production cost model.
2. Publicly available emissions data from the EPA showing different emissions factors at different levels of plant operation, available at ftp://newftp.epa.gov/DMDnLoad/emissions/hourly/monthly/2018/

 **Step 2: Programmatically fit a curve to each power plant**

Staff plans to use the emissions data (item 2 above) to programmatically estimate a best-fit curve for each plant using the Python programming language (specifically, the Pandas, Numpy, and Scipy packages). This curve will show the relationship between emissions rates (lbs Nox / mmbtu of fuel burn) versus operating level (% of nameplate MW).

Note that different plants have different emissions profiles, and staff will examine various ways of curve fitting to determine the most appropriate curve per plant. A sample plot is provided below, showing that a quadratic curve provides an accurate description of this particular plant’s (Moss Landing’s) emissions data. However, as each plant has its own emissions profile, staff will also investigate other curve fitting types, as appropriate (log-transform, etc).

The output of this step is, by plant, an emissions curve (e.g. the red line above) showing the relationship between emissions rates and operating level.

**Step 3: Use the curves estimated in Step 2 to estimate emissions by plant**

Staff will then apply the equation for each curve to the SERVM dispatch data. The result is an estimate of emissions by plant based on projected operation of the system.