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Mr. Tom Skibitski
New Mexico Environment Department
DOE Oversight Bureau
P.O. Box 5400 MS 1396
Albuquerque, NM 87185-5400

RE: Comments Regarding Sampling and Analysis Plan (SAP) for Regional PCB Project on the Upper Rio Grande Watershed

Dear Mr. Skibitski,

Los Alamos National Security, LLC, has reviewed the draft Sampling and Analysis Plan (SAP) for Regional PCB Project on the Upper Rio Grande Watershed (Plan), prepared by the New Mexico Environment Department (NMED) Department of Energy Oversight Bureau (hereafter, the Bureau) and other NMED personnel (dated June 27, 2008). The objective of the investigation plan is to determine the regional spatial variability of polychlorinated biphenyl (PCB) concentrations in surface water from the Rio Grande and its tributaries around the Los Alamos National Laboratory (the Laboratory).

The Laboratory appreciates the opportunity to comment on the draft SAP and acknowledges the initiative NMED has taken to develop this SAP. The Laboratory has an interest in this matter because of the need to identify PCB sources that may require best management practices (BMPs) to protect the quality of receiving water. The purpose of this letter is to express the Laboratory's interest in providing additional resources to support this project.

Our goal is to ensure that sufficient, meaningful data are obtained and that the data and results can be used to prioritize BMP enhancements and other management actions. The Laboratory would be receptive to removing or controlling contaminant discharges from sites where contamination is known to exist. Characterizing background is an essential first step in the cleanup of site contamination.

The Laboratory is willing to provide additional resources to collect samples for analysis to further the goals of NMED's draft SAP. In addition, the Laboratory offers general comments on the following areas:

1. Linking monitoring activities to management questions
2. Including additional quality assurance (QA) samples (e.g., more blanks, replicates)
3. Providing details about collecting precipitation and snowpack samples and collecting additional samples
4. Augmenting soil and sediment samples to characterize the potential reservoir of PCBs at background locations
5. Specifying approaches to measuring flow and data quality objectives (DQOs) for flow

Each of these areas is discussed below. The additional monitoring proposed above is necessary to address the management questions framed by NMED in the draft SAP.

Linking monitoring activities to management questions
Monitoring studies should be designed to answer specific management questions. At the conclusion of Section 1.0 of the draft SAP, NMED posed the following management questions:

1. When measuring at these low levels [made possible by using method 1668A], is there a concentration for PCBs in surface water at "background" locations that is necessary to understand and interpret PCB measurements associated with present or historical LANL operations?
2. Do the levels of PCBs found in precipitation account for a significant portion of total PCBs found in storm water runoff?
3. What concentrations of PCBs are to be expected in the Rio Grande and its tributaries and can we evaluate PCB analytical results found in LANL tributaries in a broader regional context?
4. Are there correlations between total PCBs, suspended sediment concentration, particle size, and total organic carbon in storm water found at "background" locations?

The Laboratory supports these management questions posed by NMED as foundational to the study design. However, the proposed assessment may not completely address the management questions, and other important management questions may be missing. Furthermore, it should be noted that the first two bullets at the end of Section 1.0 are not management questions but rather are operating principles. We also suggest setting apart from the four management questions posed above the statement that all participants have agreed on the need to evaluate local and regional contributions and that NMED believes Method 1668A to be the appropriate analytical technique.

Section 3.2.1 (Station Locations) posits the goal of the study: to select five to eight ephemeral station locations along the north and northeast watersheds of the Jemez Mountains to approximate the geology and geography of watersheds at the Laboratory. The goal of these activities is to collect data that will be used as a background set to evaluate watershed discharges at the Laboratory. The Laboratory would like to support, and to participate in, this part of the study by making available to the Bureau existing data and staff knowledge to help ensure that the selected sampling locations and data represent conditions that are sufficiently similar to those at the Laboratory.

Later in the draft SAP, in Section 3.2.4 (Flow Measurements), an implied management question appears with respect to load-duration curves and total maximum daily load (TMDL) allocations. While load-duration curves and TMDL allocations may be important to studies in the near future, they appear to be beyond the scope of a regional assessment. Recognizing the importance of flow in watershed management, we suggest including this management question:

- What are the typical flow regimes of streams sampled, and how do stream flows and PCB concentrations respond to rainfall events and annual snowmelt?

In addition, the Laboratory recommends including and addressing the following management question so other pollutants that should have regional background characterizations can be addressed more efficiently:

- Do any background concentrations of trace metals, aluminum and gross alpha need to be evaluated to understand and interpret these constituent measurements associated with present or historical LANL operations?

The additional comments below propose reflect specific suggestions and details that may help to address the above management questions through the proposed monitoring.

Including additional QA samples (e.g., more blanks, replicates)
The total number of QA samples proposed may not be adequate for Method 1668A, a fairly recent method not yet promulgated or fully validated by U.S. Environmental Protection Agency (EPA) protocols for compliance monitoring. The Laboratory proposes working with Bureau staff to develop a robust sampling QA/quality control (QC) regime to meet the needs of both parties. An enhanced QA/QC plan will address procedural blank and sample preservation and number and type of QA/QC samples collected.

Providing details about collecting precipitation and snowpack samples and additional sampling
The draft SAP calls for eight snowpack samples and eight precipitation samples (Table 3.2 of the SAP); however, the sampling locations and methods were not specified. The Laboratory will work the Bureau to develop a robust precipitation sampling regime to meet the needs of both agencies. Sampling methods and locations should be identified jointly to satisfy the goals of the project. In previous comment letters, we have provided literature citations for studies that characterize PCB concentrations in rainwater and snow. Table 1 below summarizes references we have identified. We are happy to share these journal articles, as well as our PCB citations database and any other new references identified, to help refine the details of sample collection for rainwater and snowpack.

Table 1. References to studies included in Figure 1

Location	Citation
Heraklion, Greece, rainwater	(Mandalakis and Stephanou, 2004)
Green Bay, Wisconsin, rainwater	(Franz and Eisenreich, 1993)
Southern Sweden rainwater	(Backe et al., 2002)
Paris, France, rainwater	(Teil et al., 2004)
Chicago, Illinois, rainwater	(Offenberg and Baker, 1997)
Canadian Arctic Snow	(Gregor and Gummer, 1989)

Augmenting soil and sediment samples to characterize background
The Laboratory has observed that single-stage samplers tend to collect relatively high amounts of suspended sediments. High and variable concentrations of total suspended solids (TSS) may confound a proper assessment of background. Because PCBs preferentially associate with particles, samples with high TSS are expected to have high total PCB concentrations as well. To control for this effect and to predict background PCB concentrations in the water column under a range of TSS concentrations, it is essential to characterize the background soil and sediment concentrations of PCBs in watershed areas on the Pajarito Plateau and upstream of the Laboratory. To that end, the Laboratory is willing to augment soil and sediment sample collection to better understand background soil and sediment concentrations of PCBs. We propose using existing data and Laboratory staff expertise to help determine the locations and number of samples that would benefit the project. The Laboratory suggests it may be more cost and time efficient to collect these constituents concurrently with other analytes, such as aluminum, selenium, and gross alpha, that have background concentrations that also should be characterized to set priorities for management actions.

Specifying flow measurement techniques and DQOs
If flow data are critical to the study for the above objective, the SAP should include details of sample collection, methods, and QA for all the proposed sampling locations.

It may take a year or more to develop rating curves for unrated streams, especially for ephemeral tributaries. Instruments such as the Level Troll and ISCO 4230 (not called for in study design) measure only stage height, which must be converted to calculated/estimated discharge from either a site specific rating curve, Manning formula, or primary device (e.g., a weir, a flume). The Laboratory is interested in additional

information on the Mecklenburg method referred to the SAP and is willing to provide assistance with the task of researching the method.

Additional recommendations
The Bureau should consider including a discussion of how the sampling sites were selected and their location in the watershed in relation to Los Alamos County and the Laboratory. This information will clarify how and why the sampling locations and methods were selected. In Table 3.1, at least 12 ephemeral sampling locations have not been specified.

Single-stage samplers can be viewed as a compromise method that provides no control of or feedback about key sample collection factors (e.g., enable time, sample duration, time stamp). Because of the potential for high bias from suspended sediments, the Bureau may want to consider conducting side-by-side/concurrent sampling using both single-stage and auto samplers with intakes higher in the water column. As proposed, sampling during the first 30 minutes may not be sufficient to evaluate load durations and to develop TMDL allocations because the PCB concentrations may vary during the course of a storm event. Collecting flow-weighted composites or a series of samples across the hydrograph may be preferable, especially the latter.

In the SAP, the distinction between "storm water" and receiving water, such as the Rio Grande, needs to be made clearer. The plan calls for sampling in locations that appear to be receiving waters. Stormwater discharges are distinct from receiving waters. "Wet-weather flows" or "storm flows" may be a more appropriate term to use in the SAP. To be most comparable to stormwater samples collected at the Laboratory, actual stormwater discharge sampling (before the stormwater mixes with waters of the state) should be conducted.

Conclusions and next steps
In conclusion, the Laboratory fully supports the intent of the SAP as proposed, with minor refinements to the underlying management questions, and acknowledges that a greater level of effort will be required to adequately answer management questions.

The greater effort will necessarily result in higher costs. The Laboratory is willing to provide the labor and financial resources necessary to achieve the proposed higher level of effort. This support will allow more rapid progress towards answering questions that are critical to informed decision making related to PCBs and other pollutants.

As a next step, we propose meeting with your staff to discuss some of the issues identified above, refine the SAP, and develop a detailed schedule and estimate of the labor and analytical costs required. We would be happy to discuss any of these issues and respond to any questions you may have about the proposed refinements.

If you have any questions, please contact Steve Veenis at (505) 667-0013 (veenis@lanl.gov).

Sincerely,

Steve Veenis

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